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**CDC® 7155 DISK STORAGE SUBSYSTEM**  
**7155 DISK STORAGE CONTROLLER**  
**844-4X DOUBLE DENSITY DISK STORAGE UNIT**  
**885 DISK STORAGE UNIT**

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**REFERENCE MANUAL**

# REVISION RECORD

| REVISION                    | DESCRIPTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A<br>(12-29-78)             | Manual released.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| B<br>(04-11-80)             | Manual revised; includes Engineering Change Order 41159. Pages 30C5 (1-4), 30C6 (1-5), 30C7 (1-6), 31B3 (3-2), 31C7 (3-10), 31D1 (3-18), 31E3 (3-30), 31F1 (A-1), 31F3 (B-1), and 31H2 (D-2) are revised.                                                                                                                                                                                                                                                                                        |
| C<br>(06-27-80)             | Manual revised; includes Engineering Change Order 41289, publications change only. Pages 31B5 (3-4), 31D14 (3-27), and 31F4 (B-2) are revised.                                                                                                                                                                                                                                                                                                                                                   |
| D<br>(10-17-80)             | Manual revised; includes Field Change Order 41463. Pages 31C1/C2 (3-7), 31C3/C4 (3-8), 31C5/C6 (3-9), 31C7 (3-10), 31C9 (3-12), 31C14 (3-17), 31D8 (3-21), and 31D10 (3-23) are revised. Page 31C8 (3-10.1/3-10.2) is added.                                                                                                                                                                                                                                                                     |
| E<br>(04-07-81)             | Manual revised; includes Field Change Order 41917. Pages 30C2 (1-1), 30C4 (1-3), 30C7 (1-6), 30D2 (2-1), 31B3 (3-2), 31B4 (3-3), 31C3/C4 (3-8), 31D2 (3-17), 31D3 (3-18), 31E4 (3-29), 31E5 (3-30), 31F3 (B-1), and 31G4 (C-4) are revised.                                                                                                                                                                                                                                                      |
| F<br>(11-20-81)             | Manual revised; includes Engineering Change Order 42819. Pages 30D2 (2-1), 31B3 (3-2), 31B4 (3-3), 31B6 (3-5), 31B7 (3-6), 31C1/C2 (3-7), 31C3/C4 (3-8), 31C5/C6 (3-9), 31C7/C8 (3-10), 31C11 (3-12), 31D2 (3-17), 31D3 (3-18), 31D5/D6 (3-19), 31D7/D8 (3-20), 31D10 (3-21), 31D11 (3-22), 31D12 (3-23), 31D13 (3-24), 31D14 (3-25), 31E1 (3-26), 31E2 (3-27), 31E3 (3-28), 31E4 (3-29), 31E5 (3-30), 31H2 (D-2), and 30-31H12/H13/H14 are revised. Pages 31E6 (3-31), 31E7 (3-32) are deleted. |
| G<br>(06-14-82)             | Manual revised; includes Engineering Change Order 43562. Pages 30C7 (1-6), 30D2 (2-1), 30D5 (2-4), 31B6 (3-3), 31B10 (3-7), 31C5/C6 (3-10), 31D2 through 31D5 (3-17 through 3-20), 31D9 (3-24), 31D10 (3-25), 31F3 (B-1), 31G3 (C-3), and 31G4 (C-4) are revised.                                                                                                                                                                                                                                |
| H<br>(02-01-83)             | Manual revised; includes Field Change Order 43605. Pages 30C7 (1-6), 31B7 (3-4), 31D11 (3-26), and 31E1 (3-28) are revised.                                                                                                                                                                                                                                                                                                                                                                      |
| J<br>(07-29-83)             | Manual revised; includes Field Change Order 44698. Pages 30-31 B7/B8, 30-31 H12 (Contents), 30-31 H13/H14 (Index-1), 31B3 (3-2), 31B4 (3-2.1), 31B7 (3-4), 31C5/C6 (3-10), 31D1 (3-16), 31D12 through 31E3 (3-27 through 3-30), 31F3 (B-1), and 31F4 (B-2) are revised.                                                                                                                                                                                                                          |
| K<br>(09-02-83)             | Manual revised, includes Engineering Change Order 44807. Page 30/B5 (v/vi) is revised.                                                                                                                                                                                                                                                                                                                                                                                                           |
| L<br>(02-14-85)             | Manual revised; includes Field Change Order 46696. Pages 30-31B6 through B9, 30-31H11/H12 (Contents), 30C2 (1-1), 30C3 (1-2), 30C6 (1-5), 30C7 (1-6), 31B5 (3-2.2), 31B6 (3-3), 31B7 (3-4), 31B5/B6 (3-10), 31D2 (3-17), 31D4 (3-19), 31F3 (B-1), 31F4 (B-2), and 31F7 (B-5) are revised. Pages 30B6 (vi), 31E4 (3-31), and 31F8 (B-6) are added.                                                                                                                                                |
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or use Comment Sheet in the back of this manual.

## LIST OF EFFECTIVE PAGES

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## PREFACE

This manual contains operation and programming information for the CDC® 7155 Disk Storage Subsystem, which provides mass storage for large Control Data computers. The manual is written for computer operators and for system programmers who generate or maintain peripheral processor-resident programs that drive the 7155 subsystem.

The following Control Data products are used in 7155 subsystems.

| <u>Product</u> | <u>Nomenclature</u>                            |
|----------------|------------------------------------------------|
| 7155-1         | Single-access disk storage controller          |
| 7155-11        | Single-access disk storage controller          |
| 7155-12        | Two-access disk storage controller             |
| 7155-13        | Three-access disk storage controller           |
| 7155-14        | Four-access disk storage controller            |
| 844-41         | Two-channel disk storage unit                  |
| 844-44         | Four-channel disk storage unit                 |
| 883-60         | Disk pack for 844-4X                           |
| 885-11         | Single-channel disk storage unit               |
| 885-12         | Two-channel disk storage unit                  |
| 10396-1        | Second channel for 885-11                      |
| 10397-1        | Additional access for 7155-1/11/12/13          |
| 10398-1        | 844-4X interface for<br>7155-1/11/12/13/14     |
| 10399-1        | Second 885 interface for<br>7155-1/11/12/13/14 |
| 65290          | Large sector hardware option<br>7155-1/2/3/4   |

### RELATED PUBLICATIONS

The following manuals contain information applicable to the 7155 subsystem.

| <u>Control Data Publication</u>                                                   | <u>Publication Number</u> |
|-----------------------------------------------------------------------------------|---------------------------|
| CYBER 70 Models 72/73/74, 6000<br>Computer Systems Input/Output<br>Specifications | 60352500                  |
| CYBER 170 Models 171 through 175<br>Computer Systems Hardware Reference<br>Manual | 60420000                  |
| 7155 Operator Maintenance Guide                                                   | 60456650                  |
| FA211 Disk Controller Hardware<br>Maintenance Manual†                             | 60455690                  |

### CONVENTIONS

The following conventions are used in this manual.

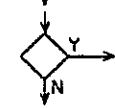
- All numbers are decimal unless another base is indicated.
- Bits are numbered from right to left, beginning with 0. Thus, the number of a bit indicates its power of two.
- Flowchart symbols are:



Entry/exit point



Processing



Decision; Y represents yes and N represents no

- Logical zero and logical one are abbreviated 0 and 1, respectively.

### DISCLAIMER

The 7155 subsystem is intended for use only as described in this manual. Control Data cannot be responsible for the proper functioning of undescribed functions or parameters.

†The controller hardware maintenance manual references other hardware maintenance manuals associated with the 7155 subsystem.

**WARNING**

This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, will cause interference to radio communications. This equipment has been tested with a Class A computing devices and has been found to comply with Part 15 of the FCC Rules which are designed to provide reasonable protection against such interference. Operation of this equipment in a residential area may cause unacceptable interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

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The 7155 Disk Storage Subsystem provides random-access mass storage for CDC 6000 series, CDC CYBER 70 model 72, 73, 74 and CDC CYBER 170 series computers. A peripheral processor (PP) channel provides the computer/subsystem connection. Besides incorporating features of the 7154 Disk Storage Subsystem, the 7155 subsystem also:

- Enables use of high-capacity, high-speed, fixed media CDC 885 Disk Storage Units along with removeable-media CDC 844-4X Double Density Disk Storage Units.
- Allows data to be transferred between PP and 7155 Disk Storage Controller (controller) at the maximum PP channel rate.
- Incorporates simplified design and enhanced diagnostic capability to improve subsystem reliability.

This section provides hardware descriptions, configuration examples, storage theory, and functional specifications applicable to the 7155 subsystem. Refer to the glossary (appendix A) for definitions of terms used in this manual.

**HARDWARE**

Figures 1-1 through 1-3 show the controller and disk storage units used in 7155 subsystems. A subsystem may contain one or more controllers, one to eight 844-4X Double Density Disk Storage Units (844 drives) per controller, and one to eight 885 Disk Storage Units per controller. Each 885 Disk Storage Unit contains two 885 drives, so two to 16 885 drives may attach to one controller.

**NOTE**

Within this manual, the term drive refers to either type of drive. The specific terms 844 drive and 885 drive appear in statements that apply to one type of drive only.

**CONTROLLER**

The controller is a programmable device that provides overall subsystem control. Before use, the controller must be initialized as described in section 2. Figure 1-4 shows the following controller elements.

| <u>Element</u>          | <u>Description</u>                                                                                                                                                                                                                                                                                             |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PP access               | Provides connection between one PP channel and access control.                                                                                                                                                                                                                                                 |
| Access control          | Determines PP access to be connected. Establishes data path between connected access and buffer. Establishes control path between connected access and processor channels.                                                                                                                                     |
| Processor               | Executes controlware to provide functions described in section 3. Controlware includes code stored in read-only memory (ROM) portion and random access memory (RAM) portion of processor memory. Refer to controller hardware maintenance manual listed in the preface for processor instruction descriptions. |
| Processor memory †      | Contains 7K or 9K words of 16-bit-per-word storage. Includes 1K ROM and 4K RAM for controlware storage, and 2K or 4K buffer†† for data transfer operations.                                                                                                                                                    |
| Processor channels      | Provide control/status paths between processor and access control and between processor and data format/error correction code (ECC) control. Also provide block transfer path for autoloading/autodump operations.                                                                                             |
| Data format/ECC control | Generates/detects write/read and cyclic redundancy code (CRC) patterns.                                                                                                                                                                                                                                        |
| 885 drive interface     | Provides connection between data format/ECC control and two to eight 885 drives.                                                                                                                                                                                                                               |
| 844 drive interface     | Provides connection between data format/ECC control and one to eight 844 drives.                                                                                                                                                                                                                               |

The basic controller has one PP access and a drive interface that accommodates two to eight 885 drives. The following three options allow connection of additional PP channels and drives to the controller. The last option allows NOS/VE to run on an FA211-A.

†1 K = 1024

††The 7155-1 Disk Storage Controller has a 2K buffer and the 7155-11/12/13/14 Disk Storage Controllers have a 4K buffer.

Standard Option

Description

- 10397-1 Adds one PP access to controller. Maximum number of PP access per controller is four.
- 10398-1 Expands drive interface to allow connection of one to eight 844 drives.
- 10399-1 Expands drive interface to allow connection of additional two to eight 885 drives.
- 65290-1 Allows the FA211-A to run serial large sector mode on 885 drives.

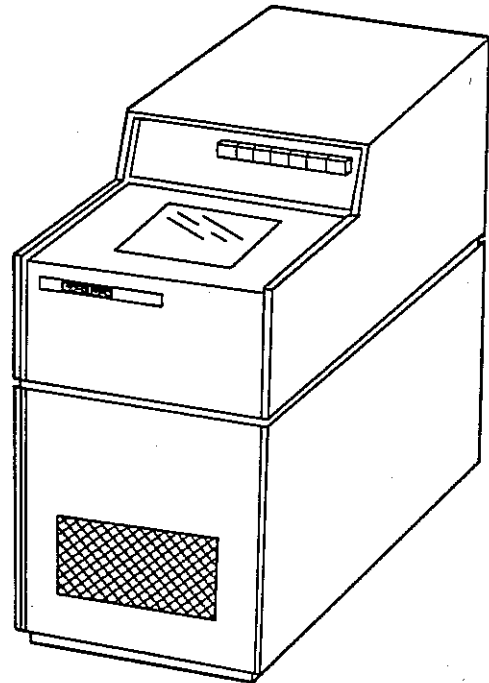


Figure 1-2. 844-4x Double Density Disk Storage Unit

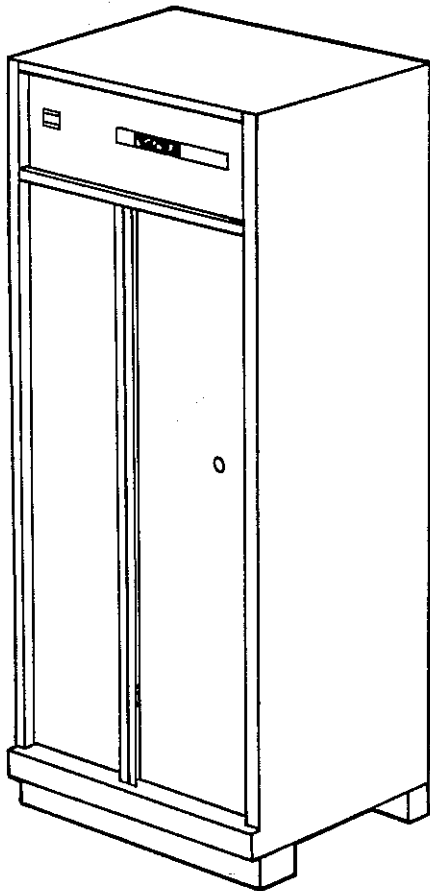


Figure 1-1. 7155 Disk Storage Controller

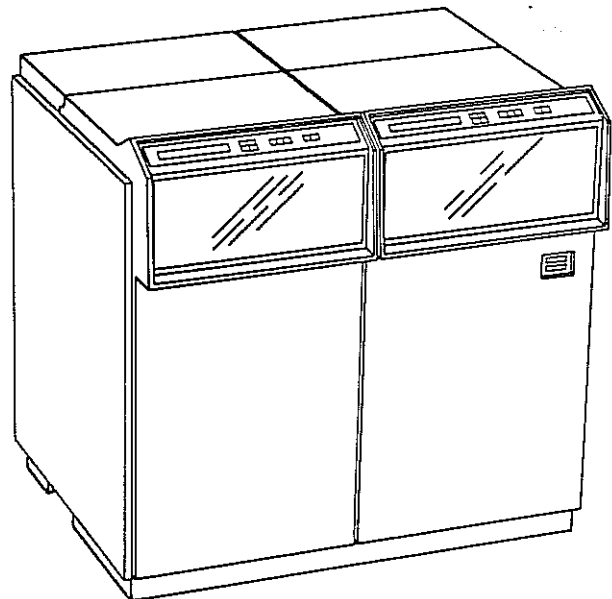
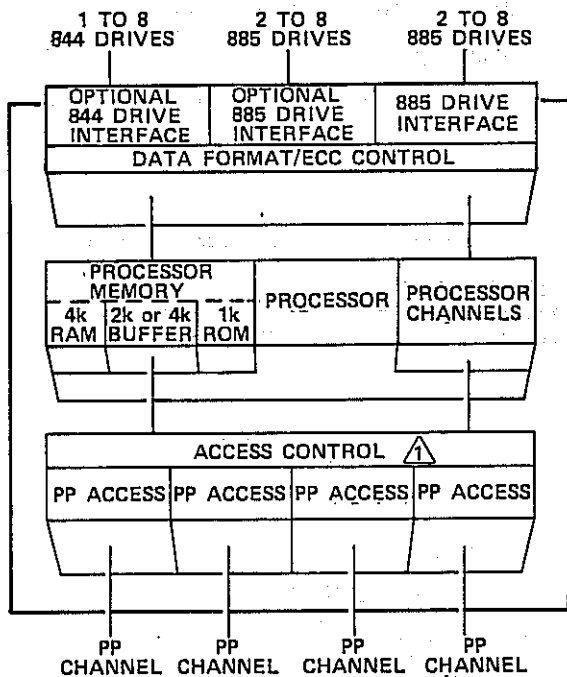


Figure 1-3. 885 Disk Storage Unit



⚠ The controller has from one to four PP accesses, depending upon the model and options. Refer to the preface for product information.

Figure 1-4. Controller Functional Elements

## DRIVES

Although they differ in physical appearance, data transfer rates, and data capacity, the 844 drive and the 885 drive each contain the functional elements shown in figure 1-5 and described briefly as follows:

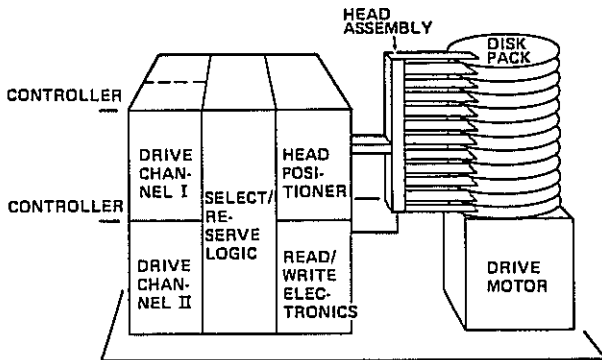


Figure 1-5. Drive Functional Elements

† 885 drive combines head assembly and disk pack in unit called head/disk assembly (HDA).

| Element                | Description                                                                                                                                                                                                                                                                  |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Drive channel          | Connects select/reserve logic with one set of controller/drive interface lines. 844-41, 844-44, 885-11, and 885-12 drives have two, four, one, and two drive channels each, respectively. Standard option 10396-1 adds second drive channel to each drive in 885-11 cabinet. |
| Select/reserve logic   | Determines drive channel to be connected. Controls head positioner and read/write electronics in response to controller commands.                                                                                                                                            |
| Head positioner        | Positions head assembly to disk pack cylinder specified by controller commands.                                                                                                                                                                                              |
| Read/write electronics | Translates digital data waveforms to write current and read current to digital data waveforms.                                                                                                                                                                               |
| Head assembly†         | Contains several read/write heads, each of which translates current to magnetic flux changes on rotating disk pack, and vice versa.                                                                                                                                          |
| Disk pack†             | Provides surfaces for recording data as magnetic flux changes.                                                                                                                                                                                                               |
| Drive motor            | Rotates disk pack.                                                                                                                                                                                                                                                           |

## CONFIGURATIONS

Figures 1-6 and 1-7 show minimum and large 7155 subsystem configurations, respectively.

## STORAGE THEORY

All rotating magnetic data storage devices apply the principle that electric current flowing near a recording medium changes the magnetic flux of the medium. Conversely, when motion exists between a conductor and a nearby medium containing magnetic flux changes, current flows in the conductor.

For a drive, the conductor is a read/write head and the medium is a disk pack. The drive's read/write electronics convert data to write current, and extract data from detected read current.

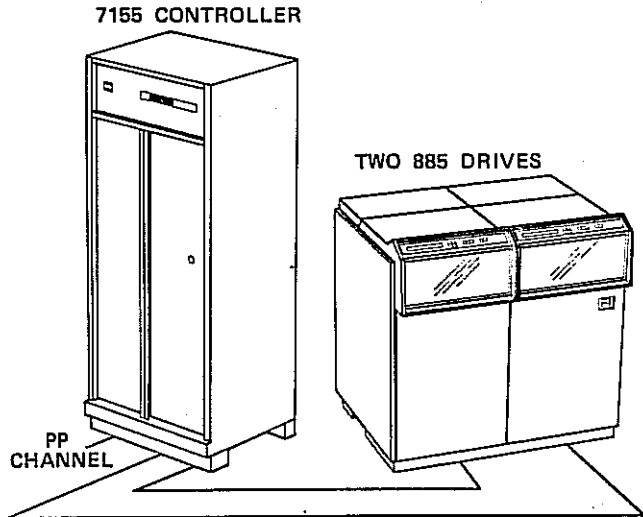


Figure 1-6. Minimum 7155 Subsystem

### DATA ORGANIZATION

As a disk pack rotates, current-induced flux changes trace a circular path around the disk. These flux changes are grouped into sectors, tracks, and cylinders.

- A sector is an arc of contiguous flux changes traced by a head.
- A track is the circle of flux changes traced by a head at one head position.
- A cylinder is all of the tracks at one head position.

A complete disk address consists of a cylinder number, a track number, and a sector number. Figure 1-8 shows the relationship of sector, track, and cylinder.

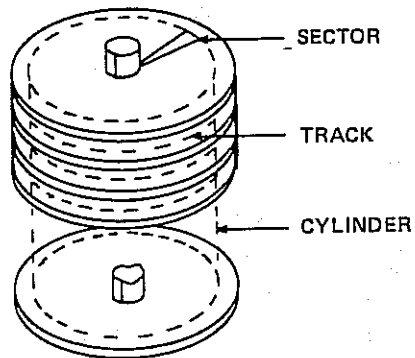


Figure 1-8. Data Organization

### SECTOR FORMAT

Figure 1-9 shows the fields within 844 and 885 sectors. Table 3-5 lists the number of bits in each field. Field descriptions are as follows.

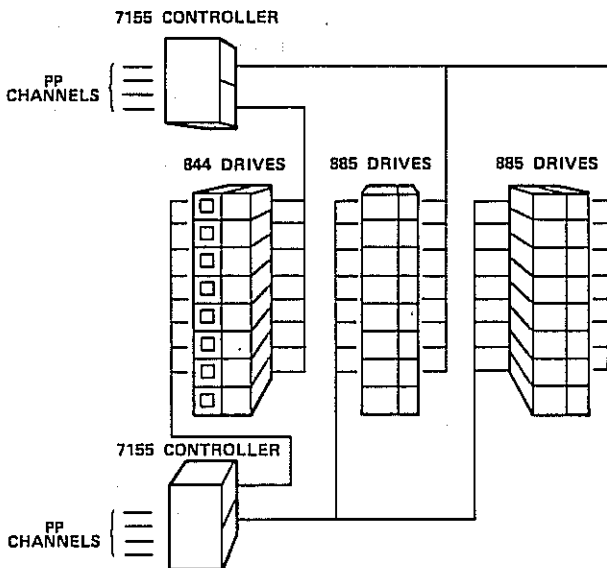


Figure 1-7. Large 7155 Subsystem

| <u>Field</u>                            | <u>Description</u>                                                                                                                            |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| Sync pattern/byte 1                     | Synchronizes drive read electronics with first bit of address field.                                                                          |
| Address field/checkword                 | Provides disk address and flaw information for sector. Checkword is code used to detect (and in some cases correct) error in preceding field. |
| Sync pattern/byte 2                     | Synchronizes drive read electronics with first bit of data field.                                                                             |
| Data field/checkword/end-of-record byte | Contains 322 (344 in 885 Large Sector Mode) 12-bit words of data, associated checkword, and end-of-record byte.                               |
| Tolerance gap                           | Accommodates minor head displacement and satisfies control-ware overhead requirements.                                                        |

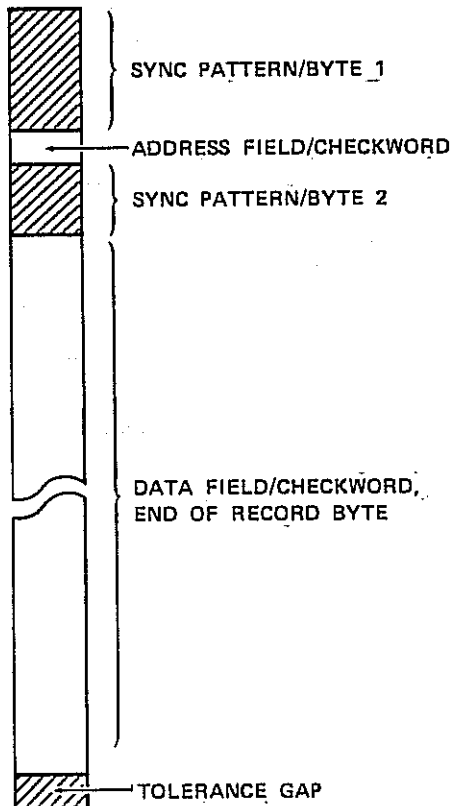


Figure 1-9. Sector Format

## INTERLACING

High subsystem data transfer rates may result in less time between consecutive sectors than is required for PP program overhead. To prevent lost disk revolutions caused by this type of conflict, the 7155 subsystem retains the variable interlace capability of earlier subsystems.

Interlace is the ratio of number of sectors, processed to number of sectors actually passing the head. Thus, a 1:1 interlace operation processes every sector passing the head and a 2:1 interlace operation processes every other sector passing the head.

For a given cylinder, a 2:1 interlace operation processes all even-numbered sectors before processing odd-numbered sectors.

The seek function preceding an operation establishes the interlace for the operation. Gap sector functions issued during an operation can change the interlace to 3:1 (from 1:1) or 4:1 (from 2:1) on a sector-to-sector basis.

All interlaces except 1:1 require more than one disk revolution to process all sectors on a track.

## TYPICAL OPERATION

A PP performs an operation (such as a read or a write) by issuing a series of functions to the controller. The following sequence shows functions used by a PP during a typical read operation.

| <u>Activity</u>                                                   | <u>Function(s)</u>              |
|-------------------------------------------------------------------|---------------------------------|
| Connect controller and check subsystem status                     | General status, detailed status |
| Establish interlace, reserve drive, and initiate head positioning | Seek                            |
| Wait for drive to become on-cylinder                              | General status, seek            |
| Transfer data from drive to controller to PP                      | Read                            |
| Check for read errors                                             | General status, detailed status |
| Release controller and drive                                      | Operation complete              |

## FUNCTIONAL SPECIFICATIONS

Tables 1-1 through 1-4 provide data capacities and functional specifications for 844 and 885 drives. The only functional specification applicable to the controller is the maximum transfer rate between the controller and a PP, which is  $5.88 \times 10^6$  12-bit words/second. Although the controller is able to transfer data up to 5.88 MHz, a PP is able to transfer data at only 1 MHz or 2 MHz.

TABLE 1-1. 844 DRIVE DATA CAPACITY †

| Number of    | Per    |       |          |             |
|--------------|--------|-------|----------|-------------|
|              | Sector | Track | Cylinder | Disk Pack   |
| 12-bit words | 322    | 7 728 | 146 832  | 120 402 240 |
| Sectors      | 1      | 24    | 456      | 373 920     |
| Tracks       | -      | 1     | 19       | 15 580      |
| Cylinders    | -      | -     | 1        | 820         |

TABLE 1-2. 885 DRIVE DATA CAPACITY †

| Number of    | Per    |        |          |             |
|--------------|--------|--------|----------|-------------|
|              | Sector | Track  | Cylinder | Disk Pack   |
| 12-bit words | 322    | 10 304 | 412 160  | 346 626 560 |
| Sectors      | 1      | 32     | 1 280    | 1 076 480   |
| Tracks       | -      | 1      | 40       | 33 640      |
| Cylinders    | -      | -      | 1        | 841         |

TABLE 1-3. 885 LARGE SECTOR MODE DRIVE DATA CAPACITY †

| Number of    | Per    |        |          |             |
|--------------|--------|--------|----------|-------------|
|              | Sector | Track  | Cylinder | Disk Pack   |
| 12-bit words | 1376   | 11 008 | 440 320  | 370 309 120 |
| Sectors      | 1      | 8      | 320      | 269 120     |
| Tracks       | -      | -      | 40       | 33 640      |
| Cylinders    | -      | -      | -        | 841         |

† Does not include cylinders reserved for maintenance purposes.

TABLE 1-4. DRIVE FUNCTIONAL SPECIFICATIONS

| Characteristic                 | Value                          |                                |
|--------------------------------|--------------------------------|--------------------------------|
|                                | 844 Drive                      | 885 Drive                      |
| Maximum seek time              | 55 milliseconds                | 50 milliseconds                |
| Average seek time              | 30 milliseconds                | 25 milliseconds                |
| Cylinder-to-cylinder seek time | 10 milliseconds                | 10 milliseconds                |
| Nominal disk revolution time   | 16.7 milliseconds              | 16.7 milliseconds              |
| Transfer rate                  | $6.45 \times 10^6$ bits/second | $9.58 \times 10^6$ bits/second |

Table 1-5 lists average data transfer rates for one or more tracks of data. The 1:1 interlace rates are determined by dividing track data capacity by the nominal disk revolution time. Rates for 2:1 interlace are half those for 1:1 interlace since only half of a track's data transfers per revolution during a 2:1 interlace transfer.

TABLE 1-5. AVERAGE DATA TRANSFER RATES

| Drive | Interlace | Average Data Transfer Rate (12-bit words/second) |
|-------|-----------|--------------------------------------------------|
| 844   | 1:1       | $4.63 \times 10^5$                               |
|       | 2:1       | $2.31 \times 10^5$                               |
| 885   | 1:1       | $6.17 \times 10^5$                               |
|       | 2:1       | $3.09 \times 10^5$                               |

This section describes operator switches/indicators for each subsystem equipment and provides procedures for typical operator tasks.

**SWITCHES/INDICATORS**

Figures 2-1 through 2-3 show the locations of subsystem operator switches/indicators. Tables 2-1 through 2-3 describe switch/indicator functions.

**OPERATING PROCEDURES**

Although subsystem operator intervention is infrequent and determined by site configuration, the following paragraphs provide general guidelines for typical operator tasks.

**SUBSYSTEM POWER CONTROL**

Each controller and drive contains power sequence circuitry that regulates initial subsystem electrical load. This circuitry allows power feeding the entire subsystem to be controlled from a single power control box. At installation time, a customer engineer performs the cable routing and switch setting required for power sequencing. Thereafter, the operator normally controls subsystem power from the power control box.

Once power has been applied, the subsystem is ready for operation when the READY indicator lights on the last drive to receive power. The operator can turn a single drive off or on with the drive's START switch. Removing logic power from a controller that is providing power sequencing to a group of drives also removes power from each drive whose LOCAL/REMOTE switch (a customer engineer switch located inside the drive cabinet) is set to REMOTE.

**CONTROLLER INITIALIZATION**

A controller must be autoloaded with controlware before the controller can execute the complete function set described in section 3. The following functions reside permanently in the ROM portion of processor memory to enable autoloading.

- 0012<sub>g</sub> General status
- 0042<sub>g</sub> Clear connected access
- 01NN<sub>g</sub> Autoload from disk
- 0414<sub>g</sub> Autoload from PP

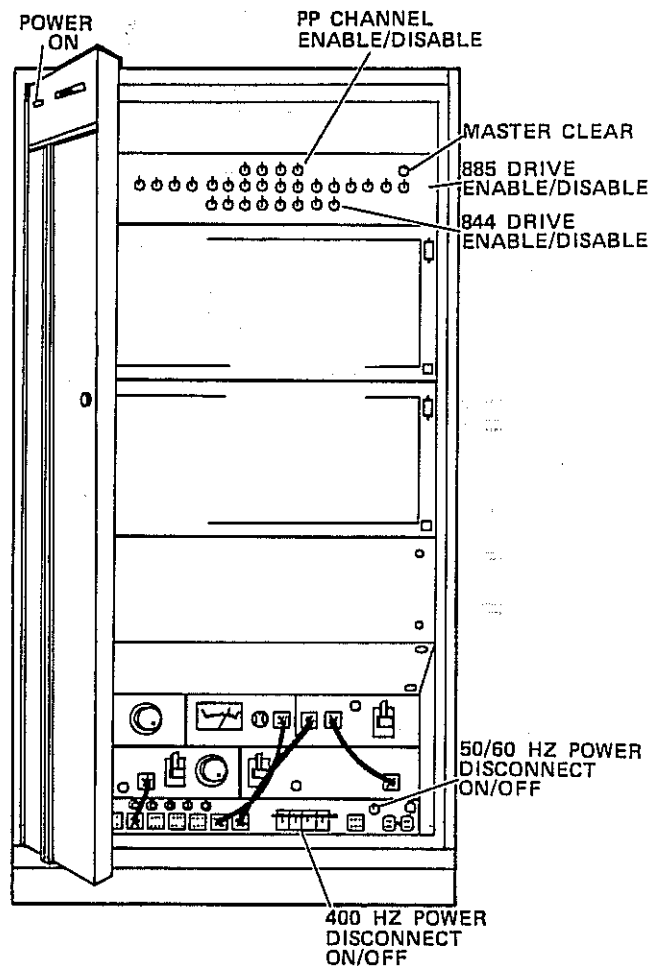


Figure 2-1. Controller Switch/Indicator Locations

Although all controller autoload procedures rely on one or more of these functions, the exact procedure used depends upon site operating procedures, the operating system in use, computer system configuration, and whether or not the computer system is running. Refer to the appropriate operating system installation handbook for controller autoload procedures that Control Data recommends.

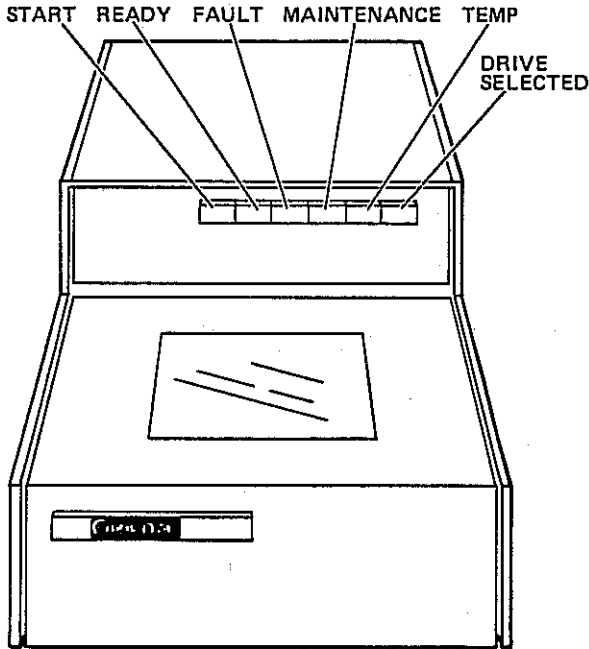


Figure 2-2. 844 Drive Switch/Indicator Locations

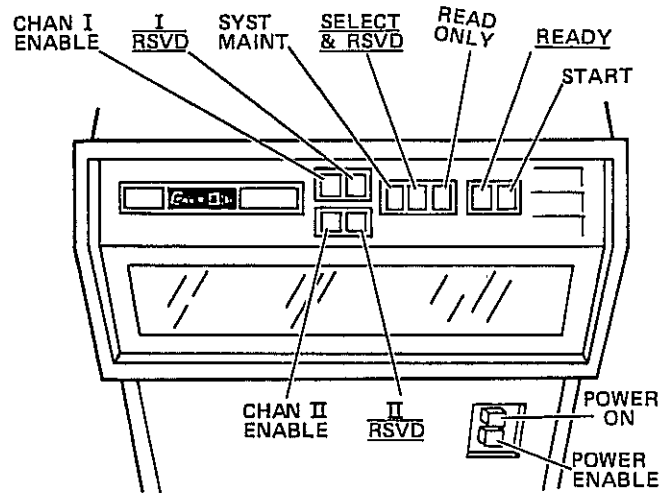


Figure 2-3. 885 Drive Switch/Indicator Locations

#### DISK PACK EXCHANGE

Use the following procedure to exchange the disk pack of an 844 drive.

1. If START switch/indicator is lighted, press it and wait for disk pack to stop.
2. Press main cover latch and lift main cover.
3. Place disk pack cover over disk pack. Turn cover counterclockwise until spindle clicks. Lift cover and disk pack from drive.
4. Place new cover and disk pack on spindle. Turn cover clockwise until it stops. Lift cover from drive.
5. Close main cover, ensuring that it latches.
6. Press START switch/indicator. Drive is ready for operation when READY indicator lights.



TABLE 2-1. CONTROLLER SWITCHES/INDICATORS

| Name                             | Description          | Function                                                                                                       |
|----------------------------------|----------------------|----------------------------------------------------------------------------------------------------------------|
| POWER ON                         | Indicator            | Lights when power is applied to controller.                                                                    |
| PP CHANNEL ENABLE/DISABLE        | Toggle switches (4)  | Enables/disables communication between controller and PP channel attached to access associated with switch.    |
| MASTER CLEAR                     | Pushbutton switch    | Clears controller logic and connected access and forces processor memory address to 20 000g.                   |
| 885 DRIVE ENABLE/DISABLE         | Toggle switches (16) | Enables/disables communication between controller and 885 drive attached to connector associated with switch.  |
| 844 DRIVE ENABLE/DISABLE         | Toggle switches (8)  | Enables/disables communication between controller and 844 drive attached to connectors associated with switch. |
| 50/60 HZ POWER DISCONNECT ON/OFF | Toggle switch        | ON: Applies power to blower.<br>OFF: Removes power from blower.                                                |
| 400 HZ POWER DISCONNECT ON/OFF   | Toggle switch        | ON: Applies power to controller logic.<br>OFF: Removes power from controller logic.                            |

TABLE 2-2. 844 DRIVE SWITCHES/INDICATORS

| Name        | Description      | Function                                                                                             |
|-------------|------------------|------------------------------------------------------------------------------------------------------|
| START       | Switch/indicator | Applies/removes power to/from drive logic and drive motor. Lights when power is applied.             |
| READY       | Indicator        | Lights when disk pack reaches operating speed and heads are loaded.                                  |
| FAULT       | Switch/indicator | Clears drive fault status. Lights when drive fault status is active.                                 |
| MAINTENANCE | Indicator        | Lights when drive power is not sequenced by controller.                                              |
| TEMP        | Indicator        | Lights when over-temperature condition exists within drive.                                          |
| None        | Indicator        | Lights when drive is selected by controller. Customer may elect to apply numbered lens to indicator. |

TABLE 2-3. 885 DRIVE SWITCHES/INDICATORS

| Name                     | Description      | Function                                                                                                                                         |
|--------------------------|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| CHAN I ENABLE            | Switch/indicator | Enables/disables communication between drive and controller attached to associated drive channel. Lights when communication is enabled.          |
| CHAN II ENABLE           | Switch/indicator | Enables/disables communication between drive and controller attached to associated drive channel. Lights when communication is enabled.          |
| <u>I RSVD</u>            | Indicator        | Lights when associated drive channel is reserved by controller.                                                                                  |
| <u>II RSVD</u>           | Indicator        | Lights when associated drive channel is reserved by controller.                                                                                  |
| SYST MAINT               | Switch/indicator | Maintenance use only. Enables/disables fault checking and manual seek tests. Lights when fault checking and manual seeks are enabled.            |
| <u>SELECT &amp; RSVD</u> | Indicator        | Lights when reserved drive channel is active.                                                                                                    |
| READ ONLY                | Switch/indicator | Disables/enables write logic within drive. Lights when write logic is disabled.                                                                  |
| <u>READY</u>             | Indicator        | Lights when disk pack reaches operating speed and drive is on track.                                                                             |
| START                    | Switch/indicator | Applies/removes power to/from drive motor. Lights when power is applied.                                                                         |
| POWER ENABLE             | Switch/indicator | Enables/disables cabinet power input. Lights when power is enabled.                                                                              |
| POWER ON                 | Switch/indicator | Maintenance use only. Applies power to both drives, provided LOCAL/REMOTE switch (inside cabinet) is set to LOCAL. Lights when power is applied. |

This section covers some general topics of interest to the programmer, defines function codes, and provides error recovery sequences. Unless otherwise indicated, all 4-digit numbers referenced in this section are octal.

### GENERAL CONSIDERATIONS

The programmer should be familiar with the following information before working on 7155-related PP programs.

#### PP TYPE

PPs attached to a controller may operate at either 1 MHz or 2 MHz. A PP channel without parity must attach to a PP access having channel parity disabled. Disabling channel parity is a customer engineering task performed during subsystem installation.

#### EQUIPMENT CODE

Since a controller is the only device on a channel, no equipment select code is required and all 12 bits are used for function selection.

#### ACCESS CONNECTION

When no accesses are connected, the controller connects to the first access receiving a function. As long as one access is connected, the controller ignores all functions received on other accesses except for 0012 (general status) and 0042 (clear connected access) functions, which are processed normally. When one access is connected and an unconnected access receives a general status function, the status word returned is 2000.

Access connection clears when:

- The connected access receives a 0010 (operation complete) function.
- Any access receives a 0042 (clear connected access) function.
- A power on or pushbutton master clear occurs.
- A deadstart master clear occurs on the connected access. The deadstart master clear also releases all drives, provided controlware instruction and buffer tests (which precede drive release) execute without error.

### CONTROLWARE

Controlware used with the controller includes permanently resident code (ROM controlware) and MA721 code loaded at autoload time (RAM controlware). ROM controlware includes a processor instruction test, a buffer test, a drive release routine, the function idle loop, and routines to process 0012 (general status), 0042 (clear connected access), 0057 (echo one word), 0061 (autodump), 0062 (manipulate processor), 0063 (input display data), 01NN (autoload from disk), and 0414 (autoload from PP) functions. RAM controlware includes routines to process the remaining functions.

Figure 3-1 shows ROM controlware execution following a power on, pushbutton, or deadstart master clear.

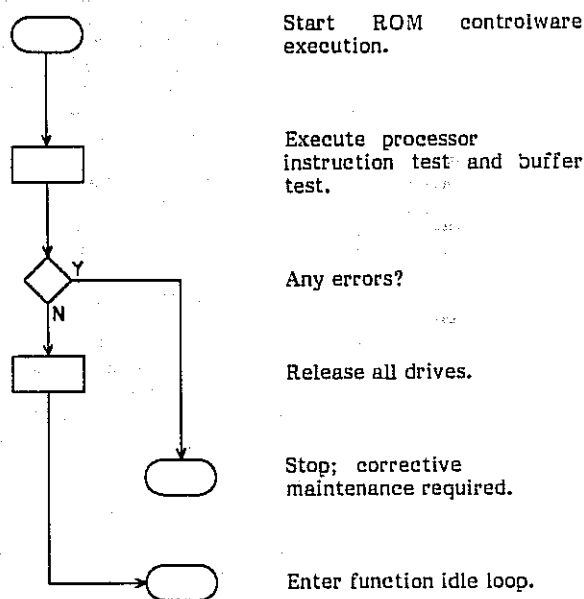


Figure 3-1. Initial ROM Controlware Execution

### PACK DATA

Appendix D provides locations and format descriptions for disk sectors that contain factory-recorded manufacturing data, flaw data, and defective sector data.

## DEADMAN TIMER

For disk read/write-type functions and 0043/0044 (buffer read/write) functions, the controller deactivates the PP channel when an error occurs that would prevent successful completion of the function. However, for other functions that transfer data, status, or parameters between the controller and the PP, the controller uses a deadman timer. This timer monitors the connected PP channel for a hung condition. When it detects that an active channel has not transferred a word for  $4.5 \pm 1.5$  seconds, the timer deactivates the channel. Note 1 of table 3-1 identifies functions for which the controller is able to provide deadman timeout status.

## PARITY ERRORS

Parity error types and corresponding detection/processing procedures (for PPs with channel parity) are as follows:

| <u>Error Type</u>                        | <u>Detection/Processing Procedure</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Parity error on function                 | Controller does not respond to function having parity error, but instead clears parity error status and waits for next function. PP must time out each function to avoid possible channel hang. After detecting function time out, PP should deactivate channel; resend function; and, if parity errors continue, abort operation.                                                                                                                                                                                                                                                                                                                                                          |
| Parity error on parameter or data output | After completing parameter output, PP must issue 0012 (general status) function, <sup>†</sup> after which controller prepares status and clears parity error condition. Refer to the other two error types if parity error occurs during general or detailed status request. General status is 5000 and extended detailed status (word 16, bit 6) reflects error condition. Refer to the other two error types if parity error occurs during general or detailed status request. General status is 5000 and extended detailed status (word 16, bit 6) reflects error condition. PP should reissue function; reoutput parameter(s) or data; and, if parity errors continue, abort operation. |
| Parity error on input                    | After completing input, PP should test appropriate bit in status and control register before issuing next function. Since controller cannot detect parity error on PP input, general status shows only what happened within subsystem. Suggested PP actions are: <ul style="list-style-type: none"><li>• Reissue function and reinput data or status.</li><li>• Reseek sector and reread sector or block of sectors.</li><li>• Abort operation if parity errors continue.</li></ul>                                                                                                                                                                                                         |

## Error Type

## Detection/Processing Procedure

Program memory parity error

All functions other than 414 and 1UU will time out under this condition. To properly report and recover from this error the PP should:

- Issue a zero word autoloading to clear the hang.
- Issue the autodump function to sweep memory. Discard the dump data.
- Issue the input processor status function. Input 20 words. If word 1 indicates a RAM parity error, log the error and continue to step 4.
- If the timeout was on a write function, the WBDF cell in controlware will say the type of write error it was and will help identify the disk recovery address.<sup>††</sup> If this is a write buffer to disk error and word 20 in step 3 indicates a model B controller, read the subsystem data buffer. A write buffer to disk error will not be recoverable in a model A controller.
- Download controlware via the interlock autoloading function and retry the operation.

## INPUT/OUTPUT RULES

The following rules govern PP channel use.

- All functions must have a timeout limit (1 second is recommended) to prevent subsystem failures and errors from hanging channel.
- PP must activate channel before transferring parameters or data.
- PP must deactivate channel following output of parameters or data.
- Controller deactivates channel following PP input or when disk data transfer error prevents PP input/output from completing normally.
- Controller deactivates channel when error conditions leaves controller connected and channel active for  $4.5 \pm 1.5$  seconds.

<sup>†</sup> 0062 (manipulate processor) function does not have to be followed by 0012 (general status) function.

<sup>††</sup> WBDF is location 321 of program memory and may be examined via the 62 and 63 functions. A zero in WBDF indicates a buffer to disk error (reference detailed status word 13 bit 11). This cell should be used rather than detailed status because the latter cannot be guaranteed under RAM parity conditions.

## LOGICAL SECTORS

Unless otherwise specified, this manual identifies disk sectors by their logical (as opposed to physical) sector numbers. For 844 drives, logical and physical sector numbers are identical and range from 0 through 23. For most tracks on an 885 drive, logical and physical sector numbers are identical and range from 0 to 31.

Controller detailed status (word 7, bits 11 through 4) and operating system messages always use logical sector numbers to identify 885 sectors. However, factory and utility maps (and in some cases, the controller) use physical sector numbers to identify 885 sectors. Proper use of the format pack (0016), return cylinder addresses (0017), and scan cylinder addresses (0047) functions requires knowledge of the relationship between logical and physical 885 sectors.

The only time the physical and logical sector numbers for an 885 sector differ is when the track containing the sector also contains one or more skipped sectors. A skipped sector is one whose address and data fields have been zero-filled to avoid detection by the controller. When physical sector  $n$  (where  $n$  ranges from 0 to 31) is skipped on an 885 track, each logical sector after physical sector  $n$  has a smaller number than its corresponding physical sector. Figure 3-1.1 shows the relationship between physical and logical sector numbers for tracks with zero, one, or two skipped sectors. A track with more than two skipped sectors contains a track flaw bit in the address field of each logical sector and is unused. Figure 3-1.2 shows how to convert a logical 885 sector number to a physical sector number.

| P00 | P01 | P02 | P03 | ... | P29 | P30 | P31 | P32 | P33 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| L00 | L01 | L02 | L03 | ... | L29 | L30 | L31 | UUU | UUU |

Situation A: No defective sectors; sectors 32 and 33 unused.

| P00 | P01 | P02 | P03 | ... | P29 | P30 | P31 | P32 | P33 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| L00 | L01 | XXX | L02 | ... | L28 | L29 | L30 | L31 | UUU |

Situation B: One defective sector; physical sector 02 skipped, physical sector 33 unused.

| P00 | P01 | P02 | P03 | ... | P29 | P30 | P31 | P32 | P33 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| L00 | L01 | XXX | L02 | ... | L28 | XXX | L29 | L30 | L31 |

Situation C: Two defective sectors; physical sectors 02 and 30 skipped.

### Notes:

- L<sub>ln</sub> = Logical sector number  
 P<sub>pn</sub> = Physical sector number  
 UUU = Unused, formatted sector  
 XXX = Skipped, zero-filled sector
- When it formats multiple tracks, the format pack (0016) function places logical sector numbers 32 and 33 in the second to last full sector and last full sector, respectively, of each track. (Physical sector 34, mentioned in the return drive address (0017) function, is actually a 93-microsecond tolerance gap that is not used for data storage.) Since 7155 controlware normally processes only the first 32 logical sectors on a track, logical sectors 32 and 33 are never encountered in normal processing, and need not be zero-filled (skipped) if defective.

On a track with 32 logical sectors, an 885 physical sector number may be the same as, one greater than, or two greater than its corresponding logical sector number. The relationship between the two numbers depends upon whether there are any skipped sectors between the start of the track and the sector to be skipped. To determine the value to use for the physical sector number of a sector to be skipped, obtain values P, L and then identify the P/L relationship that applies to your case. P and L are defined as follows:

P Physical sector number of skipped sector in same track as sector to be skipped (from utility map).

L Logical sector number of defective sector (from operating system).

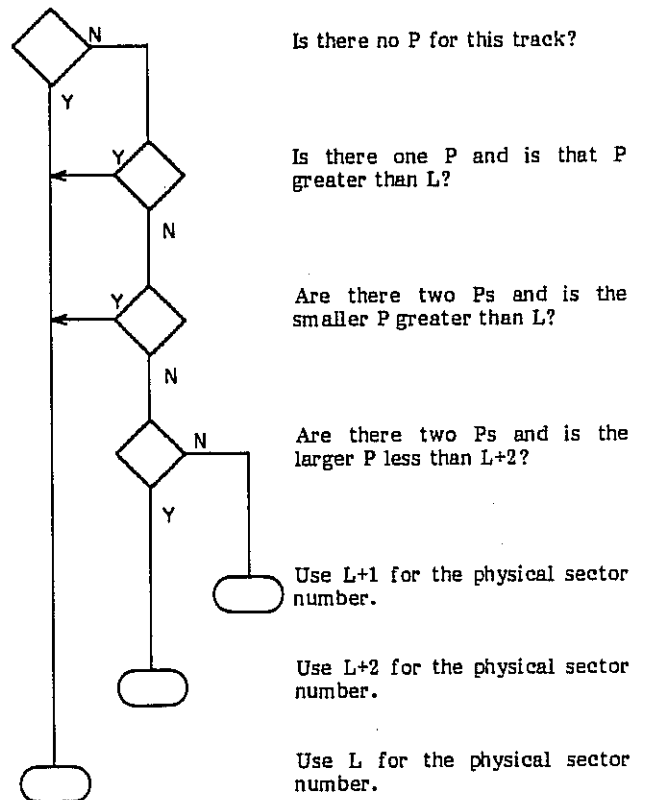


Figure 3-1.2. Logical-to-Physical 885 Sector Conversion

Figure 3-1.1. 885 Sector Numbering

## FUNCTIONS

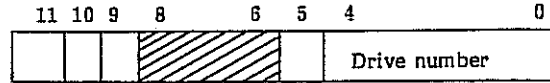
Table 3-1 lists functions to which the controller responds and appendix B provides function timing information. The following paragraphs describe each function.

### 0000 - CONNECT

Reserves drive without initiating head movement. Drive remains reserved until PP issues 0010 (operation complete), 0015 (drop seals), or 0020 (drive release) function.

Bit 11 of connect parameter drops drive reserve held by another controller. Parameter bit 10 is for diagnostic use only. Parameter bit 5 indicates 885 drive.

Parameter format:



885 drive  
 Select 885 Large Sector Mode  
 Enable diagnostic connect  
 Drop drive reserve

Legal drive numbers (bits 0 through 5) are:

844 0 through 7

885 40g through 57g

#### NOTE

If bit 11 fails to drop 844 drive reserve, issue deadstart master clear or press controller MASTER CLEAR button.

TABLE 3-1. SUBSYSTEM FUNCTIONS

| Octal Code | Function                 | Words Output | Words Input | General Status Required | Octal Code | Function                        | Words Output | Words Input | General Status Required |
|------------|--------------------------|--------------|-------------|-------------------------|------------|---------------------------------|--------------|-------------|-------------------------|
| 0000       | Connect ①                | 1            |             | Yes                     | 0027       | Read checkword gap sector       |              |             | Yes                     |
| 0001       | Seek, 1:1 interlace ①    | 4            |             | Yes                     | 0030       | Read factory data               |              | 322         | Yes                     |
| 0002       | Seek, 2:1 interlace ①    | 4            |             | Yes                     | 0031       | Read utility map                |              | 322         | Yes                     |
| 0004       | Read                     |              | ⑥           | Yes                     | 0032       | Block transfer buffer read      |              | 322         | No                      |
| 0005       | Write                    | ⑥            |             | Yes 2                   | 0033       | Block transfer buffer write ①   | 322          |             | Yes                     |
| 0006       | Write verify             | ⑥            |             | Yes 2                   | 0034       | Read protected sector           |              | 322         | Yes                     |
| 0007       | Read checkword           |              |             | Yes                     | 0035       | Write last sector               |              | ⑥           | Yes                     |
| 0010       | Operation complete       |              |             | No                      | 0036       | Write verify last sector        |              | ⑥           | Yes                     |
| 0011       | Disable drive reserve    |              |             | No                      | 0037       | Write protected sector          | 322          |             | Yes                     |
| 0012       | General status           |              | 1           | No                      | 0040       | Read short                      |              | 319 ⑤       | Yes                     |
| 0013       | Detailed status          |              | 12          | No                      | 0041       | Select strobe and offset ①      | 1            |             | Yes                     |
| 0014       | Continue                 | ⑥ ③          | ⑥ ④         | Yes                     | 0042       | Clear connected access          |              |             | No                      |
| 0015       | Drop seeks               |              |             | No                      | 0043       | Buffer read                     |              | 322         | Yes                     |
| 0016       | Format pack ①            | 7            |             | Yes                     | 0044       | Buffer write                    | 322          |             | Yes                     |
| 0017       | Return drive address     |              | 3           | No                      | 0046       | Write buffer to disk            |              |             | Yes                     |
| 0020       | Drive release            |              |             | No                      | 0047       | Scan cylinder addresses         |              |             | Yes                     |
| 0021       | Return cylinder address  |              | 1           | No                      | 0050       | Output on processor channel ①   | 3            |             | Yes                     |
| 0022       | Set/clear flaw ①         | 1            |             | Yes                     | 0051       | Execute control word sequence ① | 49           |             | Yes                     |
| 0023       | Extended detailed status |              | 20          | No                      |            |                                 |              |             |                         |
| 0024       | Read gap sector          |              | ⑥           | Yes                     |            |                                 |              |             |                         |
| 0025       | Write gap sector         | ⑥            |             | Yes ②                   |            |                                 |              |             |                         |
| 0026       | Write verify gap sector  | ⑥            |             | Yes ②                   |            |                                 |              |             |                         |

NOTES

- ① When PP channel deadman timer expires during this function, controller prepares 5000 general status and sets deadman timeout bit (word 17, bit 3) in detailed status.
- ② Except when executing this function at 2:1 interlace on 844 drive, controller returns general status before transferring data from buffer to disk. If error occurs during buffer-to-disk transfer, controller responds only to 0012 (general status) function. This ensures that buffer-to-disk errors do not go undetected.
- ③ Following write-type function only.
- ④ Following read-type function only.
- ⑤ 844 only; use 318 for 885; 1360 for 885 large sector.
- ⑥ 322 words for small sector, 1376 words for large sector 885.

TABLE 3-1. SUBSYSTEM FUNCTIONS (Contd)

| Octal Code | Function                       | Words Output | General Words Input | Status Required | Octal Code | Function                | Words Output | General Words Input | Status Required |
|------------|--------------------------------|--------------|---------------------|-----------------|------------|-------------------------|--------------|---------------------|-----------------|
| 0052       | Input processor channel status |              | 32                  | No              | 0063       | Input display data      |              | 64                  | No              |
| 0053       | Echo output channels           |              | 32                  | No              | 0064       | Time difference counter |              |                     | No              |
| 0054       | Issue processor flag pulse 1   | 1            |                     | Yes             | 0066       | Force Error             | 1            |                     | Yes             |
| 0055       | Enable input channel timing 1  | 1            |                     | Yes             | 0067       | Interlock Autoload      | 16870        |                     | Yes             |
| 0056       | Input timing data              |              | 2                   | No              | 01NN       | Autoload from disk      |              |                     | No              |
| 0057       | Echo one word                  | 1            | 1                   | No              | 03NN       | Disk deadstart          |              |                     | No              |
| 0061       | Autodump                       |              | 12 288              | No              | 0414       | Autoload from PP        | 16 870       |                     | Yes             |
| 0062       | Manipulate processor           | 5            |                     | No              | 0720       | Echo one word           | 1            | 1                   | No              |



0001 — SEEK, 1:1 INTERLACE OR  
 0002 — SEEK, 2:1 INTERLACE

Conditions controller for 1:1 interlace (consecutive sector) or 2:1 interlace (alternate sector) data transfer. When necessary, seek function also reserves drive and initiates or maintains head motion. Zero-filled general status indicates normal completion and on-cylinder drive. PP waiting for seek to complete must reissue seek before requesting general status. Seeks may proceed concurrently on two or more drives, thereby enabling seek overlap.

Once an operation that transfers data with consecutive (1:1 interlace) or alternate (2:1 interlace) sectors becomes on-cylinder, no additional seek functions are required unless the operation continues on another cylinder.

**NOTE**

A new seek function is always required when changing operations, regardless of starting address (for example, a write followed by a read).

Parameter format:

|        |                                            |
|--------|--------------------------------------------|
| Word 1 | Refer to 0000 - (connect) parameter format |
| Word 2 | Starting cylinder number                   |
| Word 3 | Starting track number                      |
| Word 4 | Starting sector number                     |

Address ranges:

| Drive | Range    |       |        |
|-------|----------|-------|--------|
|       | Cylinder | Track | Sector |
| 844   | 0-822    | 0-18  | 0-23   |
| 885   | 0-842    | 0-39  | 0-31†  |

0004 — READ

Transfers one sector of data from drive to controller to PP. Previous seek function specifies starting sector. PP must follow each read function with a one-sector block input.

† Each 885 track has 34 physical sectors and 32 logical sectors. The last two sectors in each track are reserved for use as spares.

0005 — WRITE

Transfers one sector of data from PP to controller to drive. Previous seek function specifies starting sector. PP must follow each write function with a one-sector block output.

0006 — WRITE VERIFY

Conditions controller to compare PP output data with data from one disk sector. No data transfers to drive. Previous seek function specifies starting sector. PP must follow each write verify function with a one-sector block output.

0007 — READ CHECKWORD

Conditions controller to test one disk sector for checkword errors. No data transfers to PP. Previous seek function specifies starting sector.

0010 — OPERATION COMPLETE

Releases controller and last drive selected by controller, thereby making controller available to other PP accesses. Other drives must previously have been released by 0015 (drop seeks) or 0020 (drive release) function.

**NOTE**

When issued after an operation complete function, a 0012 (general status) function reserves the controller again.

0011 — DISABLE DRIVE RESERVE

Multiple-controller subsystems only. Releases all 844 drives reserved by another controller. Should be used only when 844 drives are reserved by inoperative controller. Use bit 11 of first parameter sent with 0000 (connect) or 0001/0002 (seek) function to release each 885 drive reserved by inoperative controller.

**NOTE**

Disable drive reserve function drops 844 drive reserves only if select lines to drives are low. When inoperative controller leaves select lines high, deadstart master clear or controller pushbutton master clear drops reserves.

## 0012 — GENERAL STATUS

Transfers general status word from controller to PP. Except as indicated in table 3-1, PP must request and input general status after completing each function. Zero-filled general status indicates normal function completion. Table 3-2 defines general status bits.

TABLE 3-2. GENERAL STATUS

| Bit | Definition                                                                                                                                                                              |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 11  | Abnormal termination. Preceding function terminated abnormally. General status bits 8 and 9 indicate whether recovery is possible. Detailed status shows cause of abnormal termination. |
| 10  | Multiple-access controller reserved. Controller is reserved to another PP channel. All other status bits are meaningless.                                                               |
| 9   | Nonrecoverable error. Controller detected error from which no recovery is possible. Detailed status identifies error.                                                                   |
| 8   | Recovery in process. Controller is ready to attempt error recovery in response to 0014 (continue) function.                                                                             |
| 7   | Checksum error. Controller detected checksum error in address field or data field of sector. Detailed status word 2, bits 8 through 11, provides error analysis.                        |
| 6   | Correctable address error. Controller detected correctable read address checksum error. 0014 (continue) function enables data to be processed on subsequent disk revolution.            |
| 5   | Unused.                                                                                                                                                                                 |
| 4   | Drive malfunction. Drive-related error occurred. Detailed status reflects drive status at time of malfunction.                                                                          |
| 3   | Drive reserved. Requested drive is reserved by other controller.                                                                                                                        |
| 2   | Autoload error. Controlware loaded is not compatible with controller.                                                                                                                   |
| 1   | Busy. Controller and/or requested drive are busy.                                                                                                                                       |
| 0   | Unused.                                                                                                                                                                                 |

## 0013 — DETAILED STATUS OR 0023 — EXTENDED DETAILED STATUS

Transfers 12-word (0013) or 20-word (0023) status block from controller to PP. Abnormal termination status (general status bit 11) determines applicability of drive status fields within detailed status block. When abnormal termination is 0, drive status applies to drive referenced by last 0000 (connect) or 0001/0002 (seek) function. When abnormal termination is 1, drive status (if any) is that taken by controller upon abnormal termination of function listed in detailed status word 3.

PP must follow detailed status function with block input of appropriate length. PP may then attempt error recovery with 0014 (continue) function (if general status bit 8 is 1) or may issue new function.

Figure 3-2 shows detailed status block format and table 3-3 defines detailed status bits. Appendix C correlates various subsystem conditions with corresponding general and detailed status.

## 0014 — CONTINUE

This function is used to step controller through a semiautomatic error recovery sequence, and also to resume formatting after controller has paused following detection of sector or track flaws during 844 pack formatting. Refer to Error Recovery (later in this section) and 0016-format pack function description for additional information concerning use of continue function.

### Continue During Error Recovery

PP should issue a continue function and reinitiate previous data transfer when abnormal termination and recovery in progress status (general status bits 11 and 8, respectively) occurs during any of the following function sequences:

- 0004-Read
- 0005-Write
- 0006-Write Verify
- 0007-Read Checkword
- 0024-Read Gap Sector
- 0025-Write Gap Sector
- 0026-Write Verify Gap Sector
- 0027-Read Checkword Gap Sector
- 0030-Read Factory Data
- 0031-Read Utility Map
- 0034-Read Protected Sector
- 0035-Write Last Sector
- 0037-Write Protected Sector

Continue function enables PP to try up to nine combinations of data strobe and head positioner offset while attempting to read address or data fields. (Controller always writes data at nominal strobe and offset settings.) Since controller tries three times at each combination (one try per continue function) a total of 27 continue functions can be issued before controller declares an error unrecoverable. Strobe and offset combination presently in effect can be determined by checking detailed status word 1, bits 4 through 11. Any seek function or controller-initiated seek operation forces strobe/offset retry count to zero, and each continue function issued during read error recovery increments strobe/retry count by one.

When general status indicates recovery in progress, issuing any function except continue causes controller to exit from error recovery sequence and process new function. PP must read general and detailed status after each continue function to determine state of error recovery efforts. Abnormal termination and nonrecoverable error (general status bits 11 and 9, respectively) indicate controller has aborted error recovery and stopped accepting continue functions.

Controller response to a continue function depends upon type of error encountered (and reported in detailed status) as follows.

- Address field correctable checkword error. Continue function causes controller to read same address field on next disk revolution and begin processing data field if second read was error-free or correctable.

**NOTE**

In order to ensure that address and data errors that appear to be correctable are in fact correctable (and not caused by intermittent hardware problems rather than media defects), controller corrects apparently correctable checkword errors only after corresponding address or data has been read twice using nominal strobe and offset settings, and second read was error-free or correctable. When a correctable data checkword error occurs during a data field read not using nominal strobe and offset settings, controller declares correctable checkword error (sets bits 9 and 8 of general status to 0 and 1, respectively) and places error location and correction vector in detailed status, but does not correct data returned to PP.

- Address field sync error or noncorrectable checkword error. Each continue function causes controller to reread the address field using strobe and offset settings indicated in detailed status word 1, bits 4 through 11. When a reread attempt results in a correctable checkword error and strobe/offset retry count is less than 4, next continue function causes controller to read and correct address field on next revolution and begin processing data field. If no reread attempt is successful, controller sets nonrecoverable error bit in general status.

- Seek error. First continue function causes controller to determine difference between present cylinder and target cylinder, and to move heads accordingly. If this fails to locate correct cylinder, a second continue function causes controller to reposition heads to cylinder zero and retry seek from there. If neither of these head movements locates proper cylinder, controller sets nonrecoverable error bit in general status.
- Track or sector miscompare. A continue function causes controller to recheck track and sector numbers on next revolution. If miscompare is still present, controller sets nonrecoverable error bit in general status.
- Data field sync error or checkword error. Each continue function causes controller to reread data field using strobe and offset setting indicated in detailed status word 1, bits 4 through 11. When a reread attempt using nominal strobe/offset settings results in a correctable checkword error, next continue function causes controller to correct error before transmitting data to PP.

Continue During 844 Pack Formatting

After completing the formatting requested by a 0016 (format pack) function, the controller sets track and sector flaws in the area just formatted according to the utility flaw map. When the return flaw data bit (parameter word 2, bit 9) is 1, the controller notifies the PP of the sector to be flawed before flawing the sector. To perform this notification, the controller places the address of the sector to be flawed in detailed status and then sets general status to 4400 octal. After reading general and detailed status, the PP issues a continue function to enable the controller to flaw the sector and place the address of the next flawed sector (if there is one) in detailed status.

**0015 — DROP SEEKS**

Multiple-access drives only. Releases all drives except last drive referenced by 0000 (connect) or 0001/0002 (seek) function. Head motion continues, but each released drive becomes selected to next requesting controller. When reselecting a released drive, PP must issue new seek function to establish initial disk address.

**NOTE**

0010 (operation complete) and 0020 (drive release) functions can be used to release drives individually.

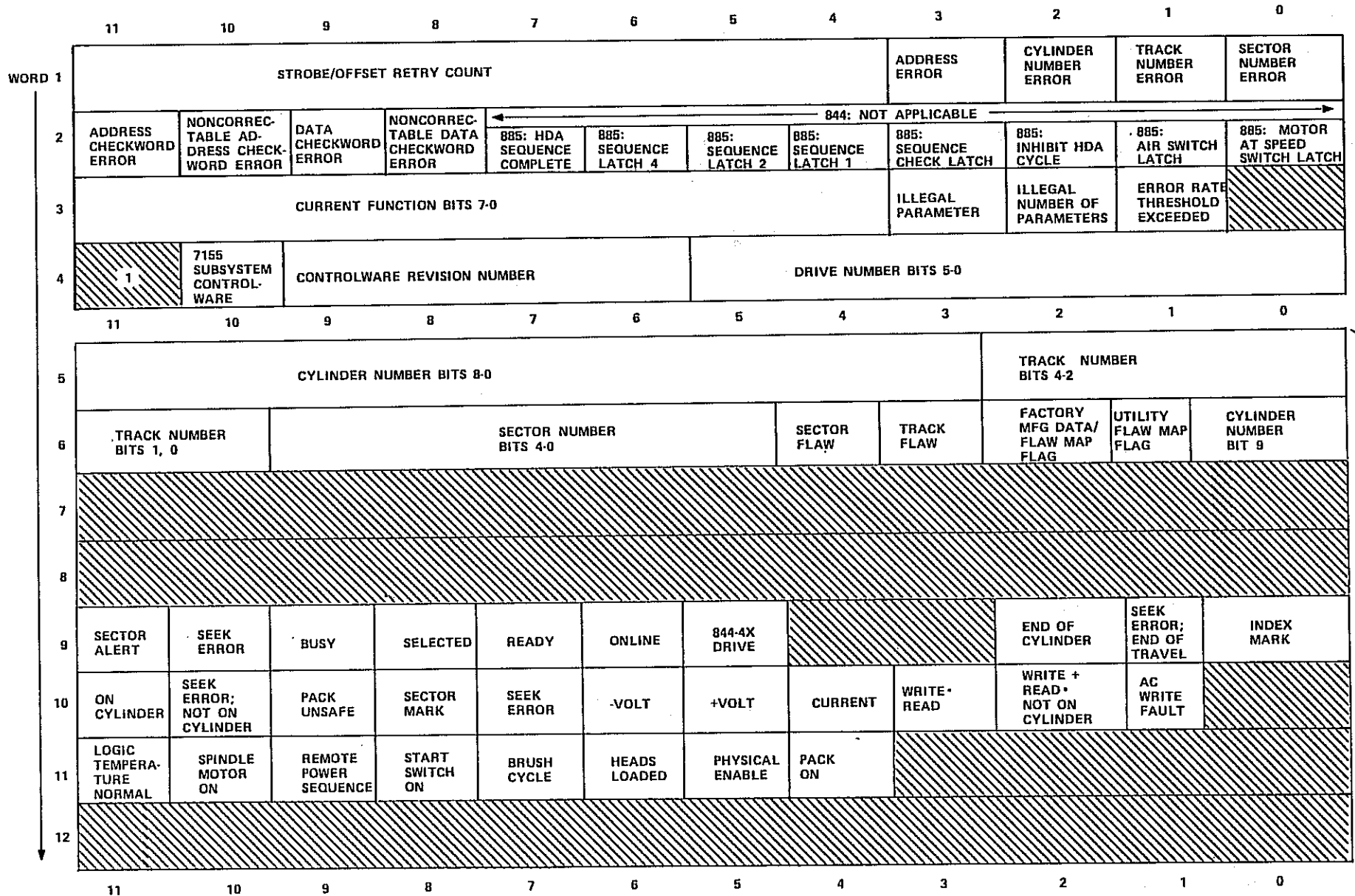


Figure 3-2. Detailed Status (Sheet 1 of 3)

|        |                                |                       |                     |                       |                        |                            |                          |                     |                                         |                         |                           |                   |  |
|--------|--------------------------------|-----------------------|---------------------|-----------------------|------------------------|----------------------------|--------------------------|---------------------|-----------------------------------------|-------------------------|---------------------------|-------------------|--|
|        | 11                             | 10                    | 9                   | 8                     | 7                      | 6                          | 5                        | 4                   | 3                                       | 2                       | 1                         | 0                 |  |
| WORD 5 | TRACK FLAW                     | FACTORY FLAW MAP FLAW |                     |                       |                        |                            | CYLINDER NUMBER BITS 9-4 |                     |                                         |                         |                           |                   |  |
| 6      | CYLINDER NUMBER BITS 3-0       |                       |                     |                       |                        | TRACK NUMBER BITS 7-0      |                          |                     |                                         |                         |                           |                   |  |
| 7      | LOGICAL SECTOR NUMBER BITS 7-0 |                       |                     |                       |                        |                            |                          |                     | READY AND SAFE                          | SYSTEM MAINTENANCE MODE | DRIVE NUMBER BITS 6 AND 7 |                   |  |
| 8      | DRIVE NUMBER BITS 5-0          |                       |                     |                       |                        |                            | UNUSED BUT RESERVED      | WRITE ENABLE        | ONLINE                                  | AIR SWITCH              | START SWITCH ON           | MOTOR AT SPEED    |  |
| 9      | INDEX                          | SECTOR MARK/ON SECTOR | ON CYLINDER         | SELECTED AND RESERVED | READY AND SAFE         | ON SECTOR                  | STATUS VALID             | STATUS PARITY ERROR | SEEK TIMEOUT ERROR                      | SEEK OVERSHOOT ERROR    | SERVO OFF TRACK           | REZERO MODE LATCH |  |
| 10     | SERVO LATCH                    | LINEAR MODE LATCH     | CONTROL LATCH       | WAIT LATCH            | LAST SEEK FORWARD      | GUARD BAND PATTERN CROSSED | TARGET VELOCITY          | TRACK CROSSING      |                                         |                         | ODD TRACK                 | ON CYLINDER       |  |
| 11     | CAPABLE ENABLE ERROR           | WRITE OVERRUN         | MULTIPLE HEAD ERROR | WRITE CURRENT ERROR   | WRITE TRANSITION ERROR | CONTROL ERROR              | INDEX CHECK              | HEAD SHORT          | WRITE + READ + NO CONTROL SELECT ACTIVE | WRITE WHILE IN OFFSET   |                           |                   |  |
| 12     | EARLY STROBE                   | LATE STROBE           | FORWARD OFFSET      | REVERSE OFFSET        |                        | SECTOR COMPARE ERROR       | DRIVE ERROR              |                     | READ/ WRITE ERROR                       |                         |                           | ACCESS CHECK      |  |
|        | 11                             | 10                    | 9                   | 8                     | 7                      | 6                          | 5                        | 4                   | 3                                       | 2                       | 1                         | 0                 |  |

885 DRIVE ONLY

Figure 3-2. Detailed Status (Sheet 2 of 3)

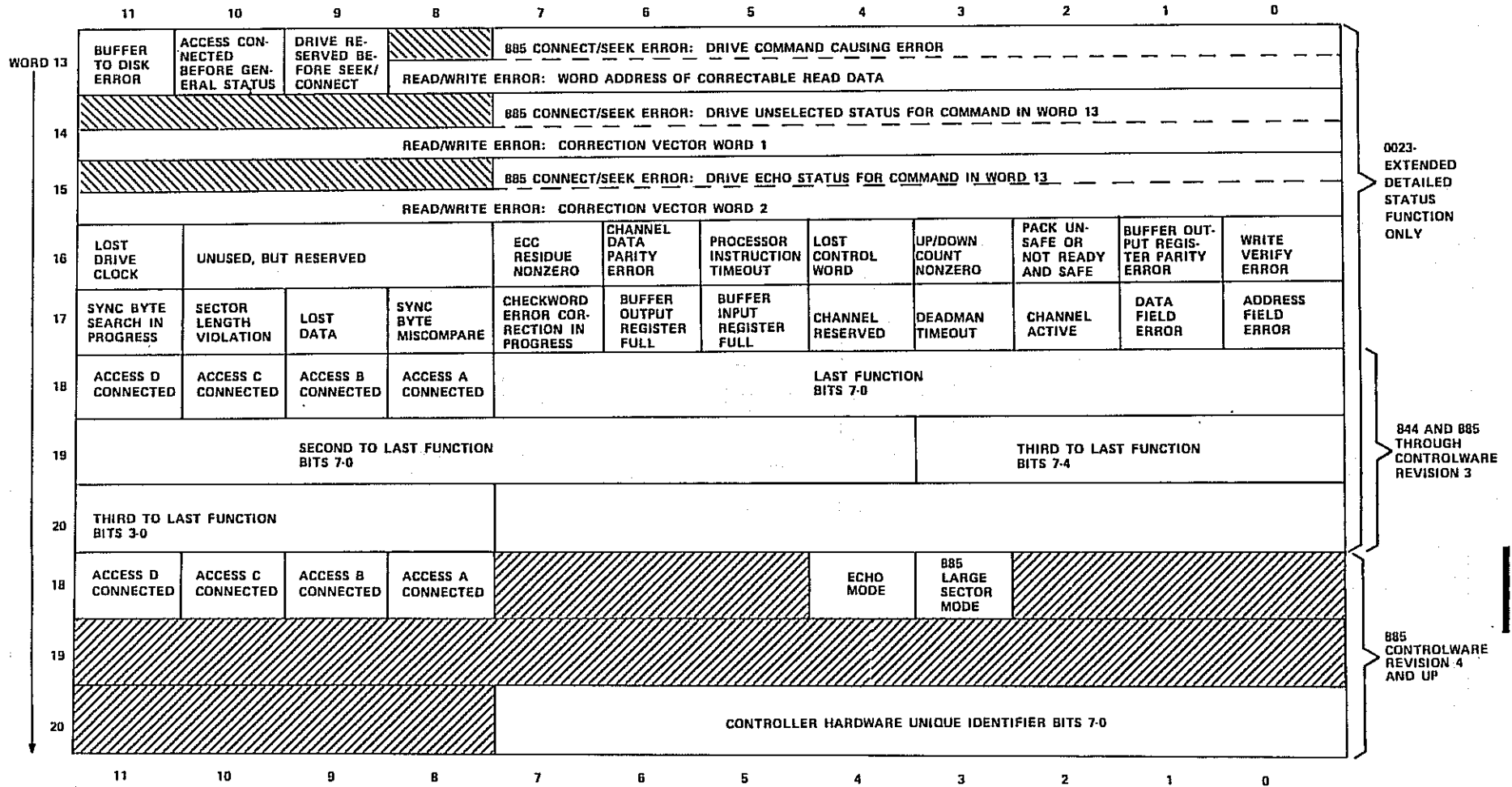


Figure 3-2. Detailed Status (Sheet 3 of 3)

TABLE 3-3. DETAILED STATUS

| Word   | Bit(s)  | Applies To |         | Definition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |    |    |    |    |    |    |        |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |        |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |
|--------|---------|------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----|----|----|----|----|----|--------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--------|---------|-------|------|---------|-------|------|---------|-------|------|---------|-------|------|---------|-------|------|---------|-------|------|---------|-------|------|---------|-------|------|---------|-------|
|        |         | 844        | 885     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |    |    |    |    |    |    |        |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |        |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |
| 1      | 11-4    | •          | •       | Strobe/offset retry count - Indicates head positioner offset and strobe to be tried next upon receipt of 0014 (continue) function as follows:<br><table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Count</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> <th>6</th> <th>7</th> <th>8</th> <th>9</th> <th>10</th> <th>11</th> <th>12</th> <th>13</th> <th>14</th> <th>15</th> <th>16</th> <th>17</th> <th>18</th> <th>19</th> <th>20</th> <th>21</th> <th>22</th> <th>23</th> <th>24</th> <th>25</th> <th>26</th> <th>27</th> </tr> </thead> <tbody> <tr> <td>Offset</td> <td>Nominal</td> <td>Nominal</td> <td>Nominal</td> <td>Nominal</td> <td>Reverse</td> <td>Reverse</td> <td>Reverse</td> <td>Reverse</td> <td>Reverse</td> <td>Reverse</td> <td>Reverse</td> <td>Reverse</td> <td>Reverse</td> <td>Reverse</td> <td>Reverse</td> <td>Reverse</td> <td>Reverse</td> <td>Reverse</td> <td>Reverse</td> <td>Reverse</td> <td>Reverse</td> <td>Reverse</td> <td>Reverse</td> <td>Reverse</td> <td>Reverse</td> <td>Reverse</td> </tr> <tr> <td>Strobe</td> <td>Nominal</td> <td>Early</td> <td>Late</td> <td>Nominal</td> <td>Early</td> <td>Late</td> <td>Nominal</td> <td>Early</td> <td>Late</td> <td>Nominal</td> <td>Early</td> <td>Late</td> <td>Nominal</td> <td>Early</td> <td>Late</td> <td>Nominal</td> <td>Early</td> <td>Late</td> <td>Nominal</td> <td>Early</td> <td>Late</td> <td>Nominal</td> <td>Early</td> <td>Late</td> <td>Nominal</td> <td>Early</td> </tr> </tbody> </table> | Count   | 1       | 2       | 3       | 4       | 5       | 6       | 7       | 8       | 9       | 10      | 11      | 12      | 13      | 14      | 15      | 16      | 17      | 18      | 19      | 20      | 21      | 22 | 23 | 24 | 25 | 26 | 27 | Offset | Nominal | Nominal | Nominal | Nominal | Reverse | Reverse | Reverse | Reverse | Reverse | Reverse | Reverse | Reverse | Reverse | Reverse | Reverse | Reverse | Reverse | Reverse | Reverse | Reverse | Reverse | Reverse | Reverse | Reverse | Reverse | Reverse | Strobe | Nominal | Early | Late | Nominal | Early | Late | Nominal | Early | Late | Nominal | Early | Late | Nominal | Early | Late | Nominal | Early | Late | Nominal | Early | Late | Nominal | Early | Late | Nominal | Early |
| Count  | 1       | 2          | 3       | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 5       | 6       | 7       | 8       | 9       | 10      | 11      | 12      | 13      | 14      | 15      | 16      | 17      | 18      | 19      | 20      | 21      | 22      | 23      | 24      | 25      | 26      | 27 |    |    |    |    |    |        |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |        |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |
| Offset | Nominal | Nominal    | Nominal | Nominal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Reverse | Reverse | Reverse | Reverse | Reverse | Reverse | Reverse | Reverse | Reverse | Reverse | Reverse | Reverse | Reverse | Reverse | Reverse | Reverse | Reverse | Reverse | Reverse | Reverse | Reverse | Reverse |    |    |    |    |    |    |        |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |        |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |
| Strobe | Nominal | Early      | Late    | Nominal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Early   | Late    | Nominal | Early   | Late    | Nominal | Early   | Late    | Nominal | Early   | Late    | Nominal | Early   | Late    | Nominal | Early   | Late    | Nominal | Early   | Late    | Nominal | Early   |    |    |    |    |    |    |        |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |        |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |
| 1      | 3       | •          | •       | Address error - PP-specified address does not agree with address from disk.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |    |    |    |    |    |    |        |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |        |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |
| 1      | 2       | •          | •       | Cylinder number error - Cylinder number from sector is incorrect.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |    |    |    |    |    |    |        |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |        |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |
| 1      | 1       | •          | •       | Track number error - Track number from sector is incorrect.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |    |    |    |    |    |    |        |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |        |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |
| 1      | 0       | •          | •       | Sector number error - Sector number from sector is incorrect.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |    |    |    |    |    |    |        |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |        |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |
| 2      | 11      | •          | •       | Address checkword error - Checkword error detected after reading address field.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |    |    |    |    |    |    |        |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |        |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |
| 2      | 10      | •          | •       | Noncorrectable address checkword error - Address field read cannot be corrected. Address read from disk begins in word 5.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |    |    |    |    |    |    |        |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |        |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |
| 2      | 9       | •          | •       | Data checkword error - Checkword error detected after reading data field.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |    |    |    |    |    |    |        |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |        |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |
| 2      | 8       | •          | •       | Noncorrectable data checkword error - Data field read contains error that cannot be corrected with 8-bit correction vector. Address of failing sector begins in word 5. (Correctable data checkword error is indicated when general status bits 9 and 8 are 0 and 1, respectively.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |    |    |    |    |    |    |        |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |        |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |
| 2      | 7-0     | •          |         | Not applicable.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |    |    |    |    |    |    |        |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |        |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |
| 2      | 7       |            | •       | Head/disk assembly sequence complete.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |    |    |    |    |    |    |        |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |        |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |
| 2      | 6       |            | •       | Sequence latch 4.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |    |    |    |    |    |    |        |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |        |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |
| 2      | 5       |            | •       | Sequence latch 2.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |    |    |    |    |    |    |        |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |        |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |
| 2      | 4       |            | •       | Sequence latch 1.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |    |    |    |    |    |    |        |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |        |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |
| 2      | 3       |            | •       | Sequence check latch.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |    |    |    |    |    |    |        |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |        |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |
| 2      | 2       |            | •       | Inhibit head/disk assembly cycle.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |    |    |    |    |    |    |        |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |        |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |
| 2      | 1       |            | •       | Air switch latch.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |    |    |    |    |    |    |        |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |        |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |
| 2      | 0       |            | •       | Motor at speed switch latch.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |    |    |    |    |    |    |        |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |        |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |
| 3      | 11-4    | •          | •       | Current function bits 7 through 0 - Lower 8 bits of function causing this copy of detailed status.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |    |    |    |    |    |    |        |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |        |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |
| 3      | 3       | •          | •       | Illegal parameter - Illegal parameter(s) received with current function.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |    |    |    |    |    |    |        |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |        |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |
| 3      | 2       | •          | •       | Illegal number of parameters - Illegal number of parameters received with current function. (Applies only to functions not causing transfer to disk.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |    |    |    |    |    |    |        |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |        |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |
| 3      | 1       | •          | •       | Error rate threshold exceeded - During last 65 000 read operations on selected drive, controller detected read errors (excluding flaws) after at least three head positioning changes. Threshold counter and read operation counter reset to zero after threshold error or 65 000 read operations.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |    |    |    |    |    |    |        |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |        |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |
| 3      | 0       | •          | •       | Unused.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |    |    |    |    |    |    |        |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |        |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |
| 4      | 11      | •          | •       | Constant 1.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |    |    |    |    |    |    |        |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |        |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |
| 4      | 10      | •          | •       | 7155 subsystem controlware - MA721 controlware is resident in controller.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |    |    |    |    |    |    |        |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |        |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |
| 4      | 9-6     | •          | •       | Controlware revision number - Revision number of controlware resident in controller.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |    |    |    |    |    |    |        |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |        |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |      |         |       |





TABLE 3-3. DETAILED STATUS (Contd)

| Word | Bit(s) | Applies To |     | Definition                                                                                                               |
|------|--------|------------|-----|--------------------------------------------------------------------------------------------------------------------------|
|      |        | 844        | 885 |                                                                                                                          |
| 4    | 5-0    | •          | •   | Drive number - Number of drive associated with this copy of detailed status.                                             |
| 5    | 11-3   | •          |     | Cylinder number bits 8 through 0 - Lower 9 bits of cylinder number.                                                      |
| 5    | 2-0    | •          |     | Track number bits 4 through 2 - Upper 3 bits of track number.                                                            |
| 6    | 11,10  | •          |     | Track number bits 1 and 0 - Lower 2 bits of track number.                                                                |
| 6    | 9-5    | •          |     | Sector number bits 4 through 0.                                                                                          |
| 6    | 4      | •          |     | Sector flaw - This sector has been tagged as bad.                                                                        |
| 6    | 3      | •          |     | Track flaw - The track containing this sector has been tagged as bad.                                                    |
| 6    | 2      | •          |     | Factory manufacturing data/flaw map flag - This sector contains either factory manufacturing data or factory flaw data.  |
| 6    | 1      | •          |     | Utility flaw map flag - This sector contains utility flaw data.                                                          |
| 6    | 0      | •          |     | Cylinder number bit 9 - Upper bit of cylinder number.                                                                    |
| 7    | 11-0   | •          |     | Unused.                                                                                                                  |
| 8    | 11-0   | •          |     | Unused.                                                                                                                  |
| 9    | 11     | •          |     | Sector alert - Addressed sector is next sector.                                                                          |
| 9    | 10     | •          |     | Seek error - Seek did not complete in time, heads moved to end of travel, or heads unexpectedly moved from track center. |
| 9    | 9      | •          |     | Busy - Drive is reserved by another controller.                                                                          |
| 9    | 8      | •          |     | Selected - Drive is selected.                                                                                            |
| 9    | 7      | •          |     | Ready - Pack is spinning and heads are loaded.                                                                           |
| 9    | 6      | •          |     | Online - Drive is online.                                                                                                |
| 9    | 5      | •          |     | 844-4X drive - Double-density 844 drive.                                                                                 |
| 9    | 4,3    | •          |     | Unused.                                                                                                                  |
| 9    | 2      | •          |     | End of cylinder - Head counter advanced beyond 18.                                                                       |
| 9    | 1      | •          |     | Seek error; end of travel - Heads moved to end of travel in either direction.                                            |
| 9    | 0      | •          |     | Index mark - Start of track.                                                                                             |
| 10   | 11     | •          |     | On cylinder - Heads are positioned over tracks.                                                                          |
| 10   | 10     | •          |     | Seek error; not on cylinder - Heads unexpectedly moved from track center.                                                |
| 10   | 9      | •          |     | Pack unsafe - At least one of the error conditions indicated by word 10, bits 6 through 1 exists.                        |
| 10   | 8      | •          |     | Sector mark - Start of sector.                                                                                           |
| 10   | 7      | •          |     | Seek error - Same indication as word 9, bit 10, seek error.                                                              |
| 10   | 6      | •          |     | -Volt - Abnormal negative voltage condition.                                                                             |
| 10   | 5      | •          |     | +Volt - Abnormal positive voltage condition.                                                                             |

TABLE 3-3. DETAILED STATUS (Contd)

| Word | Bit(s) | Applies To |     | Definition                                                                                                          |
|------|--------|------------|-----|---------------------------------------------------------------------------------------------------------------------|
|      |        | 844        | 885 |                                                                                                                     |
| 10   | 4      | •          |     | Current - More than one head selected, both write drivers on, write gate without write data, or selected head open. |
| 10   | 3      | •          |     | Write read - Write gate received while read gate was enabled.                                                       |
| 10   | 2      | •          |     | Write + read not on cylinder - Write gate or read gate received while off cylinder.                                 |
| 10   | 1      | •          |     | Alternating current write fault.                                                                                    |
| 10   | 0      | •          |     | Unused.                                                                                                             |
| 11   | 11     | •          |     | Logic temperature normal.                                                                                           |
| 11   | 10     | •          |     | Spindle motor on.                                                                                                   |
| 11   | 9      | •          |     | Remote power sequence - Drive power is sequenced by controller.                                                     |
| 11   | 8      | •          |     | START switch on.                                                                                                    |
| 11   | 7      | •          |     | Brush cycle - Pack brush cycle is in progress.                                                                      |
| 11   | 6      | •          |     | Heads loaded.                                                                                                       |
| 11   | 5      | •          |     | Physical enable - Drive cover is closed, DC circuit breakers are closed, and START switch is on.                    |
| 11   | 4      | •          |     | Pack on - Pack is mounted on spindle.                                                                               |
| 11   | 3-0    | •          |     | Unused.                                                                                                             |
| 12   | 11-0   | •          |     | Unused.                                                                                                             |
| 5    | 11     | •          |     | Track flaw - The track containing this sector has been tagged as bad.                                               |
| 5    | 10     | •          |     | Factory flaw map flag - This sector contains factory flaw data.                                                     |
| 5    | 9-6    | •          |     | Unused.                                                                                                             |
| 5    | 5-0    | •          |     | Cylinder number bits 9 through 4 - Upper 6 bits of cylinder number.                                                 |
| 6    | 11-8   | •          |     | Cylinder number bits 3 through 0 - Lower 4 bits of cylinder number.                                                 |
| 6    | 7-0    | •          |     | Track number bits 7 through 0.                                                                                      |
| 7    | 11-4   | •          |     | Logical sector number bits 7 through 0.                                                                             |
| 7    | 3      | •          |     | Ready and safe - Drive is prepared to perform any function.                                                         |
| 7    | 2      | •          |     | System maintenance mode - SYST MAINT switch on drive is active.                                                     |
| 7    | 1,0    | •          |     | Drive number bits 6 and 7 - Upper 2 bits of drive number. From switches in each drive.                              |
| 8    | 11-6   | •          |     | Drive number bits 5 through 0 - Lower 6 bits of drive number. From switches in each drive.                          |
| 8    | 5      | •          |     | Unused, but reserved.                                                                                               |
| 8    | 4      | •          |     | Write enable - Drive is capable of writing (READ ONLY switch is inactive).                                          |
| 8    | 3      | •          |     | Online.                                                                                                             |

TABLE 3-3. DETAILED STATUS (Contd)

| Word | Bit(s) | Applies To |     | Definition                                                                                                      |
|------|--------|------------|-----|-----------------------------------------------------------------------------------------------------------------|
|      |        | 844        | 885 |                                                                                                                 |
| 8    | 2      |            |     | • Air switch - Airflow sensor detects cooling air movement.                                                     |
| 8    | 1      |            |     | • Start switch on - START switch on drive operator panel is active.                                             |
| 8    | 0      |            |     | • Motor at speed - Pack is rotating at nominal speed.                                                           |
| 9    | 11     |            |     | • Index - Start of track.                                                                                       |
| 9    | 10     |            |     | • Sector mark/on sector - Start of record or on sector condition.                                               |
| 9    | 9      |            |     | • On cylinder - Drive is following track.                                                                       |
| 9    | 8      |            |     | • Selected and reserved - Drive is selected and available.                                                      |
| 9    | 7      |            |     | • Ready and safe - Drive is prepared to perform any function.                                                   |
| 9    | 6      |            |     | • On sector.                                                                                                    |
| 9    | 5      |            |     | • Status valid - Controller may sample drive status.                                                            |
| 9    | 4      |            |     | • Status parity error - Controller detected drive status parity error.                                          |
| 9    | 3      |            |     | • Seek timeout error - Seek did not complete within 180 milliseconds.                                           |
| 9    | 2      |            |     | • Seek overshoot error - Carriage moved too rapidly, did not stop at proper cylinder, or moved into crash stop. |
| 9    | 1      |            |     | • Servo off track - Track following failure before or during read/write operation.                              |
| 9    | 0      |            |     | • Rezero mode latch                                                                                             |
| 10   | 11     |            |     | • Servo latch                                                                                                   |
| 10   | 10     |            |     | • Linear mode latch                                                                                             |
| 10   | 9      |            |     | • Control latch                                                                                                 |
| 10   | 8      |            |     | • Wait latch                                                                                                    |

These bits indicate state of drive access control as follows:

| Word, Bit |       |       |      |      | Hexadecimal Decode | Access Control State |
|-----------|-------|-------|------|------|--------------------|----------------------|
| 9,0       | 10,11 | 10,10 | 10,9 | 10,8 |                    |                      |
| 0         | 0     | 0     | 0    | 1    | 01                 | Wait                 |
| 0         | 0     | 0     | 0    | 0    | 00                 | Start rezero         |
| 1         | 0     | 0     | 0    | 0    | 10                 | Move out             |
| 1         | 0     | 0     | 1    | 0    | 12                 | Turn around          |
| 1         | 0     | 1     | 1    | 0    | 16                 | Move in              |
| 0         | 0     | 1     | 1    | 0    | 06                 | Rezero linear mode   |
| 0         | 1     | 1     | 1    | 0    | 0E                 | On track             |
| 0         | 1     | 0     | 1    | 0    | 0A                 | Accelerate           |
| 0         | 1     | 0     | 0    | 0    | 08                 | Decelerate           |
| 0         | 1     | 1     | 0    | 0    | 0C                 | Seek linear mode     |

TABLE 3-3. DETAILED STATUS (Contd)

| Word | Bit(s) | Applies To |     | Definition                                                                                                                                                                      |
|------|--------|------------|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      |        | 844        | 885 |                                                                                                                                                                                 |
| 10   | 7      |            | •   | Last seek forward.                                                                                                                                                              |
| 10   | 6      |            | •   | Guard band pattern crossed - Carriage crossed one or both outer band patterns.                                                                                                  |
| 10   | 5      |            | •   | Target velocity - Actual head velocity equals desired head velocity.                                                                                                            |
| 10   | 4      |            | •   | Track crossing - Servo track crossing pulse.                                                                                                                                    |
| 10   | 3,2    |            | •   | Unused.                                                                                                                                                                         |
| 10   | 1      |            | •   | Odd track.                                                                                                                                                                      |
| 10   | 0      |            | •   | On cylinder.                                                                                                                                                                    |
| 11   | 11     |            | •   | Capable enable error - Writing attempted with READ ONLY operator panel switch active or reading/writing attempted with drive not ready or servo not in track following mode.    |
| 11   | 10     |            | •   | Write overrun - Writing attempted through index mark.                                                                                                                           |
| 11   | 9      |            | •   | Multiple head error - More than one head per arm selected.                                                                                                                      |
| 11   | 8      |            | •   | Write current error - Drive detected no write current during write operation or drive detected write current while reading.                                                     |
| 11   | 7      |            | •   | Write transition error - Drive detected no write transitions within 4 microseconds of write gate or drive detected write transitions in absence of write gate or while reading. |
| 11   | 6      |            | •   | Control error - Write gate present with unselect or read gate.                                                                                                                  |
| 11   | 5      |            | •   | Index check - Drive failed to decode index mark from servo disk.                                                                                                                |
| 11   | 4      |            | •   | Head short - More than one head selected.                                                                                                                                       |
| 11   | 3      |            | •   | Write + read - no control select active.                                                                                                                                        |
| 11   | 2      |            | •   | Write while in offset.                                                                                                                                                          |
| 11   | 1,0    |            | •   | Unused.                                                                                                                                                                         |
| 12   | 11     |            | •   | Early strobe.                                                                                                                                                                   |
| 12   | 10     |            | •   | Late strobe.                                                                                                                                                                    |
| 12   | 9      |            | •   | Forward offset.                                                                                                                                                                 |
| 12   | 8      |            | •   | Reverse offset.                                                                                                                                                                 |
| 12   | 7      |            | •   | Unused.                                                                                                                                                                         |
| 12   | 6      |            | •   | Sector compare error - Drive detected two index marks without detecting on-sector condition.                                                                                    |
| 12   | 5      |            | •   | Drive error - At least one of the conditions indicated by word 2, bit 3; or word 9, bits 3, 2, 1; or word 12, bit 6 exists.                                                     |
| 12   | 4      |            | •   | Unused.                                                                                                                                                                         |
| 12   | 3      |            | •   | Read/write error - Drive detected at least one of the error conditions indicated by word 11.                                                                                    |
| 12   | 2,1    |            | •   | Unused.                                                                                                                                                                         |
| 12   | 0      |            | •   | Access check - Drive detected positioner failure.                                                                                                                               |

TABLE 3-3. DETAILED STATUS (Contd)

| Word                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Bit(s)                        | Applies To |     | Definition                                                                                                                                                                                                                                                                                                                                                                                                       |                           |                |    |                              |    |                              |    |                               |    |                               |    |            |    |             |    |                              |    |                              |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|------------|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|----------------|----|------------------------------|----|------------------------------|----|-------------------------------|----|-------------------------------|----|------------|----|-------------|----|------------------------------|----|------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                               | 844        | 885 |                                                                                                                                                                                                                                                                                                                                                                                                                  |                           |                |    |                              |    |                              |    |                               |    |                               |    |            |    |             |    |                              |    |                              |
| 13                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 11                            | •          | •   | Buffer to disk error - Controller detected error while transferring data from buffer to disk during 1:1 interlace write or 2:1 interlace 885 write.                                                                                                                                                                                                                                                              |                           |                |    |                              |    |                              |    |                               |    |                               |    |            |    |             |    |                              |    |                              |
| 13                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 10                            | •          | •   | Access connected before general status - Enables each of two or more PPs using same channel (and therefore, same controller access) to determine whether access was already connected when PP issued general status function. To ensure validity of this bit, all PPs using same channel must begin each operation with a 0012 (general status) function followed by a 0023 (extended detailed status) function. |                           |                |    |                              |    |                              |    |                               |    |                               |    |            |    |             |    |                              |    |                              |
| 13                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 9                             | •          | •   | Drive reserved before seek/connect - Enables each of two or more PPs using same controller and drive to determine whether drive was already reserved to controller when PP issued 0000 (connect) or 0001/0002 (seek) function.                                                                                                                                                                                   |                           |                |    |                              |    |                              |    |                               |    |                               |    |            |    |             |    |                              |    |                              |
| <div style="border: 1px solid black; display: inline-block; padding: 2px;">NOTE</div> <p>Word 13, bits 8 through 0 and words 14 and 15 apply only to 885 drive connect/seek errors or correctable read/write errors.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                               |            |     |                                                                                                                                                                                                                                                                                                                                                                                                                  |                           |                |    |                              |    |                              |    |                               |    |                               |    |            |    |             |    |                              |    |                              |
| 13                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 8                             | •          |     | 885 connect/seek error - Unused.                                                                                                                                                                                                                                                                                                                                                                                 |                           |                |    |                              |    |                              |    |                               |    |                               |    |            |    |             |    |                              |    |                              |
| 13                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 7-0                           | •          |     | 885 connect/seek error: Drive command causing error - Command decode sent to drive that resulted in error. Possible decodes are:                                                                                                                                                                                                                                                                                 |                           |                |    |                              |    |                              |    |                               |    |                               |    |            |    |             |    |                              |    |                              |
| <table border="0" style="width: 100%;"> <thead> <tr> <th style="text-align: center;"><u>Hexadecimal Decode</u></th> <th style="text-align: center;"><u>Command</u></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">40</td> <td>Load upper cylinder register</td> </tr> <tr> <td style="text-align: center;">41</td> <td>Load lower cylinder register</td> </tr> <tr> <td style="text-align: center;">42</td> <td>Load upper difference counter</td> </tr> <tr> <td style="text-align: center;">43</td> <td>Load lower difference counter</td> </tr> <tr> <td style="text-align: center;">48</td> <td>Start seek</td> </tr> <tr> <td style="text-align: center;">4A</td> <td>Clear fault</td> </tr> <tr> <td style="text-align: center;">80</td> <td>Read upper cylinder register</td> </tr> <tr> <td style="text-align: center;">81</td> <td>Read lower cylinder register</td> </tr> </tbody> </table> |                               |            |     |                                                                                                                                                                                                                                                                                                                                                                                                                  | <u>Hexadecimal Decode</u> | <u>Command</u> | 40 | Load upper cylinder register | 41 | Load lower cylinder register | 42 | Load upper difference counter | 43 | Load lower difference counter | 48 | Start seek | 4A | Clear fault | 80 | Read upper cylinder register | 81 | Read lower cylinder register |
| <u>Hexadecimal Decode</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <u>Command</u>                |            |     |                                                                                                                                                                                                                                                                                                                                                                                                                  |                           |                |    |                              |    |                              |    |                               |    |                               |    |            |    |             |    |                              |    |                              |
| 40                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Load upper cylinder register  |            |     |                                                                                                                                                                                                                                                                                                                                                                                                                  |                           |                |    |                              |    |                              |    |                               |    |                               |    |            |    |             |    |                              |    |                              |
| 41                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Load lower cylinder register  |            |     |                                                                                                                                                                                                                                                                                                                                                                                                                  |                           |                |    |                              |    |                              |    |                               |    |                               |    |            |    |             |    |                              |    |                              |
| 42                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Load upper difference counter |            |     |                                                                                                                                                                                                                                                                                                                                                                                                                  |                           |                |    |                              |    |                              |    |                               |    |                               |    |            |    |             |    |                              |    |                              |
| 43                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Load lower difference counter |            |     |                                                                                                                                                                                                                                                                                                                                                                                                                  |                           |                |    |                              |    |                              |    |                               |    |                               |    |            |    |             |    |                              |    |                              |
| 48                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Start seek                    |            |     |                                                                                                                                                                                                                                                                                                                                                                                                                  |                           |                |    |                              |    |                              |    |                               |    |                               |    |            |    |             |    |                              |    |                              |
| 4A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Clear fault                   |            |     |                                                                                                                                                                                                                                                                                                                                                                                                                  |                           |                |    |                              |    |                              |    |                               |    |                               |    |            |    |             |    |                              |    |                              |
| 80                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Read upper cylinder register  |            |     |                                                                                                                                                                                                                                                                                                                                                                                                                  |                           |                |    |                              |    |                              |    |                               |    |                               |    |            |    |             |    |                              |    |                              |
| 81                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Read lower cylinder register  |            |     |                                                                                                                                                                                                                                                                                                                                                                                                                  |                           |                |    |                              |    |                              |    |                               |    |                               |    |            |    |             |    |                              |    |                              |
| 13                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 8-0                           | •          | •   | Read/write error: Word address of correctable read data - Location in data field of 12-bit word modified by correction vector word 1. First location is 000. For error logging only.                                                                                                                                                                                                                             |                           |                |    |                              |    |                              |    |                               |    |                               |    |            |    |             |    |                              |    |                              |
| 14                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 11-8                          | •          |     | 885 connect/seek error - Unused.                                                                                                                                                                                                                                                                                                                                                                                 |                           |                |    |                              |    |                              |    |                               |    |                               |    |            |    |             |    |                              |    |                              |
| 14                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 7-0                           | •          |     | 885 connect/seek error: Unselected status for command in word 13 - Definitions for word 14, bits 7 through 0 are identical to those for word 9, bits 11 through 4. Word 14 status is that returned for command in word 13.                                                                                                                                                                                       |                           |                |    |                              |    |                              |    |                               |    |                               |    |            |    |             |    |                              |    |                              |
| 14                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 11-0                          | •          | •   | Read/write error; Correction vector word 1 - First word of 24-bit correction vector that controller applied to data field with logical difference operation. For error logging only.                                                                                                                                                                                                                             |                           |                |    |                              |    |                              |    |                               |    |                               |    |            |    |             |    |                              |    |                              |
| 15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 11-8                          | •          |     | 885 connect/seek error - Unused.                                                                                                                                                                                                                                                                                                                                                                                 |                           |                |    |                              |    |                              |    |                               |    |                               |    |            |    |             |    |                              |    |                              |

TABLE 3-3. DETAILED STATUS (Contd)

| Word                       | Bit(s)                   | Applies To               |             | Definition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                            |                  |   |               |  |  |  |  |  |   |   |   |   |   |   |   |   |    |                         |  |  |  |  |  |  |  |    |                         |  |  |  |  |  |  |  |    |         |                          |  |  |  |  |  |  |    |                          |  |  |  |  |  |  |  |    |                |              |             |                  |        |  |  |               |    |                |              |             |                  |        |  |  |          |    |                         |  |  |  |  |  |  |  |    |                         |  |  |  |  |  |  |  |
|----------------------------|--------------------------|--------------------------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|------------------|---|---------------|--|--|--|--|--|---|---|---|---|---|---|---|---|----|-------------------------|--|--|--|--|--|--|--|----|-------------------------|--|--|--|--|--|--|--|----|---------|--------------------------|--|--|--|--|--|--|----|--------------------------|--|--|--|--|--|--|--|----|----------------|--------------|-------------|------------------|--------|--|--|---------------|----|----------------|--------------|-------------|------------------|--------|--|--|----------|----|-------------------------|--|--|--|--|--|--|--|----|-------------------------|--|--|--|--|--|--|--|
|                            |                          | 844                      | 885         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                            |                  |   |               |  |  |  |  |  |   |   |   |   |   |   |   |   |    |                         |  |  |  |  |  |  |  |    |                         |  |  |  |  |  |  |  |    |         |                          |  |  |  |  |  |  |    |                          |  |  |  |  |  |  |  |    |                |              |             |                  |        |  |  |               |    |                |              |             |                  |        |  |  |          |    |                         |  |  |  |  |  |  |  |    |                         |  |  |  |  |  |  |  |
| 15                         | 7-0                      |                          | •           | <p>885 connect/seek error: Drive echo status for command in word 13 - Echo status returned by drive for command in word 13. Status descriptions for each possible command decode are:</p> <table border="1"> <thead> <tr> <th rowspan="2">Hexadecimal Command Decode</th> <th colspan="8">Echo Status Bits</th> </tr> <tr> <th>7</th> <th>6</th> <th>5</th> <th>4</th> <th>3</th> <th>2</th> <th>1</th> <th>0</th> </tr> </thead> <tbody> <tr> <td>40</td> <td colspan="8">Upper cylinder register</td> </tr> <tr> <td>41</td> <td colspan="8">Lower cylinder register</td> </tr> <tr> <td>42</td> <td>Forward</td> <td colspan="7">Upper difference counter</td> </tr> <tr> <td>43</td> <td colspan="8">Lower difference counter</td> </tr> <tr> <td>48</td> <td>Control select</td> <td>Access error</td> <td>Drive check</td> <td>Read/write check</td> <td>Online</td> <td colspan="2" style="background-color: #cccccc;"></td> <td>Offset active</td> </tr> <tr> <td>4A</td> <td>Control select</td> <td>Access error</td> <td>Drive check</td> <td>Read/write check</td> <td>Online</td> <td colspan="2" style="background-color: #cccccc;"></td> <td>On track</td> </tr> <tr> <td>80</td> <td colspan="8">Upper cylinder register</td> </tr> <tr> <td>81</td> <td colspan="8">Lower cylinder register</td> </tr> </tbody> </table> | Hexadecimal Command Decode | Echo Status Bits |   |               |  |  |  |  |  | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | 40 | Upper cylinder register |  |  |  |  |  |  |  | 41 | Lower cylinder register |  |  |  |  |  |  |  | 42 | Forward | Upper difference counter |  |  |  |  |  |  | 43 | Lower difference counter |  |  |  |  |  |  |  | 48 | Control select | Access error | Drive check | Read/write check | Online |  |  | Offset active | 4A | Control select | Access error | Drive check | Read/write check | Online |  |  | On track | 80 | Upper cylinder register |  |  |  |  |  |  |  | 81 | Lower cylinder register |  |  |  |  |  |  |  |
| Hexadecimal Command Decode | Echo Status Bits         |                          |             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                            |                  |   |               |  |  |  |  |  |   |   |   |   |   |   |   |   |    |                         |  |  |  |  |  |  |  |    |                         |  |  |  |  |  |  |  |    |         |                          |  |  |  |  |  |  |    |                          |  |  |  |  |  |  |  |    |                |              |             |                  |        |  |  |               |    |                |              |             |                  |        |  |  |          |    |                         |  |  |  |  |  |  |  |    |                         |  |  |  |  |  |  |  |
|                            | 7                        | 6                        | 5           | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 3                          | 2                | 1 | 0             |  |  |  |  |  |   |   |   |   |   |   |   |   |    |                         |  |  |  |  |  |  |  |    |                         |  |  |  |  |  |  |  |    |         |                          |  |  |  |  |  |  |    |                          |  |  |  |  |  |  |  |    |                |              |             |                  |        |  |  |               |    |                |              |             |                  |        |  |  |          |    |                         |  |  |  |  |  |  |  |    |                         |  |  |  |  |  |  |  |
| 40                         | Upper cylinder register  |                          |             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                            |                  |   |               |  |  |  |  |  |   |   |   |   |   |   |   |   |    |                         |  |  |  |  |  |  |  |    |                         |  |  |  |  |  |  |  |    |         |                          |  |  |  |  |  |  |    |                          |  |  |  |  |  |  |  |    |                |              |             |                  |        |  |  |               |    |                |              |             |                  |        |  |  |          |    |                         |  |  |  |  |  |  |  |    |                         |  |  |  |  |  |  |  |
| 41                         | Lower cylinder register  |                          |             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                            |                  |   |               |  |  |  |  |  |   |   |   |   |   |   |   |   |    |                         |  |  |  |  |  |  |  |    |                         |  |  |  |  |  |  |  |    |         |                          |  |  |  |  |  |  |    |                          |  |  |  |  |  |  |  |    |                |              |             |                  |        |  |  |               |    |                |              |             |                  |        |  |  |          |    |                         |  |  |  |  |  |  |  |    |                         |  |  |  |  |  |  |  |
| 42                         | Forward                  | Upper difference counter |             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                            |                  |   |               |  |  |  |  |  |   |   |   |   |   |   |   |   |    |                         |  |  |  |  |  |  |  |    |                         |  |  |  |  |  |  |  |    |         |                          |  |  |  |  |  |  |    |                          |  |  |  |  |  |  |  |    |                |              |             |                  |        |  |  |               |    |                |              |             |                  |        |  |  |          |    |                         |  |  |  |  |  |  |  |    |                         |  |  |  |  |  |  |  |
| 43                         | Lower difference counter |                          |             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                            |                  |   |               |  |  |  |  |  |   |   |   |   |   |   |   |   |    |                         |  |  |  |  |  |  |  |    |                         |  |  |  |  |  |  |  |    |         |                          |  |  |  |  |  |  |    |                          |  |  |  |  |  |  |  |    |                |              |             |                  |        |  |  |               |    |                |              |             |                  |        |  |  |          |    |                         |  |  |  |  |  |  |  |    |                         |  |  |  |  |  |  |  |
| 48                         | Control select           | Access error             | Drive check | Read/write check                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Online                     |                  |   | Offset active |  |  |  |  |  |   |   |   |   |   |   |   |   |    |                         |  |  |  |  |  |  |  |    |                         |  |  |  |  |  |  |  |    |         |                          |  |  |  |  |  |  |    |                          |  |  |  |  |  |  |  |    |                |              |             |                  |        |  |  |               |    |                |              |             |                  |        |  |  |          |    |                         |  |  |  |  |  |  |  |    |                         |  |  |  |  |  |  |  |
| 4A                         | Control select           | Access error             | Drive check | Read/write check                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Online                     |                  |   | On track      |  |  |  |  |  |   |   |   |   |   |   |   |   |    |                         |  |  |  |  |  |  |  |    |                         |  |  |  |  |  |  |  |    |         |                          |  |  |  |  |  |  |    |                          |  |  |  |  |  |  |  |    |                |              |             |                  |        |  |  |               |    |                |              |             |                  |        |  |  |          |    |                         |  |  |  |  |  |  |  |    |                         |  |  |  |  |  |  |  |
| 80                         | Upper cylinder register  |                          |             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                            |                  |   |               |  |  |  |  |  |   |   |   |   |   |   |   |   |    |                         |  |  |  |  |  |  |  |    |                         |  |  |  |  |  |  |  |    |         |                          |  |  |  |  |  |  |    |                          |  |  |  |  |  |  |  |    |                |              |             |                  |        |  |  |               |    |                |              |             |                  |        |  |  |          |    |                         |  |  |  |  |  |  |  |    |                         |  |  |  |  |  |  |  |
| 81                         | Lower cylinder register  |                          |             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                            |                  |   |               |  |  |  |  |  |   |   |   |   |   |   |   |   |    |                         |  |  |  |  |  |  |  |    |                         |  |  |  |  |  |  |  |    |         |                          |  |  |  |  |  |  |    |                          |  |  |  |  |  |  |  |    |                |              |             |                  |        |  |  |               |    |                |              |             |                  |        |  |  |          |    |                         |  |  |  |  |  |  |  |    |                         |  |  |  |  |  |  |  |
| 15                         | 11-0                     | •                        | •           | Read/write error: Correction vector word 2 - Second word of 24-bit correction vector that controller applied to data field with logical difference operation. For error logging only.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                            |                  |   |               |  |  |  |  |  |   |   |   |   |   |   |   |   |    |                         |  |  |  |  |  |  |  |    |                         |  |  |  |  |  |  |  |    |         |                          |  |  |  |  |  |  |    |                          |  |  |  |  |  |  |  |    |                |              |             |                  |        |  |  |               |    |                |              |             |                  |        |  |  |          |    |                         |  |  |  |  |  |  |  |    |                         |  |  |  |  |  |  |  |
| 16                         | 11                       | •                        | •           | Lost drive clock - Drive read/write clock absent for at least 340 nanoseconds.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                            |                  |   |               |  |  |  |  |  |   |   |   |   |   |   |   |   |    |                         |  |  |  |  |  |  |  |    |                         |  |  |  |  |  |  |  |    |         |                          |  |  |  |  |  |  |    |                          |  |  |  |  |  |  |  |    |                |              |             |                  |        |  |  |               |    |                |              |             |                  |        |  |  |          |    |                         |  |  |  |  |  |  |  |    |                         |  |  |  |  |  |  |  |
| 16                         | 10-8                     | •                        |             | Unused, but reserved.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                            |                  |   |               |  |  |  |  |  |   |   |   |   |   |   |   |   |    |                         |  |  |  |  |  |  |  |    |                         |  |  |  |  |  |  |  |    |         |                          |  |  |  |  |  |  |    |                          |  |  |  |  |  |  |  |    |                |              |             |                  |        |  |  |               |    |                |              |             |                  |        |  |  |          |    |                         |  |  |  |  |  |  |  |    |                         |  |  |  |  |  |  |  |
| 16                         | 7                        | •                        | •           | Error correction code (ECC) residue nonzero.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                            |                  |   |               |  |  |  |  |  |   |   |   |   |   |   |   |   |    |                         |  |  |  |  |  |  |  |    |                         |  |  |  |  |  |  |  |    |         |                          |  |  |  |  |  |  |    |                          |  |  |  |  |  |  |  |    |                |              |             |                  |        |  |  |               |    |                |              |             |                  |        |  |  |          |    |                         |  |  |  |  |  |  |  |    |                         |  |  |  |  |  |  |  |
| 16                         | 6                        | •                        | •           | Channel parity error - Controller detected parity error on data transfer from PP to the connected access. Operation completes despite parity error.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                            |                  |   |               |  |  |  |  |  |   |   |   |   |   |   |   |   |    |                         |  |  |  |  |  |  |  |    |                         |  |  |  |  |  |  |  |    |         |                          |  |  |  |  |  |  |    |                          |  |  |  |  |  |  |  |    |                |              |             |                  |        |  |  |               |    |                |              |             |                  |        |  |  |          |    |                         |  |  |  |  |  |  |  |    |                         |  |  |  |  |  |  |  |
| 16                         | 5                        | •                        | •           | Processor instruction timeout - 30-millisecond timeout occurred while processor awaited read next instruction (RNI) occurrence during data transfer on a processor channel. Subsequent processor channel transfers (except one-word inputs) fall through until instruction timeout condition clears.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                            |                  |   |               |  |  |  |  |  |   |   |   |   |   |   |   |   |    |                         |  |  |  |  |  |  |  |    |                         |  |  |  |  |  |  |  |    |         |                          |  |  |  |  |  |  |    |                          |  |  |  |  |  |  |  |    |                |              |             |                  |        |  |  |               |    |                |              |             |                  |        |  |  |          |    |                         |  |  |  |  |  |  |  |    |                         |  |  |  |  |  |  |  |
| 16                         | 4                        | •                        | •           | Lost control word - During control word sequence, bit counter became zero before controller detected next control word.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                            |                  |   |               |  |  |  |  |  |   |   |   |   |   |   |   |   |    |                         |  |  |  |  |  |  |  |    |                         |  |  |  |  |  |  |  |    |         |                          |  |  |  |  |  |  |    |                          |  |  |  |  |  |  |  |    |                |              |             |                  |        |  |  |               |    |                |              |             |                  |        |  |  |          |    |                         |  |  |  |  |  |  |  |    |                         |  |  |  |  |  |  |  |
| 16                         | 3                        | •                        | •           | Up/down count nonzero - Number of buffer words read was less than number of buffer words written during normal read/write operation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                            |                  |   |               |  |  |  |  |  |   |   |   |   |   |   |   |   |    |                         |  |  |  |  |  |  |  |    |                         |  |  |  |  |  |  |  |    |         |                          |  |  |  |  |  |  |    |                          |  |  |  |  |  |  |  |    |                |              |             |                  |        |  |  |               |    |                |              |             |                  |        |  |  |          |    |                         |  |  |  |  |  |  |  |    |                         |  |  |  |  |  |  |  |
| 16                         | 2                        | •                        | •           | Pack unsafe or not ready and safe - Drive detected failure and is not safe for reading/writing.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                            |                  |   |               |  |  |  |  |  |   |   |   |   |   |   |   |   |    |                         |  |  |  |  |  |  |  |    |                         |  |  |  |  |  |  |  |    |         |                          |  |  |  |  |  |  |    |                          |  |  |  |  |  |  |  |    |                |              |             |                  |        |  |  |               |    |                |              |             |                  |        |  |  |          |    |                         |  |  |  |  |  |  |  |    |                         |  |  |  |  |  |  |  |
| 16                         | 1                        | •                        | •           | Buffer output register parity error - Controller detected parity error during buffer operation. Operation completes despite parity error.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                            |                  |   |               |  |  |  |  |  |   |   |   |   |   |   |   |   |    |                         |  |  |  |  |  |  |  |    |                         |  |  |  |  |  |  |  |    |         |                          |  |  |  |  |  |  |    |                          |  |  |  |  |  |  |  |    |                |              |             |                  |        |  |  |               |    |                |              |             |                  |        |  |  |          |    |                         |  |  |  |  |  |  |  |    |                         |  |  |  |  |  |  |  |
| 16                         | 0                        | •                        | •           | Write verify error - Controller detected miscompare during write verify operation. Operation completes despite error.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                            |                  |   |               |  |  |  |  |  |   |   |   |   |   |   |   |   |    |                         |  |  |  |  |  |  |  |    |                         |  |  |  |  |  |  |  |    |         |                          |  |  |  |  |  |  |    |                          |  |  |  |  |  |  |  |    |                |              |             |                  |        |  |  |               |    |                |              |             |                  |        |  |  |          |    |                         |  |  |  |  |  |  |  |    |                         |  |  |  |  |  |  |  |
| 17                         | 11                       | •                        | •           | Sync byte search in progress.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                            |                  |   |               |  |  |  |  |  |   |   |   |   |   |   |   |   |    |                         |  |  |  |  |  |  |  |    |                         |  |  |  |  |  |  |  |    |         |                          |  |  |  |  |  |  |    |                          |  |  |  |  |  |  |  |    |                |              |             |                  |        |  |  |               |    |                |              |             |                  |        |  |  |          |    |                         |  |  |  |  |  |  |  |    |                         |  |  |  |  |  |  |  |
| 17                         | 10                       | •                        | •           | Sector length violation - Sector mark occurred while read gate or write gate was active. Operation in progress halts with error.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                            |                  |   |               |  |  |  |  |  |   |   |   |   |   |   |   |   |    |                         |  |  |  |  |  |  |  |    |                         |  |  |  |  |  |  |  |    |         |                          |  |  |  |  |  |  |    |                          |  |  |  |  |  |  |  |    |                |              |             |                  |        |  |  |               |    |                |              |             |                  |        |  |  |          |    |                         |  |  |  |  |  |  |  |    |                         |  |  |  |  |  |  |  |
| 17                         | 9                        | •                        | •           | Lost data - Buffer failed to exchange data with shift register fast enough to match disk transfer rate. Operation in progress halts with error.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                            |                  |   |               |  |  |  |  |  |   |   |   |   |   |   |   |   |    |                         |  |  |  |  |  |  |  |    |                         |  |  |  |  |  |  |  |    |         |                          |  |  |  |  |  |  |    |                          |  |  |  |  |  |  |  |    |                |              |             |                  |        |  |  |               |    |                |              |             |                  |        |  |  |          |    |                         |  |  |  |  |  |  |  |    |                         |  |  |  |  |  |  |  |

TABLE 3-3. DETAILED STATUS (Contd)

| Word                                                                                                                                                                                                                                                                                                                            | Bit(s) | Applies To |     | Definition                                                                                                                                                                                                   |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|------------|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                                                                 |        | 844        | 885 |                                                                                                                                                                                                              |
| 17                                                                                                                                                                                                                                                                                                                              | 8      | •          | •   | Sync byte miscompare - Sync byte read from drive did not compare with sync byte supplied by controller.                                                                                                      |
| 17                                                                                                                                                                                                                                                                                                                              | 7      | •          | •   | Checkword error correction in progress - Controller is determining whether checkword error is correctable.                                                                                                   |
| 17                                                                                                                                                                                                                                                                                                                              | 6      | •          | •   | Buffer output register full.                                                                                                                                                                                 |
| 17                                                                                                                                                                                                                                                                                                                              | 5      | •          | •   | Buffer input register full.                                                                                                                                                                                  |
| 17                                                                                                                                                                                                                                                                                                                              | 4      | •          | •   | Channel reserved - Data path between connected access and buffer is enabled. Controller disables this path between functions to prevent PP to PP transfers on disk channel from interacting with controller. |
| 17                                                                                                                                                                                                                                                                                                                              | 3      | •          | •   | Deadman timeout - Connected access has not transferred word on active PP channel for $4.8 \pm 0.5$ seconds. Controller has deactivated channel.                                                              |
| 17                                                                                                                                                                                                                                                                                                                              | 2      | •          | •   | Channel active - PP channel selected by processor channel 0, bits 0 and 1 is active.                                                                                                                         |
| 17                                                                                                                                                                                                                                                                                                                              | 1      | •          | •   | Data field error.                                                                                                                                                                                            |
| 17                                                                                                                                                                                                                                                                                                                              | 0      | •          | •   | Address field error.                                                                                                                                                                                         |
| 18                                                                                                                                                                                                                                                                                                                              | 1      | •          | •   | Access D connected.                                                                                                                                                                                          |
| 18                                                                                                                                                                                                                                                                                                                              | 0      | •          | •   | Access C connected.                                                                                                                                                                                          |
| 18                                                                                                                                                                                                                                                                                                                              | 9      | •          | •   | Access B connected.                                                                                                                                                                                          |
| 18                                                                                                                                                                                                                                                                                                                              | 8      | •          | •   | Access A connected.                                                                                                                                                                                          |
| 18                                                                                                                                                                                                                                                                                                                              | 7-0    | •          | •   | Last function bits 7 through 0 - Lower 8 bits of last function processed.                                                                                                                                    |
| <div style="border: 1px solid black; display: inline-block; padding: 2px;">NOTE</div> <p>Controller does not record 0013/0023 (detailed status) functions in words 18 through 20. Descriptions for these words are valid only through controlware revision 03. Status descriptions for revision 04 and up are listed below.</p> |        |            |     |                                                                                                                                                                                                              |
| 19                                                                                                                                                                                                                                                                                                                              | 11-4   | •          | •   | Second to last function bits 7 through 0 - Lower 8 bits of second to last function processed.                                                                                                                |
| 19                                                                                                                                                                                                                                                                                                                              | 3-0    | •          | •   | Third to last function bits 7 through 4 - Upper 4 bits of lower 8 bits of third to last function processed.                                                                                                  |
| 20                                                                                                                                                                                                                                                                                                                              | 11-8   | •          | •   | Third to last function bits 3 through 0 - Lower 4 bits of third to last function processed.                                                                                                                  |
| 20                                                                                                                                                                                                                                                                                                                              | 7-0    | •          | •   | Fourth to last function bits 7 through 0 - Lower 8 bits of fourth to last function processed.                                                                                                                |

The following applies to controlware revisions 04 and higher only.

|    |      |   |   |                                                                                       |
|----|------|---|---|---------------------------------------------------------------------------------------|
| 18 | 11-8 | • | • | Same as above.                                                                        |
| 18 | 7-5  | • | • | Unused.                                                                               |
| 18 | 4    | • | • | Echo mode. Drive status from 885 is invalid.                                          |
| 18 | 3    | • | • | Large Sector Mode.                                                                    |
| 18 | 2-0  | • | • | Unused.                                                                               |
| 19 | 11-0 | • | • | Unused.                                                                               |
| 20 | 11-8 | • | • | Unused.                                                                               |
| 20 | 7-0  | • | • | Controller hardware unique identifier bits 7-0. From switches on controller card A07. |

## 0016 — FORMAT PACK

Writes new address and data fields on a disk pack or HDA using nominal head positioner offset and strobe settings. Table 3-4 shows the 844 and 885 sector format patterns. A new pack must be entirely formatted before the PP directs read/write functions to it. Each format pack function requires a seven-word parameter block, whose content varies with the type of format operation as described in the following paragraphs.

### CAUTION

All format operations destroy data residing in the area being formatted. Before attempting to reformat a disk area containing customer data or flaw maps, ensure that the data has been archived to another device.

TABLE 3-4. SECTOR FORMAT PATTERNS

| Order | Field             | Number of Bits |      |
|-------|-------------------|----------------|------|
|       |                   | 844            | 885  |
| 1     | Sync pattern 1    | 312            | 200  |
| 2     | Sync byte 1       | 6              | 8    |
| 3     | Address field     | 24             | 32   |
| 4     | Address checkword | 32             | 48   |
| 5     | Sync pattern 2    | 102            | 152  |
| 6     | Sync byte 2       | 6              | 8    |
| 7     | Data field        | 3864           | 3864 |
| 8     | Data checkword    | 32             | 48   |
| 9     | Pad byte          | 6              | 8    |
| 10    | Tolerance gap     | 96             | 304  |
| Total |                   | 4480           | 4672 |

The 844 recording frequency is 6.45 million bits per second. The 885 recording frequency is 9.58 million bits per second.

### Formatting 844 Pack

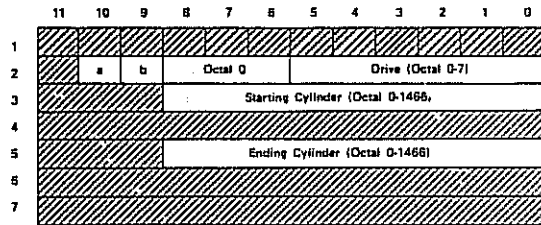
Upon receipt of a format pack function and the parameter block shown in figure 3-3, the controller first ensures that a utility map is present on the pack. If the map is not present, the controller returns 5000 general status and aborts the function. Otherwise, the controller formats the entire pack or selected cylinders according to the parameter block. The controller does not format factory and utility map areas (cylinder 822; track 0; sectors 0, 1, 2). Formatting the entire 844 pack requires a minimum of 5 minutes.

When formatting is complete and the return flaw data bit (parameter word 2, bit 9) is 0, the controller places sector and track flaw bits (as required) in the address headers of all sectors that have flaw entries in the utility map. Factory flaw criteria for the disk packs used on 844-4x drives are:

**Sector flaw** The sector contains a defect that prevents the controller from reading it without a correctable or noncorrectable error.

**Track flaw** The track contains more than 12 sector flaws.

When the return flaw data bit is 1 and the controller has completed the formatting specified in the format pack parameter block, the controller reads from the utility flaw map the first sector flaw address corresponding to the area just flawed, places this address in detailed status, and sets general status to 4400 octal. Upon detection of the 4400 general status, the PP may take detailed status to obtain the flaw address and then issue a 0014 (continue) function. This causes the controller to set the appropriate flaw bits in the address field of the sector just identified in detailed status, to transfer the address of the next flawed sector from the utility flaw map to detailed status, and to set general status to 4400. When the PP has received the last sector flaw address corresponding to the area just formatted, the controller sets general status to 0000.



a Format entire pack  
b Return flaw data

Figure 3-3. 844: Format Multiple Track Parameters

### Formatting 844 Map Sectors

Figure 3-4 shows the format pack parameter block used for reformatting an 844 factory or utility map sector. Refer to appendix D for map addresses and data formats.

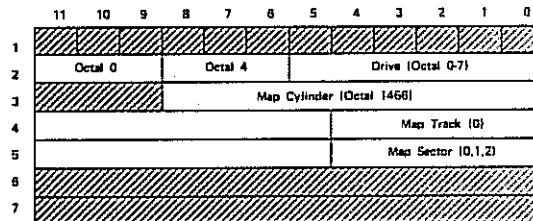
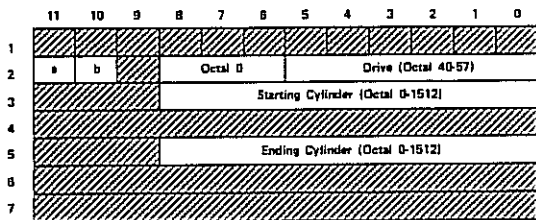


Figure 3-4. 844: Format Map Sector Parameters

### Formatting 885 HDA

Upon receipt of a format pack function and the parameter block shown in figure 3-5, the controller formats all 34 physical sectors on each track of the entire 885 HDA or the selected cylinders. The controller does not format the tracks containing factory and utility flaw maps (cylinder 841, tracks 0, 1). When the save controlware track bit (parameter word 2, bit 11) is 1, the controller does not format the track containing 7155 controlware (cylinder 841, track 2). During formatting, the controller neither checks for flaws nor modifies the contents of flaw maps. Formatting an entire HDA requires a minimum of 10 minutes.





- a Save controlware track
- b Format entire HDA

Figure 3-5. 885: Format Multiple Track Parameters

After the entire HDA is formatted, the PP must use a read factory data (0030) function to read the defective sectors table in the utility map (cylinder 841, track 1, sectors 2-18), and then must reformat any track containing one or more defective sectors.

The defective sectors table in the factory map contains the address of each sector unable to record information without error. The defective sectors table in the utility map starts out as a copy of the defective sectors table in the factory map, and also may contain user entries.

For each 885 track with one or two entries in the defective sectors table of the utility map, the PP should issue one format pack function with the parameter block shown in figure 3-6. This zero-fills defective sector(s) and readjusts logical sector numbers to allow use of the spare sector(s) at the end of the track.

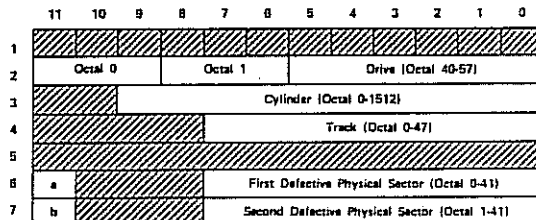
For each 885 track with more than two entries in the defective sectors table of the utility map, the PP should issue 34 format pack functions (one function for each physical sector on the track) using the parameter block shown in figure 3-7 for good sectors, and using the parameter block shown in figure 3-8 for defective sectors. This sets the track flaw bit in each good sector on the track and zero-fills each defective sector.

**NOTES**

The PP should ignore defective sector entries for flaw map tracks (cylinder 841, tracks 0, 1).

Formatting is not required to switch between 885 small and large sector modes. Reference 885-1X large sector section, this manual.

After any 885 format operation (and required zero-filling of defective sectors and flawing of tracks) the PP should verify that the defective sectors table and the track flaw table in the utility map accurately reflect the condition of the HDA. After verifying the tables, the PP can determine unusable areas of the HDA by consulting the track flaw table alone. The PP need reference the defective sectors table only when reformatting tracks containing defective sectors.



- a When 1, indicates no defective sectors
- b When 1, indicates no second defective sector

Figure 3-6. 885: Format Track (Zero, One, or Two Skipped Sectors) Parameters

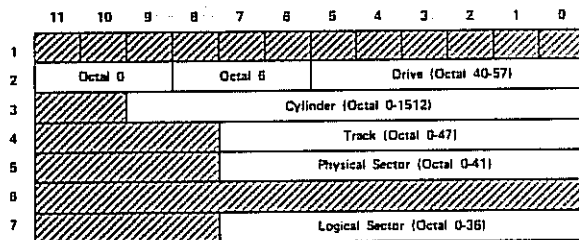


Figure 3-7. 885: Format Good Sector (More Than Two Skipped Sectors in Track) Parameters

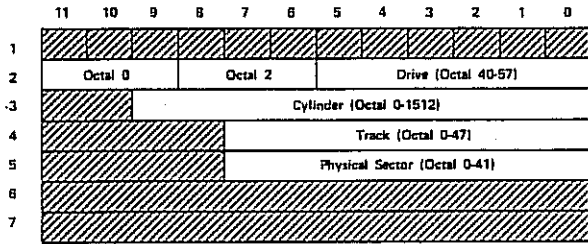


Figure 3-8. 885: Format Defective Sector (More Than Two Skipped Sectors in Track) Parameters

**Formatting 885 Utility Map**

Use format pack function and parameter block shown in figure 3-9 to format an 885 utility map sector. The controller does not allow formatting of 885 factory map sectors.

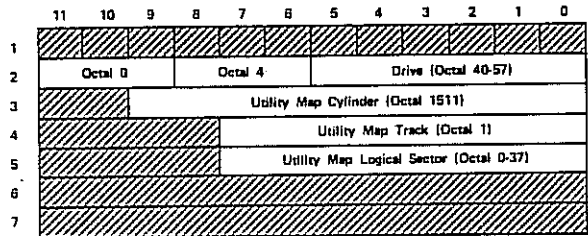


Figure 3-9. 885: Format Utility Map Sector Parameters

**0017 — RETURN DRIVE ADDRESS**

Transfers three-word general status/drive address block from controller to PP. Word 1 is general status applicable to last connect (0000) or seek (0001/0002) function. Word 2 contains current (0000 general status) or destination (0002 general status) cylinder address. When general status is 0000, word 3 contains physical sector number of sector currently under read/write heads. Table 3-5 lists physical sector number ranges and approximate sector times for 844 and 885 drives. For 885 drives, the controller identifies the 93-microsecond tolerance gap between physical sector 33 and physical sector 0 as sector 34.

TABLE 3-5. PHYSICAL SECTOR TIMES

| Drive | Physical Sector | Time per Sector  |
|-------|-----------------|------------------|
| 844   | 0-23            | 695 microseconds |
| 885   | 0-33            | 487 microseconds |
| 885   | 34              | 93 microseconds  |

**0020 — DRIVE RELEASE**

Releases reserve on last drive accessed by controller. Does not clear controller access connection.

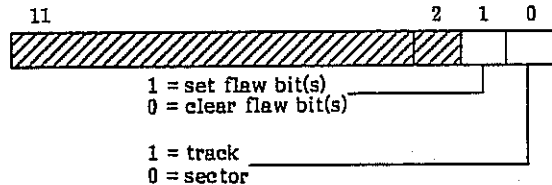
**0021 — RETURN CYLINDER ADDRESS**

Transfers from drive to controller to PP one word containing current (zero-filled general status) or destination (0002 general status) cylinder address. PP must have previously reserved drive with 0000 (connect) function.

**0022 — SET/CLEAR FLAW**

844 drives only. Sets/clears flaw bit(s) on individual track or sector, then automatically seeks to and updates utility map. Controller returns 0002 general status word while drive seeks to utility map. PP must have previously issued successful 0001/0002 (seek) function that specified track/sector requiring flaw bit change(s).

Parameter format:



PP should use following procedure when flaw bit changes are required for 885 drive.

1. Use 0030 (read factory data) function(s) to read defective sectors map.
2. Use 0016 (format pack) function(s) to set track flaw bits or to zero-fill defective sectors and reformat good sectors as necessary.
3. Use 0037 (write protected sector) function(s) to update utility map as necessary.

### 0023 — EXTENDED DETAILED STATUS

Refer to 0013 (detailed status) function description.

### 0024 — READ GAP SECTOR, 0025 — WRITE GAP SECTOR, 0026 — WRITE VERIFY GAP SECTOR, AND 0027 — READ CHECKWORD GAP SECTOR

These functions are identical to corresponding 0004 through 0007 functions except for number of skipped sectors between logical sectors. Gap sector completes the function it replaces, then skips an additional two sectors. Refer to table 3-6.

TABLE 3-6. SKIPPED SECTORS BETWEEN LOGICAL SECTORS

| Interlace | Number of Skipped Sectors Between Logical Sectors |                      |
|-----------|---------------------------------------------------|----------------------|
|           | Nongap Sector Functions                           | Gap Sector Functions |
| 1:1       | 0                                                 | 2                    |
| 2:1       | 1                                                 | 3                    |

### 0030 — READ FACTORY DATA

Identical to 0004 (read) function except read data must come from any pack data area described in appendix D except 844 utility map.

### 0031 — READ UTILITY MAP

844 drives only. Identical to 0004 (read) function except read data must come from 844 utility map described in appendix D.

### 0032 — BLOCK TRANSFER BUFFER READ

Transfers 322 12-bit words from controller buffer to PP. As in 0004 (read) function, each word transferred is rightmost 12 bits of 16-bit buffer word. PP must follow block transfer buffer read function with 322-word block input.

### 0033 — BLOCK TRANSFER BUFFER WRITE

Transfers 322 12-bit words from PP to controller buffer. As in 0005 (write) function, each word transferred is rightmost 12 bits of 16-bit buffer word. PP must follow block transfer buffer write function with 322-word block output. In case of channel parity error or if controller receives less than 322 words, controller returns 5000 general status.

### 0034 — READ PROTECTED SECTOR

Identical to 0004 (read) function except read data must come from sector written with 0037 (write protected sector) function.

### 0035 — WRITE LAST SECTOR

Identical to 0005 (write) function except when 1:1 interlace is selected, controller returns general status after rather than before transferring data from buffer to disk. Since this prevents next physical sector from being written without an additional disk revolution, PP should issue write last sector function only for last sector of block.

### 0036 — WRITE VERIFY LAST SECTOR

Identical to 0006 (write verify) function except when 1:1 interlace is selected, controller returns general status after rather than before verifying sector. Since this prevents next physical sector from being verified without an additional disk revolution, PP should issue write verify last sector function only for last sector of block.

### 0037 — WRITE PROTECTED SECTOR

Identical to 0035 (write last sector) function except seek preceding write protected sector function must specify one of following sectors.

- 844 drive      Cylinder 822, track 0, sector 0, 1, or 2 or sector having sector flaw bit set in address field.
- 885 drive      Cylinder 841, track 1, sectors 0 through 31 or sector having track flaw bit set in address field.

### 0040 — READ SHORT

Diagnostic use only. Identical to 0004 (read) function except controller transfers 319 words (844) or 318 words (885) to PP and disables checkword error logic before processing controller-generated checkword. This allows PP to test controller checkword error logic by reading sector that contains fixed checkword as last portion of data field. PP must follow read short function with 319-word (844) or 318-word (885) block input. Table 3-7 shows possible write test patterns for use with read short function.

### 0041 — SELECT STROBE AND OFFSET

Disk pack margin testing only. Selects abnormal strobe/head positioner offset for subsequent read-type functions. Next 0000 (connect) or 0001/0002 (seek) function returns strobe/offset to nominal. Controller does not reply to any function during 10 milliseconds required for offset change to or from nominal. Write-type functions are illegal when strobe/offset are not nominal. Figure 3-10 shows strobe/offset read sequence.

Parameter format:

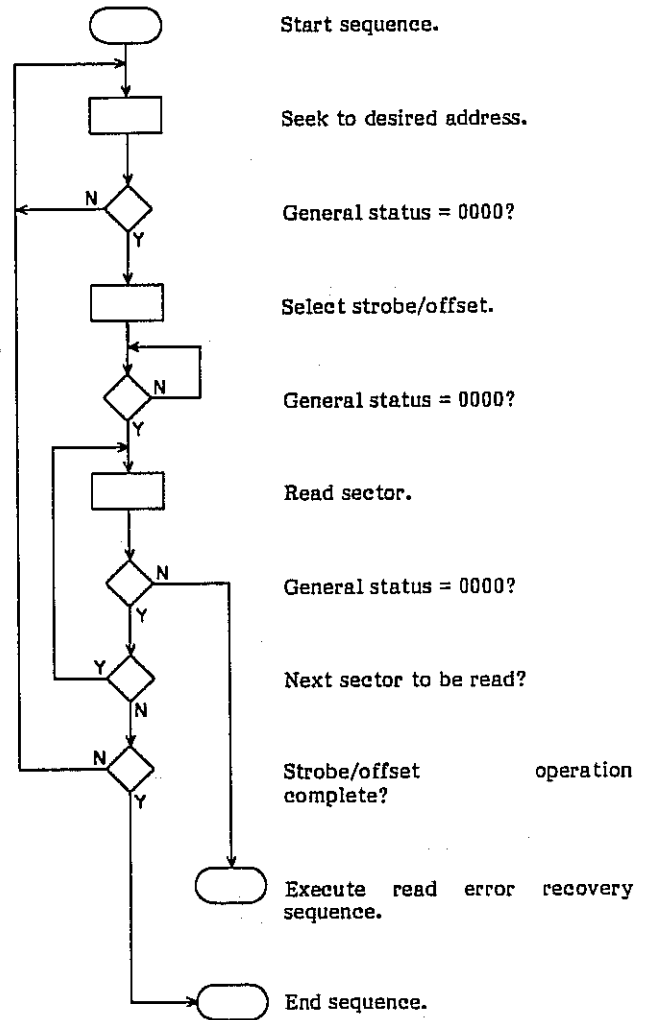
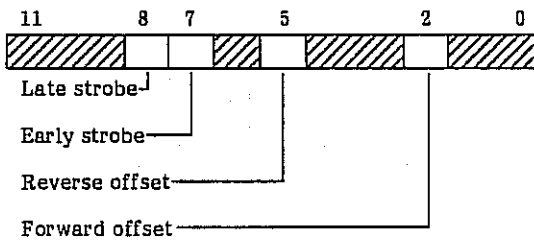


Figure 3-10. Strobe/Offset Read Sequence

TABLE 3-7. WRITE TEST PATTERNS FOR USE WITH READ SHORT FUNCTION

| Test                           | Write Test Pattern |        |             |               |      | General Status Expected After Read Short Function |
|--------------------------------|--------------------|--------|-------------|---------------|------|---------------------------------------------------|
|                                | Word 1             | Word 2 | Words 3-318 | Words 319-322 |      |                                                   |
|                                |                    |        |             | 844           | 885  |                                                   |
| No checkword error             | 0000               | 0000   | 0000        | 0000          | 7777 | 0000                                              |
| Correctable checkword error    | 4000               | 0000   | 0000        | 0000          | 7777 | 4600†                                             |
| Noncorrectable checkword error | 4000               | 4000   | 0000        | 0000          | 7777 | 4600††                                            |

† Detailed status word 2, bit 8 should be 0.  
 †† Detailed status word 2, bit 8 should be 1. General status becomes 5200 after 27 retries.

**0042 — CLEAR CONNECTED ACCESS**

Hung controller condition only. Clears connected access, thereby enabling controller to connect to next access receiving function.

**0043 — BUFFER READ AND  
0044 — BUFFER WRITE**

Identical to 0032/0033 (block transfer buffer read/write) functions except controller uses alternate logic to control transfers.

**0046 — WRITE BUFFER TO DISK**

Transfers one sector of data from controller buffer to drive. Previous seek function specifies starting sector. Write buffer to disk function provides alternate recovery method for buffer to disk (detailed status word 13, bit 11) write errors. Figure 3-11 shows recommended buffer to disk error recovery sequence.

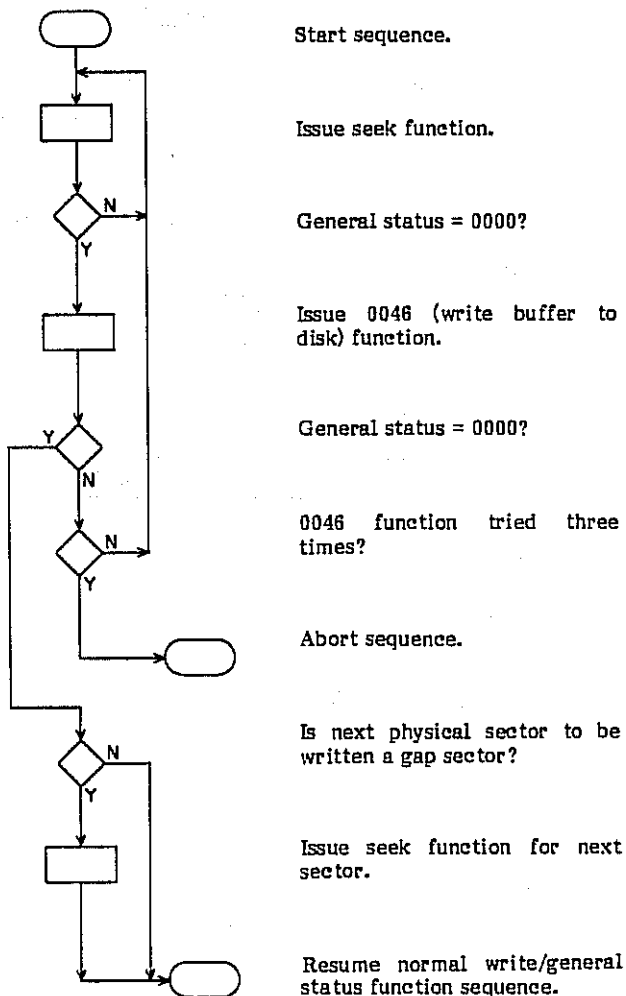


Figure 3-11. Buffer to Disk Error Recovery Sequence

**0047 — SCAN CYLINDER ADDRESSES**

985 drives only. Causes controller to read all address fields on one cylinder and to generate buffer table entries for abnormal sectors. PP must precede scan cylinder addresses function with 0001 (seek, 1:1 interlace) function that specifies cylinder to be scanned. PP should use 0032 (block transfer buffer read) function or 0043 (buffer read) function to input scan results. General status is 0002 while controller performs scan.

Buffer table contains up to 160 two-word entries. Table entry format is as follows:

|      |                        |   |                                  |   |
|------|------------------------|---|----------------------------------|---|
| Word | 11                     | 6 | 5                                | 0 |
| 1    | Table entry code       |   |                                  |   |
| 2    | Track number<br>(0-39) |   | Physical sector<br>number (0-33) |   |

Table entry codes are:

| Word 1 Code | Description                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0000        | Indicates end of table.                                                                                                                                                                                                                                                                                                                                                                                                 |
| 0001        | Word 2 contains physical address of defective sector.                                                                                                                                                                                                                                                                                                                                                                   |
| 0002        | Word 2 contains address of flawed track (one address per flawed track).                                                                                                                                                                                                                                                                                                                                                 |
| 0003        | Word 2 contains physical address of: <ul style="list-style-type: none"> <li>• Sector that is first logical sector on flawed track, but whose logical sector number is not 0.</li> <li>• Sector on flaw map track having flaw map bit not set.</li> <li>• Sector on flawed track having track flaw bit not set.</li> <li>• Sector having incorrect address.</li> <li>• Sector having address checkword error.</li> </ul> |

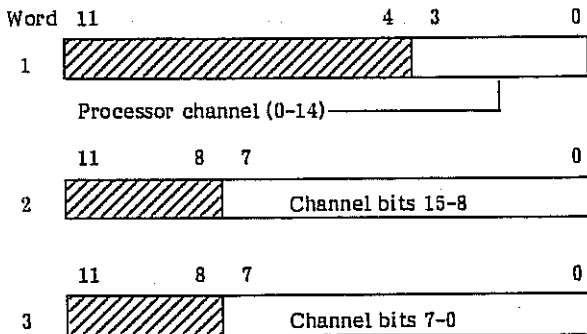
## 0050 — OUTPUT ON PROCESSOR CHANNEL

**CAUTION**

Incorrect use of this function can destroy disk pack data.

Diagnostic use only. Outputs 16-bit value on processor channel within controller. Refer to controller hardware maintenance manual listed in preface for processor channel bit descriptions.

**Parameter format:**



## 0051 — EXECUTE CONTROL WORD SEQUENCE

**CAUTION**

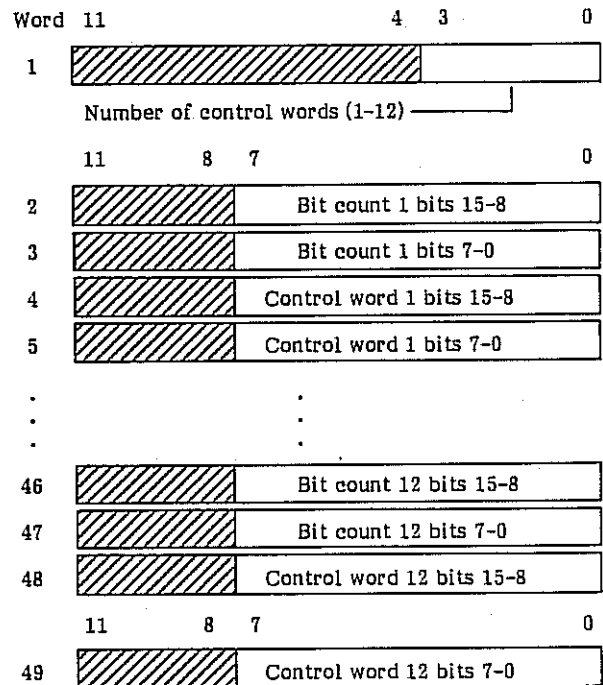
Incorrect use of this function can destroy disk pack data.

Diagnostic use only. Transfers up to 12 16-bit bit count words and associated control words from PP to controller, then initiates control word execution. Controller outputs bit count words on processor channel 4 and outputs control words on processor channel 5. Each bit count word must be large enough to allow its associated control word to execute for at least 3 microseconds. Controller issues terminate control word flag pulse before last control word to prevent lost control word status (extended detailed status word 16, bit 4).

**NOTE**

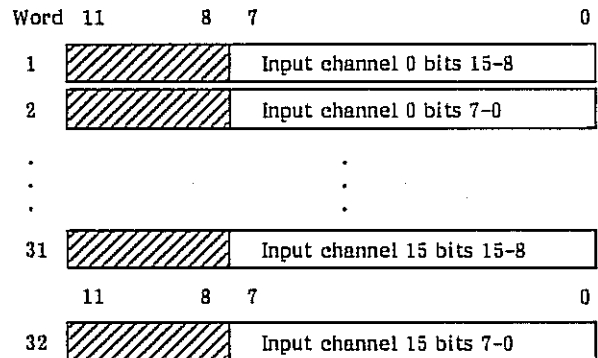
PP must send all 49 parameter words regardless of number of control words to be executed.

**Parameter format:**



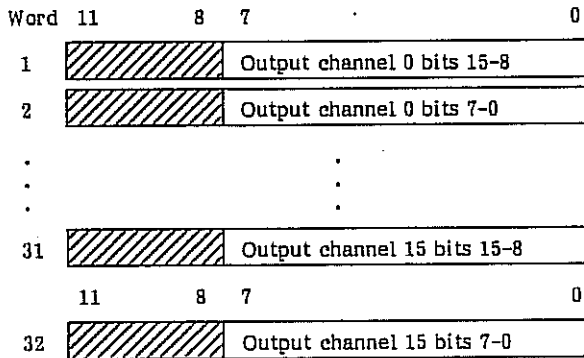
## 0052 — INPUT PROCESSOR CHANNEL STATUS

Diagnostic use only. Transfers contents of processor input channels 0 through 15 from controller to PP. If it does not input all 32 words, PP must deactivate channel. Controller to PP transfer format is as follows:



### 0053 — ECHO OUTPUT CHANNELS

Diagnostic use only. Transfers contents of processor output channels 0 through 15 from controller to PP. Before issuing echo output channels function, PP should issue series of 0050 (output on processor channel) functions to place echo values on all processor channels. If it does not input all 32 words, PP must deactivate channel. Controller to PP transfer format is as follows:



### 0054 — ISSUE PROCESSOR FLAG PULSE

Diagnostic use only. Outputs flag pulse on processor channel within controller. Parameter word contains code that specifies processor channel number. Refer to controller hardware maintenance manual listed in preface for flag pulse descriptions.

Parameter format:

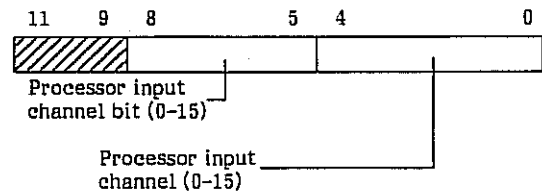


| Flag Code | Processor Channel | Flag Pulse                 |
|-----------|-------------------|----------------------------|
| 0         | 0                 | Clear connected accesses   |
| 1         | 1                 | Master clear control logic |
| 2         | 2                 | Start error correction     |
| 3         | 3                 | Clear ECC register         |
| 4         | 4                 | Clear internal status      |
| 5         | 5                 | Terminate control word     |
| 6         | 6                 | Clear access control logic |
| 7         | 7                 | Set reserve latch          |
| 11        | 11                | Load ECC register          |

### 0055 — ENABLE INPUT CHANNEL TIMING

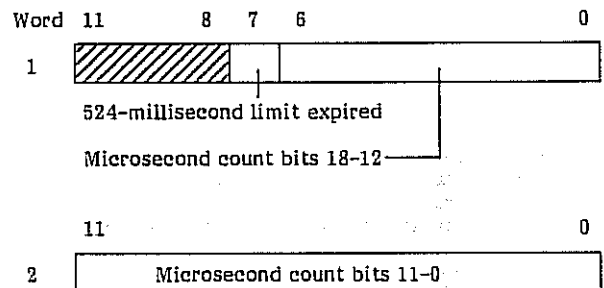
Diagnostic use only. Specifies processor input channel bit to be timed by controller after next 0050 (output on processor channel) or 0051 (execute control word sequence) function. Timer runs until specified processor input channel bit becomes 1 or until 524-millisecond limit occurs. Controller does not reply to functions during timing operation. 0056 (input timing data) function transfers timing data from controller to PP.

Parameter format:



### 0056 — INPUT TIMING DATA

Diagnostic use only. Transfers from controller to PP timing data collected in response to last 0055/0050/0051 function sequence or 0064 function. Controller to PP transfer format is as follows:



### 0057 — ECHO ONE WORD OR 0720 — ECHO ONE WORD

Diagnostic use only. Causes controller to accept one word (regardless of channel parity error status) and return it to PP. When word to be echoed has parity error, controller returns ones complement of word to PP. Figure 3-12 shows echo sequence.

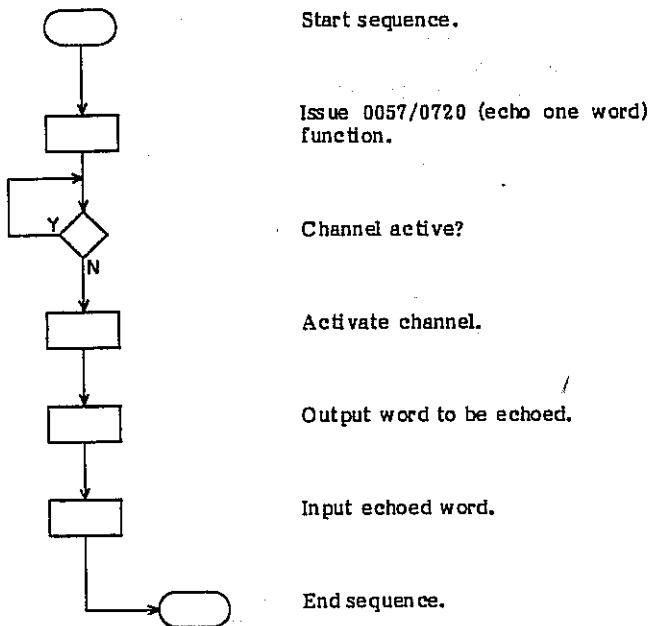
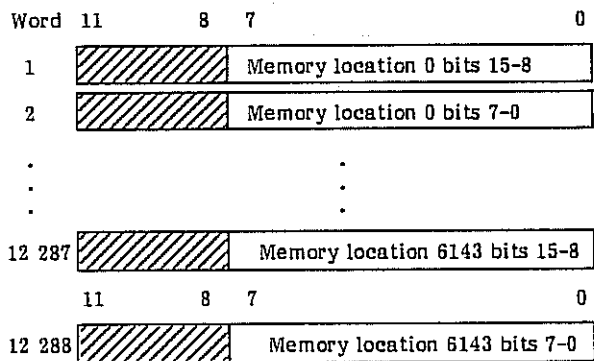


Figure 3-12. Echo Sequence

**0061 — AUTODUMP**

Diagnostic use only. Transfers entire contents of processor memory from controller to PP. If it does not input all 12 288 words, PP must deactivate channel. Controller to PP transfer format is as follows (all numbers are decimal):

If a deadstart dump is being done, the deadstart master clear will force controller ROM diagnostics and alter some controlware locations. To avoid this, disable the channel access switches while deadstarting, then enable them before the autodump function is sent.



**0062 — MANIPULATE PROCESSOR**

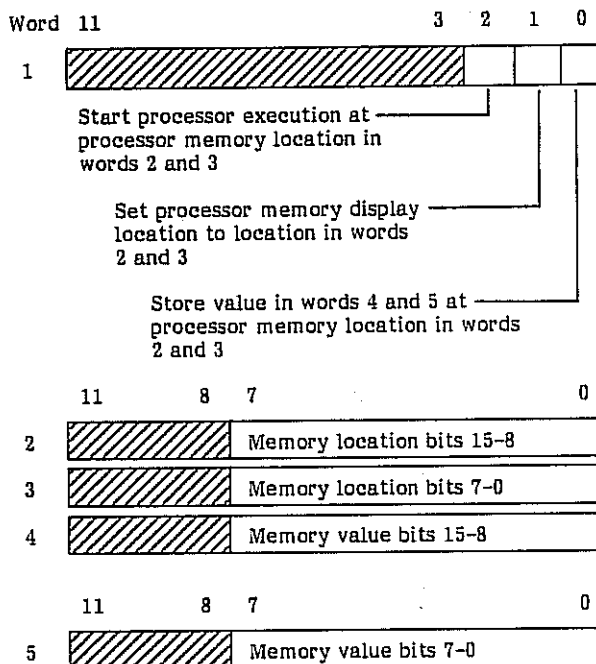
Diagnostic use only. Allows PP to:

- Store value in RAM or buffer portion of processor memory.
- Set processor memory display location for subsequent 0063 (input display data) function(s).

- Start processor execution at any location in processor memory.

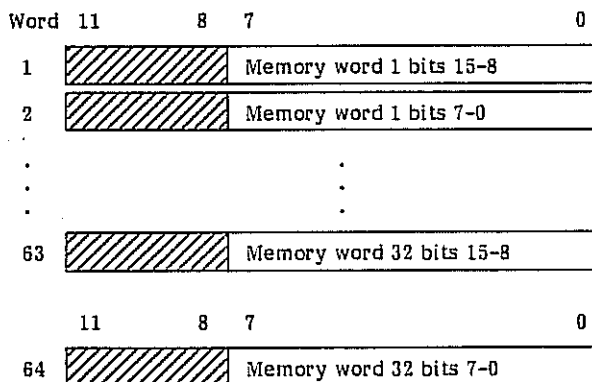
Each processor instruction sequence must end with long jump to address contained in processor memory location 104g. Refer to controller hardware maintenance manual listed in preface for processor instruction descriptions.

Parameter format:



**0063 — INPUT DISPLAY DATA**

Diagnostic use only. Transfers 32 16-bit processor memory words from controller to PP starting at location set by preceding 0062 (manipulate processor) function. If it does not input all 64 12-bit words, PP must deactivate channel. Controller to PP transfer format is as follows:





## 0064 — TIME DIFFERENCE COUNTER

885 drive diagnostic use only. Causes controller to issue 256-cylinder forward seek to drive and time difference counter as it goes from 10 to 8, and to prepare timing data for transfer to PP via 0056 (input timing data) function. PP should position drive to cylinder 0 before issuing time difference counter function.

## 0066 — FORCE ERROR (not available in model A controllers)

This command allows the PP to cause one of four RAM parity errors or a recoverable write buffer to disk error on the next data function issued.

One word parameter format:

0000—Non buffer to disk RAM P.E., WBDF non zero†

0001—Non buffer to disk RAM P.E., WBDF zero†

0002—Write buffer to disk RAM P.E., WBDF zero†

0003—Read function incomplete transfer RAM P.E.

0004—Non P.E. write buffer to disk error, WBDF zero†

## 0067 — INTERLOCK AUTOLOAD

This command will do a full download of controlware but will not force ROM. The drives will not be released.

## 01NN — AUTOLOAD FROM DISK

### NOTE

Execution of this function as described requires RAM controlware and a processor/memory/controller diagnostic to be resident on selected drive.

Causes controller to execute autoloading sequence shown in figure 3-13. Function word format is as follows:

|     |                                |   |   |
|-----|--------------------------------|---|---|
| 11  | 6                              | 5 | 0 |
| 01g | Drive number<br>(0-7, 40g-57g) |   |   |

Diagnostic and RAM controlware are located on 30 consecutive sectors in 1:1 interlace format at following addresses:

885: cylinder 841, track 2, sectors 1 through 30

844: cylinder 822, track 1, sectors 0 through 23, and cylinder 822, track 2, sectors 0 through 5

This data is packed, with each sector containing 241 16-bit words followed by 8 bits of zero fill.

## 03NN — DISK DEADSTART

Connects access, positions selected drive to deadstart sector, and transfers up to 322 words from drive to controller to PP. When transfer completes, controller releases drive, clears access connection, and prepares general/detailed status identical to that prepared after 0001/0002 (seek) and 0004 (read) functions.

Deadstart sector is cylinder 822, track 0, sector 3 for 844 drives and cylinder 841, track 1, sector 30 for 885 drives. First word in deadstart sector must specify number of words to be transferred. Use 0037 (write protected sector) function to place bootstrap program in deadstart sector.

Address field of 844 deadstart sector must have sector flaw bit set. When it is not flawed from factory, use 0022 (set/clear flaw) function to flaw deadstart sector. To prevent pack interchange problems, check head alignment before flawing deadstart sector.

†WBDF is location 321 of program memory and may be examined via the 62 and 63 functions. A zero in WBDF indicates a buffer to disk error (reference detailed status word 13 bit 11). This cell should be used rather than detailed status because the latter cannot be guaranteed under RAM parity conditions.

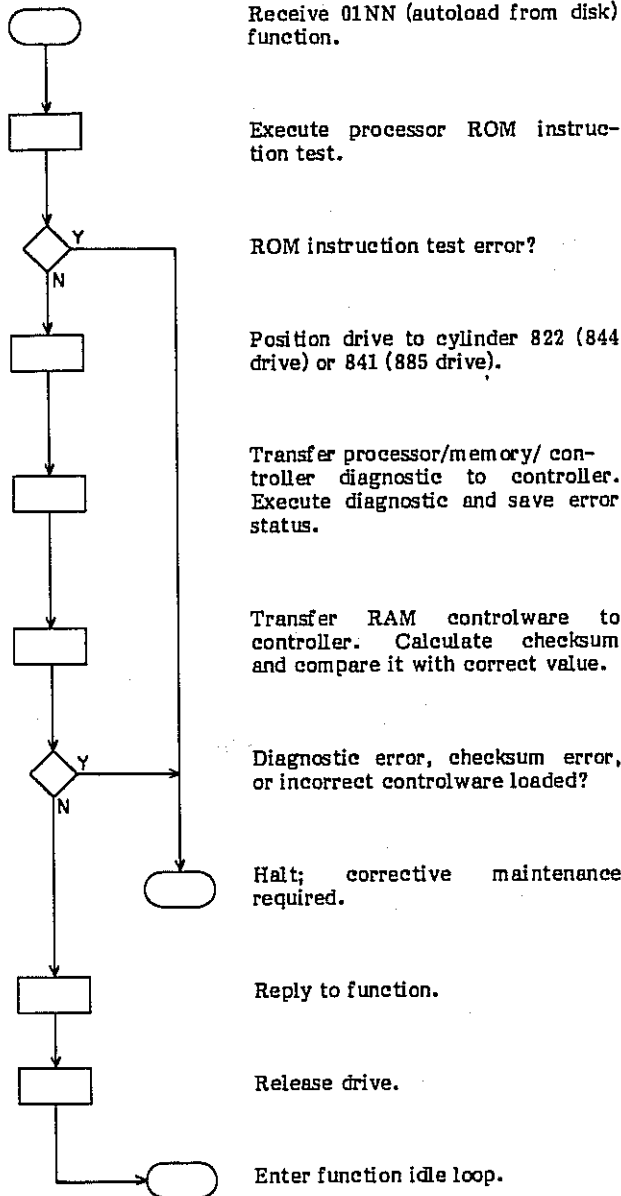


Figure 3-13. Controller Activity During Autoload from Disk Function

†Must be 7540 if CC is 00.

Address field of 885 deadstart sector has factory flaw map flag set. This flag is set when pack leaves factory.

Example deadstart panel setting is as follows:

| Octal Setting                                                 | Description                                             |
|---------------------------------------------------------------|---------------------------------------------------------|
| 75CC <sup>†</sup>                                             | Deactivate channel CC.                                  |
| 77CC<br>03NN                                                  | Issue disk deadstart function specifying drive NN.      |
| 74CC                                                          | Activate channel CC.                                    |
| 71CC<br>ADDR                                                  | Input deadstart data on channel CC to PP location ADDR. |
| CC must be 00, 12g, or 13g for 12-channel computer.           |                                                         |
| CC must be 00, 12g, 13g, 32g, or 33g for 24-channel computer. |                                                         |

#### 0414 — AUTOLOAD FROM PP

Transfers 16870 12-bit words of autoload data from PP to processor memory within controller. PP to controller transfer format is as follows (all numbers are decimal).

| Word   | 11                           | 8 | 7 | 0 |
|--------|------------------------------|---|---|---|
| 1      | Autoload word 1 bits 15-8    |   |   |   |
| 2      | Autoload word 1 bits 7-0     |   |   |   |
| ...    | ...                          |   |   |   |
| 14 459 | Autoload word 7230 bits 15-8 |   |   |   |
|        | 11                           | 8 | 7 | 0 |
| 14 460 | Autoload word 7230 bits 7-0  |   |   |   |

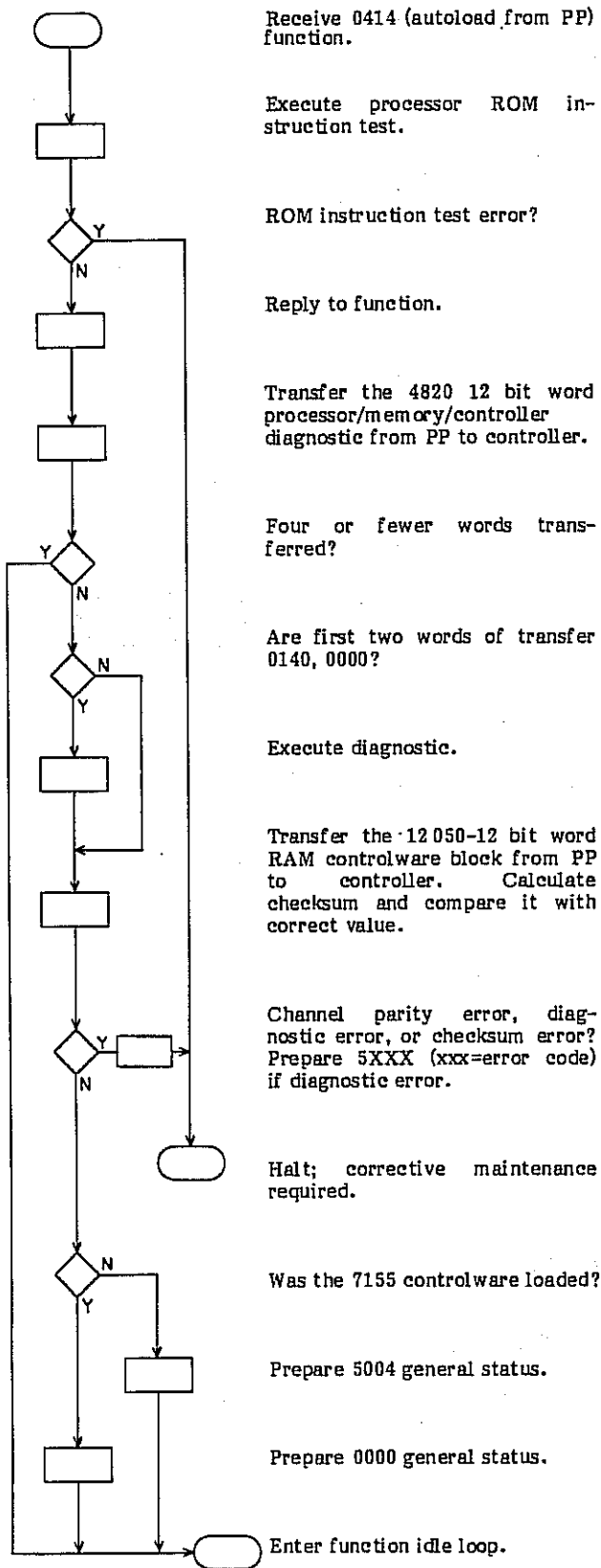
Figure 3-14 shows controller activity during 0414 (autoload from PP) function.

#### 0720 — ECHO ONE WORD

Refer to 0057 (echo one word) function description.

### ERROR RECOVERY

A PP uses general status to determine whether subsystem operations are proceeding normally. Zero-filled general status indicates the preceding function completed without error. 4XXX general status indicates the controller has detected a potentially recoverable error, has switched to



recovery mode, and is ready to accept a 0014 (continue) function in place of the failing function. 5XXX general status indicates the preceding function resulted in a nonrecoverable error. Refer to appendix B for status associated with specific error conditions.

When 4XXX general status indicates a potentially recoverable error, the PP should do the following until general status becomes 00XX or 5XXX.

- Request detailed status for error logging.
- Issue 0014 (continue) function in place of failing function.
- Reinitiate appropriate data transfer.

When 5XXX general status indicates a nonrecoverable error, the PP should:

- Reissue failing function a number of times.
- Check after each try for 00XX or 4XXX general status.
- Request detailed status for error logging as required.
- Abort function sequence if 5XXX general status persists.

Figure 3-14. Controller Activity During Autoload from PP Function

Figure 3-15 is a suggested error recovery sequence for failing functions receiving function replies. Figure 3-16 is a suggested error recovery sequence for 1:1 interlace write-type functions not receiving function replies. Table 3-8 shows potentially recoverable read/write errors and the number of times the 0014 (continue) function (and appropriate data transfer) may have to be issued for recovery.

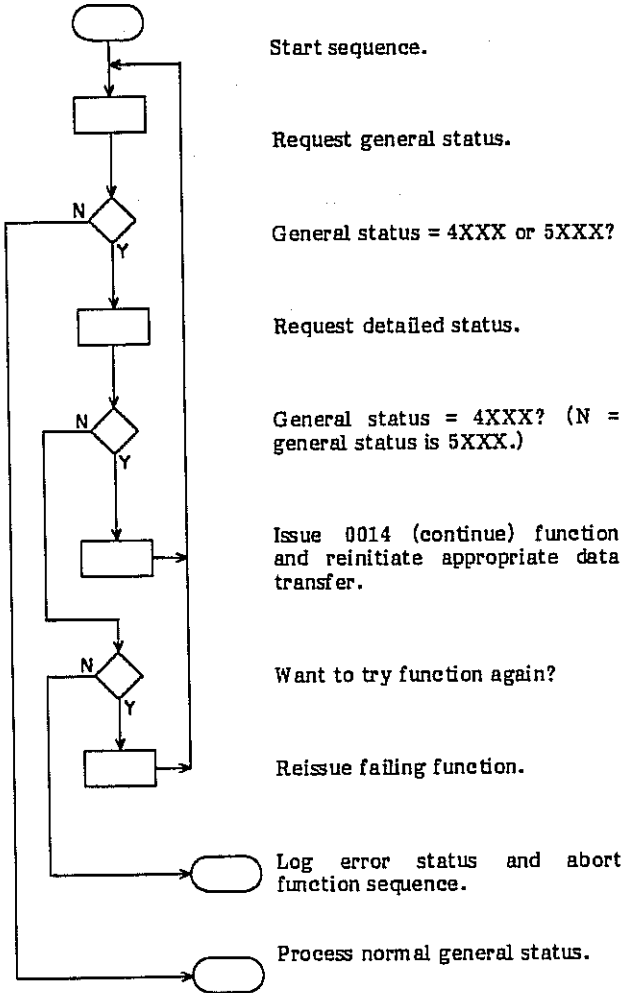


Figure 3-15. Generalized Error Recovery Sequence

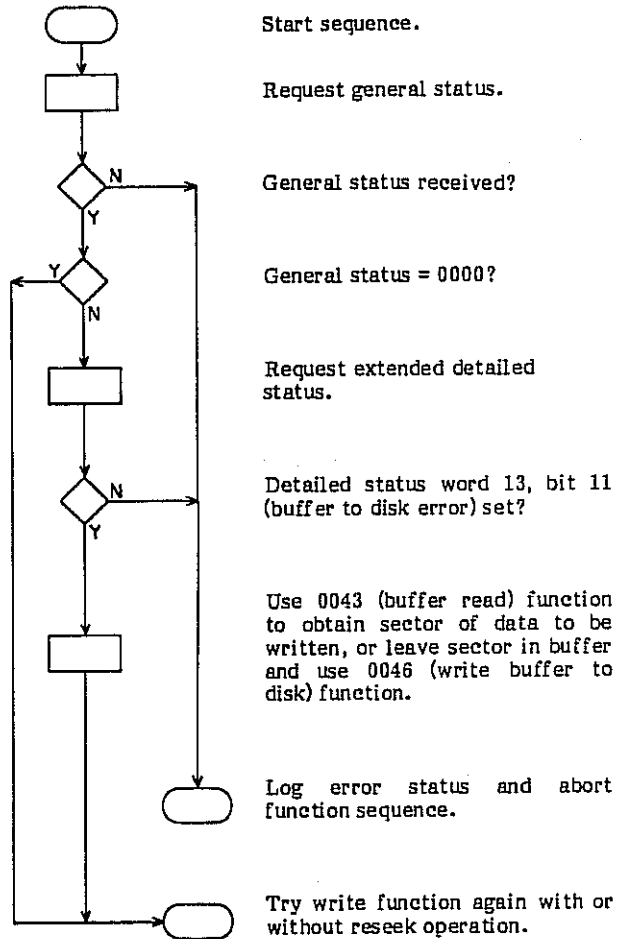


Figure 3-16. 1:1 Interlace Write Error Recovery Sequence

TABLE 3-8. POTENTIALLY RECOVERABLE READ/WRITE ERRORS

| Function Type | Error                | Number of 0014 (Continue) Functions Required |
|---------------|----------------------|----------------------------------------------|
| All           | Address sync         | 1 to 27 (number required = A)                |
|               | Address checkword    | 1 to 27-A                                    |
|               | Head-positioning     | 1 or 2                                       |
|               | Track/sector compare | 1                                            |
| Read          | Data sync            | 1 to 27 (number required = D)                |
|               | Data checkword       | 1 to 27-D                                    |
| Write         | Channel parity       | 1 to 3                                       |

## 885-IX LARGE SECTOR OPERATION

A 1 to 1 seek command with parameter word 1 bit 9 set selects the large sector. Physically it consists of four sectors. The sector number sent in parameter word 4 of the seek command must contain the physical starting address of the large sector (0, 4, 8, 12, 16, 20, 24, 28). Each of the 4 physical sectors comprising the large sector contains an address field. The subsystem controlware will read each of

the 4 address and data fields, skipping defective sectors if present, and combine the data to form one large sector.

Since no address fields are destroyed, reformatting the pack is not necessary if switching pack usage from large to small sectors. The address returned in detailed status word 7 will contain the small logical sector number (0 to 31).



# GLOSSARY

A

|               |                                                                                                                                                                                                   |                    |                                                                                                                                                                            |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Access        | The logical interface between a PP channel and the controller. A controller can have from one to four accesses.                                                                                   | Disk               | Refer to disk pack.                                                                                                                                                        |
| Address Field | The portion of each sector that identifies the sector's location on the disk pack. An address field contains cylinder/-track/sector numbers and bit(s) to flag the sector or its track as flawed. | Disk Pack          | An assembly of magnetically coated disks used for data storage. The disk pack used with 844 drives is removeable, while the disk pack used with 885 drives is fixed.       |
| Buffer        | A portion of processor memory used for temporary data storage during data transfer operations.                                                                                                    | Drive              | An 844-4x Double Density Disk Storage Unit or one spindle of an 885 Disk Storage Unit.                                                                                     |
| Channel       | A PP channel from a CDC 6000 series, CDC CYBER 70 model 72/73/74, or CDC CYBER 170 series computer.                                                                                               | Drive Channel      | The logical interface between a controller and a drive. An 844 drive has two or four drive channels and an 885 drive has one drive channel with a second channel optional. |
| Checksum      | A code used for detecting/correcting errors in the preceding address or data field.                                                                                                               | End-of-Record Byte | A byte that appears after the data checksum to indicate the end of a sector.                                                                                               |
| Controller    | A 7155 Disk Storage Controller.                                                                                                                                                                   | Fixed Module Drive | Another name for the 885 drive. Abbreviated FMD.                                                                                                                           |
| Controlware   | Controller-resident code that determines the functional characteristics of the controller. MA721 is the equipment configurator for controlware used in the 7155 controller.                       | Flaw               | A defect in the magnetic coating of a disk pack that prevents error-free data storage. Sectors or tracks containing flaws are not used for data storage.                   |
| Cylinder      | All of the tracks at one head position.                                                                                                                                                           | Function           | A 12-bit code issued by a PP to the controller to initiate subsystem activity. Section 3 describes functions applicable to the 7155 subsystem.                             |
| Data Field    | The portion of each sector that contains 322 12-bit words of data.                                                                                                                                | Gap Sector         | A sector that is skipped during a data transfer operation to allow additional time for PP overhead.                                                                        |
| Deadman Timer | A controller circuit that deactivates the connected channel when the channel is active, but has failed to transfer a word for approximately 5 seconds.                                            | Head               | A device that translates electric current to magnetic flux changes on a rotating disk pack and vice versa.                                                                 |
| Deadstart     | The process of changing the state of a computer system from not running to running. The operating system is assumed not to be resident in central memory at deadstart time.                       | Head/Disk Assembly | An assembly containing the heads, disk pack, and protective shroud for an 885 drive. Abbreviated HDA.                                                                      |
|               |                                                                                                                                                                                                   | Head Positioner    | The servo-controlled voice coil actuator used to position heads in a drive.                                                                                                |

|                    |                                                                                                                               |                      |                                                                                                                                                                          |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Interlace          | The ratio of number of sectors processed to number of sectors actually passing the head.                                      | Random Access Memory | A portion of processor memory used for controlware storage. Abbreviated RAM.                                                                                             |
| Operation          | A subsystem task controlled by one or more PP-issued functions.                                                               | Read Only Memory     | A nonvolatile, read-only portion of processor memory containing brief processor tests and code for processing controller autoloading-related functions. Abbreviated ROM. |
| Overhead           | Program activity not directly related to transferring data to or from the disk.                                               | Sector               | An arc of contiguous magnetic flux changes traced on a disk pack by a head.                                                                                              |
| Pack               | Refer to disk pack.                                                                                                           | Subsystem            | A collection of disk storage equipment that may include one or more controllers, one to eight 844 drives per controller, and two to sixteen 885 drives per controller.   |
| Parameter          | One or more 12-bit words issued by a PP after a function to provide the controller with information relative to the function. | Sync Pattern         | A series of flux changes that synchronizes drive read electronics with the first bit of an address or data field.                                                        |
| Processor          | A microprocessor within the controller programmed to execute a modified CDC CYBER PP instruction set.                         | Tolerance Gap        | A field placed at the end of each sector to ensure that drive motor speed variations do not result in writing into the next sector.                                      |
| Processor Channels | Controller internal paths used by the processor to monitor/control subsystem activities and to communicate with the PP.       | Track                | The circle of flux changes traced on a disk pack by a head at one head position.                                                                                         |
| Processor Memory   | A memory used by the processor for controlware storage and for temporary data storage.                                        |                      |                                                                                                                                                                          |



# TIMING DATA

B

Table B-1 lists function reply times, data/parameter window times, and total execution times for each function.

Function reply time is the time between function issue by PP and function reply (channel deactivation) by controller. Unless otherwise indicated, function reply times assume that the preceding function has completed, that the controller is waiting for another function, and that the controller is connected to the access receiving the function.

The minimum data/parameter window time is the shortest amount of time between function reply and data/parameter transfer. When the PP has not started data/parameter transfer by the maximum window time, the controller prepares error status and waits for the next function.

Total execution time begins when the controller detects the function and ends when the controller starts waiting for the next function. The maximum execution time is usually the result of an error condition. For example, the 300-millisecond maximum execution time for the 0004 (read) function is determined by the worst case return to zero seek time.

Figures B-1 through B-7 show timing for operations that transfer disk data.

Use table B-1 to determine timing for individual functions; use figures B-1 through B-7 to determine timing for complete operations.

TABLE B-1. FUNCTION TIMING DATA

| Octal Code | Function                  | Time (Minimum/Maximum)  |                       |                         | Notes |
|------------|---------------------------|-------------------------|-----------------------|-------------------------|-------|
|            |                           | Function Reply          | Data/Parameter Window | Total Execution         |       |
| 0000       | Connect                   | 20 $\mu$ s/30 $\mu$ s   | 5 $\mu$ s/4.8 s       | 60 $\mu$ s/4.8 s        |       |
| 0001       | Seek, 1:1 interlace       | 20 $\mu$ s/30 $\mu$ s   | 5 $\mu$ s/4.8 s       | 60 $\mu$ s/4.8 s        |       |
| 0002       | Seek, 2:1 interlace       | 20 $\mu$ s/30 $\mu$ s   | 5 $\mu$ s/4.8 s       | 60 $\mu$ s/4.8 s        |       |
| 0004       | Read                      | 20 $\mu$ s/30 $\mu$ s   | 8 $\mu$ s/1 rev       | 620 $\mu$ s/300 ms      | †     |
| 0005       | Write                     | 25 $\mu$ s/75 $\mu$ s   | 5 $\mu$ s/1 rev       | 620 $\mu$ s/300 ms      | †     |
| 0006       | Write verify              | 25 $\mu$ s/75 $\mu$ s   | 5 $\mu$ s/1 rev       | 620 $\mu$ s/300 ms      | †     |
| 0007       | Read checkword            | 30 $\mu$ s/40 $\mu$ s   | Not applicable        | 620 $\mu$ s/300 ms      | †     |
| 0010       | Operation complete        | 30 $\mu$ s/40 $\mu$ s   | Not applicable        | 35 $\mu$ s/45 $\mu$ s   |       |
| 0011       | Disable drive reserve     | 40 $\mu$ s/45 $\mu$ s   | Not applicable        | 45 $\mu$ s/50 $\mu$ s   |       |
| 0012       | General status            | 15 $\mu$ s/20 $\mu$ s   | 5 $\mu$ s/4.8 s       | 35 $\mu$ s/4.8 s        | ††    |
| 0013       | Detailed status           | 20 $\mu$ s/30 $\mu$ s   | 15 $\mu$ s/4.8 s      | 60 $\mu$ s/4.8 s        |       |
| 0014       | Continue                  | Not applicable          | Not applicable        | Not applicable          | †††   |
| 0015       | Drop seeks                | 130 $\mu$ s/140 $\mu$ s | Not applicable        | 135 $\mu$ s/145 $\mu$ s |       |
| 0016       | Format pack               | 20 $\mu$ s/30 $\mu$ s   | 5 $\mu$ s/4.8 s       | 300 $\mu$ s/600 s       | ††††  |
| 0017       | Return drive address      | 15 $\mu$ s/20 $\mu$ s   | 5 $\mu$ s/4.8 s       | 35 $\mu$ s/4.8 s        |       |
| 0020       | Drive release             | 30 $\mu$ s/40 $\mu$ s   | Not applicable        | 35 $\mu$ s/45 s         |       |
| 0021       | Return cylinder address   | 20 $\mu$ s/30 $\mu$ s   | 5 $\mu$ s/4.8 s       | 30 $\mu$ s/4.8 s        |       |
| 0022       | Set/clear flaw            | 20 $\mu$ s/30 $\mu$ s   | 5 $\mu$ s/4.8 s       | 50 ms/4.8 s             |       |
| 0023       | Extended detailed status  | 20 $\mu$ s/30 $\mu$ s   | 15 $\mu$ s/4.8 s      | 100 $\mu$ s/4.8 s       |       |
| 0024       | Read gap sector           | 20 $\mu$ s/30 $\mu$ s   | 8 $\mu$ s/1 rev       | 620 $\mu$ s/300 ms      |       |
| 0025       | Write gap sector          | 25 $\mu$ s/75 $\mu$ s   | 5 $\mu$ s/1 rev       | 620 $\mu$ s/300 ms      |       |
| 0026       | Write verify gap sector   | 25 $\mu$ s/75 $\mu$ s   | 5 $\mu$ s/1 rev       | 620 $\mu$ s/300 ms      |       |
| 0027       | Read checkword gap sector | 30 $\mu$ s/40 $\mu$ s   | Not applicable        | 620 $\mu$ s/300 ms      |       |

**NOTE**

Time abbreviations are:  $\mu$ s (microsecond), ms (millisecond), rev (revolution), s (second).

†Not maintaining interlace. Refer to figures B-1 through B-7.

††General status function reply time is 20  $\mu$ s/50 ms when controller is connected to another access.

†††Refer to times for function in progress.

††††Formatting entire pack.

TABLE B-1. FUNCTION TIMING DATA (Contd)

| Octal Code | Function                       | Time (Minimum/Maximum) |                       |                    | Notes |
|------------|--------------------------------|------------------------|-----------------------|--------------------|-------|
|            |                                | Function Reply         | Data/Parameter Window | Total Execution    |       |
| 0030       | Read factory data              | 20 $\mu$ s/30 $\mu$ s  | 8 $\mu$ s/1 rev       | 620 $\mu$ s/300 ms | †     |
| 0031       | Read utility map               | 20 $\mu$ s/30 $\mu$ s  | 8 $\mu$ s/1 rev       | 620 $\mu$ s/300 ms | †     |
| 0032       | Block transfer buffer read     | 20 $\mu$ s/30 $\mu$ s  | 5 $\mu$ s/4.8 s       | 200 $\mu$ s/4.8 s  |       |
| 0033       | Block transfer buffer write    | 20 $\mu$ s/30 $\mu$ s  | 5 $\mu$ s/4.8 s       | 200 $\mu$ s/4.8 s  |       |
| 0034       | Read protected sector          | 20 $\mu$ s/30 $\mu$ s  | 8 $\mu$ s/1 rev       | 620 $\mu$ s/300 ms | †     |
| 0035       | Write last sector              | 25 $\mu$ s/75 $\mu$ s  | 5 $\mu$ s/1 rev       | 620 $\mu$ s/300 ms | †     |
| 0036       | Write verify last sector       | 25 $\mu$ s/75 $\mu$ s  | 5 $\mu$ s/1 rev       | 620 $\mu$ s/300 ms | †     |
| 0037       | Write protected sector         | 25 $\mu$ s/75 $\mu$ s  | 5 $\mu$ s/1 rev       | 620 $\mu$ s/300 ms | †     |
| 0040       | Read short                     | 20 $\mu$ s/30 $\mu$ s  | 8 $\mu$ s/1 rev       | 620 $\mu$ s/300 ms | †     |
| 0041       | Select strobe and offset       | 20 $\mu$ s/30 $\mu$ s  | 5 $\mu$ s/4.8 s       | 75 s/4.8 s         |       |
| 0042       | Clear connected access         | 20 $\mu$ s/50 ms       | Not applicable        | 20 s/50 ms         |       |
| 0043       | Buffer read                    | 20 $\mu$ s/30 $\mu$ s  | 5 $\mu$ s/2 ms        | 200 $\mu$ s/2 ms   |       |
| 0044       | Buffer write                   | 20 $\mu$ s/30 $\mu$ s  | 5 $\mu$ s/2 ms        | 200 $\mu$ s/2 ms   |       |
| 0046       | Write buffer to disk           | 25 $\mu$ s/75 $\mu$ s  | Not applicable        | 620 $\mu$ s/300 ms | †     |
| 0047       | Scan cylinder address          | 20 $\mu$ s/30 $\mu$ s  | Not applicable        | 650 ms/705 ms      |       |
| 0050       | Output on processor channel    | 20 $\mu$ s/30 $\mu$ s  | 5 $\mu$ s/4.8 s       | 60 $\mu$ s/4.8 s   |       |
| 0051       | Execute control word sequence  | 20 $\mu$ s/30 $\mu$ s  | 5 $\mu$ s/4.8 s       | 190 $\mu$ s/4.8 s  |       |
| 0052       | Input processor channel status | 20 $\mu$ s/30 $\mu$ s  | 5 $\mu$ s/4.8 s       | 120 $\mu$ s/4.8 s  |       |
| 0053       | Echo output channels           | 20 $\mu$ s/30 $\mu$ s  | 5 $\mu$ s/4.8 s       | 120 $\mu$ s/4.8 s  |       |
| 0054       | Issue processor flag pulse     | 20 $\mu$ s/30 $\mu$ s  | 5 $\mu$ s/4.8 s       | 60 $\mu$ s/4.8 s   |       |
| 0055       | Enable input channel timing    | 20 $\mu$ s/30 $\mu$ s  | 5 $\mu$ s/4.8 s       | 35 $\mu$ s/4.8 s   |       |
| 0056       | Input timing data              | 20 $\mu$ s/30 $\mu$ s  | 5 $\mu$ s/4.8 s       | 40 $\mu$ s/4.8 s   |       |
| 0057       | Echo one word                  | 20 $\mu$ s/30 $\mu$ s  | 5 $\mu$ s/4.8 s       | 40 $\mu$ s/4.8 s   |       |
| 0061       | Autodump                       | 20 $\mu$ s/30 $\mu$ s  | 5 $\mu$ s/4.8 s       | 7 ms/4.8 s         |       |
| 0062       | Manipulate processor           | 20 $\mu$ s/30 $\mu$ s  | 5 $\mu$ s/4.8 s       | 80 $\mu$ s/4.8 s   |       |
| 0063       | Input display data             | 20 $\mu$ s/30 $\mu$ s  | 5 $\mu$ s/4.8 s       | 100 $\mu$ s/4.8 s  |       |
| 0064       | Time difference counter        | 20 $\mu$ s/30 $\mu$ s  | Not applicable        | 22 ms/25 ms        |       |
| 0066       | Force Error                    | 20 $\mu$ s/30 $\mu$ s  | 5 $\mu$ s/4.8 s       | 32 $\mu$ s/4.8 s   |       |
| 0067       | Interlock Autoload             | 85 $\mu$ s/95 $\mu$ s  | 5 $\mu$ s/4.8 s       | 155 $\mu$ s/4.8 s  |       |
| 01NN       | Autoload from disk             | 650 $\mu$ s/1.1 s      | Not applicable        | Not applicable     |       |
| 03NN       | Disk deadstart                 | 100 $\mu$ s/50 ms      | 100 $\mu$ s/1 rev     | 700 $\mu$ s/300 ms |       |
| 0414       | Autoload from PP               | 30 ms/35 ms            | 5 $\mu$ s/4.8 s       | 185 ms/4.8 s       |       |
| 0720       | Echo one word                  | 20 $\mu$ s/30 $\mu$ s  | 5 $\mu$ s/4.8 s       | 40 $\mu$ s/4.8 s   |       |

† Not maintaining interlace. Refer to figures B-1 through B-7.



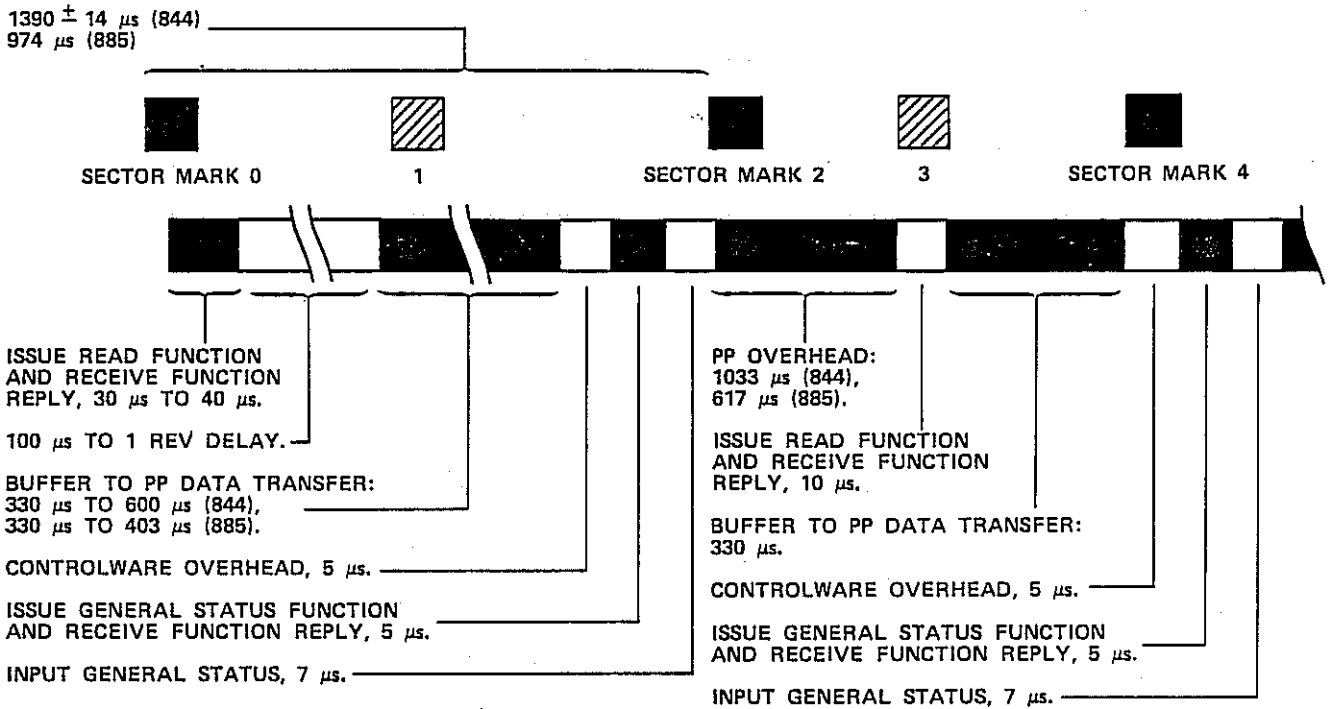


Figure B-3. 2:1 Interlace Read (1-MHz PP)

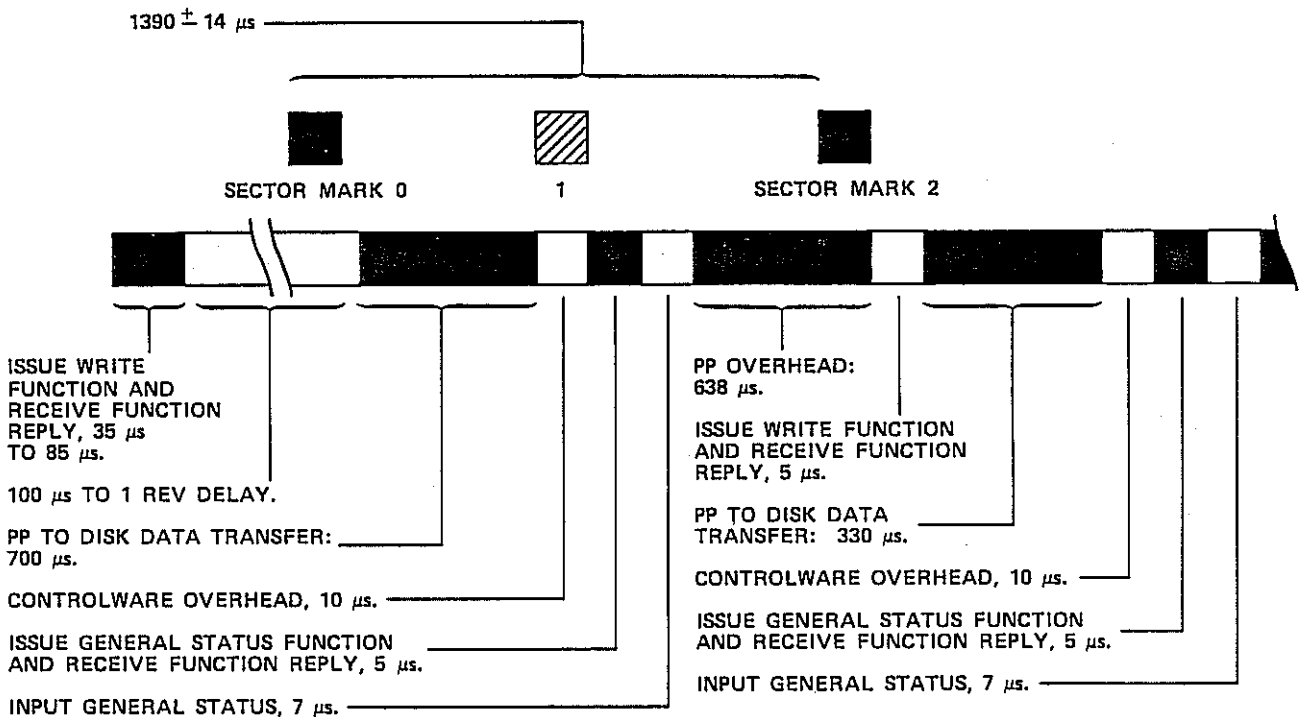


Figure B-4. 844 2:1 Interlace Write (1-MHz PP)

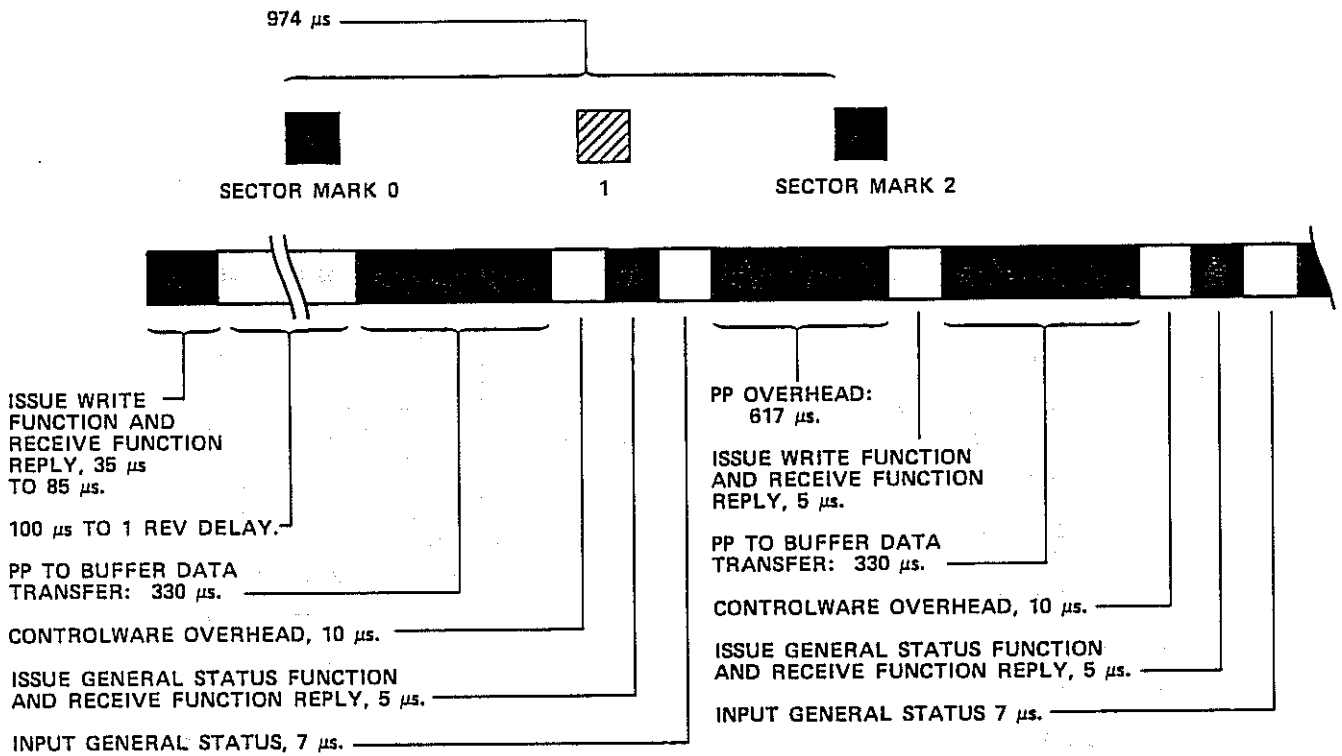


Figure B-5. 885 2:1 Interface Write (1-MHz PP)

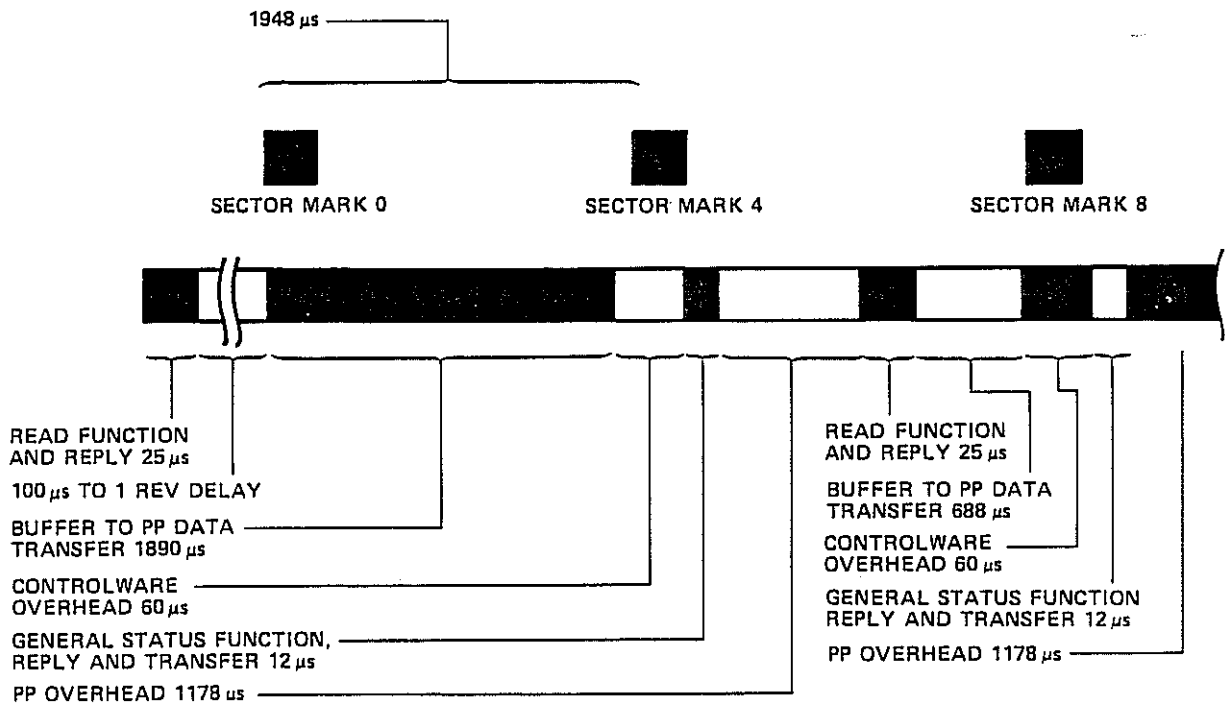


Figure B-6. 885-1X Large Sector Read

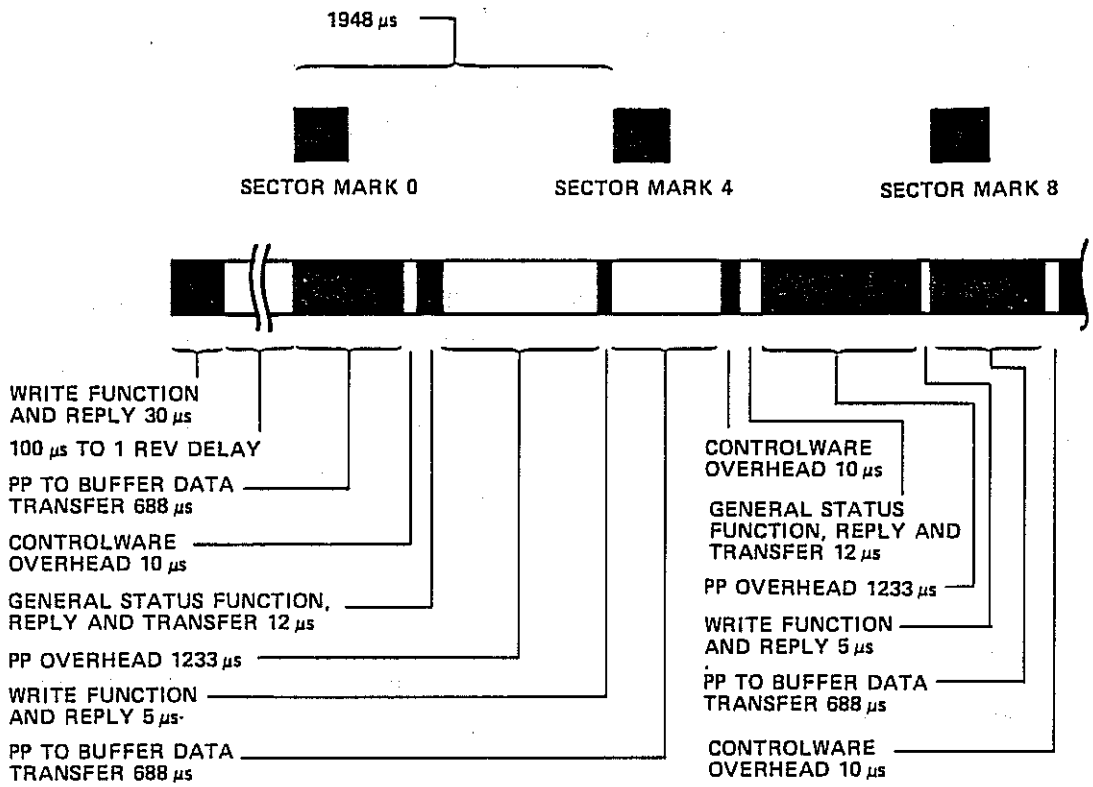


Figure B-7. 885-1X Large Sector Write

# STATUS RESPONSES

C

Tables C-1 through C-5 correlate general status and detailed status with conditions occurring during various types of operations. Refer to tables 3-2 and 3-3 and figure 3-2 for status bit descriptions. Interpret the status summaries in this appendix as follows:

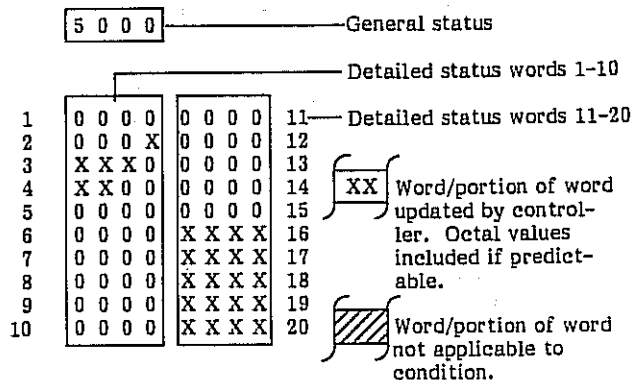


TABLE C-1. CONNECT/SEEK STATUS

| Condition                                                                                        | Status Summary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Condition | Status Summary |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |    |        |        |    |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |      |       |    |   |       |       |    |   |       |        |    |   |       |        |    |   |      |       |    |   |      |       |    |   |      |       |    |   |       |       |    |   |        |       |    |    |       |       |    |
|--------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------------|--------|----|---|--------|--------|----|---|--------|--------|----|---|--------|--------|----|---|--------|--------|----|---|--------|--------|----|---|--------|--------|----|---|--------|--------|----|---|--------|--------|----|----|--------|--------|----|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|------|-------|----|---|-------|-------|----|---|-------|--------|----|---|-------|--------|----|---|------|-------|----|---|------|-------|----|---|------|-------|----|---|-------|-------|----|---|--------|-------|----|----|-------|-------|----|
| 1. Drive online, ready, selected, and on-cylinder.                                               | <p>0 0 0 0</p> <table border="1"> <tr><td>1</td><td>██████</td><td>XXXXX</td><td>11</td></tr> <tr><td>2</td><td>0XXXX</td><td>XXXXX</td><td>12</td></tr> <tr><td>3</td><td>██████</td><td>X</td><td>13</td></tr> <tr><td>4</td><td>XX</td><td>██████</td><td>14</td></tr> <tr><td>5</td><td>██████</td><td>██████</td><td>15</td></tr> <tr><td>6</td><td>██████</td><td>██████</td><td>16</td></tr> <tr><td>7</td><td>000X</td><td>██████</td><td>17</td></tr> <tr><td>8</td><td>XXXXX</td><td>XXXXX</td><td>18</td></tr> <tr><td>9</td><td>XXXXX</td><td>XXXXX</td><td>19</td></tr> <tr><td>10</td><td>XXXXX</td><td>XXXXX</td><td>20</td></tr> </table>                     | 1         | ██████         | XXXXX  | 11 | 2 | 0XXXX  | XXXXX  | 12 | 3 | ██████ | X      | 13 | 4 | XX     | ██████ | 14 | 5 | ██████ | ██████ | 15 | 6 | ██████ | ██████ | 16 | 7 | 000X   | ██████ | 17 | 8 | XXXXX  | XXXXX  | 18 | 9 | XXXXX  | XXXXX  | 19 | 10 | XXXXX  | XXXXX  | 20 | 5. Controller received illegal cylinder, head, or sector parameter.                | <p>5 0 0 0</p> <table border="1"> <tr><td>1</td><td>0000</td><td>0000</td><td>11</td></tr> <tr><td>2</td><td>0000</td><td>0000</td><td>12</td></tr> <tr><td>3</td><td>XXXX0</td><td>██████</td><td>13</td></tr> <tr><td>4</td><td>XXXXX</td><td>0000</td><td>14</td></tr> <tr><td>5</td><td>0000</td><td>0000</td><td>15</td></tr> <tr><td>6</td><td>0000</td><td>XXXXX</td><td>16</td></tr> <tr><td>7</td><td>0000</td><td>XXXXX</td><td>17</td></tr> <tr><td>8</td><td>0000</td><td>XXXXX</td><td>18</td></tr> <tr><td>9</td><td>██████</td><td>XXXXX</td><td>19</td></tr> <tr><td>10</td><td>0000</td><td>XXXXX</td><td>20</td></tr> </table>       | 1 | 0000 | 0000  | 11 | 2 | 0000  | 0000  | 12 | 3 | XXXX0 | ██████ | 13 | 4 | XXXXX | 0000   | 14 | 5 | 0000 | 0000  | 15 | 6 | 0000 | XXXXX | 16 | 7 | 0000 | XXXXX | 17 | 8 | 0000  | XXXXX | 18 | 9 | ██████ | XXXXX | 19 | 10 | 0000  | XXXXX | 20 |
| 1                                                                                                | ██████                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | XXXXX     | 11             |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |    |        |        |    |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |      |       |    |   |       |       |    |   |       |        |    |   |       |        |    |   |      |       |    |   |      |       |    |   |      |       |    |   |       |       |    |   |        |       |    |    |       |       |    |
| 2                                                                                                | 0XXXX                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | XXXXX     | 12             |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |    |        |        |    |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |      |       |    |   |       |       |    |   |       |        |    |   |       |        |    |   |      |       |    |   |      |       |    |   |      |       |    |   |       |       |    |   |        |       |    |    |       |       |    |
| 3                                                                                                | ██████                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | X         | 13             |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |    |        |        |    |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |      |       |    |   |       |       |    |   |       |        |    |   |       |        |    |   |      |       |    |   |      |       |    |   |      |       |    |   |       |       |    |   |        |       |    |    |       |       |    |
| 4                                                                                                | XX                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | ██████    | 14             |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |    |        |        |    |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |      |       |    |   |       |       |    |   |       |        |    |   |       |        |    |   |      |       |    |   |      |       |    |   |      |       |    |   |       |       |    |   |        |       |    |    |       |       |    |
| 5                                                                                                | ██████                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | ██████    | 15             |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |    |        |        |    |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |      |       |    |   |       |       |    |   |       |        |    |   |       |        |    |   |      |       |    |   |      |       |    |   |      |       |    |   |       |       |    |   |        |       |    |    |       |       |    |
| 6                                                                                                | ██████                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | ██████    | 16             |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |    |        |        |    |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |      |       |    |   |       |       |    |   |       |        |    |   |       |        |    |   |      |       |    |   |      |       |    |   |      |       |    |   |       |       |    |   |        |       |    |    |       |       |    |
| 7                                                                                                | 000X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | ██████    | 17             |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |    |        |        |    |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |      |       |    |   |       |       |    |   |       |        |    |   |       |        |    |   |      |       |    |   |      |       |    |   |      |       |    |   |       |       |    |   |        |       |    |    |       |       |    |
| 8                                                                                                | XXXXX                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | XXXXX     | 18             |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |    |        |        |    |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |      |       |    |   |       |       |    |   |       |        |    |   |       |        |    |   |      |       |    |   |      |       |    |   |      |       |    |   |       |       |    |   |        |       |    |    |       |       |    |
| 9                                                                                                | XXXXX                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | XXXXX     | 19             |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |    |        |        |    |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |      |       |    |   |       |       |    |   |       |        |    |   |       |        |    |   |      |       |    |   |      |       |    |   |      |       |    |   |       |       |    |   |        |       |    |    |       |       |    |
| 10                                                                                               | XXXXX                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | XXXXX     | 20             |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |    |        |        |    |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |      |       |    |   |       |       |    |   |       |        |    |   |       |        |    |   |      |       |    |   |      |       |    |   |      |       |    |   |       |       |    |   |        |       |    |    |       |       |    |
| 1                                                                                                | 0000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0000      | 11             |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |    |        |        |    |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |      |       |    |   |       |       |    |   |       |        |    |   |       |        |    |   |      |       |    |   |      |       |    |   |      |       |    |   |       |       |    |   |        |       |    |    |       |       |    |
| 2                                                                                                | 0000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0000      | 12             |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |    |        |        |    |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |      |       |    |   |       |       |    |   |       |        |    |   |       |        |    |   |      |       |    |   |      |       |    |   |      |       |    |   |       |       |    |   |        |       |    |    |       |       |    |
| 3                                                                                                | XXXX0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | ██████    | 13             |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |    |        |        |    |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |      |       |    |   |       |       |    |   |       |        |    |   |       |        |    |   |      |       |    |   |      |       |    |   |      |       |    |   |       |       |    |   |        |       |    |    |       |       |    |
| 4                                                                                                | XXXXX                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0000      | 14             |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |    |        |        |    |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |      |       |    |   |       |       |    |   |       |        |    |   |       |        |    |   |      |       |    |   |      |       |    |   |      |       |    |   |       |       |    |   |        |       |    |    |       |       |    |
| 5                                                                                                | 0000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0000      | 15             |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |    |        |        |    |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |      |       |    |   |       |       |    |   |       |        |    |   |       |        |    |   |      |       |    |   |      |       |    |   |      |       |    |   |       |       |    |   |        |       |    |    |       |       |    |
| 6                                                                                                | 0000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | XXXXX     | 16             |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |    |        |        |    |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |      |       |    |   |       |       |    |   |       |        |    |   |       |        |    |   |      |       |    |   |      |       |    |   |      |       |    |   |       |       |    |   |        |       |    |    |       |       |    |
| 7                                                                                                | 0000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | XXXXX     | 17             |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |    |        |        |    |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |      |       |    |   |       |       |    |   |       |        |    |   |       |        |    |   |      |       |    |   |      |       |    |   |      |       |    |   |       |       |    |   |        |       |    |    |       |       |    |
| 8                                                                                                | 0000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | XXXXX     | 18             |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |    |        |        |    |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |      |       |    |   |       |       |    |   |       |        |    |   |       |        |    |   |      |       |    |   |      |       |    |   |      |       |    |   |       |       |    |   |        |       |    |    |       |       |    |
| 9                                                                                                | ██████                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | XXXXX     | 19             |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |    |        |        |    |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |      |       |    |   |       |       |    |   |       |        |    |   |       |        |    |   |      |       |    |   |      |       |    |   |      |       |    |   |       |       |    |   |        |       |    |    |       |       |    |
| 10                                                                                               | 0000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | XXXXX     | 20             |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |    |        |        |    |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |      |       |    |   |       |       |    |   |       |        |    |   |       |        |    |   |      |       |    |   |      |       |    |   |      |       |    |   |       |       |    |   |        |       |    |    |       |       |    |
| 2. Drive online, ready, selected; heads in motion.                                               | <p>0 0 0 2</p> <table border="1"> <tr><td>1</td><td>██████</td><td>XXXXX</td><td>11</td></tr> <tr><td>2</td><td>0XXXX</td><td>XXXXX</td><td>12</td></tr> <tr><td>3</td><td>██████</td><td>X</td><td>13</td></tr> <tr><td>4</td><td>XX</td><td>██████</td><td>14</td></tr> <tr><td>5</td><td>██████</td><td>██████</td><td>15</td></tr> <tr><td>6</td><td>██████</td><td>██████</td><td>16</td></tr> <tr><td>7</td><td>000X</td><td>██████</td><td>17</td></tr> <tr><td>8</td><td>XXXXX</td><td>XXXXX</td><td>18</td></tr> <tr><td>9</td><td>XXXXX</td><td>XXXXX</td><td>19</td></tr> <tr><td>10</td><td>XXXXX</td><td>XXXXX</td><td>20</td></tr> </table>                     | 1         | ██████         | XXXXX  | 11 | 2 | 0XXXX  | XXXXX  | 12 | 3 | ██████ | X      | 13 | 4 | XX     | ██████ | 14 | 5 | ██████ | ██████ | 15 | 6 | ██████ | ██████ | 16 | 7 | 000X   | ██████ | 17 | 8 | XXXXX  | XXXXX  | 18 | 9 | XXXXX  | XXXXX  | 19 | 10 | XXXXX  | XXXXX  | 20 | 6. Controller detected channel parity error during parameter transfer.             | <p>5 0 0 0</p> <table border="1"> <tr><td>1</td><td>0000</td><td>0000</td><td>11</td></tr> <tr><td>2</td><td>0000</td><td>0000</td><td>12</td></tr> <tr><td>3</td><td>XXXX0</td><td>██████</td><td>13</td></tr> <tr><td>4</td><td>XXXXX</td><td>0000</td><td>14</td></tr> <tr><td>5</td><td>0000</td><td>0000</td><td>15</td></tr> <tr><td>6</td><td>0000</td><td>XXXXX</td><td>16</td></tr> <tr><td>7</td><td>0000</td><td>XXXXX</td><td>17</td></tr> <tr><td>8</td><td>0000</td><td>XXXXX</td><td>18</td></tr> <tr><td>9</td><td>██████</td><td>XXXXX</td><td>19</td></tr> <tr><td>10</td><td>0000</td><td>XXXXX</td><td>20</td></tr> </table>       | 1 | 0000 | 0000  | 11 | 2 | 0000  | 0000  | 12 | 3 | XXXX0 | ██████ | 13 | 4 | XXXXX | 0000   | 14 | 5 | 0000 | 0000  | 15 | 6 | 0000 | XXXXX | 16 | 7 | 0000 | XXXXX | 17 | 8 | 0000  | XXXXX | 18 | 9 | ██████ | XXXXX | 19 | 10 | 0000  | XXXXX | 20 |
| 1                                                                                                | ██████                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | XXXXX     | 11             |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |    |        |        |    |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |      |       |    |   |       |       |    |   |       |        |    |   |       |        |    |   |      |       |    |   |      |       |    |   |      |       |    |   |       |       |    |   |        |       |    |    |       |       |    |
| 2                                                                                                | 0XXXX                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | XXXXX     | 12             |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |    |        |        |    |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |      |       |    |   |       |       |    |   |       |        |    |   |       |        |    |   |      |       |    |   |      |       |    |   |      |       |    |   |       |       |    |   |        |       |    |    |       |       |    |
| 3                                                                                                | ██████                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | X         | 13             |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |    |        |        |    |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |      |       |    |   |       |       |    |   |       |        |    |   |       |        |    |   |      |       |    |   |      |       |    |   |      |       |    |   |       |       |    |   |        |       |    |    |       |       |    |
| 4                                                                                                | XX                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | ██████    | 14             |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |    |        |        |    |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |      |       |    |   |       |       |    |   |       |        |    |   |       |        |    |   |      |       |    |   |      |       |    |   |      |       |    |   |       |       |    |   |        |       |    |    |       |       |    |
| 5                                                                                                | ██████                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | ██████    | 15             |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |    |        |        |    |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |      |       |    |   |       |       |    |   |       |        |    |   |       |        |    |   |      |       |    |   |      |       |    |   |      |       |    |   |       |       |    |   |        |       |    |    |       |       |    |
| 6                                                                                                | ██████                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | ██████    | 16             |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |    |        |        |    |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |      |       |    |   |       |       |    |   |       |        |    |   |       |        |    |   |      |       |    |   |      |       |    |   |      |       |    |   |       |       |    |   |        |       |    |    |       |       |    |
| 7                                                                                                | 000X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | ██████    | 17             |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |    |        |        |    |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |      |       |    |   |       |       |    |   |       |        |    |   |       |        |    |   |      |       |    |   |      |       |    |   |      |       |    |   |       |       |    |   |        |       |    |    |       |       |    |
| 8                                                                                                | XXXXX                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | XXXXX     | 18             |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |    |        |        |    |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |      |       |    |   |       |       |    |   |       |        |    |   |       |        |    |   |      |       |    |   |      |       |    |   |      |       |    |   |       |       |    |   |        |       |    |    |       |       |    |
| 9                                                                                                | XXXXX                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | XXXXX     | 19             |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |    |        |        |    |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |      |       |    |   |       |       |    |   |       |        |    |   |       |        |    |   |      |       |    |   |      |       |    |   |      |       |    |   |       |       |    |   |        |       |    |    |       |       |    |
| 10                                                                                               | XXXXX                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | XXXXX     | 20             |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |    |        |        |    |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |      |       |    |   |       |       |    |   |       |        |    |   |       |        |    |   |      |       |    |   |      |       |    |   |      |       |    |   |       |       |    |   |        |       |    |    |       |       |    |
| 1                                                                                                | 0000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0000      | 11             |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |    |        |        |    |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |      |       |    |   |       |       |    |   |       |        |    |   |       |        |    |   |      |       |    |   |      |       |    |   |      |       |    |   |       |       |    |   |        |       |    |    |       |       |    |
| 2                                                                                                | 0000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0000      | 12             |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |    |        |        |    |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |      |       |    |   |       |       |    |   |       |        |    |   |       |        |    |   |      |       |    |   |      |       |    |   |      |       |    |   |       |       |    |   |        |       |    |    |       |       |    |
| 3                                                                                                | XXXX0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | ██████    | 13             |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |    |        |        |    |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |      |       |    |   |       |       |    |   |       |        |    |   |       |        |    |   |      |       |    |   |      |       |    |   |      |       |    |   |       |       |    |   |        |       |    |    |       |       |    |
| 4                                                                                                | XXXXX                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0000      | 14             |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |    |        |        |    |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |      |       |    |   |       |       |    |   |       |        |    |   |       |        |    |   |      |       |    |   |      |       |    |   |      |       |    |   |       |       |    |   |        |       |    |    |       |       |    |
| 5                                                                                                | 0000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0000      | 15             |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |    |        |        |    |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |      |       |    |   |       |       |    |   |       |        |    |   |       |        |    |   |      |       |    |   |      |       |    |   |      |       |    |   |       |       |    |   |        |       |    |    |       |       |    |
| 6                                                                                                | 0000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | XXXXX     | 16             |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |    |        |        |    |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |      |       |    |   |       |       |    |   |       |        |    |   |       |        |    |   |      |       |    |   |      |       |    |   |      |       |    |   |       |       |    |   |        |       |    |    |       |       |    |
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| 9                                                                                                | ██████                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | XXXXX     | 19             |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |    |        |        |    |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |      |       |    |   |       |       |    |   |       |        |    |   |       |        |    |   |      |       |    |   |      |       |    |   |      |       |    |   |       |       |    |   |        |       |    |    |       |       |    |
| 10                                                                                               | 0000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | XXXXX     | 20             |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |    |        |        |    |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |      |       |    |   |       |       |    |   |       |        |    |   |       |        |    |   |      |       |    |   |      |       |    |   |      |       |    |   |       |       |    |   |        |       |    |    |       |       |    |
| 3. Drive reserved to other controller.                                                           | <p>0 0 1 0</p> <table border="1"> <tr><td>1</td><td>██████</td><td>██████</td><td>11</td></tr> <tr><td>2</td><td>██████</td><td>██████</td><td>12</td></tr> <tr><td>3</td><td>██████</td><td>██████</td><td>13</td></tr> <tr><td>4</td><td>██████</td><td>██████</td><td>14</td></tr> <tr><td>5</td><td>██████</td><td>██████</td><td>15</td></tr> <tr><td>6</td><td>██████</td><td>██████</td><td>16</td></tr> <tr><td>7</td><td>██████</td><td>██████</td><td>17</td></tr> <tr><td>8</td><td>██████</td><td>██████</td><td>18</td></tr> <tr><td>9</td><td>██████</td><td>██████</td><td>19</td></tr> <tr><td>10</td><td>██████</td><td>██████</td><td>20</td></tr> </table> | 1         | ██████         | ██████ | 11 | 2 | ██████ | ██████ | 12 | 3 | ██████ | ██████ | 13 | 4 | ██████ | ██████ | 14 | 5 | ██████ | ██████ | 15 | 6 | ██████ | ██████ | 16 | 7 | ██████ | ██████ | 17 | 8 | ██████ | ██████ | 18 | 9 | ██████ | ██████ | 19 | 10 | ██████ | ██████ | 20 | 7. Drive offline, drive not selected, drive not ready, seek error, or drive fault. | <p>5 0 2 0</p> <table border="1"> <tr><td>1</td><td>0000</td><td>XXXXX</td><td>11</td></tr> <tr><td>2</td><td>0XXXX</td><td>XXXXX</td><td>12</td></tr> <tr><td>3</td><td>XXXX0</td><td>XXXXX</td><td>13</td></tr> <tr><td>4</td><td>XXXXX</td><td>██████</td><td>14</td></tr> <tr><td>5</td><td>0000</td><td>XXXXX</td><td>15</td></tr> <tr><td>6</td><td>0000</td><td>XXXXX</td><td>16</td></tr> <tr><td>7</td><td>00XX</td><td>XXXXX</td><td>17</td></tr> <tr><td>8</td><td>XXXXX</td><td>XXXXX</td><td>18</td></tr> <tr><td>9</td><td>XXXXX</td><td>XXXXX</td><td>19</td></tr> <tr><td>10</td><td>XXXXX</td><td>XXXXX</td><td>20</td></tr> </table> | 1 | 0000 | XXXXX | 11 | 2 | 0XXXX | XXXXX | 12 | 3 | XXXX0 | XXXXX  | 13 | 4 | XXXXX | ██████ | 14 | 5 | 0000 | XXXXX | 15 | 6 | 0000 | XXXXX | 16 | 7 | 00XX | XXXXX | 17 | 8 | XXXXX | XXXXX | 18 | 9 | XXXXX  | XXXXX | 19 | 10 | XXXXX | XXXXX | 20 |
| 1                                                                                                | ██████                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | ██████    | 11             |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |    |        |        |    |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |      |       |    |   |       |       |    |   |       |        |    |   |       |        |    |   |      |       |    |   |      |       |    |   |      |       |    |   |       |       |    |   |        |       |    |    |       |       |    |
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| 10                                                                                               | ██████                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | ██████    | 20             |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |    |        |        |    |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |      |       |    |   |       |       |    |   |       |        |    |   |       |        |    |   |      |       |    |   |      |       |    |   |      |       |    |   |       |       |    |   |        |       |    |    |       |       |    |
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| 10                                                                                               | XXXXX                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | XXXXX     | 20             |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |    |        |        |    |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |      |       |    |   |       |       |    |   |       |        |    |   |       |        |    |   |      |       |    |   |      |       |    |   |      |       |    |   |       |       |    |   |        |       |    |    |       |       |    |
| 4. Controller received function but did not receive all parameters.                              | <p>5 0 0 0</p> <table border="1"> <tr><td>1</td><td>0000</td><td>0000</td><td>11</td></tr> <tr><td>2</td><td>0000</td><td>0000</td><td>12</td></tr> <tr><td>3</td><td>XXXX4</td><td>██████</td><td>13</td></tr> <tr><td>4</td><td>XXXXX</td><td>0000</td><td>14</td></tr> <tr><td>5</td><td>0000</td><td>0000</td><td>15</td></tr> <tr><td>6</td><td>0000</td><td>XXXXX</td><td>16</td></tr> <tr><td>7</td><td>0000</td><td>XXXXX</td><td>17</td></tr> <tr><td>8</td><td>0000</td><td>XXXXX</td><td>18</td></tr> <tr><td>9</td><td>██████</td><td>XXXXX</td><td>19</td></tr> <tr><td>10</td><td>0000</td><td>XXXXX</td><td>20</td></tr> </table>                              | 1         | 0000           | 0000   | 11 | 2 | 0000   | 0000   | 12 | 3 | XXXX4  | ██████ | 13 | 4 | XXXXX  | 0000   | 14 | 5 | 0000   | 0000   | 15 | 6 | 0000   | XXXXX  | 16 | 7 | 0000   | XXXXX  | 17 | 8 | 0000   | XXXXX  | 18 | 9 | ██████ | XXXXX  | 19 | 10 | 0000   | XXXXX  | 20 | 8. Processor memory parity error (processor stops).                                | No status returned.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |   |      |       |    |   |       |       |    |   |       |        |    |   |       |        |    |   |      |       |    |   |      |       |    |   |      |       |    |   |       |       |    |   |        |       |    |    |       |       |    |
|                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 1         | 0000           | 0000   | 11 |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |    |        |        |    |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |      |       |    |   |       |       |    |   |       |        |    |   |       |        |    |   |      |       |    |   |      |       |    |   |      |       |    |   |       |       |    |   |        |       |    |    |       |       |    |
| 2                                                                                                | 0000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0000      | 12             |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |    |        |        |    |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |      |       |    |   |       |       |    |   |       |        |    |   |       |        |    |   |      |       |    |   |      |       |    |   |      |       |    |   |       |       |    |   |        |       |    |    |       |       |    |
| 3                                                                                                | XXXX4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | ██████    | 13             |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |    |        |        |    |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |      |       |    |   |       |       |    |   |       |        |    |   |       |        |    |   |      |       |    |   |      |       |    |   |      |       |    |   |       |       |    |   |        |       |    |    |       |       |    |
| 4                                                                                                | XXXXX                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0000      | 14             |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |    |        |        |    |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |      |       |    |   |       |       |    |   |       |        |    |   |       |        |    |   |      |       |    |   |      |       |    |   |      |       |    |   |       |       |    |   |        |       |    |    |       |       |    |
| 5                                                                                                | 0000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0000      | 15             |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |    |        |        |    |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |      |       |    |   |       |       |    |   |       |        |    |   |       |        |    |   |      |       |    |   |      |       |    |   |      |       |    |   |       |       |    |   |        |       |    |    |       |       |    |
| 6                                                                                                | 0000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | XXXXX     | 16             |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |    |        |        |    |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |      |       |    |   |       |       |    |   |       |        |    |   |       |        |    |   |      |       |    |   |      |       |    |   |      |       |    |   |       |       |    |   |        |       |    |    |       |       |    |
| 7                                                                                                | 0000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | XXXXX     | 17             |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |    |        |        |    |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |      |       |    |   |       |       |    |   |       |        |    |   |       |        |    |   |      |       |    |   |      |       |    |   |      |       |    |   |       |       |    |   |        |       |    |    |       |       |    |
| 8                                                                                                | 0000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | XXXXX     | 18             |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |    |        |        |    |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |      |       |    |   |       |       |    |   |       |        |    |   |       |        |    |   |      |       |    |   |      |       |    |   |      |       |    |   |       |       |    |   |        |       |    |    |       |       |    |
| 9                                                                                                | ██████                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | XXXXX     | 19             |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |    |        |        |    |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |      |       |    |   |       |       |    |   |       |        |    |   |       |        |    |   |      |       |    |   |      |       |    |   |      |       |    |   |       |       |    |   |        |       |    |    |       |       |    |
| 10                                                                                               | 0000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | XXXXX     | 20             |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |    |        |        |    |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |      |       |    |   |       |       |    |   |       |        |    |   |       |        |    |   |      |       |    |   |      |       |    |   |      |       |    |   |       |       |    |   |        |       |    |    |       |       |    |
| 9. Channel parity error during status function transfer (controller does not reply to function). | No status returned.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |           |                |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |   |        |        |    |    |        |        |    |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |      |       |    |   |       |       |    |   |       |        |    |   |       |        |    |   |      |       |    |   |      |       |    |   |      |       |    |   |       |       |    |   |        |       |    |    |       |       |    |



TABLE C-2. READ/WRITE STATUS

| Condition                                                                                    | Status Summary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Condition | Status Summary |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
|----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------------|---------|----|---|---------|---------|----|---|---------|---------|----|---|---------|---------|----|---|---------|---------|----|---|---------|---------|----|---|---------|---------|----|---|---------|---------|----|---|---------|---------|----|----|---------|---------|----|----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---------|---------|----|---|---------|---------|----|---|---------|---------|----|---|---------|---------|----|---|---------|---------|----|---|---------|---------|----|---|---------|---------|----|---|---------|---------|----|---|---------|---------|----|----|---------|---------|----|
| 1. Recoverable address field sync byte error during read, write, or read checkword function. | <p>4 4 0 0</p> <table border="1"> <tr><td>1</td><td>X X X 0</td><td>X X X X</td><td>11</td></tr> <tr><td>2</td><td>0 X X X</td><td>X X X X</td><td>12</td></tr> <tr><td>3</td><td>X X X 0</td><td>X 0 0 0</td><td>13</td></tr> <tr><td>4</td><td>X X X X</td><td>0 0 0 0</td><td>14</td></tr> <tr><td>5</td><td>X X X X</td><td>0 0 0 0</td><td>15</td></tr> <tr><td>6</td><td>X X X X</td><td>X X X X</td><td>16</td></tr> <tr><td>7</td><td>X X X X</td><td>X X X X</td><td>17</td></tr> <tr><td>8</td><td>X X X X</td><td>X X X X</td><td>18</td></tr> <tr><td>9</td><td>X X X X</td><td>X X X X</td><td>19</td></tr> <tr><td>10</td><td>X X X X</td><td>X X X X</td><td>20</td></tr> </table> | 1         | X X X 0        | X X X X | 11 | 2 | 0 X X X | X X X X | 12 | 3 | X X X 0 | X 0 0 0 | 13 | 4 | X X X X | 0 0 0 0 | 14 | 5 | X X X X | 0 0 0 0 | 15 | 6 | X X X X | X X X X | 16 | 7 | X X X X | X X X X | 17 | 8 | X X X X | X X X X | 18 | 9 | X X X X | X X X X | 19 | 10 | X X X X | X X X X | 20 | 6. Nonrecoverable cylinder number miscompare during read, write, or read checkword function. | <p>5 0 0 0</p> <table border="1"> <tr><td>1</td><td>0 0 1 4</td><td>X X X X</td><td>11</td></tr> <tr><td>2</td><td>0 X X X</td><td>X X X X</td><td>12</td></tr> <tr><td>3</td><td>X X X 0</td><td>X 0 0 0</td><td>13</td></tr> <tr><td>4</td><td>X X X X</td><td>0 0 0 0</td><td>14</td></tr> <tr><td>5</td><td>X X X X</td><td>0 0 0 0</td><td>15</td></tr> <tr><td>6</td><td>X X X X</td><td>X X X X</td><td>16</td></tr> <tr><td>7</td><td>X X X X</td><td>X X X X</td><td>17</td></tr> <tr><td>8</td><td>X X X X</td><td>X X X X</td><td>18</td></tr> <tr><td>9</td><td>X X X X</td><td>X X X X</td><td>19</td></tr> <tr><td>10</td><td>X X X X</td><td>X X X X</td><td>20</td></tr> </table> | 1 | 0 0 1 4 | X X X X | 11 | 2 | 0 X X X | X X X X | 12 | 3 | X X X 0 | X 0 0 0 | 13 | 4 | X X X X | 0 0 0 0 | 14 | 5 | X X X X | 0 0 0 0 | 15 | 6 | X X X X | X X X X | 16 | 7 | X X X X | X X X X | 17 | 8 | X X X X | X X X X | 18 | 9 | X X X X | X X X X | 19 | 10 | X X X X | X X X X | 20 |
| 1                                                                                            | X X X 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 11             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 2                                                                                            | 0 X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 12             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 3                                                                                            | X X X 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X 0 0 0   | 13             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 4                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 14             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 5                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 15             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 6                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 16             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 7                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 17             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 8                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 18             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 9                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 19             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 10                                                                                           | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 20             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 1                                                                                            | 0 0 1 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 11             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 2                                                                                            | 0 X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 12             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 3                                                                                            | X X X 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X 0 0 0   | 13             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 4                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 14             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 5                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 15             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 6                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 16             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 7                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 17             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 8                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 18             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 9                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 19             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 10                                                                                           | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 20             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 2. Nonrecoverable address field sync byte error during write function.                       | <p>5 0 0 0</p> <table border="1"> <tr><td>1</td><td>0 1 0 0</td><td>X X X X</td><td>11</td></tr> <tr><td>2</td><td>0 X X X</td><td>X X X X</td><td>12</td></tr> <tr><td>3</td><td>X X X 0</td><td>X 0 0 0</td><td>13</td></tr> <tr><td>4</td><td>X X X X</td><td>0 0 0 0</td><td>14</td></tr> <tr><td>5</td><td>X X X X</td><td>0 0 0 0</td><td>15</td></tr> <tr><td>6</td><td>X X X X</td><td>X X X X</td><td>16</td></tr> <tr><td>7</td><td>X X X X</td><td>X X X X</td><td>17</td></tr> <tr><td>8</td><td>X X X X</td><td>X X X X</td><td>18</td></tr> <tr><td>9</td><td>X X X X</td><td>X X X X</td><td>19</td></tr> <tr><td>10</td><td>X X X X</td><td>X X X X</td><td>20</td></tr> </table> | 1         | 0 1 0 0        | X X X X | 11 | 2 | 0 X X X | X X X X | 12 | 3 | X X X 0 | X 0 0 0 | 13 | 4 | X X X X | 0 0 0 0 | 14 | 5 | X X X X | 0 0 0 0 | 15 | 6 | X X X X | X X X X | 16 | 7 | X X X X | X X X X | 17 | 8 | X X X X | X X X X | 18 | 9 | X X X X | X X X X | 19 | 10 | X X X X | X X X X | 20 | 7. Cylinder number miscompare during write verify function.                                  | <p>5 0 0 0</p> <table border="1"> <tr><td>1</td><td>0 0 1 4</td><td>X X X X</td><td>11</td></tr> <tr><td>2</td><td>0 X X X</td><td>X X X X</td><td>12</td></tr> <tr><td>3</td><td>X X X 0</td><td>X 0 0 0</td><td>13</td></tr> <tr><td>4</td><td>X X X X</td><td>0 0 0 0</td><td>14</td></tr> <tr><td>5</td><td>X X X X</td><td>0 0 0 0</td><td>15</td></tr> <tr><td>6</td><td>X X X X</td><td>X X X X</td><td>16</td></tr> <tr><td>7</td><td>X X X X</td><td>X X X X</td><td>17</td></tr> <tr><td>8</td><td>X X X X</td><td>X X X X</td><td>18</td></tr> <tr><td>9</td><td>X X X X</td><td>X X X X</td><td>19</td></tr> <tr><td>10</td><td>X X X X</td><td>X X X X</td><td>20</td></tr> </table> | 1 | 0 0 1 4 | X X X X | 11 | 2 | 0 X X X | X X X X | 12 | 3 | X X X 0 | X 0 0 0 | 13 | 4 | X X X X | 0 0 0 0 | 14 | 5 | X X X X | 0 0 0 0 | 15 | 6 | X X X X | X X X X | 16 | 7 | X X X X | X X X X | 17 | 8 | X X X X | X X X X | 18 | 9 | X X X X | X X X X | 19 | 10 | X X X X | X X X X | 20 |
| 1                                                                                            | 0 1 0 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 11             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 2                                                                                            | 0 X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 12             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 3                                                                                            | X X X 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X 0 0 0   | 13             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 4                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 14             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 5                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 15             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 6                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 16             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 7                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 17             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 8                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 18             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 9                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 19             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 10                                                                                           | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 20             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 1                                                                                            | 0 0 1 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 11             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 2                                                                                            | 0 X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 12             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 3                                                                                            | X X X 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X 0 0 0   | 13             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 4                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 14             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 5                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 15             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 6                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 16             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 7                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 17             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 8                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 18             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 9                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 19             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 10                                                                                           | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 20             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 3. Nonrecoverable address sync byte error during write verify function.                      | <p>5 0 0 0</p> <table border="1"> <tr><td>1</td><td>0 0 2 0</td><td>X X X X</td><td>11</td></tr> <tr><td>2</td><td>0 X X X</td><td>X X X X</td><td>12</td></tr> <tr><td>3</td><td>0 1 4 0</td><td>X 0 0 0</td><td>13</td></tr> <tr><td>4</td><td>X X X X</td><td>0 0 0 0</td><td>14</td></tr> <tr><td>5</td><td>X X X X</td><td>0 0 0 0</td><td>15</td></tr> <tr><td>6</td><td>X X X X</td><td>X X X X</td><td>16</td></tr> <tr><td>7</td><td>X X X X</td><td>X X X X</td><td>17</td></tr> <tr><td>8</td><td>X X X X</td><td>X X X X</td><td>18</td></tr> <tr><td>9</td><td>X X X X</td><td>X X X X</td><td>19</td></tr> <tr><td>10</td><td>X X X X</td><td>X X X X</td><td>20</td></tr> </table> | 1         | 0 0 2 0        | X X X X | 11 | 2 | 0 X X X | X X X X | 12 | 3 | 0 1 4 0 | X 0 0 0 | 13 | 4 | X X X X | 0 0 0 0 | 14 | 5 | X X X X | 0 0 0 0 | 15 | 6 | X X X X | X X X X | 16 | 7 | X X X X | X X X X | 17 | 8 | X X X X | X X X X | 18 | 9 | X X X X | X X X X | 19 | 10 | X X X X | X X X X | 20 | 8. Track number miscompare during read, write, or read checkword function.                   | <p>4 4 0 0</p> <table border="1"> <tr><td>1</td><td>0 0 1 2</td><td>X X X X</td><td>11</td></tr> <tr><td>2</td><td>0 X X X</td><td>X X X X</td><td>12</td></tr> <tr><td>3</td><td>X X X 0</td><td>X 0 0 0</td><td>13</td></tr> <tr><td>4</td><td>X X X X</td><td>0 0 0 0</td><td>14</td></tr> <tr><td>5</td><td>X X X X</td><td>0 0 0 0</td><td>15</td></tr> <tr><td>6</td><td>X X X X</td><td>X X X X</td><td>16</td></tr> <tr><td>7</td><td>X X X X</td><td>X X X X</td><td>17</td></tr> <tr><td>8</td><td>X X X X</td><td>X X X X</td><td>18</td></tr> <tr><td>9</td><td>X X X X</td><td>X X X X</td><td>19</td></tr> <tr><td>10</td><td>X X X X</td><td>X X X X</td><td>20</td></tr> </table> | 1 | 0 0 1 2 | X X X X | 11 | 2 | 0 X X X | X X X X | 12 | 3 | X X X 0 | X 0 0 0 | 13 | 4 | X X X X | 0 0 0 0 | 14 | 5 | X X X X | 0 0 0 0 | 15 | 6 | X X X X | X X X X | 16 | 7 | X X X X | X X X X | 17 | 8 | X X X X | X X X X | 18 | 9 | X X X X | X X X X | 19 | 10 | X X X X | X X X X | 20 |
| 1                                                                                            | 0 0 2 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 11             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 2                                                                                            | 0 X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 12             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 3                                                                                            | 0 1 4 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X 0 0 0   | 13             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 4                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 14             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 5                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 15             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 6                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 16             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 7                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 17             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 8                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 18             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 9                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 19             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 10                                                                                           | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 20             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 1                                                                                            | 0 0 1 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 11             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 2                                                                                            | 0 X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 12             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 3                                                                                            | X X X 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X 0 0 0   | 13             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 4                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 14             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 5                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 15             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 6                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 16             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 7                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 17             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 8                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 18             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 9                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 19             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 10                                                                                           | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 20             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 4. Nonrecoverable address sync byte error during read or read checkword function.            | <p>5 0 0 0</p> <table border="1"> <tr><td>1</td><td>0 7 0 0</td><td>X X X X</td><td>11</td></tr> <tr><td>2</td><td>0 X X X</td><td>X X X X</td><td>12</td></tr> <tr><td>3</td><td>X X X 0</td><td>X 0 0 0</td><td>13</td></tr> <tr><td>4</td><td>X X X X</td><td>0 0 0 0</td><td>14</td></tr> <tr><td>5</td><td>X X X X</td><td>0 0 0 0</td><td>15</td></tr> <tr><td>6</td><td>X X X X</td><td>X X X X</td><td>16</td></tr> <tr><td>7</td><td>X X X X</td><td>X X X X</td><td>17</td></tr> <tr><td>8</td><td>X X X X</td><td>X X X X</td><td>18</td></tr> <tr><td>9</td><td>X X X X</td><td>X X X X</td><td>19</td></tr> <tr><td>10</td><td>X X X X</td><td>X X X X</td><td>20</td></tr> </table> | 1         | 0 7 0 0        | X X X X | 11 | 2 | 0 X X X | X X X X | 12 | 3 | X X X 0 | X 0 0 0 | 13 | 4 | X X X X | 0 0 0 0 | 14 | 5 | X X X X | 0 0 0 0 | 15 | 6 | X X X X | X X X X | 16 | 7 | X X X X | X X X X | 17 | 8 | X X X X | X X X X | 18 | 9 | X X X X | X X X X | 19 | 10 | X X X X | X X X X | 20 | 9. Nonrecoverable track number miscompare during read, write, or read checkword function.    | <p>5 0 0 0</p> <table border="1"> <tr><td>1</td><td>0 0 1 2</td><td>X X X X</td><td>11</td></tr> <tr><td>2</td><td>0 X X X</td><td>X X X X</td><td>12</td></tr> <tr><td>3</td><td>X X X 0</td><td>X 0 0 0</td><td>13</td></tr> <tr><td>4</td><td>X X X X</td><td>0 0 0 0</td><td>14</td></tr> <tr><td>5</td><td>X X X X</td><td>0 0 0 0</td><td>15</td></tr> <tr><td>6</td><td>X X X X</td><td>X X X X</td><td>16</td></tr> <tr><td>7</td><td>X X X X</td><td>X X X X</td><td>17</td></tr> <tr><td>8</td><td>X X X X</td><td>X X X X</td><td>18</td></tr> <tr><td>9</td><td>X X X X</td><td>X X X X</td><td>19</td></tr> <tr><td>10</td><td>X X X X</td><td>X X X X</td><td>20</td></tr> </table> | 1 | 0 0 1 2 | X X X X | 11 | 2 | 0 X X X | X X X X | 12 | 3 | X X X 0 | X 0 0 0 | 13 | 4 | X X X X | 0 0 0 0 | 14 | 5 | X X X X | 0 0 0 0 | 15 | 6 | X X X X | X X X X | 16 | 7 | X X X X | X X X X | 17 | 8 | X X X X | X X X X | 18 | 9 | X X X X | X X X X | 19 | 10 | X X X X | X X X X | 20 |
| 1                                                                                            | 0 7 0 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 11             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 2                                                                                            | 0 X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 12             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 3                                                                                            | X X X 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X 0 0 0   | 13             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 4                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 14             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 5                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 15             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 6                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 16             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 7                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 17             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 8                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 18             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 9                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 19             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 10                                                                                           | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 20             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 1                                                                                            | 0 0 1 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 11             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 2                                                                                            | 0 X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 12             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 3                                                                                            | X X X 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X 0 0 0   | 13             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 4                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 14             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 5                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 15             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 6                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 16             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 7                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 17             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 8                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 18             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 9                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 19             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 10                                                                                           | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 20             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 5. Cylinder number miscompare during read, write, or read checkword function.                | <p>4 4 0 0</p> <table border="1"> <tr><td>1</td><td>0 0 1 4</td><td>X X X X</td><td>11</td></tr> <tr><td>2</td><td>0 X X X</td><td>X X X X</td><td>12</td></tr> <tr><td>3</td><td>X X X 0</td><td>X 0 0 0</td><td>13</td></tr> <tr><td>4</td><td>X X X X</td><td>0 0 0 0</td><td>14</td></tr> <tr><td>5</td><td>X X X X</td><td>0 0 0 0</td><td>15</td></tr> <tr><td>6</td><td>X X X X</td><td>X X X X</td><td>16</td></tr> <tr><td>7</td><td>X X X X</td><td>X X X X</td><td>17</td></tr> <tr><td>8</td><td>X X X X</td><td>X X X X</td><td>18</td></tr> <tr><td>9</td><td>X X X X</td><td>X X X X</td><td>19</td></tr> <tr><td>10</td><td>X X X X</td><td>X X X X</td><td>20</td></tr> </table> | 1         | 0 0 1 4        | X X X X | 11 | 2 | 0 X X X | X X X X | 12 | 3 | X X X 0 | X 0 0 0 | 13 | 4 | X X X X | 0 0 0 0 | 14 | 5 | X X X X | 0 0 0 0 | 15 | 6 | X X X X | X X X X | 16 | 7 | X X X X | X X X X | 17 | 8 | X X X X | X X X X | 18 | 9 | X X X X | X X X X | 19 | 10 | X X X X | X X X X | 20 | 10. Sector number miscompare during read, write, or read checkword function.                 | <p>4 4 0 0</p> <table border="1"> <tr><td>1</td><td>0 0 1 1</td><td>X X X X</td><td>11</td></tr> <tr><td>2</td><td>0 X X X</td><td>X X X X</td><td>12</td></tr> <tr><td>3</td><td>X X X 0</td><td>X 0 0 0</td><td>13</td></tr> <tr><td>4</td><td>X X X X</td><td>0 0 0 0</td><td>14</td></tr> <tr><td>5</td><td>X X X X</td><td>0 0 0 0</td><td>15</td></tr> <tr><td>6</td><td>X X X X</td><td>X X X X</td><td>16</td></tr> <tr><td>7</td><td>X X X X</td><td>X X X X</td><td>17</td></tr> <tr><td>8</td><td>X X X X</td><td>X X X X</td><td>18</td></tr> <tr><td>9</td><td>X X X X</td><td>X X X X</td><td>19</td></tr> <tr><td>10</td><td>X X X X</td><td>X X X X</td><td>20</td></tr> </table> | 1 | 0 0 1 1 | X X X X | 11 | 2 | 0 X X X | X X X X | 12 | 3 | X X X 0 | X 0 0 0 | 13 | 4 | X X X X | 0 0 0 0 | 14 | 5 | X X X X | 0 0 0 0 | 15 | 6 | X X X X | X X X X | 16 | 7 | X X X X | X X X X | 17 | 8 | X X X X | X X X X | 18 | 9 | X X X X | X X X X | 19 | 10 | X X X X | X X X X | 20 |
| 1                                                                                            | 0 0 1 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 11             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 2                                                                                            | 0 X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 12             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 3                                                                                            | X X X 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X 0 0 0   | 13             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 4                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 14             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 5                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 15             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 6                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 16             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 7                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 17             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 8                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 18             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 9                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 19             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 10                                                                                           | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 20             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 1                                                                                            | 0 0 1 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 11             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 2                                                                                            | 0 X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 12             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 3                                                                                            | X X X 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X 0 0 0   | 13             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 4                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 14             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 5                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 15             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 6                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 16             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 7                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 17             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 8                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 18             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 9                                                                                            | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 19             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 10                                                                                           | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 20             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |

TABLE C-2. READ/WRITE STATUS (Contd)

| Condition                                                                                                            | Status Summary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Condition | Status Summary |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
|----------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------------|---------|----|---|---------|---------|----|---|---------|---------|----|---|---------|---------|----|---|---------|---------|----|---|---------|---------|----|---|---------|---------|----|---|---------|---------|----|---|---------|---------|----|----|---------|---------|----|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---------|---------|----|---|---------|---------|----|---|---------|---------|----|---|---------|---------|----|---|---------|---------|----|---|---------|---------|----|---|---------|---------|----|---|---------|---------|----|---|---------|---------|----|----|---------|---------|----|
| 11. Nonrecoverable sector number misccompare during read, write, or read checkword function.                         | <p>5 0 0 0</p> <table border="1"> <tr><td>1</td><td>0 0 1 1</td><td>X X X X</td><td>11</td></tr> <tr><td>2</td><td>0 0 0 0</td><td>X X X X</td><td>12</td></tr> <tr><td>3</td><td>X X X 0</td><td>X 0 0 0</td><td>13</td></tr> <tr><td>4</td><td>X X X X</td><td>0 0 0 0</td><td>14</td></tr> <tr><td>5</td><td>X X X X</td><td>0 0 0 0</td><td>15</td></tr> <tr><td>6</td><td>X X X X</td><td>X X X X</td><td>16</td></tr> <tr><td>7</td><td>X X X X</td><td>X X X X</td><td>17</td></tr> <tr><td>8</td><td>X X X X</td><td>X X X X</td><td>18</td></tr> <tr><td>9</td><td>X X X X</td><td>X X X X</td><td>19</td></tr> <tr><td>10</td><td>X X X X</td><td>X X X X</td><td>20</td></tr> </table> | 1         | 0 0 1 1        | X X X X | 11 | 2 | 0 0 0 0 | X X X X | 12 | 3 | X X X 0 | X 0 0 0 | 13 | 4 | X X X X | 0 0 0 0 | 14 | 5 | X X X X | 0 0 0 0 | 15 | 6 | X X X X | X X X X | 16 | 7 | X X X X | X X X X | 17 | 8 | X X X X | X X X X | 18 | 9 | X X X X | X X X X | 19 | 10 | X X X X | X X X X | 20 | 16. Nonrecoverable address checkword error during read or read checkword function.    | <p>5 2 0 0</p> <table border="1"> <tr><td>1</td><td>0 7 0 0</td><td>X X X X</td><td>11</td></tr> <tr><td>2</td><td>6 X X X</td><td>X X X X</td><td>12</td></tr> <tr><td>3</td><td>X X X 0</td><td>X 0 0 0</td><td>13</td></tr> <tr><td>4</td><td>X X X X</td><td>0 0 0 0</td><td>14</td></tr> <tr><td>5</td><td>X X X X</td><td>0 0 0 0</td><td>15</td></tr> <tr><td>6</td><td>X X X X</td><td>X X X X</td><td>16</td></tr> <tr><td>7</td><td>X X X X</td><td>X X X X</td><td>17</td></tr> <tr><td>8</td><td>X X X X</td><td>X X X X</td><td>18</td></tr> <tr><td>9</td><td>X X X X</td><td>X X X X</td><td>19</td></tr> <tr><td>10</td><td>X X X X</td><td>X X X X</td><td>20</td></tr> </table> | 1 | 0 7 0 0 | X X X X | 11 | 2 | 6 X X X | X X X X | 12 | 3 | X X X 0 | X 0 0 0 | 13 | 4 | X X X X | 0 0 0 0 | 14 | 5 | X X X X | 0 0 0 0 | 15 | 6 | X X X X | X X X X | 16 | 7 | X X X X | X X X X | 17 | 8 | X X X X | X X X X | 18 | 9 | X X X X | X X X X | 19 | 10 | X X X X | X X X X | 20 |
| 1                                                                                                                    | 0 0 1 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 11             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 2                                                                                                                    | 0 0 0 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 12             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 3                                                                                                                    | X X X 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X 0 0 0   | 13             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 4                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 14             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 5                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 15             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 6                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 16             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 7                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 17             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 8                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 18             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 9                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 19             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 10                                                                                                                   | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 20             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 1                                                                                                                    | 0 7 0 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 11             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 2                                                                                                                    | 6 X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 12             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 3                                                                                                                    | X X X 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X 0 0 0   | 13             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 4                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 14             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 5                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 15             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 6                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 16             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 7                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 17             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 8                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 18             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 9                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 19             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 10                                                                                                                   | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 20             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 12. Sector flaw or track flaw bit set in addressed sector (does not apply to read/write protected sector functions). | <p>5 0 0 0</p> <table border="1"> <tr><td>1</td><td>0 0 1 0</td><td>X X X X</td><td>11</td></tr> <tr><td>2</td><td>0 X X X</td><td>X X X X</td><td>12</td></tr> <tr><td>3</td><td>X X X 0</td><td>X 0 0 0</td><td>13</td></tr> <tr><td>4</td><td>X X X X</td><td>0 0 0 0</td><td>14</td></tr> <tr><td>5</td><td>X X X X</td><td>0 0 0 0</td><td>15</td></tr> <tr><td>6</td><td>X X X X</td><td>X X X X</td><td>16</td></tr> <tr><td>7</td><td>X X X X</td><td>X X X X</td><td>17</td></tr> <tr><td>8</td><td>X X X X</td><td>X X X X</td><td>18</td></tr> <tr><td>9</td><td>X X X X</td><td>X X X X</td><td>19</td></tr> <tr><td>10</td><td>X X X X</td><td>X X X X</td><td>20</td></tr> </table> | 1         | 0 0 1 0        | X X X X | 11 | 2 | 0 X X X | X X X X | 12 | 3 | X X X 0 | X 0 0 0 | 13 | 4 | X X X X | 0 0 0 0 | 14 | 5 | X X X X | 0 0 0 0 | 15 | 6 | X X X X | X X X X | 16 | 7 | X X X X | X X X X | 17 | 8 | X X X X | X X X X | 18 | 9 | X X X X | X X X X | 19 | 10 | X X X X | X X X X | 20 | 17. Nonrecoverable address checkword error during write function.                     | <p>5 2 0 0</p> <table border="1"> <tr><td>1</td><td>0 1 0 0</td><td>X X X X</td><td>11</td></tr> <tr><td>2</td><td>6 X X X</td><td>X X X X</td><td>12</td></tr> <tr><td>3</td><td>X X X 0</td><td>X 0 0 0</td><td>13</td></tr> <tr><td>4</td><td>X X X X</td><td>0 0 0 0</td><td>14</td></tr> <tr><td>5</td><td>X X X X</td><td>0 0 0 0</td><td>15</td></tr> <tr><td>6</td><td>X X X X</td><td>X X X X</td><td>16</td></tr> <tr><td>7</td><td>X X X X</td><td>X X X X</td><td>17</td></tr> <tr><td>8</td><td>X X X X</td><td>X X X X</td><td>18</td></tr> <tr><td>9</td><td>X X X X</td><td>X X X X</td><td>19</td></tr> <tr><td>10</td><td>X X X X</td><td>X X X X</td><td>20</td></tr> </table> | 1 | 0 1 0 0 | X X X X | 11 | 2 | 6 X X X | X X X X | 12 | 3 | X X X 0 | X 0 0 0 | 13 | 4 | X X X X | 0 0 0 0 | 14 | 5 | X X X X | 0 0 0 0 | 15 | 6 | X X X X | X X X X | 16 | 7 | X X X X | X X X X | 17 | 8 | X X X X | X X X X | 18 | 9 | X X X X | X X X X | 19 | 10 | X X X X | X X X X | 20 |
| 1                                                                                                                    | 0 0 1 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 11             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 2                                                                                                                    | 0 X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 12             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 3                                                                                                                    | X X X 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X 0 0 0   | 13             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 4                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 14             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 5                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 15             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 6                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 16             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 7                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 17             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 8                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 18             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 9                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 19             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 10                                                                                                                   | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 20             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 1                                                                                                                    | 0 1 0 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 11             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 2                                                                                                                    | 6 X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 12             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 3                                                                                                                    | X X X 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X 0 0 0   | 13             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 4                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 14             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 5                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 15             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 6                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 16             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 7                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 17             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 8                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 18             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 9                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 19             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 10                                                                                                                   | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 20             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 13. Correctable address checkword error during read, write, or read checkword function.                              | <p>4 7 0 0</p> <table border="1"> <tr><td>1</td><td>0 0 0 0</td><td>X X X X</td><td>11</td></tr> <tr><td>2</td><td>4 X X X</td><td>X X X X</td><td>12</td></tr> <tr><td>3</td><td>X X X 0</td><td>X 0 0 0</td><td>13</td></tr> <tr><td>4</td><td>X X X X</td><td>0 0 0 0</td><td>14</td></tr> <tr><td>5</td><td>X X X X</td><td>0 0 0 0</td><td>15</td></tr> <tr><td>6</td><td>X X X X</td><td>X X X X</td><td>16</td></tr> <tr><td>7</td><td>X X X X</td><td>X X X X</td><td>17</td></tr> <tr><td>8</td><td>X X X X</td><td>X X X X</td><td>18</td></tr> <tr><td>9</td><td>X X X X</td><td>X X X X</td><td>19</td></tr> <tr><td>10</td><td>X X X X</td><td>X X X X</td><td>20</td></tr> </table> | 1         | 0 0 0 0        | X X X X | 11 | 2 | 4 X X X | X X X X | 12 | 3 | X X X 0 | X 0 0 0 | 13 | 4 | X X X X | 0 0 0 0 | 14 | 5 | X X X X | 0 0 0 0 | 15 | 6 | X X X X | X X X X | 16 | 7 | X X X X | X X X X | 17 | 8 | X X X X | X X X X | 18 | 9 | X X X X | X X X X | 19 | 10 | X X X X | X X X X | 20 | 18. Data field sync byte error during read or read checkword function.                | <p>4 4 0 0</p> <table border="1"> <tr><td>1</td><td>X X X 0</td><td>X X X X</td><td>11</td></tr> <tr><td>2</td><td>0 X X X</td><td>X X X X</td><td>12</td></tr> <tr><td>3</td><td>X X X 0</td><td>X 0 0 0</td><td>13</td></tr> <tr><td>4</td><td>X X X X</td><td>0 0 0 0</td><td>14</td></tr> <tr><td>5</td><td>X X X X</td><td>0 0 0 0</td><td>15</td></tr> <tr><td>6</td><td>X X X X</td><td>X X X X</td><td>16</td></tr> <tr><td>7</td><td>X X X X</td><td>X X X X</td><td>17</td></tr> <tr><td>8</td><td>X X X X</td><td>X X X X</td><td>18</td></tr> <tr><td>9</td><td>X X X X</td><td>X X X X</td><td>19</td></tr> <tr><td>10</td><td>X X X X</td><td>X X X X</td><td>20</td></tr> </table> | 1 | X X X 0 | X X X X | 11 | 2 | 0 X X X | X X X X | 12 | 3 | X X X 0 | X 0 0 0 | 13 | 4 | X X X X | 0 0 0 0 | 14 | 5 | X X X X | 0 0 0 0 | 15 | 6 | X X X X | X X X X | 16 | 7 | X X X X | X X X X | 17 | 8 | X X X X | X X X X | 18 | 9 | X X X X | X X X X | 19 | 10 | X X X X | X X X X | 20 |
| 1                                                                                                                    | 0 0 0 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 11             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 2                                                                                                                    | 4 X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 12             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 3                                                                                                                    | X X X 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X 0 0 0   | 13             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 4                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 14             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 5                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 15             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 6                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 16             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 7                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 17             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 8                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 18             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 9                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 19             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 10                                                                                                                   | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 20             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 1                                                                                                                    | X X X 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 11             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 2                                                                                                                    | 0 X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 12             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 3                                                                                                                    | X X X 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X 0 0 0   | 13             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
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| 5                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 15             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 6                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 16             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 7                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 17             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 8                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 18             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 9                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 19             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 10                                                                                                                   | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 20             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 14. Address checkword error during write verify function.                                                            | <p>5 2 0 0</p> <table border="1"> <tr><td>1</td><td>0 0 2 0</td><td>X X X X</td><td>11</td></tr> <tr><td>2</td><td>6 X X X</td><td>X X X X</td><td>12</td></tr> <tr><td>3</td><td>X X X 0</td><td>X 0 0 0</td><td>13</td></tr> <tr><td>4</td><td>X X X X</td><td>0 0 0 0</td><td>14</td></tr> <tr><td>5</td><td>X X X X</td><td>0 0 0 0</td><td>15</td></tr> <tr><td>6</td><td>X X X X</td><td>X X X X</td><td>16</td></tr> <tr><td>7</td><td>X X X X</td><td>X X X X</td><td>17</td></tr> <tr><td>8</td><td>X X X X</td><td>X X X X</td><td>18</td></tr> <tr><td>9</td><td>X X X X</td><td>X X X X</td><td>19</td></tr> <tr><td>10</td><td>X X X X</td><td>X X X X</td><td>20</td></tr> </table> | 1         | 0 0 2 0        | X X X X | 11 | 2 | 6 X X X | X X X X | 12 | 3 | X X X 0 | X 0 0 0 | 13 | 4 | X X X X | 0 0 0 0 | 14 | 5 | X X X X | 0 0 0 0 | 15 | 6 | X X X X | X X X X | 16 | 7 | X X X X | X X X X | 17 | 8 | X X X X | X X X X | 18 | 9 | X X X X | X X X X | 19 | 10 | X X X X | X X X X | 20 | 19. Nonrecoverable data field sync byte error during read or read checkword function. | <p>5 0 0 0</p> <table border="1"> <tr><td>1</td><td>0 7 0 0</td><td>X X X X</td><td>11</td></tr> <tr><td>2</td><td>0 X X X</td><td>X X X X</td><td>12</td></tr> <tr><td>3</td><td>X X X 0</td><td>X 0 0 0</td><td>13</td></tr> <tr><td>4</td><td>X X X X</td><td>0 0 0 0</td><td>14</td></tr> <tr><td>5</td><td>X X X X</td><td>0 0 0 0</td><td>15</td></tr> <tr><td>6</td><td>X X X X</td><td>X X X X</td><td>16</td></tr> <tr><td>7</td><td>X X X X</td><td>X X X X</td><td>17</td></tr> <tr><td>8</td><td>X X X X</td><td>X X X X</td><td>18</td></tr> <tr><td>9</td><td>X X X X</td><td>X X X X</td><td>19</td></tr> <tr><td>10</td><td>X X X X</td><td>X X X X</td><td>20</td></tr> </table> | 1 | 0 7 0 0 | X X X X | 11 | 2 | 0 X X X | X X X X | 12 | 3 | X X X 0 | X 0 0 0 | 13 | 4 | X X X X | 0 0 0 0 | 14 | 5 | X X X X | 0 0 0 0 | 15 | 6 | X X X X | X X X X | 16 | 7 | X X X X | X X X X | 17 | 8 | X X X X | X X X X | 18 | 9 | X X X X | X X X X | 19 | 10 | X X X X | X X X X | 20 |
| 1                                                                                                                    | 0 0 2 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 11             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 2                                                                                                                    | 6 X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 12             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 3                                                                                                                    | X X X 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X 0 0 0   | 13             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 4                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 14             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 5                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 15             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 6                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 16             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 7                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 17             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 8                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 18             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 9                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 19             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 10                                                                                                                   | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 20             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 1                                                                                                                    | 0 7 0 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 11             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 2                                                                                                                    | 0 X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 12             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 3                                                                                                                    | X X X 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X 0 0 0   | 13             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 4                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 14             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 5                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 15             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 6                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 16             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 7                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 17             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 8                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 18             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 9                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 19             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 10                                                                                                                   | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 20             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 15. Address checkword error during read, write, or read checkword function.                                          | <p>4 6 0 0</p> <table border="1"> <tr><td>1</td><td>X X X 0</td><td>X X X X</td><td>11</td></tr> <tr><td>2</td><td>6 X X X</td><td>X X X X</td><td>12</td></tr> <tr><td>3</td><td>X X X 0</td><td>X 0 0 0</td><td>13</td></tr> <tr><td>4</td><td>X X X X</td><td>0 0 0 0</td><td>14</td></tr> <tr><td>5</td><td>X X X X</td><td>0 0 0 0</td><td>15</td></tr> <tr><td>6</td><td>X X X X</td><td>X X X X</td><td>16</td></tr> <tr><td>7</td><td>X X X X</td><td>X X X X</td><td>17</td></tr> <tr><td>8</td><td>X X X X</td><td>X X X X</td><td>18</td></tr> <tr><td>9</td><td>X X X X</td><td>X X X X</td><td>19</td></tr> <tr><td>10</td><td>X X X X</td><td>X X X X</td><td>20</td></tr> </table> | 1         | X X X 0        | X X X X | 11 | 2 | 6 X X X | X X X X | 12 | 3 | X X X 0 | X 0 0 0 | 13 | 4 | X X X X | 0 0 0 0 | 14 | 5 | X X X X | 0 0 0 0 | 15 | 6 | X X X X | X X X X | 16 | 7 | X X X X | X X X X | 17 | 8 | X X X X | X X X X | 18 | 9 | X X X X | X X X X | 19 | 10 | X X X X | X X X X | 20 | 20. Correctable data field checkword error during read or read checkword function.    | <p>4 6 0 0</p> <table border="1"> <tr><td>1</td><td>X X X 0</td><td>X X X X</td><td>11</td></tr> <tr><td>2</td><td>1 X X X</td><td>X X X X</td><td>12</td></tr> <tr><td>3</td><td>X X X 0</td><td>X X X X</td><td>13</td></tr> <tr><td>4</td><td>X X X X</td><td>X X X X</td><td>14</td></tr> <tr><td>5</td><td>X X X X</td><td>X X X X</td><td>15</td></tr> <tr><td>6</td><td>X X X X</td><td>X X X X</td><td>16</td></tr> <tr><td>7</td><td>X X X X</td><td>X X X X</td><td>17</td></tr> <tr><td>8</td><td>X X X X</td><td>X X X X</td><td>18</td></tr> <tr><td>9</td><td>X X X X</td><td>X X X X</td><td>19</td></tr> <tr><td>10</td><td>X X X X</td><td>X X X X</td><td>20</td></tr> </table> | 1 | X X X 0 | X X X X | 11 | 2 | 1 X X X | X X X X | 12 | 3 | X X X 0 | X X X X | 13 | 4 | X X X X | X X X X | 14 | 5 | X X X X | X X X X | 15 | 6 | X X X X | X X X X | 16 | 7 | X X X X | X X X X | 17 | 8 | X X X X | X X X X | 18 | 9 | X X X X | X X X X | 19 | 10 | X X X X | X X X X | 20 |
| 1                                                                                                                    | X X X 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 11             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 2                                                                                                                    | 6 X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 12             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 3                                                                                                                    | X X X 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X 0 0 0   | 13             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 4                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 14             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 5                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 15             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 6                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 16             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 7                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 17             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 8                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 18             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 9                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 19             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 10                                                                                                                   | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 20             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 1                                                                                                                    | X X X 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 11             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 2                                                                                                                    | 1 X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 12             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 3                                                                                                                    | X X X 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 13             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 4                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 14             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 5                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 15             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 6                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 16             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 7                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 17             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 8                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 18             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 9                                                                                                                    | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 19             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 10                                                                                                                   | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 20             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |

TABLE C-2. READ/WRITE STATUS (Contd)

| Condition                                                                             | Status Summary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Condition | Status Summary |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
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| 21. Noncorrectable data field checkword error during read or read checkword function. | <div style="border: 1px solid black; padding: 2px; display: inline-block;">4 6 0 0</div><br><table style="border-collapse: collapse; width: 100%;"> <tr><td style="width: 5%;">1</td><td style="width: 20%; border: 1px solid black; padding: 2px;">X X X 0</td><td style="width: 20%; border: 1px solid black; padding: 2px;">X X X X</td><td style="width: 5%;">11</td></tr> <tr><td>2</td><td style="border: 1px solid black; padding: 2px;">1 4 X X</td><td style="border: 1px solid black; padding: 2px;">X X X X</td><td>12</td></tr> <tr><td>3</td><td style="border: 1px solid black; padding: 2px;">X X X 0</td><td style="border: 1px solid black; padding: 2px;">X 0 0 0</td><td>13</td></tr> <tr><td>4</td><td style="border: 1px solid black; padding: 2px;">X X X X</td><td style="border: 1px solid black; padding: 2px;">0 0 0 0</td><td>14</td></tr> <tr><td>5</td><td style="border: 1px solid black; padding: 2px;">X X X X</td><td style="border: 1px solid black; padding: 2px;">0 0 0 0</td><td>15</td></tr> <tr><td>6</td><td style="border: 1px solid black; padding: 2px;">X X X X</td><td style="border: 1px solid black; padding: 2px;">X X X X</td><td>16</td></tr> <tr><td>7</td><td style="border: 1px solid black; padding: 2px;">X X X X</td><td style="border: 1px solid black; padding: 2px;">X X X X</td><td>17</td></tr> <tr><td>8</td><td style="border: 1px solid black; padding: 2px;">X X X X</td><td style="border: 1px solid black; padding: 2px;">X X X X</td><td>18</td></tr> <tr><td>9</td><td style="border: 1px solid black; padding: 2px;">X X X X</td><td style="border: 1px solid black; padding: 2px;">X X X X</td><td>19</td></tr> <tr><td>10</td><td style="border: 1px solid black; padding: 2px;">X X X X</td><td style="border: 1px solid black; padding: 2px;">X X X X</td><td>20</td></tr> </table>                                                                                                                                                                                   | 1         | X X X 0        | X X X X | 11 | 2 | 1 4 X X | X X X X | 12 | 3 | X X X 0 | X 0 0 0 | 13 | 4 | X X X X | 0 0 0 0 | 14 | 5 | X X X X | 0 0 0 0 | 15 | 6 | X X X X | X X X X | 16 | 7 | X X X X | X X X X | 17 | 8 | X X X X | X X X X | 18 | 9 | X X X X | X X X X | 19 | 10 | X X X X | X X X X | 20 | 23. Controller status error, lost control word error, or sector length violation † during read, write, read checkword, or write verify function. | <div style="border: 1px solid black; padding: 2px; display: inline-block;">5 0 0 0</div><br><table style="border-collapse: collapse; width: 100%;"> <tr><td style="width: 5%;">1</td><td style="width: 20%; border: 1px solid black; padding: 2px;">0 0 0 0</td><td style="width: 20%; border: 1px solid black; padding: 2px;">X X X X</td><td style="width: 5%;">11</td></tr> <tr><td>2</td><td style="border: 1px solid black; padding: 2px;">0 X X X</td><td style="border: 1px solid black; padding: 2px;">X X X X</td><td>12</td></tr> <tr><td>3</td><td style="border: 1px solid black; padding: 2px;">X X X 0</td><td style="border: 1px solid black; padding: 2px;">X 0 0 0</td><td>13</td></tr> <tr><td>4</td><td style="border: 1px solid black; padding: 2px;">X X X X</td><td style="border: 1px solid black; padding: 2px;">0 0 0 0</td><td>14</td></tr> <tr><td>5</td><td style="border: 1px solid black; padding: 2px;">X X X X</td><td style="border: 1px solid black; padding: 2px;">0 0 0 0</td><td>15</td></tr> <tr><td>6</td><td style="border: 1px solid black; padding: 2px;">X X X X</td><td style="border: 1px solid black; padding: 2px;">X X X X</td><td>16</td></tr> <tr><td>7</td><td style="border: 1px solid black; padding: 2px;">X X X X</td><td style="border: 1px solid black; padding: 2px;">X X X X</td><td>17</td></tr> <tr><td>8</td><td style="border: 1px solid black; padding: 2px;">X X X X</td><td style="border: 1px solid black; padding: 2px;">X X X X</td><td>18</td></tr> <tr><td>9</td><td style="border: 1px solid black; padding: 2px;">X X X X</td><td style="border: 1px solid black; padding: 2px;">X X X X</td><td>19</td></tr> <tr><td>10</td><td style="border: 1px solid black; padding: 2px;">X X X X</td><td style="border: 1px solid black; padding: 2px;">X X X X</td><td>20</td></tr> </table> | 1 | 0 0 0 0 | X X X X | 11 | 2 | 0 X X X | X X X X | 12 | 3 | X X X 0 | X 0 0 0 | 13 | 4 | X X X X | 0 0 0 0 | 14 | 5 | X X X X | 0 0 0 0 | 15 | 6 | X X X X | X X X X | 16 | 7 | X X X X | X X X X | 17 | 8 | X X X X | X X X X | 18 | 9 | X X X X | X X X X | 19 | 10 | X X X X | X X X X | 20 |
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| 22. Nonrecoverable data field checkword error during read or read checkword function. | <div style="border: 1px solid black; padding: 2px; display: inline-block;">5 2 0 0</div><br><table style="border-collapse: collapse; width: 100%;"> <tr><td style="width: 5%;">1</td><td style="width: 20%; border: 1px solid black; padding: 2px;">0 7 0 0</td><td style="width: 20%; border: 1px solid black; padding: 2px;">X X X X</td><td style="width: 5%;">11</td></tr> <tr><td>2</td><td style="border: 1px solid black; padding: 2px;">1 4 X X</td><td style="border: 1px solid black; padding: 2px;">X X X X</td><td>12</td></tr> <tr><td>3</td><td style="border: 1px solid black; padding: 2px;">X X X 0</td><td style="border: 1px solid black; padding: 2px;">X</td><td>13</td></tr> <tr><td>4</td><td style="border: 1px solid black; padding: 2px;">X X X X</td><td style="border: 1px solid black; padding: 2px; background: repeating-linear-gradient(45deg, transparent, transparent 2px, black 2px, black 4px);"> </td><td>14</td></tr> <tr><td>5</td><td style="border: 1px solid black; padding: 2px;">X X X X</td><td style="border: 1px solid black; padding: 2px; background: repeating-linear-gradient(45deg, transparent, transparent 2px, black 2px, black 4px);"> </td><td>15</td></tr> <tr><td>6</td><td style="border: 1px solid black; padding: 2px;">X X X X</td><td style="border: 1px solid black; padding: 2px;">X X X X</td><td>16</td></tr> <tr><td>7</td><td style="border: 1px solid black; padding: 2px;">X X X X</td><td style="border: 1px solid black; padding: 2px;">X X X X</td><td>17</td></tr> <tr><td>8</td><td style="border: 1px solid black; padding: 2px;">X X X X</td><td style="border: 1px solid black; padding: 2px;">X X X X</td><td>18</td></tr> <tr><td>9</td><td style="border: 1px solid black; padding: 2px;">X X X X</td><td style="border: 1px solid black; padding: 2px;">X X X X</td><td>19</td></tr> <tr><td>10</td><td style="border: 1px solid black; padding: 2px;">X X X X</td><td style="border: 1px solid black; padding: 2px;">X X X X</td><td>20</td></tr> </table> | 1         | 0 7 0 0        | X X X X | 11 | 2 | 1 4 X X | X X X X | 12 | 3 | X X X 0 | X       | 13 | 4 | X X X X |         | 14 | 5 | X X X X |         | 15 | 6 | X X X X | X X X X | 16 | 7 | X X X X | X X X X | 17 | 8 | X X X X | X X X X | 18 | 9 | X X X X | X X X X | 19 | 10 | X X X X | X X X X | 20 | 24. Lost data † during read or write function.<br><br>25. Data field compare error † during write verify function.                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
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† For write or write verify function, status summary shows status returned after function timeout.

TABLE C-3. SELECT STROBE AND OFFSET/BUFFER WRITE STATUS

| Condition                                 | Status Summary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             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| 1. Function completed without error.      | <div style="border: 1px solid black; padding: 2px; display: inline-block;">0 0 0 0</div><br><table style="border-collapse: collapse; width: 100%;"> <tr><td style="width: 5%;">1</td><td style="width: 20%; border: 1px solid black; padding: 2px; background: repeating-linear-gradient(45deg, transparent, transparent 2px, black 2px, black 4px);"> </td><td style="width: 20%; border: 1px solid black; padding: 2px; background: repeating-linear-gradient(45deg, transparent, transparent 2px, black 2px, black 4px);"> </td><td style="width: 5%;">11</td></tr> <tr><td>2</td><td style="border: 1px solid black; padding: 2px; background: repeating-linear-gradient(45deg, transparent, transparent 2px, black 2px, black 4px);"> </td><td style="border: 1px solid black; padding: 2px; background: repeating-linear-gradient(45deg, transparent, transparent 2px, black 2px, black 4px);"> </td><td>12</td></tr> <tr><td>3</td><td style="border: 1px solid black; padding: 2px; background: repeating-linear-gradient(45deg, transparent, transparent 2px, black 2px, black 4px);"> </td><td style="border: 1px solid black; padding: 2px; background: repeating-linear-gradient(45deg, transparent, transparent 2px, black 2px, black 4px);"> </td><td>13</td></tr> <tr><td>4</td><td style="border: 1px solid black; padding: 2px; background: repeating-linear-gradient(45deg, transparent, transparent 2px, black 2px, black 4px);"> </td><td style="border: 1px solid black; padding: 2px; background: repeating-linear-gradient(45deg, transparent, transparent 2px, black 2px, black 4px);"> </td><td>14</td></tr> <tr><td>5</td><td style="border: 1px solid black; padding: 2px; background: repeating-linear-gradient(45deg, transparent, transparent 2px, black 2px, black 4px);"> </td><td style="border: 1px solid black; padding: 2px; background: repeating-linear-gradient(45deg, transparent, transparent 2px, black 2px, black 4px);"> </td><td>15</td></tr> <tr><td>6</td><td style="border: 1px solid black; padding: 2px; background: repeating-linear-gradient(45deg, transparent, transparent 2px, black 2px, black 4px);"> </td><td style="border: 1px solid black; padding: 2px; background: repeating-linear-gradient(45deg, transparent, transparent 2px, black 2px, black 4px);"> </td><td>16</td></tr> <tr><td>7</td><td style="border: 1px solid black; padding: 2px; background: repeating-linear-gradient(45deg, transparent, transparent 2px, black 2px, black 4px);"> </td><td style="border: 1px solid black; padding: 2px; background: repeating-linear-gradient(45deg, transparent, transparent 2px, black 2px, black 4px);"> </td><td>17</td></tr> <tr><td>8</td><td style="border: 1px solid black; padding: 2px; background: repeating-linear-gradient(45deg, transparent, transparent 2px, black 2px, black 4px);"> </td><td style="border: 1px solid black; padding: 2px; background: repeating-linear-gradient(45deg, transparent, transparent 2px, black 2px, black 4px);"> </td><td>18</td></tr> <tr><td>9</td><td style="border: 1px solid black; padding: 2px; background: repeating-linear-gradient(45deg, transparent, transparent 2px, black 2px, black 4px);"> </td><td style="border: 1px solid black; padding: 2px; background: repeating-linear-gradient(45deg, transparent, transparent 2px, black 2px, black 4px);"> </td><td>19</td></tr> <tr><td>10</td><td style="border: 1px solid black; padding: 2px; background: repeating-linear-gradient(45deg, transparent, transparent 2px, black 2px, black 4px);"> </td><td style="border: 1px solid black; padding: 2px; background: repeating-linear-gradient(45deg, transparent, transparent 2px, black 2px, black 4px);"> </td><td>20</td></tr> </table> | 1         |                |         | 11 | 2 |         |         | 12 | 3 |         |  | 13 | 4 |         |  | 14 | 5 |         |  | 15 | 6 |         |         | 16 | 7 |         |         | 17 | 8 |         |         | 18 | 9 |         |         | 19 | 10 |         |         | 20 | 3. Channel parity error during parameter transfer. | <div style="border: 1px solid black; padding: 2px; display: inline-block;">5 0 0 0</div><br><table style="border-collapse: collapse; width: 100%;"> <tr><td style="width: 5%;">1</td><td style="width: 20%; border: 1px solid black; padding: 2px;">0 0 0 0</td><td style="width: 20%; border: 1px solid black; padding: 2px;">0 0 0 0</td><td style="width: 5%;">11</td></tr> <tr><td>2</td><td style="border: 1px solid black; padding: 2px;">0 0 0 0</td><td style="border: 1px solid black; padding: 2px;">0 0 0 0</td><td>12</td></tr> <tr><td>3</td><td style="border: 1px solid black; padding: 2px;">X X X 0</td><td style="border: 1px solid black; padding: 2px; background: repeating-linear-gradient(45deg, transparent, transparent 2px, black 2px, black 4px);"> </td><td>13</td></tr> <tr><td>4</td><td style="border: 1px solid black; padding: 2px;">X X 0 0</td><td style="border: 1px solid black; padding: 2px; background: repeating-linear-gradient(45deg, transparent, transparent 2px, black 2px, black 4px);"> </td><td>14</td></tr> <tr><td>5</td><td style="border: 1px solid black; padding: 2px;">0 0 0 0</td><td style="border: 1px solid black; padding: 2px; background: repeating-linear-gradient(45deg, transparent, transparent 2px, black 2px, black 4px);"> </td><td>15</td></tr> <tr><td>6</td><td style="border: 1px solid black; padding: 2px;">0 0 0 0</td><td style="border: 1px solid black; padding: 2px;">X X X X</td><td>16</td></tr> <tr><td>7</td><td style="border: 1px solid black; padding: 2px;">0 0 0 0</td><td style="border: 1px solid black; padding: 2px;">X X X X</td><td>17</td></tr> <tr><td>8</td><td style="border: 1px solid black; padding: 2px;">0 0 0 0</td><td style="border: 1px solid black; padding: 2px;">X X X X</td><td>18</td></tr> <tr><td>9</td><td style="border: 1px solid black; padding: 2px;">0 0 0 0</td><td style="border: 1px solid black; padding: 2px;">X X X X</td><td>19</td></tr> <tr><td>10</td><td style="border: 1px solid black; padding: 2px;">0 0 0 0</td><td style="border: 1px solid black; padding: 2px;">X X X X</td><td>20</td></tr> </table> | 1 | 0 0 0 0 | 0 0 0 0 | 11 | 2 | 0 0 0 0 | 0 0 0 0 | 12 | 3 | X X X 0 |  | 13 | 4 | X X 0 0 |  | 14 | 5 | 0 0 0 0 |  | 15 | 6 | 0 0 0 0 | X X X X | 16 | 7 | 0 0 0 0 | X X X X | 17 | 8 | 0 0 0 0 | X X X X | 18 | 9 | 0 0 0 0 | X X X X | 19 | 10 | 0 0 0 0 | X X X X | 20 |
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TABLE C-4. FORMAT PACK STATUS

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| 1. Function completed without error.                                               | <p>0 0 0 0</p> <table border="1"> <tr><td>1</td><td>█</td><td>█</td><td>11</td></tr> <tr><td>2</td><td>█</td><td>█</td><td>12</td></tr> <tr><td>3</td><td>█</td><td>█</td><td>13</td></tr> <tr><td>4</td><td>█</td><td>█</td><td>14</td></tr> <tr><td>5</td><td>█</td><td>█</td><td>15</td></tr> <tr><td>6</td><td>█</td><td>█</td><td>16</td></tr> <tr><td>7</td><td>█</td><td>█</td><td>17</td></tr> <tr><td>8</td><td>█</td><td>█</td><td>18</td></tr> <tr><td>9</td><td>█</td><td>█</td><td>19</td></tr> <tr><td>10</td><td>█</td><td>█</td><td>20</td></tr> </table>                                                                                                                         | 1         | █              | █       | 11 | 2 | █       | █       | 12 | 3 | █       | █       | 13 | 4 | █       | █       | 14 | 5 | █       | █       | 15 | 6 | █       | █       | 16 | 7 | █       | █       | 17 | 8 | █       | █       | 18 | 9 | █       | █       | 19 | 10 | █       | █       | 20 | 6. Illegal starting/ending disk address parameter.                                                                   | <p>5 0 0 0</p> <table border="1"> <tr><td>1</td><td>0 0 0 0</td><td>0 0 0 0</td><td>11</td></tr> <tr><td>2</td><td>0 0 0 0</td><td>0 0 0 0</td><td>12</td></tr> <tr><td>3</td><td>0 3 5 0</td><td>█ 0 0 0</td><td>13</td></tr> <tr><td>4</td><td>X X X X</td><td>0 0 0 0</td><td>14</td></tr> <tr><td>5</td><td>0 0 0 0</td><td>0 0 0 0</td><td>15</td></tr> <tr><td>6</td><td>0 0 0 0</td><td>0 0 0 0</td><td>16</td></tr> <tr><td>7</td><td>0 0 0 0</td><td>0 0 0 0</td><td>17</td></tr> <tr><td>8</td><td>0 0 0 0</td><td>X X X X</td><td>18</td></tr> <tr><td>9</td><td>0 0 0 0</td><td>X X X X</td><td>19</td></tr> <tr><td>10</td><td>0 0 0 0</td><td>X X X X</td><td>20</td></tr> </table> | 1 | 0 0 0 0 | 0 0 0 0 | 11 | 2 | 0 0 0 0 | 0 0 0 0 | 12 | 3 | 0 3 5 0 | █ 0 0 0 | 13 | 4 | X X X X | 0 0 0 0 | 14 | 5 | 0 0 0 0 | 0 0 0 0 | 15 | 6 | 0 0 0 0 | 0 0 0 0 | 16 | 7 | 0 0 0 0 | 0 0 0 0 | 17 | 8 | 0 0 0 0 | X X X X | 18 | 9 | 0 0 0 0 | X X X X | 19 | 10 | 0 0 0 0 | X X X X | 20 |
| 1                                                                                  | █                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | █         | 11             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
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| 6                                                                                  | 0 0 0 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 16             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 7                                                                                  | 0 0 0 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 17             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 8                                                                                  | 0 0 0 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 18             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 9                                                                                  | 0 0 0 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 19             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 10                                                                                 | 0 0 0 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 20             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 2. Drive reserved to other controller.                                             | <p>0 0 1 0</p> <table border="1"> <tr><td>1</td><td>█</td><td>█</td><td>11</td></tr> <tr><td>2</td><td>█</td><td>█</td><td>12</td></tr> <tr><td>3</td><td>█</td><td>█</td><td>13</td></tr> <tr><td>4</td><td>█</td><td>█</td><td>14</td></tr> <tr><td>5</td><td>█</td><td>█</td><td>15</td></tr> <tr><td>6</td><td>█</td><td>█</td><td>16</td></tr> <tr><td>7</td><td>█</td><td>█</td><td>17</td></tr> <tr><td>8</td><td>█</td><td>█</td><td>18</td></tr> <tr><td>9</td><td>█</td><td>█</td><td>19</td></tr> <tr><td>10</td><td>█</td><td>█</td><td>20</td></tr> </table>                                                                                                                         | 1         | █              | █       | 11 | 2 | █       | █       | 12 | 3 | █       | █       | 13 | 4 | █       | █       | 14 | 5 | █       | █       | 15 | 6 | █       | █       | 16 | 7 | █       | █       | 17 | 8 | █       | █       | 18 | 9 | █       | █       | 19 | 10 | █       | █       | 20 | 7. Utility map not readable.                                                                                         | Status is identical to that listed in table C-2 for read functions, except all general status is 5XXX (nonrecoverable).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 1                                                                                  | █                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | █         | 11             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 2                                                                                  | █                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | █         | 12             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 3                                                                                  | █                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | █         | 13             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 4                                                                                  | █                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | █         | 14             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 5                                                                                  | █                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | █         | 15             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 6                                                                                  | █                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | █         | 16             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 7                                                                                  | █                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | █         | 17             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 8                                                                                  | █                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | █         | 18             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 9                                                                                  | █                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | █         | 19             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 10                                                                                 | █                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | █         | 20             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 3. Drive offline, drive not selected, drive not ready, seek error, or drive fault. | <p>5 0 2 0</p> <table border="1"> <tr><td>1</td><td>0 0 0 0</td><td>X X X X</td><td>11</td></tr> <tr><td>2</td><td>0 X X X</td><td>X X X X</td><td>12</td></tr> <tr><td>3</td><td>0 3 4 0</td><td>█ 0 0 0</td><td>13</td></tr> <tr><td>4</td><td>X X X X</td><td>0 0 0 0</td><td>14</td></tr> <tr><td>5</td><td>0 0 0 0</td><td>0 0 0 0</td><td>15</td></tr> <tr><td>6</td><td>0 0 0 0</td><td>X X X X</td><td>16</td></tr> <tr><td>7</td><td>0 0 0 X</td><td>X X X X</td><td>17</td></tr> <tr><td>8</td><td>X X X X</td><td>X X X X</td><td>18</td></tr> <tr><td>9</td><td>X X X X</td><td>X X X X</td><td>19</td></tr> <tr><td>10</td><td>X X X X</td><td>X X X X</td><td>20</td></tr> </table> | 1         | 0 0 0 0        | X X X X | 11 | 2 | 0 X X X | X X X X | 12 | 3 | 0 3 4 0 | █ 0 0 0 | 13 | 4 | X X X X | 0 0 0 0 | 14 | 5 | 0 0 0 0 | 0 0 0 0 | 15 | 6 | 0 0 0 0 | X X X X | 16 | 7 | 0 0 0 X | X X X X | 17 | 8 | X X X X | X X X X | 18 | 9 | X X X X | X X X X | 19 | 10 | X X X X | X X X X | 20 | 8. Drive fault during formatting.                                                                                    | <p>5 0 X 0</p> <table border="1"> <tr><td>1</td><td>0 0 0 0</td><td>X X X X</td><td>11</td></tr> <tr><td>2</td><td>0 X X X</td><td>X X X X</td><td>12</td></tr> <tr><td>3</td><td>0 3 4 0</td><td>█ 0 0 0</td><td>13</td></tr> <tr><td>4</td><td>X X X X</td><td>0 0 0 0</td><td>14</td></tr> <tr><td>5</td><td>X X X X</td><td>0 0 0 0</td><td>15</td></tr> <tr><td>6</td><td>X X X X</td><td>X X X X</td><td>16</td></tr> <tr><td>7</td><td>X X X X</td><td>X X X X</td><td>17</td></tr> <tr><td>8</td><td>X X X X</td><td>X X X X</td><td>18</td></tr> <tr><td>9</td><td>X X X X</td><td>X X X X</td><td>19</td></tr> <tr><td>10</td><td>X X X X</td><td>X X X X</td><td>20</td></tr> </table> | 1 | 0 0 0 0 | X X X X | 11 | 2 | 0 X X X | X X X X | 12 | 3 | 0 3 4 0 | █ 0 0 0 | 13 | 4 | X X X X | 0 0 0 0 | 14 | 5 | X X X X | 0 0 0 0 | 15 | 6 | X X X X | X X X X | 16 | 7 | X X X X | X X X X | 17 | 8 | X X X X | X X X X | 18 | 9 | X X X X | X X X X | 19 | 10 | X X X X | X X X X | 20 |
| 1                                                                                  | 0 0 0 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 11             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 2                                                                                  | 0 X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 12             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 3                                                                                  | 0 3 4 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | █ 0 0 0   | 13             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 4                                                                                  | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 14             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 5                                                                                  | 0 0 0 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 15             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 6                                                                                  | 0 0 0 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 16             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 7                                                                                  | 0 0 0 X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 17             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 8                                                                                  | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 18             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 9                                                                                  | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 19             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 10                                                                                 | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 20             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 1                                                                                  | 0 0 0 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 11             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 2                                                                                  | 0 X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 12             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 3                                                                                  | 0 3 4 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | █ 0 0 0   | 13             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 4                                                                                  | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 14             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 5                                                                                  | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 15             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 6                                                                                  | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 16             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 7                                                                                  | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 17             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 8                                                                                  | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 18             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 9                                                                                  | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 19             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 10                                                                                 | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 20             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 4. Controller status error.                                                        | <p>5 0 0 0</p> <table border="1"> <tr><td>1</td><td>0 0 0 0</td><td>X X X X</td><td>11</td></tr> <tr><td>2</td><td>0 X X X</td><td>X X X X</td><td>12</td></tr> <tr><td>3</td><td>0 3 4 0</td><td>█ 0 0 0</td><td>13</td></tr> <tr><td>4</td><td>X X X X</td><td>0 0 0 0</td><td>14</td></tr> <tr><td>5</td><td>X X X X</td><td>0 0 0 0</td><td>15</td></tr> <tr><td>6</td><td>X X X X</td><td>X X X X</td><td>16</td></tr> <tr><td>7</td><td>X X X X</td><td>X X X X</td><td>17</td></tr> <tr><td>8</td><td>X X X X</td><td>X X X X</td><td>18</td></tr> <tr><td>9</td><td>X X X X</td><td>X X X X</td><td>19</td></tr> <tr><td>10</td><td>X X X X</td><td>X X X X</td><td>20</td></tr> </table> | 1         | 0 0 0 0        | X X X X | 11 | 2 | 0 X X X | X X X X | 12 | 3 | 0 3 4 0 | █ 0 0 0 | 13 | 4 | X X X X | 0 0 0 0 | 14 | 5 | X X X X | 0 0 0 0 | 15 | 6 | X X X X | X X X X | 16 | 7 | X X X X | X X X X | 17 | 8 | X X X X | X X X X | 18 | 9 | X X X X | X X X X | 19 | 10 | X X X X | X X X X | 20 | 9. 844 drive only. Sector or track flaw condition detected during formatting. Detailed status contains disk address. | <p>4 4 0 0</p> <table border="1"> <tr><td>1</td><td>0 0 0 0</td><td>0 0 0 0</td><td>11</td></tr> <tr><td>2</td><td>0 0 0 0</td><td>0 0 0 0</td><td>12</td></tr> <tr><td>3</td><td>0 3 4 0</td><td>█ 0 0 0</td><td>13</td></tr> <tr><td>4</td><td>X X X X</td><td>0 0 0 0</td><td>14</td></tr> <tr><td>5</td><td>X X X X</td><td>0 0 0 0</td><td>15</td></tr> <tr><td>6</td><td>X X X X</td><td>0 0 0 0</td><td>16</td></tr> <tr><td>7</td><td>0 0 0 0</td><td>0 0 0 0</td><td>17</td></tr> <tr><td>8</td><td>0 0 0 0</td><td>X X X X</td><td>18</td></tr> <tr><td>9</td><td>0 0 0 0</td><td>X X X X</td><td>19</td></tr> <tr><td>10</td><td>0 0 0 0</td><td>X X X X</td><td>20</td></tr> </table> | 1 | 0 0 0 0 | 0 0 0 0 | 11 | 2 | 0 0 0 0 | 0 0 0 0 | 12 | 3 | 0 3 4 0 | █ 0 0 0 | 13 | 4 | X X X X | 0 0 0 0 | 14 | 5 | X X X X | 0 0 0 0 | 15 | 6 | X X X X | 0 0 0 0 | 16 | 7 | 0 0 0 0 | 0 0 0 0 | 17 | 8 | 0 0 0 0 | X X X X | 18 | 9 | 0 0 0 0 | X X X X | 19 | 10 | 0 0 0 0 | X X X X | 20 |
| 1                                                                                  | 0 0 0 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 11             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 2                                                                                  | 0 X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 12             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 3                                                                                  | 0 3 4 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | █ 0 0 0   | 13             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 4                                                                                  | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 14             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 5                                                                                  | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 15             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 6                                                                                  | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 16             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 7                                                                                  | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 17             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 8                                                                                  | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 18             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 9                                                                                  | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 19             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 10                                                                                 | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 20             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 1                                                                                  | 0 0 0 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 11             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 2                                                                                  | 0 0 0 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 12             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 3                                                                                  | 0 3 4 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | █ 0 0 0   | 13             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 4                                                                                  | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 14             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 5                                                                                  | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 15             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 6                                                                                  | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 16             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 7                                                                                  | 0 0 0 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 17             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 8                                                                                  | 0 0 0 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 18             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 9                                                                                  | 0 0 0 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 19             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 10                                                                                 | 0 0 0 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 20             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 5. Subsystem busy processing function.                                             | <p>0 0 0 2</p> <table border="1"> <tr><td>1</td><td>█</td><td>█</td><td>11</td></tr> <tr><td>2</td><td>█</td><td>█</td><td>12</td></tr> <tr><td>3</td><td>█</td><td>█</td><td>13</td></tr> <tr><td>4</td><td>█</td><td>█</td><td>14</td></tr> <tr><td>5</td><td>█</td><td>█</td><td>15</td></tr> <tr><td>6</td><td>█</td><td>█</td><td>16</td></tr> <tr><td>7</td><td>█</td><td>█</td><td>17</td></tr> <tr><td>8</td><td>█</td><td>█</td><td>18</td></tr> <tr><td>9</td><td>█</td><td>█</td><td>19</td></tr> <tr><td>10</td><td>█</td><td>█</td><td>20</td></tr> </table>                                                                                                                         | 1         | █              | █       | 11 | 2 | █       | █       | 12 | 3 | █       | █       | 13 | 4 | █       | █       | 14 | 5 | █       | █       | 15 | 6 | █       | █       | 16 | 7 | █       | █       | 17 | 8 | █       | █       | 18 | 9 | █       | █       | 19 | 10 | █       | █       | 20 |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 1                                                                                  | █                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | █         | 11             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 2                                                                                  | █                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | █         | 12             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 3                                                                                  | █                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | █         | 13             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 4                                                                                  | █                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | █         | 14             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 5                                                                                  | █                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | █         | 15             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 6                                                                                  | █                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | █         | 16             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 7                                                                                  | █                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | █         | 17             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 8                                                                                  | █                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | █         | 18             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 9                                                                                  | █                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | █         | 19             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 10                                                                                 | █                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | █         | 20             |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |

TABLE C-5. SET/CLEAR FLAW STATUS

| Condition                                                                       | Status Summary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Condition | Status Summary  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
|---------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|---------|---------|---------|----|---------|---------|---------|----|---------|---------|---------|----|---------|---------|---------|----|---------|---------|---------|----|---------|---------|---------|----|---------|---------|---------|----|---------|---------|---------|----|---------|---------|---------|----|----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|---------|---------|----|---|---------|---------|----|---|---------|---------|----|---|---------|---------|----|---|---------|---------|----|---|---------|---------|----|---|---------|---------|----|---|---------|---------|----|---|---------|---------|----|----|---------|---------|----|
| 1. Function completed without error.                                            | <p>0 0 0 0</p> <table border="1"> <tr><td>1</td><td></td><td></td><td>11</td></tr> <tr><td>2</td><td></td><td></td><td>12</td></tr> <tr><td>3</td><td></td><td></td><td>13</td></tr> <tr><td>4</td><td></td><td></td><td>14</td></tr> <tr><td>5</td><td></td><td></td><td>15</td></tr> <tr><td>6</td><td></td><td></td><td>16</td></tr> <tr><td>7</td><td></td><td></td><td>17</td></tr> <tr><td>8</td><td></td><td></td><td>18</td></tr> <tr><td>9</td><td></td><td></td><td>19</td></tr> <tr><td>10</td><td></td><td></td><td>20</td></tr> </table>                                                                                                                                             | 1         |                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 11 | 2       |         |         | 12 | 3       |         |         | 13 | 4       |         |         | 14 | 5       |         |         | 15 | 6       |         |         | 16 | 7       |         |         | 17 | 8       |         |         | 18 | 9       |         |         | 19 | 10      |         |         | 20 | 5. Subsystem busy processing function. | <p>0 0 0 2</p> <table border="1"> <tr><td>1</td><td></td><td></td><td>11</td></tr> <tr><td>2</td><td></td><td></td><td>12</td></tr> <tr><td>3</td><td></td><td></td><td>13</td></tr> <tr><td>4</td><td></td><td></td><td>14</td></tr> <tr><td>5</td><td></td><td></td><td>15</td></tr> <tr><td>6</td><td></td><td></td><td>16</td></tr> <tr><td>7</td><td></td><td></td><td>17</td></tr> <tr><td>8</td><td></td><td></td><td>18</td></tr> <tr><td>9</td><td></td><td></td><td>19</td></tr> <tr><td>10</td><td></td><td></td><td>20</td></tr> </table>                                                                                                                                             | 1  |         |         | 11 | 2 |         |         | 12 | 3 |         |         | 13 | 4 |         |         | 14 | 5 |         |         | 15 | 6 |         |         | 16 | 7 |         |         | 17 | 8 |         |         | 18 | 9 |         |         | 19 | 10 |         |         | 20 |
| 1                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |           | 11              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 2                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |           | 12              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 3                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |           | 13              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 4                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |           | 14              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 5                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |           | 15              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 6                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |           | 16              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 7                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |           | 17              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 8                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |           | 18              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 9                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |           | 19              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 10                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |           | 20              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
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| 2                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |           | 12              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
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| 5                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |           | 15              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 6                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |           | 16              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 7                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |           | 17              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 8                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |           | 18              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 9                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |           | 19              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 10                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |           | 20              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 2. Channel parity error during parameter transfer.                              | <p>5 0 0 0</p> <table border="1"> <tr><td>1</td><td>0 0 0 0</td><td>0 0 0 0</td><td>11</td></tr> <tr><td>2</td><td>0 0 0 0</td><td>0 0 0 0</td><td>12</td></tr> <tr><td>3</td><td>X X X 4</td><td>0 0 0 0</td><td>13</td></tr> <tr><td>4</td><td>X X 0 0</td><td>0 0 0 0</td><td>14</td></tr> <tr><td>5</td><td>0 0 0 0</td><td>0 0 0 0</td><td>15</td></tr> <tr><td>6</td><td>0 0 0 0</td><td>X X X X</td><td>16</td></tr> <tr><td>7</td><td>0 0 0 0</td><td>X X X X</td><td>17</td></tr> <tr><td>8</td><td>0 0 0 0</td><td>X X X X</td><td>18</td></tr> <tr><td>9</td><td>0 0 0 0</td><td>X X X X</td><td>19</td></tr> <tr><td>10</td><td>0 0 0 0</td><td>X X X X</td><td>20</td></tr> </table> | 1         | 0 0 0 0         | 0 0 0 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 11 | 2       | 0 0 0 0 | 0 0 0 0 | 12 | 3       | X X X 4 | 0 0 0 0 | 13 | 4       | X X 0 0 | 0 0 0 0 | 14 | 5       | 0 0 0 0 | 0 0 0 0 | 15 | 6       | 0 0 0 0 | X X X X | 16 | 7       | 0 0 0 0 | X X X X | 17 | 8       | 0 0 0 0 | X X X X | 18 | 9       | 0 0 0 0 | X X X X | 19 | 10      | 0 0 0 0 | X X X X | 20 | 6. Controller status error.            | <p>5 0 0 0</p> <table border="1"> <tr><td>1</td><td>0 0 0 0</td><td>X X X X</td><td>11</td></tr> <tr><td>2</td><td>0 0 0 0</td><td>X X X X</td><td>12</td></tr> <tr><td>3</td><td>0 4 4 0</td><td>0 0 0 0</td><td>13</td></tr> <tr><td>4</td><td>X X X X</td><td>0 0 0 0</td><td>14</td></tr> <tr><td>5</td><td>X X X X</td><td>0 0 0 0</td><td>15</td></tr> <tr><td>6</td><td>X X X X</td><td>X X X X</td><td>16</td></tr> <tr><td>7</td><td>X X X X</td><td>X X X X</td><td>17</td></tr> <tr><td>8</td><td>X X X X</td><td>X X X X</td><td>18</td></tr> <tr><td>9</td><td>X X X X</td><td>X X X X</td><td>19</td></tr> <tr><td>10</td><td>X X X X</td><td>X X X X</td><td>20</td></tr> </table> | 1  | 0 0 0 0 | X X X X | 11 | 2 | 0 0 0 0 | X X X X | 12 | 3 | 0 4 4 0 | 0 0 0 0 | 13 | 4 | X X X X | 0 0 0 0 | 14 | 5 | X X X X | 0 0 0 0 | 15 | 6 | X X X X | X X X X | 16 | 7 | X X X X | X X X X | 17 | 8 | X X X X | X X X X | 18 | 9 | X X X X | X X X X | 19 | 10 | X X X X | X X X X | 20 |
| 1                                                                               | 0 0 0 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 11              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
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| 3                                                                               | X X X 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 13              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
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| 6                                                                               | 0 0 0 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 16              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
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| 8                                                                               | 0 0 0 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 18              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 9                                                                               | 0 0 0 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 19              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
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| 5                                                                               | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 15              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 6                                                                               | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 16              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 7                                                                               | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 17              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 8                                                                               | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 18              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 9                                                                               | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 19              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 10                                                                              | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 20              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 3. Utility map not readable.                                                    | Status is identical to that listed in table C-2 for read functions, except all general status is 5XXX (nonrecoverable).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |           | 7. Drive fault. | <p>5 0 X 0</p> <table border="1"> <tr><td>1</td><td>0 0 0 0</td><td>X X X X</td><td>11</td></tr> <tr><td>2</td><td>0 0 0 0</td><td>X X X X</td><td>12</td></tr> <tr><td>3</td><td>0 4 4 0</td><td>0 0 0 0</td><td>13</td></tr> <tr><td>4</td><td>X X X X</td><td>0 0 0 0</td><td>14</td></tr> <tr><td>5</td><td>X X X X</td><td>0 0 0 0</td><td>15</td></tr> <tr><td>6</td><td>X X X X</td><td>X X X X</td><td>16</td></tr> <tr><td>7</td><td>0 0 0 0</td><td>X X X X</td><td>17</td></tr> <tr><td>8</td><td>0 0 0 0</td><td>X X X X</td><td>18</td></tr> <tr><td>9</td><td>X X X X</td><td>X X X X</td><td>19</td></tr> <tr><td>10</td><td>X X X X</td><td>X X X X</td><td>20</td></tr> </table> | 1  | 0 0 0 0 | X X X X | 11      | 2  | 0 0 0 0 | X X X X | 12      | 3  | 0 4 4 0 | 0 0 0 0 | 13      | 4  | X X X X | 0 0 0 0 | 14      | 5  | X X X X | 0 0 0 0 | 15      | 6  | X X X X | X X X X | 16      | 7  | 0 0 0 0 | X X X X | 17      | 8  | 0 0 0 0 | X X X X | 18      | 9  | X X X X | X X X X | 19      | 10 | X X X X                                | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 20 |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 1                                                                               | 0 0 0 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 11              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 2                                                                               | 0 0 0 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 12              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 3                                                                               | 0 4 4 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 13              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 4                                                                               | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 14              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 5                                                                               | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 15              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 6                                                                               | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 16              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 7                                                                               | 0 0 0 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 17              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 8                                                                               | 0 0 0 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 18              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 9                                                                               | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 19              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 10                                                                              | X X X X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 20              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 4. Illegal operation (attempting to set/clear sector flaw bit in flawed track). | <p>5 0 0 0</p> <table border="1"> <tr><td>1</td><td>0 0 0 0</td><td>0 0 0 0</td><td>11</td></tr> <tr><td>2</td><td>0 0 0 0</td><td>0 0 0 0</td><td>12</td></tr> <tr><td>3</td><td>0 X X 0</td><td>0 0 0 0</td><td>13</td></tr> <tr><td>4</td><td>X X X X</td><td>0 0 0 0</td><td>14</td></tr> <tr><td>5</td><td>0 0 0 0</td><td>0 0 0 0</td><td>15</td></tr> <tr><td>6</td><td>0 0 0 0</td><td>0 0 0 0</td><td>16</td></tr> <tr><td>7</td><td>0 0 0 0</td><td>0 0 0 0</td><td>17</td></tr> <tr><td>8</td><td>0 0 0 0</td><td>X X X X</td><td>18</td></tr> <tr><td>9</td><td>0 0 0 0</td><td>X X X X</td><td>19</td></tr> <tr><td>10</td><td>0 0 0 0</td><td>X X X X</td><td>20</td></tr> </table> | 1         | 0 0 0 0         | 0 0 0 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 11 | 2       | 0 0 0 0 | 0 0 0 0 | 12 | 3       | 0 X X 0 | 0 0 0 0 | 13 | 4       | X X X X | 0 0 0 0 | 14 | 5       | 0 0 0 0 | 0 0 0 0 | 15 | 6       | 0 0 0 0 | 0 0 0 0 | 16 | 7       | 0 0 0 0 | 0 0 0 0 | 17 | 8       | 0 0 0 0 | X X X X | 18 | 9       | 0 0 0 0 | X X X X | 19 | 10      | 0 0 0 0 | X X X X | 20 |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 1                                                                               | 0 0 0 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 11              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 2                                                                               | 0 0 0 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 12              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 3                                                                               | 0 X X 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 13              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
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| 6                                                                               | 0 0 0 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 16              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 7                                                                               | 0 0 0 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 0 0 0   | 17              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 8                                                                               | 0 0 0 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 18              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 9                                                                               | 0 0 0 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 19              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |
| 10                                                                              | 0 0 0 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X X X X   | 20              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |         |         |         |    |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |   |         |         |    |    |         |         |    |



# PACK DATA

D

Table D-1 provides disk addresses and entry formats for 844/885 factory and utility data areas.

TABLE D-1. PACK DATA AREAS

| Pack Data Area                          | Disk Address |       |           | Number of Entries | Entry Format                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----------------------------------------|--------------|-------|-----------|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                         | Cylinder     | Track | Sector(s) |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 844 factory-recorded manufacturing data | 822          | 0     | 0         | 1                 | <div style="display: flex; justify-content: space-between; align-items: flex-start;"> <div style="text-align: center;"> <p>47</p> <div style="border: 1px solid black; width: 100%; height: 15px; margin-bottom: 5px;"></div> <p>└─ Pack serial number</p> </div> <div style="text-align: center;"> <p>24 23</p> <div style="border: 1px solid black; width: 100%; height: 15px; margin-bottom: 5px;"></div> <p>└─ Date of pack manufacture</p> </div> <div style="text-align: center;"> <p>0</p> </div> </div> <p style="margin-top: 10px;">Example: 016852                      Example: 28 Feb. 77</p> <p style="margin-top: 5px;">0000 0001 0110 1000 0101 0010      0010 1000 0000 0010 0111 0111</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 844 factory map                         | 822          | 0     | 1         | 0-160             | <div style="display: flex; justify-content: space-between; align-items: flex-start;"> <div style="text-align: center;"> <p>23 22 21</p> <div style="border: 1px solid black; width: 100%; height: 15px; margin-bottom: 5px;"></div> <p>└─ Cylinder (0-822)</p> </div> <div style="text-align: center;"> <p>12 11</p> <div style="border: 1px solid black; width: 100%; height: 15px; margin-bottom: 5px;"></div> <p>└─ Track (0-18)</p> </div> <div style="text-align: center;"> <p>6 5</p> <div style="border: 1px solid black; width: 100%; height: 15px; margin-bottom: 5px;"></div> <p>└─ Sector (0-23)</p> </div> <div style="text-align: center;"> <p>0</p> </div> </div> <p style="margin-top: 5px;">0 1 Track flaw entry                      └─ Address of flawed sector/track</p> <p style="margin-top: 5px;">1 0 Sector flaw entry</p> <div style="text-align: center; border: 1px solid black; width: fit-content; margin: 5px auto; padding: 2px;">NOTE</div> <p style="margin-top: 5px;">Zero-filled 24-bit entry follows last map entry.</p> <p style="margin-top: 5px;">Example: Sector flaw, cylinder 409, track 3, sector 10</p> <p style="margin-top: 5px;">10 0110011001 000011 001010</p> |
| 844 utility map                         | 822          | 0     | 2         | 0-160             | <p>Entry format is identical to entry format for 844 factory map. 844 utility map is comprehensive flaw map and contains all 844 factory map entries plus all flaw entries set by 0022 (set/clear flaw) function.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

$$840_{10} = 1510_9$$

TABLE D-1. PACK DATA AREAS (Contd)

| Pack Data Area                          | Disk Address |       |           | Number of Entries | Entry Format                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------------------------------------|--------------|-------|-----------|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                         | Cylinder     | Track | Sector(s) |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 885 factory-recorded manufacturing data | 841          | 0     | 0         | 1                 | Entry format is identical to entry format for 844 factory-recorded manufacturing data.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 885 factory track flaw map              | 841          | 0     | 1         | 1-120             | <div style="display: flex; justify-content: space-between; width: 100%;"> <span>23 22</span> <span>12 11</span> <span>6 5</span> <span>0</span> </div> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <div style="display: flex; justify-content: space-between;"> <span>Cylinder (0-842)</span> <span>Track (0-39)</span> <div style="width: 50px; height: 15px; background: repeating-linear-gradient(45deg, transparent, transparent 2px, black 2px, black 4px);"></div> </div> </div> <p>Address of flawed track or flaw map track</p> <p>Map entry</p> <p style="text-align: center;"><b>NOTES</b></p> <ol style="list-style-type: none"> <li>PP must not modify 885 factory track flaw map. Refer to 885 utility map.</li> <li>All map entries must be contiguous. First entry with bit 23 clear indicates previous entry was last valid entry.</li> </ol> <p>Example: Cylinder 841, track 21</p> <p>1011 0100 1001 0101 0100 0000</p> |
| 885 factory defective sectors map       | 841          | 0     | 2-18      | 0-2040            | <div style="display: flex; justify-content: space-between; width: 100%;"> <span>23 22</span> <span>12 11</span> <span>6 5</span> <span>0</span> </div> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <div style="display: flex; justify-content: space-between;"> <span>Cylinder (0-842)</span> <span>Track (0-39)</span> <span>Physical Sector (0-33)</span> </div> </div> <p>Physical address of defective sector</p> <p>Map entry</p> <p style="text-align: center;"><b>NOTES</b></p> <ol style="list-style-type: none"> <li>Each map sector contains a maximum of 120 entries.</li> <li>PP must not modify 885 factory defective sectors map. Refer to 885 utility map.</li> <li>All map entries must be contiguous. First entry with bit 23 clear indicates previous entry was last valid entry.</li> </ol> <p>Example: Cylinder 120, track 21, sector 33</p> <p>1000 0111 1000 0110 1010 0001</p>                                     |
| 885 utility map                         | 841          | 1     | 0-18      | 2-2161            | When pack leaves factory, 885 utility map is exact copy of cylinder 841, track 0, sectors 0-18. PP should enter track flaws/defective sectors in 885 utility map and never modify 885 factory track flaw map or 885 factory defective sectors map.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

FIRST μCODE

841 2

TEST PATTERN

841 3...39

842

RESERVED FOR HW TESTING.



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