CONTROL DATA
CORPORATION

CONTROL DATA®
6682-A, 6683-A/B, 6683-D
SATELLITE COUPLERS

REFERENCE MANUAL

REVISION RECORD

REVISION	DESCRIPTION
A	Manual released. This manual supersedes the 6682-A/6683-A/B Satellite Couplers section of the
(11-1-70)	6000 Series Peripheral Equipment Reference Manual, Pub. No. 60156100. The information
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B	Manual revised; includes Engineering Change Order 34853. Page 6 added.
(3-5-74)	
C	Manual revised; includes Engineering Change Order 26972 and 36270. This edition obsoletes
(5-15-75)	all previous editions.
D	Engineering Change Order 37351. No change to manual.
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E	Manual revised; includes Engineering Change Order 37367. Page v/vi is revised. Pages iii/iv
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New features, as well as changes, deletions, and additions to information in this manual are indicated by bars in the margins or by a dot near the page number if the entire page is affected. A bar by the page number indicates pagination rather than content has changed.

MANUAL TO EQUIPMENT LEVEL CORRELATION SHEET

SHEET 1 OF 1

MANUAL REV	FCO OR ECO	EQUIPMENTS					
		6682-A	6683-A	6683-B	6683-D		
	ECO33653			B09	D01		
B	ECO34853	A13	A13	B09	D01		
C	ECO36270	A13	A13	B09	D01		
D	ECO37351	A13	A13	B09	D01		
E	ECO37367	A13	A13	B09	D01		

CONTENTS

6682-A, 6683-A/B, AND 6683-D

The CONTROL DATA® 6682-A and 6683-A/B Satellite Couplers permit communication between two CDC 6000 Series or CYBER 70 Series Computer Systems. The 6683-D coupler also functions in CDC CYBER 170 Series Computer Systems. Section 2 contains additional information on the 6683-D coupler.

This manual describes the relationship between the couplers and input/output (I/O) channels. It also includes coupler function, status reply codes, and pertinent programming information.

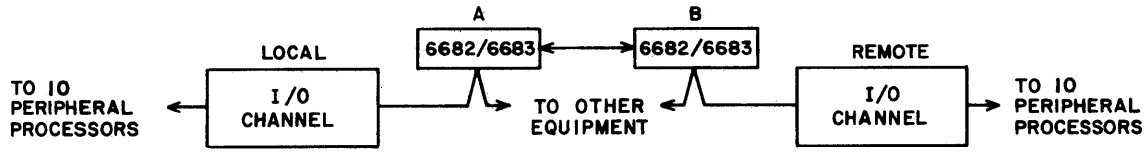

Figure 1-1. Typical Configuration

FUNCTIONAL DESCRIPTION

SYSTEM RELATIONSHIP

The satellite couplers act as a data path between two standard I/O channels. Two couplers are required, one for each I/O channel. The couplers are connected by a standard 28-pair cable. Data can be transmitted between the couplers at a rate approaching one million 12-bit words per second.

Throughout this manual, the coupler attached to the initiating I/O channel is the local division. The other coupler is the remote division. Both divisions contain control logic, a buffer register, and I/O hardware. The divisions operate asynchronously.

An I/O channel may request remote division status and prepare the local division for either an input or output operation.

STATUS

Status checks must be performed after selecting the local division for either an input or output operation. The check is accomplished by selecting status request (S200) through an FAN or FNC instruction, activating the channel, and reading in one word. A status check determines:

- If the remote processor has selected the local coupler for an output operation (status reply bit 0 sets)
- If the remote processor has selected the local coupler for an input operation (status reply bit 1 sets)
- If data placed in the local division's buffer register has been accepted by the remote division (status reply bit 2 clears)

If the remote processor requests permission to output, the local processor executes an input instruction to obtain a data word from the coupler. If the remote processor requests permission to input, the local processor executes an output instruction to send a data word to the coupler. Likewise, local processor requests should be honored by the remote processor.

If both processors make the same request simultaneously, one must change its request (that is, issue a new function code) prior to initiation of the operation. If the change is not made and if both processors activate their respective channels and initiate write operations, both channels hang up. If both channels hang up, a deadstart master clear must be used to clear them.

SELECT

Each of the three function codes selects the local coupler. A division must always be selected with the appropriate request prior to initiating a read or write operation.

PROGRAMMING

CODES

The function codes listed in Table 1-1 select one division of the coupler. They prepare this division for a status check, I/O operation, or master clear operation.

Function codes are transmitted to the division through FAN and FNC instructions.

In all discussion of codes, bit 0 is in the rightmost position. A detailed description of each code follows Table 1-1.

TABLE 1-1. 6682-A AND 6683-A/B SATELLITE COUPLER CODES

Function Codes	
Output	S000†
Input	S100
Status request	S200
Master clear	S700
Status Reply Codes	
Output channel request	0001
Input channel request	0002
Busy	0004

Function Codes

Output (S000)†

This code selects the local coupler for an output operation.

†S is the select code (0 through 7) for the coupler which is established at installation.

Input (S100)

This code selects the local coupler for an input operation.

Status Request (S200)

This code makes the local coupler status word available to the peripheral processor (PP). A one-word input operation must follow to read in the status word.

Master Clear (S700)

This code causes the local coupler to clear and transmit a master clear signal to the remote coupler.

Status Reply Codes

Output Channel Request (0001) - Bit 0

Bit 0 sets when the other PP has selected its coupler for an output operation.

Input Channel Request (0002) - Bit 1

Bit 1 sets when the other PP has selected its coupler for an input operation.

Busy (0004) - Bit 2

Bit 2 sets when a data word is in the local division buffer register and has not yet been accepted by the remote division.

PROGRAMMING CONSIDERATIONS

Data Format

Data is transmitted between the divisions in 12-bit words. No conversion or reformatting of the data occurs.

Transmission Length

Transmission length may be determined by any of the following.

- All transmissions consist of equal length blocks.
- All transmissions are headed by a word-count code word.
- The PP performing the output operation deactivates the I/O channel.

Regardless of which method is used, the number of words read by one PP should always be within three† of the number written by the other PP to avoid hanging up the PP performing the write operation. The PP sending the information hangs up if the PP receiving the information concludes its input operation more than three words before the channel sending the information terminates its output operation. The PP reamins hung up until cleared by a deadstart master clear.

If the PP performing the output operation determines the transmission length, †† the PP reading the information should continue to input information until its channel becomes inactive. The coupler connected to this channel causes the channels to become inactive after it has received the last of the data available to it from the coupler connected to the channel doing the output. Thus, the channel doing the input can determine if more data is available by performing an active jump. If more data is available, the initiation of a new input operation restarts data flow without loss of information.

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† Refer to Transient Data.
†† End of transmission must be indicated by the PP performing the output operation, which deactivates its channel.

One-Word Output

The channel performing a write operation may be deactivated following a one-word output. This permits the channel to be used in connection with other equipment on it. The word, however, remains in the coupler buffer register until it is either accepted by the remote channel or cleared by a deadstart master clear.

Transient Data

Up to four words can be in the coupler system (two divisions and the connecting cables) at the same time. One word can be in the output register of the remote coupler and the second word on the lines connecting the couplers. The third and fourth words can be in the local division's buffer and input registers, respectively. If four words are in the system, at least one word must be read to avoid hanging up the channel that is performing a write operation.

If the system has a CDC CYBER 70 extended buffer channel, a word block of less than six should not be used as the local coupler may hang in output request mode. This is caused by the buffered channel responding to an output operation and not waiting for a coupler to respond.

PASS ON/PASS BACK

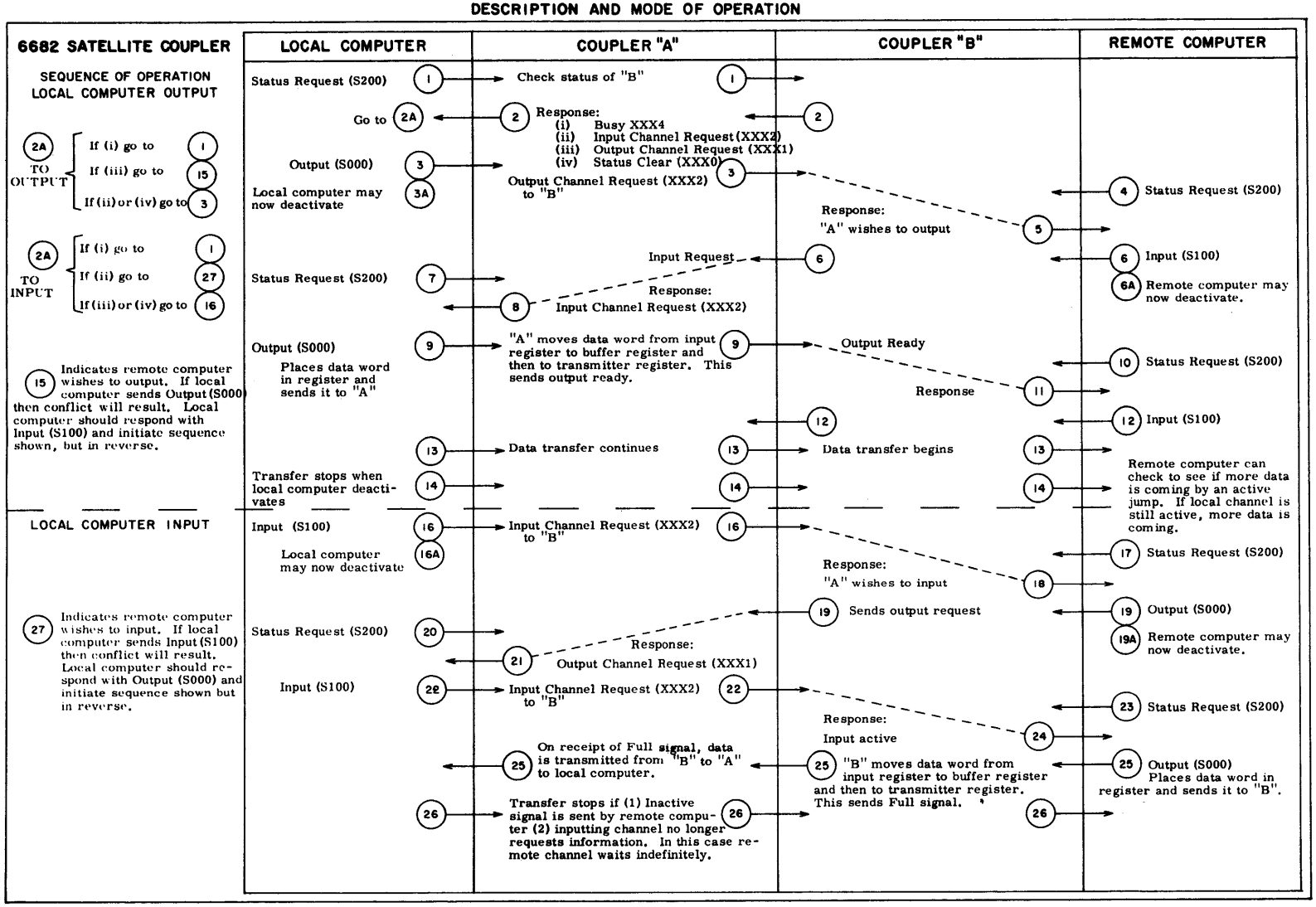
Whenever a channel configuration uses the pass-on feature with a 6683 coupler, a status check of the last used equipment following an input operation should be initiated. The normal disconnect following this status input clears any active conditions in the 6683 coupler which were connected by the pass-on.

MANUAL CONTROL

The satellite coupler chassis has a MASTER CLEAR button in the upper right corner. This switch clears the local coupler and causes a master clear signal to transmit to the remote coupler.

DESCRIPTION AND MODE OF OPERATION

TABLE 1-2. DESCRIPTION AND MODE OF OPERATION



PARITY DESCRIPTION FOR 6683-D SATELLITE COUPLER 2

INTRODUCTION

The 6683-D coupler is similar to the 6683-A/B coupler. However, the 6683-D coupler can check parity on the I/O channel and on the coupler-to-coupler interface. The 6683-D coupler can also generate parity for transmission to the local PPs. Manual switches select the parity modes. The 6683-D coupler word format is 12 information bits plus 1 parity bit.

FUNCTION PARITY

The 6683-D coupler clears its function register and does not send an inactive signal to the PPs if it receives a function word with incorrect parity.

STATUS PARITY

The 6683-D coupler generates an odd parity bit and transmits the parity bit to the PPs with the status information during a status operation.

DATA PARITY WHEN THE SYSTEM CONTAINS TWO 6683-D COUPLERS

Data received from the I/O channel or the other coupler with incorrect parity transfers as normal. The parity bits received from the I/O channel or the other coupler transfer unchanged with the data. Status bits are set to indicate where the parity error occurred. Status bit 2^3 (local parity error) sets when the local coupler detects a parity error. During an output operation, this condition transmits to the other coupler where status bit 2^4 (remote parity error) sets.

DATA PARITY WHEN THE OTHER COUPLER IN THE SYSTEM DOES NOT HAVE PARITY

Data received from the I/O channel with incorrect parity transfers to the other coupler as normal, and status bit 2^3 (local parity error) sets. During an input operation, the 6683-D coupler generates a parity bit for each data word. The parity bit transfers to the I/O channel with the data word.

PARITY MODE SWITCHES

Logic module D01 contains four toggle switches. The lowest switch is not used. If the system has two 6683-D couplers, the uppermost switch should be down, the second switch should be down, and the third switch should be down. If the other coupler in the system does not have parity, the uppermost switch should be down, the second switch should be up, and the third switch should be up. Putting the three parity switches in the up position disables parity.

FUNCTION AND STATUS CODES

Refer to Table 2-1 for function and status codes.

TABLE 2-1. 6683-D SATELLITE COUPLER FUNCTION AND STATUS CODES

Function Codes	
Output	S000
Input	S100
Status request	S200
Master clear	S700
Status Reply Codes	
Output channel request	0001
Input channel request	0002
Busy	0004
Local parity error	0010
Remote parity error	0020

In addition to the status conditions found in the 6683-A/B couplers, the 6683-D coupler sets bits to indicate local and remote parity error conditions.

LOCAL PARITY ERROR (0010) — BIT 3

Bit 3 in the local coupler sets if the local coupler detects incorrect parity on data from the I/O channel or on data from the remote coupler if the remote parity error status bit has not been received from the remote coupler.

REMOTE PARITY ERROR (0020) — BIT 4

Bit 4 in the local coupler sets if the remote coupler detects incorrect parity on data from the I/O channel or on data from the local coupler.

COMMENT SHEET

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