

DataGeneral

TECHNICAL STATEMENT

TEXT LISTING

068-000304-05

PROGRAM

ASYNCHRONOUS CONTROLLER DIAGNOSTIC

TEXT TAPE

097-000304-05

ABSTRACT

THE ALM DIAGNOSTIC PERFORMS A GATE BY GATE TEST
OF ONE TYPE ASYNCHRONOUS LINE MODULE CONTROLLER.

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0001 ALMD 14:46:30 12/06/79 10002 ALMD

A08 ASSEMBLER REV 03.01
TITL ALMD
ASYNCHRONOUS CONTROLLER DIAGNOSTIC (ALM-4, ALM-8, ALM-16)
PROGRAM NAME ALMD.SR

REVISION HISTORY
REV 4 -SUPPORT ECLIPSE IOP, DCU 200 ADDED.
CHANGED STARTING ADDRESS TO 200, ADDED
DUAL PORT COM CONTROLLER SUPPORT, REMOVED
QUESTIONS ON BAUD RATE JUMPERS AND PROVIDED
PRINTOUT OF RATES.BROUGHT UP TO CURRENT
STANDARDS USING LATEST DIAG LIBRARY.
REV 5- REMOVE 30 REFERENCES IN LOCATION 1 FOR INTERRUPTS.
CLEAR SOME DTRS.

MACHINE REQUIREMENTS:
NOVA/ECLIPSE FAMILY PROCESSOR
18K READ/WRITE MEMORY
CONSOLE DEVICE
ASYNCHRONOUS LINE MODULE
SET OF TEST PLUGS
OPTIONAL HARDWARE SUPPORTED:
DCU 50 OR DCU 200
M600 IOP OR HOST DIRECTORY
DUAL PORT COMMUNICATIONS CONTROLLER

TEST REQUIREMENTS
JUMPER PLUGS REQUIRED FOR FULL TEST,NO
PLUGS NEEDED FOR BAUD TEST ONLY.

SUMMARY
THE ALM DIAGNOSTIC PERFORMS A GATE
BY GATE TEST OF ONE TYPE ASYNCHRONOUS LINE MODULE
CONTROLLER. THE TEST INCLUDES MOST OF THE LOGIC
ON THE 15X15 INCH ASYNCHRONOUS BOARD. THE TEST IS EXE-
CUTED USING JUMPER PLUGS WHICH CONNECT LINE 0 TRANS-
MITTER TO LINE 1 RECEIVER, LINE 1 TRANSMITTER TO LINE 0
RECEIVER, LINE 2 TRANSMITTER TO LINE 3 RECEIVER, ETC.
THE JUMPER PLUGS ALSO CONNECT THE TWO MODEM OUTPUTS
TO THE FOUR MODEM INPUTS IN THE FOLLOWING MANNER:
RTS1 TO RING0 AND DSR1
RTS1 TO RING1 AND DSR0
DTR0 TO CTS0 AND C01
DTR1 TO CTS1 AND C00
RTS2 TO RING2 AND DSR3
ETC.

RESTRICTIONS NONE

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A08 ASSEMBLER REV 03.01
TITL ALMD
ASYNCHRONOUS CONTROLLER DIAGNOSTIC (ALMD)

REVISION HISTORY
REV. DATE
00 9/19/75
01 4/09/76
02 7/12/77
03 3/03/78
04 11/03/78
05 12/15/79

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10003 ALMD

01 17. PROGRAM DESCRIPTION/ THEORY OF OPERATION

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03
04 THE ALM DIAGNOSTIC IS A GATE BY GATE
05 TEST OF MOST OF THE CONTROLLER LOGIC. THE CONTROL
06 AND MODEM SECTIONS ARE DONE IN THE DIAGNOSTIC MODE,
07 WITH CLOCKING VIA THE IOPLS. MOST TRANSMIT/RECEIVE
08 TESTS ARE DONE ON LINE. EACH ROUTINE BEGINS
09 WITH AN INITIALIZING SUBROUTINE (SETUP) AND ENDS
10 WITH AN ITERATION SUBROUTINE (LOOP). MOST TESTS
11 ISSUE AN I/O RESET. IN SOME CASES, THIS MAY BE
12 USED TO SYNC A SCOPE. IN OTHER CASES, IT MAY BE BEST
13 TO SYNC ON THE CONTROLLER INSTRUCTIONS.
14
15 17.2 THE ORDER OF FUNCTION TESTING IS AS FOLLOWS:
16 CONTROL LOGIC COMMON LOGIC TO ALL LINES, INTERRUPT
17 CONTROL, DONE AND BUSY SET AND RESET, BOARD CLEAR
18 (NIOCC), TIMING LOGIC - CHECKS SCANNER BY USING IO
19 PULSE TO STEP THROUGH EACH TIME STATE AND LINE ADD-
20 RESS, AND CORRECT TIMING OF EACH BAUD CLOCK, USING
21 LINE 0 TRANSMIT CLOCK OUTPUT THROUGH BIT 7 OF DIC
22 WORD (DIAGNOSTIC MODE).
23 MODEM CONTROL OUTPUTS AND INPUTS
24 TRANSMITTER/RECEIVER TESTING- ALL BAUD CLOCKS,
25 AND ALL LINE CHARACTERISTICS (INCLUDING LOOPBACK)
26 AND TRANSMIT BREAK ARE TESTED HERE, FIRST ON
27 LINE 0.
28
29 17.3 THE MODEM AND TRANSMIT/RECEIVE TESTS ARE REPEATED FOR
30 EACH LINE TO COMPLETE A FULL PASS.
31
32 17.4 A FULL PASS IS EXECUTED 10 TIMES BEFORE THE WORD "PASS"
IS PRINTED.

10004 ALMD

01 OPERATING MODES/SWITCHES

02
03
04 SWITCH SETTINGS
05
06 LOCATION "SWREG" IS USED TO SELECT THE PROGRAM OPTIONS
07 (NOT SYSTEM CONFIGURATION). WHILE RUNNING UNDER DTOS,
08 THIS LOCATION WILL BE LOADED BY THE MONITOR.
09 UNDER STAND ALONE AND PROGRAM LOAD MODES THIS
10 LOCATION WILL BE SET ACCORDING TO THE ANSWERS SUPPLIED
11 BY THE OPERATOR. IN ANY CASE, THE OPTIONS CAN BE CHANGED
12 OR VERIFIED BY USING ONE OF THE COMMANDS GIVEN IN SEC.
13 8.1.2
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16
17 18.1 SWITCH OPTIONS
18 DIFFERENT BITS AND THEIR INTERPRETATION AT LOCATION
19 "SWREG" IS AS FOLLOWS:
20
21 BIT OCTAL BINARY INTERPRETATION
22 VALUE VALUE
23 1 40000 1 LOOP ON ERROR
24 SKIP LOOPING ON ERROR
25
26 2 20000 1 PRINT TO CONSOLE
27 ABORT PRINT OUT TO CONSOLE
28
29 3 10000 1 DO NOT PRINT % FAILURE
30 PRINT % FAILURE
31
32 4 04000 1 ALLOW END OF PASS PRINT OUT
33 SUPPRESS END OF PASS PRINT OUT
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35 5 02000 1 DO NOT PRINT ON THE LINE PRINTER
36 PRINT ON THE LINE PRINTER
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38 6 01000 1 DO NOT HALT ON ERROR
39 HALT ON ERROR
40
41 7 00400 1 DON'T PRINT SUBTEST SUMMARY OR PASS
42 PRINT SUMMARY AND/OR
43 PASSING OF EACH SUBTEST
44 PRINT ONLY THE FIRST ERROR
45 PRINT EVERY ERROR
46
47 18.1.2 SWITCH COMMANDS
48 ONCE THE PROGRAM STARTS EXECUTION THE STATE OF ANY OF
49 THE BITS CAN BE CHANGED BY HITTING KEYS 1-9, A-F. THE
50 PROGRAM WILL CONTINUE RUNNING AFTER UPDATING THE OPTIONS.
51 EACH KEY WILL COMPLEMENT THE STATE OF THE BIT AFFILIAT-
52 ED WITH IT, THUS BIT 4 CAN BE ALTERED BY HITTING KEY 4.
53 SETTING OF ANY BIT OF LOCATION "SWREG" WILL SET BIT 0.
54 (DEFAULT MODE IS DEFINED AS ALL BITS OF SWREG SET TO 0)
55 THE PROGRAM CAN BE LOCKED INTO SWITCH MODIFICATION MODE
56 BY TYPING A 0, IN WHICH CASE MORE THAN ONE BIT CAN BE
57 CHANGED BEFORE CONTROL IS ALLOWED TO RETURN TO THE
58 MAIN PROGRAM.
59
60 18.1.2.1 OTHER COMMANDS

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"CR" A "RETURN" CAN BE TYPED TO CONTINUE THE PROGRAM
AFTER ITS LOCKED IN A SWITCH MODIFICATION MODE

"D THIS COMMAND GIVEN AT ANY TIME WILL RESET "SWRES"
TO DEFAULT MODE AND RESTART THE PROGRAM.

"R THIS COMMAND GIVEN AT ANY TIME WILL RESTART THE
PROGRAM. SWITCHES ARE LEFT WITH THE VALUES THEY
HAD BEFORE THE COMMAND WAS ISSUED.

"U THIS COMMAND GIVEN AT ANY TIME WILL CAUSE THE
PROGRAM CONTROL TO GO TO ODT (NOTE: THIS IS AN
OPTIONAL COMMAND AND IS AVAILABLE ONLY IF
ODTPK IS PRESENT)

M THIS COMMAND GIVEN AT ANY TIME WILL PRINT THE
CURRENT OPERATING MODES.

9.2. OCTAL DEBUG TOOL (ODT)

THIS DIAGNOSTIC IS EQUIPPED WITH A BUILT IN ODT WHICH CAN
BE ACCESSED BY HITTING CONTROL 0 ("O") AT ANY TIME DURING
THE EXECUTION OF THE PROGRAM (AFTER SETTING THE PARA-
METERS).

ON ENTERING ODT THE ADDRESS OF THE LOCATION HAVING THE
NEXT INSTRUCTION TO BE EXECUTED WILL BE TYPED-OUT.

9.2.1 CONVENTIONS AND SYMBOLS

THE FOLLOWING CONVENTIONS ARE USED BY THE ODT:
? PRESSING ANY ILLEGAL KEY CAUSES THE ODT TO RES-
POND WITH A "?".
@ ODT IS READY AND AT YOUR SERVICE.

9.2.2 COMMAND STRUCTURE

AN ODT COMMAND HAS THE FOLLOWING FORMAT:
[ARGUMENT][COMMAND]
AN ARGUMENT MAY BE ONE OF THE FOLLOWING:
"EXP" AN OCTAL EXPRESSION CONSISTING OF OCTAL NUMBERS
SEPARATED BY PLUS (+) OR MINUS (-) SIGNS. LEAD-
ING ZEROS NEED NOT BE TYPED.
"ADR" AN ADDRESS IS THE SAME AS AN EXPRESSION EXCEPT
THAT BIT 0 IS NEGLECTED.
A COMMAND IS A SINGLE TELETYPE CHARACTER

9.2.3 ODT COMMANDS

THE LOCATIONS THAT CAN BE EXAMINED AND MODIFIED BY THE
USER ARE CALLED CELLS. THESE CELLS ARE OF TWO TYPES:
INTERNAL CPU CELLS AND MEMORY LOCATIONS.

9.2.3.1 OPENING INTERNAL CELLS

THE COMMAND TO OPEN ONE OF THE INTERNAL REGISTERS IS OF
THE FORM "NA" WHERE N IS ANY OCTAL EXPRESSION BETWEEN
0 AND 7
0-3 FOR ACCUMULATORS 0-3
4 FOR PC OF THE NEXT INSTRUCTION TO BE EXECUTED IN
THE EVENT OF A "P" COMMAND.

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5 CPU AND TIO STATUS
BIT INTERPRETATION
15 STATUS OF TIO DONE FLAG
14 STATUS OF INTERRUPTS (ION FLAG)
13 STATUS OF CARRY BIT
6 ADDRESS OF THE LOCATION HAVING THE BREAK POINT (IF
ANY)
7 INSTRUCTION AT THE BREAK POINT LOCATION

OTHER COMMANDS TO OPEN CELLS ARE:

"ADR"/ OPEN THE CELL AND PRINT ITS CONTENTS
"/ OPEN THE CELL CURRENTLY POINTED TO BY THE POINTER
AND PRINT ITS CONTENTS.
"+ADR"/ ADD "ADR" TO THE POINTER, OPEN THE CELL
AND PRINT ITS CONTENTS.
"-ADR"/ SUBTRACT "ADR" FROM THE POINTER, OPEN
THE CELL AND PRINT ITS CONTENTS.
"CR" THE RETURN KEY IS USED TO CLOSE THE OPEN CELL
WITH OR WITHOUT MODIFICATION.
"LF" LINE FEED IS USED TO CLOSE THE OPEN CELL WITH OR
WITHOUT MODIFICATION AND TO OPEN THE SUCCEEDING
CELL.
" " CLOSE THE OPEN CELL WITH OR WITHOUT MODIFICATION
AND OPEN THE PRECEDING CELL
/ CLOSE THE OPEN CELL WITHOUT MODIFICATION, AND
OPEN THE CELL POINTED TO BY ITS CONTENTS.
"+ADR"/ CLOSE THE OPEN CELL WITHOUT MODIFICATION, AND
OPEN THE CELL POINTED TO BY ITS CONTENTS + "ADR".
"-ADR"/ CLOSE THE OPEN CELL WITHOUT MODIFICATION, AND
OPEN THE CELL POINTED TO BY ITS CONTENTS - "ADR".

9.2.3.2 MODIFICATION OF A CELL

ONCE A CELL HAS BEEN OPENED ITS CONTENTS CAN BE MODIFIED
BY TYPING THE NEW VALUE THE CELL IS TO CONTAIN IN THE
FORM OF AN OCTAL EXPRESSION FOLLOWED BY "CR" OR "LF".
IF A + OR - IS TYPED AS THE FIRST CHARACTER OF THE EX-
PRESSION THEN THE VALUE OF THE EXPRESSION IS ADDED TO OR
SUBTRACTED FROM THE OLD CONTENTS OF THE CELL. THE
ADDRESS ITSELF OR AN EXPRESSION RELATIVE TO THE ADDRESS
CAN BE DEPOSITED BY TYPING A " " OR " +/-OCTAL EXPRESS-
ION". A RUBOUT COMMAND GIVEN RIGHT AFTER OPENING A CELL
ALLOWS THE MODIFICATION OF ITS CONTENTS AS IF THEY WERE
TYPED IN JUST BEFORE THE COMMAND WAS ISSUED.

9.2.3.3 OTHER ODT COMMANDS

THIS KEY IS USED TO DELETE ERRONEOUSLY TYPED
DIGITS. EACH TIME THE KEY IS PRESSED THE RIGHT MOST
DIGIT IS DELETED AND ECHOED ON THE TERMINAL. IF
THE RUBOUT KEY IS PRESSED RIGHT AFTER OPENING A
CELL THEN IT DELETES THE RIGHT MOST DIGIT OF THE CELLS
CONTENTS. THIS ALLOWS THE MODIFICATION OF THE CELL
AS IF ITS CONTENTS WERE TYPED IN JUST BEFORE THE
KEY WAS PRESSED.
"ADR"B INSERT A BREAK POINT AT LOCATION "ADR".
ONLY ONE BREAK POINT CAN BE INSERTED AND ANY
ENTRY TO ODT AFTER EXECUTING A BREAK POINT WILL
CAUSE IT TO BE DELETED.
U DELETE THE BREAK POINT IF ANY.
P RESTART THE EXECUTION OF THE PROGRAM AT LOCATION

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POINTED BY 4A.
START EXECUTING THE PROGRAM AT "ADR" AFTER AN IO-RESET.
K KILL THE STRING TYPED SO FAR. THE OOI RESPONDS WITH A "2" AND THE OPEN CELL IS CLOSED WITHOUT MODIFICATION.
= PRINT THE OCTAL VALUE OF THE INPUT ONLY. THIS WILL CLOSE ANY OPEN CELLS WITHOUT MODIFICATION AND WILL NOT OPEN A CELL

NOTE: IN PROGRAMS WHICH RELOCATE THEMSELVES THE USER SHOULD PLACE BREAK POINTS ONLY IN THE ORIGINAL PROGRAM AREA. IF A BREAK POINT IS PLACED OUTSIDE THIS AREA THE RESULTS WILL BE UNPREDICTABLE.

10008 ALMD

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OPERATING PROCEDURE
TURN POWER OFF
19.1 CONNECT TEST PLUGS
19.1.1 TURN POWER ON
19.1.2 LOAD THE PROGRAM VIA THE BINARY LOADER OR DTOS TAPE
19.2 SET SWITCHES TO 000200 (BINARY LOADER ONLY)
19.3 PRESS START (BINARY LOADER ONLY)
19.4

19.4.1 THE PROGRAM WILL RESPOND BY REQUESTING THE OPERATOR
TO TYPE 1 TO RUN BAUD RATE TEST ONLY, THE OPERATOR
MUST TYPE A 1 TO RUN BAUD RATE ONLY, TYPING ANYTHING
ELSE WILL CAUSE PROGRAM TO ASSUME FULL TEST IS DESIRED.

19.4.2 THE PROGRAM WILL NEXT ASK THE OPERATOR
TO TYPE THE DEVICE CODE. A 2 DIGIT OCTAL NUMBER FOL-
LOWED BY A CARRIAGE RETURN IS EXPECTED. THIS NUMBER
SHOULD CORRESPOND TO THE ASYNC CONTROLLER DEVICE CODE
(EITHER 34 OR 44).

19.4.3 THE PROGRAM NEXT ASKS THE OPERATOR IF
THIS CONTROLLER HAS MODEM CONTROL. THE OPERATOR
MUST(!) ELECT TO RUN MODEM TESTS IF THE MODEM
OPTION IS WIRED ON THIS CONTROLLER, SINCE THE MODEM
CTS IS USED FOR TRANSMITTING DATA. TYPE A "1" IF THIS
MODEM OPTION EXISTS, FOLLOWED BY A CARRIAGE RETURN.

19.4.4 THE PROGRAM WILL NEXT ASK THE OPERATOR TO TYPE THE
ADDRESS OF THE FIRST LINE (IN DECIMAL). THIS IS THE
RIGHT JUSTIFIED(!) BOUNDARY ADDRESS AS DEFINED BY
JUMPS #46 THROUGH #50 IF 8-LINE CONTROLLER, AND
#47 THROUGH #50 FOR 16-LINE CONTROLLER. FOR 4-LINE
CONFIGURATION AND JUMPER INTERPRETATION, CONSULT
CONFIGURATION SHEET. TYPE DECIMAL ADDRESS OF FIRST
LINE AND CARRIAGE RETURN.

19.4.5 TYPE 4, 8, 12 OR 16 TO NUMBER-OF-LINES QUESTION.
CAUTION: DO NOT TRY TO RUN DIAGNOSTIC WITH NUMBER 7
OF LINES OTHER THAN THAT CONFIGURED FOR, SINCE PRO-
GRAM WILL PULSE THE LINE SCANNER THROUGH CON-
SOLE Cycles FOR TESTING, AND ERRORS WILL RESULT.
CONSULT CONFIGURATION SHEET. TYPE NUMBER OF LINES
AND CARRIAGE RETURN.

19.4.6 THE PROGRAM WILL THEN ASK IF THIS IS A DUAL PORT SYSTEM
TYPE 1 OTHERWISE 0. IF THE RESPONSE IS "YES"
A DCU MUST BE PRESENT AND THE DCU EXISTENCE
QUESTION IS SKIPPED.

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;9.4.7 THE PROGRAM WILL ASK IF THIS IS A DCU SYSTEM
 TYPE A 1 OTHERWISE 0. IF A ONE IS TYPED THE PROG.
 WILL FIRST REQUEST THE OPERATOR TO TYPE THE DCU
 DEVICE CODE. A 2 DIGIT OCTAL NUMBER FOLLOWED BY A
 CARRIAGE RETURN IS EXPECTED. THIS NUMBER SHOULD
 CORRESPOND TO THE DCU DEVICE CODE (ANY NUMBER
 FROM 1 TO 76 OCTAL).

;9.5 WHEN OPERATOR INPUT IS COMPLETE, EXECUTION OF THE
 TEST PROGRAM BEGINS. THE FIRST PASS THROUGH THE
 PROGRAM WILL PRODUCE A LISTING OF THE BAUD RATE
 OF CLOCKS 0 THROUGH 3. CONSULT THE HARDWARE
 INSTALLATION INSTRUCTIONS IF THESE ARE TO BE
 CHANGED. RESTARTING THE PROGRAM WILL REPEAT
 THE BAUD PRINTOUT.

; WITH ALL LINES TESTED, THE WORD "PASS" WILL BE TYPED
 ON THE CONSOLE DEVICE.

;9.6 RESTART PROCEDURE
 THE PROGRAM MAY BE RESTARTED AT 200 FOR REPEAT
 EXECUTION. THIS MAY BE DONE MANUALLY OR VIA "R
 OR "0".

; IF THE PROGRAM IS RUNNING IN A DCU THE RESET
 SWITCH MUST BE PRESSED TO RESTART MANUALLY AT
 200. ALSO TWO "R'S" OR "D'S ARE REQUIRED TO
 BRING THE HOST BACK. THE FIRST CONTROL R OR D
 WILL PUT THE MACHINE IN A SPECIAL SWITCH INPUT
 MODE WHERE THE SWITCHES MAY BE SET OR EXAMINED
 USING THE "H" COMMAND.

;9.6.1 THE MESSAGE TYPE 1 FOR NEW PARAMETERS WILL APPEAR
 ON RESTART. TYPING A 1 WILL PRODUCE ALL OF THE
 QUESTIONS INITIALLY ANSWERED. TYPING ANY OTHER
 CHARACTER WILL BEGIN TESTS USING THE PREVIOUSLY
 GIVEN PARAMETERS.

;10. PROGRAM OUTPUT/ERROR DESCRIPTION

;10.1 IF A MALFUNCTION IS DETECTED, THE PROGRAM WILL CYCLE
 IN A SCOPE LOOP IN ACCORDANCE WITH THE SWITCHES.
 PROGRAM WILL PRINT THE LINE NUMBER BEING TESTED
 AT THAT TIME (PRIME LINE), AND IF TRANSMITTING AND
 RECEIVING USING 2 DIFFERENT LINES, "PRIME LINE" WILL
 BE THE TRANSMITTING LINE, AND "SECONDARY LINE" WILL
 WILL BE THE RECEIVER LINE ADDRESS.

;10.2 WHEN THE PROGRAM IS IN A SCOPE LOOP SETTING SWITCH 3(1)
 WILL CAUSE THE FAILURE RATE TO BE PRINTED. SETTING
 SWITCH 1(1) WILL CAUSE THE PROGRAM TO PROCEED TO
 THE NEXT TEST.

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;11. DEBUG HELP

;11.1 DESCRIPTION OF COMMUNICATION SYSTEM I/O FUNCTIONS:

;11.1.1 DEVICE CODE MUX = 34 (OCTAL)

;11.1.2 DOA AC,MUX SPECIFIES THE ABSOLUTE LINE ADDRESS TO
 BE USED IN CONJUNCTION WITH A DATA OUT
 INSTRUCTION TO TRANSMIT, RECEIVE, OR
 MODEM.

; BITS 0-6 NOT USED

; BITS 7-14 ABSOLUTE LINE ADDRESS

; 0=RECEIVE OR MODEM CONTROL
 ; 1=TRANSMIT CONTROL

;11.1.3 DOB AC,MUX SPECIFIES TRANSMIT DATA, TRANSMIT MODE
 (TRANSPARENT OR BREAK), AND MODEM OUT.

; BITS 0-1 TRANSMIT OR MODEM CONTROL
 ; 10=MODEM CONTROL
 ; 00=NORMAL TRANSMIT DATA
 ; 01=TRANSMIT BREAK(ASYNCH ONLY)

; BITS 2-7 NOT USED

; BITS 8-15 TRANSMIT DATA (IN TRANSMIT MODE)

; MODEM CONTROL SIGNALS

; BIT 14 1=TURN ON RTS
 ; 0=TURN OFF RTS

; BIT 15 1=TURN ON DTR
 ; 0=TURN OFF DTR

10011	ALMD	11.1.4 DOC AC,MUX	SPECIFIES ON/OFF CONTROL OF TRANSMITTER OR RECEIVER, OUTPUT LINE CHARACTER- ISTICS.
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10012	ALMD	DOC AC,MUX (CONTINUED)	10 SPECIFIES PARITY, STOP BITS, LINE SPEED, CHAR CODE LEVEL, AND LOOPBACK CONTROL.
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10013	ALMD					
01	11.1.5 DIA AC,MUX	SPECIFIES IMPLICIT ADDRESS OF INT-				
02		ERRUPING LINE, RECEIVE, MODEM, OR				
03		TRANSMIT, AND FORCES A DOA AS EXPLICIT				
04		ADDRESS FOR OUTPUTTING.				
05						
06						
07	BITS 0-6	NOT USED				
08						
09	BITS 7-14	EXPLICIT ADDRESS				
10						
11	BIT 15	TRANSMIT OR REC/MODEM CONTROL				
12						
13		0= RECEIVE OR MODEM INTERRUPT				
14		1= TRANSMIT INTERRUPT				
15						
16						
17	11.1.6 DIB AC,MUX	SPECIFIES RECEIVED DATA ON RECEIVE INT-				
18		ERRUP.				
19						
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21	BITS 0-7	NOT USED				
22						
23	BITS 8-15	RECEIVE DATA				
24						
25	11.1.7 DIC AC,MUX	SPECIFIES RECEIVER DONE/STATUS OR				
26		MODEM DONE/STATUS				
27						
28						
29	BITS 0-11	NOT USED				
30						
31		RECEIVER STATUS				
32						
33	BIT 12	FRAMING ERROR				
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35	BIT 13	PARITY ERROR				
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37	BIT 14	OVERRUN				
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39	BIT 15	0=RECEIVER STATUS				

10014 ALMD

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DIC AC,MUX (CONTINUED)

MODEM STATUS

BIT 11	CD STATUS
	1=CD IS ON
	0=CD IS OFF
BIT 12	CTS STATUS
	1=CTS ON
	0= CTS OFF
BIT 13	DSR STATUS
	1= DSR ON
	0= DSR OFF
BIT 14	RING STATUS
	1= RING ON
	0= RING OFF
BIT 15	MODEM STATUS CONTROL
	1= MODEM STATUS

10015 ALMD

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01 ;11.1.8 EFFECT OF 'BUSY' AND 'DONE' ON COMMUNICATIONS CONTROL
02 ;
03 ;
04 ;
05 BUSY: BUSY IS SET ON THE ASYNC LINES ON AN I/O RESET
06 OR START PULSE. THIS STARTS AN ICLR CYCLE WHICH
07 CLEARS MODEM MEMORY AND PRESETS THE IMPLIED ADDRESS
08 COUNTER. ON COMPLETION OF THE ICLR CYCLE,
09 BUSY RESETS, AND THE BOARD IS PLACED IN THE
10 'DIAGNOSTIC' MODE.
11 ;
12 DONE: DONE SETS ON LINES WHEN ONE
13 OF THE FOLLOWING EVENTS OCCURS:
14 1. CHARACTER RECEIVED.
15 2. TRANSMIT BUFFER EMPTY
16 3. MODEM STATUS HAS CHANGED.
17 INTERRUPTS OCCUR IN THE ABOVE ORDER OF PRIORITY,
18 AND FROM LOWEST TO HIGHEST NUMBERED LINES. A
19 'NIOC MUX' WILL CLEAR DONE, AS WELL AS A
20 'NIDIOS MUX' AND 'IORST'.
21 ;
22 IORESET: CLEARS LOGIC AND PLACES CONTROLLERS IN OFFLINE
23 DIAGNOSTIC MODE. ALSO SETS 'BUSY' (ASYNC ONLY).
24 ;
25 START: SAME AS IORESET .
26 ;
27 CLEAR: CLEARS 'DONE' AND INTERRUPT LOGIC AND PLACES
28 CONTROLLERS IN ONLINE MODE.
29 ;
30 IOPLS(MUX): STEPS INTERNAL CLOCKS IN
31 'DIAGNOSTIC' MODE.
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10016 ALMD

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10017 ALMD

10018 ALMD
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**000000 TOTAL ERRORS, 00000 FIRST PASS ERRORS

112.5 THE FOLLOWING IS A TABLE OF THE MOST COMMONLY USED
FREQUENCIES FOR BAUD CLOCKS 2 AND 3, THE JUMPERS
INSERTED, AND THE JUMPER CONFIGURATION REQUIRED
BY THE DIAGNOSTIC:

BAUD RATE	JUMPERS INSERTED	CLOCK 3	CLOCK 2	CLOCK 3	CLOCK 2	CLOCK 3
4800	W30-W34	N/A		37		N/A
3600	W29, W31, W33	N/A		52		N/A
2400	W29-W34	W38-W42		77		37
1800	W28, W30, W32	W37, W39, W41		124		52
1200	W28-W34	W37-W42		177		77
600	W27-W34	W36-W42		377		177
300	W27-W34	W35-W42		377		377
150	W27-W34	W35-W42		377		377
110	W27, W29, W31-W33, W35, W37, W39-W41			256		256
75	W27-W34	W35-W42		377		377

112.6 ON ALL INPUT REQUESTS THE OPERATOR MAY ELECT
TO ALTER FLOW OF THE PROGRAM BY STRIKING A
CONTROL 0, R OR D.

112.7 THE BAUD RATE TIMING IS ROUNDED TO THE NEAREST
5 BAUD WITH A PRECISION OF 4 BAUD. IF AN UNUSUAL
BAUD RATE IS SELECTED THE PRINTED RATE MAY BE
OFF BY 4 COUNTS.

113. RUNTIME DEPENDS UPON THE BAUD RATE OF CLOCK ZERO
AND THE NUMBER OF LINES RUN. FOR AN ALM=16 WITH
9600 BAUD AS CLOCK 0, WILL BE PRINT PASS IN LESS
THAN 5 MINUTES.

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0019 ALMD

070TD 000521 MC 5/22
S7HPD 000051 MC 4/02