

ICR11

CONTROLLER DIAGNOSTIC
MD-11-DZIRA-A

EP-DZIRA-A-DL

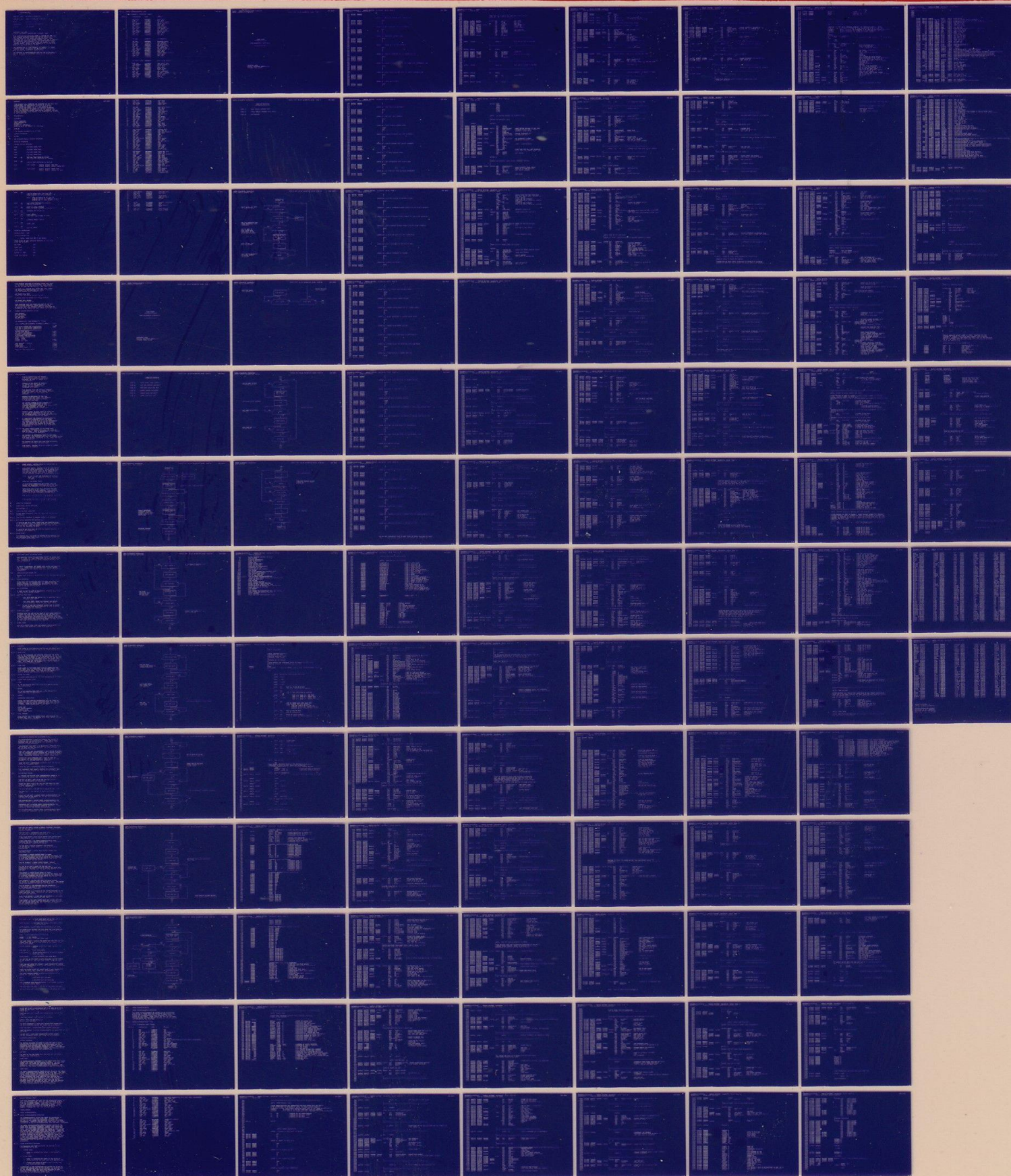
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IDENTIFICATION

SEQ 0001

PRODUCT CODE: MAINDEC-11-DZIRA-A-D
PRODUCT NAME: ICR11 CONTROLLER DIAGNOSTIC
DATE: FEBRUARY 1976
MAINTAINER: DIAGNOSTIC ENGINEERING
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1. ABSTRACT

THIS PROGRAM WILL EXERCISE AND DIAGNOSE ONE OR MORE ICR11 CONTROLLERS. THE CONTROLLER CONSISTS OF A M8094, M8098, M8096 AND M8096. IT WILL NOT EXERCISE ANY LOGIC BEYOND THE M8096. (I.E. I/O BOARDS) THEREFORE IT IS NOT NECESSARY TO REMOVE ANY OF THE MODULES FROM WITHIN THE FILE BOX EXCEPT UNSOLICITED INTERRUPT MODULES OR THEIR SOURCES. THIS PROGRAM ALSO EXERCISES THE TERMINAL AT THE ICR11 END.

2. REQUIREMENTS

2.1 EQUIPMENT

POP-11 COMPUTER
ICR11 CONTROLLER
CONSOLE TTY
REMOTE TTY (OPTIONAL)
SHORTING PLUG FOR REMOTE TTY (OPTIONAL)

2.2 STORAGE

THIS PROGRAM RESIDES IN 8K OF CORE

3. LOADING PROCEDURE

3.1 METHOD

USE STANDARD POP-11 LOADING PROCEDURE

4. STARTING PROCEDURE

4.1 CONTROL SWITCH SETTINGS

SW00		FILE BOX UNDER TEST		
SW01		FILE BOX UNDER TEST		
SW02		FILE BOX UNDER TEST		
SW03		FILE BOX UNDER TEST		
SW04	-0-	TEST ALL FILE BOXES ON SYSTEM		
	-1-	TEST FILE BOX SPECIFIED BY SW00-03		
SW05	-0-			
	-1-	LOOP ON TEST SPECIFIED BY SW07,06		
SW06		TEST NUMBER	SW07=0 SW06=0 CSR TEST	
			SW07=0 SW06=1 M8094, M8098 TEST	
SW07		TEST NUMBER	SW07=1 SW06=0 M8096 TEST	
			SW07=1 SW06=1 REMOTE TTY TEST	

SW00 -0-
 -1- LOOP ON M8098 DATA LOOP BACK TEST
 (USES SW00-07 FOR DATA PATTERN)
 NOTE: SW06,07 SHOULD BE 0,1 OR 1,0
 SW06,07 AS 0,0 WILL DEFAULT TO 0,1
 SW06,07 AS 1,1 WILL DEFAULT TO 1,0

SW09 -0- HALT AFTER PRINTING RUN SUMMARY
 -1- LOOP ON DIAGNOSTIC

SW10 -0- PRINT ON LOCAL CONSOLE
 -1- PRINT ON LOCAL CONSOLE AND REMOTE TTY

SW11 -0- RESERVED FOR FUTURE USE
 -1-

SW12 -0- QUICK VERIFY
 -1- LONG TEST (100 PASSES OF TEST)

SW13 -0-
 -1- SUPPRESS ERROR TYPEOUT

SW14 -0-
 -1- SCOPE LOOP

SW15 -0-
 -1- HALT ON ERROR

4.2

STARTING ADDRESS(ES)

PROGRAM START 200

PROGRAM RESTART 210

NOTE: SAME FILE BOX TO BE TESTED

AFTER START OF 200, SEPARATE RESTARTS OF INDIVIDUAL
 TESTS MAY BE DONE.

CSR TEST	210
M8094 TEST	204
M8096 TEST	214
REMOTE TTY TEST	220
POWER FAIL OPTION	224

THIS PROGRAM INCLUDES AN OPTIONAL POWER FAIL TEST
IF THE POWER FAIL TEST IS REQUIRED, LOAD ADDRESS
224 AND SET SWR PER SECTION 4.1, AND PRESS START.

THE TEST WILL EXECUTE AS A START 200 UNTIL AFTER
THE REMOTE TTY TEST(SECTION 4.3 *10*), AT WHICH
TIME THE PROGRAM WILL RESPOND WITH:

ICR POWER FAIL TEST
POWER DOWN THE REMOTE END OF THE ICR

POWERING DOWN THE REMOTE END SHOULD PRODUCE:

ICR POWER FAIL SENSED
POWER REMOTE END BACK UP

THIS VERIFIES THAT THE POWER FAIL BIT OF THE ICR
CSR FUNCTIONS CORRECTLY. POWER REMOTE END BACK
UP AND THE TEST WILL PROCEED NORMALLY. THIS TEST IS
PERFORMED ON ALL ICR'S AND ONLY WITHIN THE FIRST PASS.

4.3 PROGRAM AND/OR OPERATOR ACTION

LOAD PROGRAM
SET SWR TO 200
LOAD ADDRESS
SET SWR PER 4.1
PRESS START

THE PROGRAM WILL THEN RESPOND BY TYPING:

ICR11 CONTROLLER DIGNOSTIC MAINDEC-11-DZIRA-A	(*1*)
***** SYSTEM MAP *****	(*2*)
FILE BOX X ICR=XXXXXX ICSR=XXXXXX	(*3*)
FILE BOX Y ICR=YYYYYY ICSR=YYYYYY	

TESTING FILE BOX X	(*4*)
ICR VECTOR ADDRESS=NNN	(*5*)
PRIORITY LEVEL=ZZZZZ	(*6*)
MAINTENANCE MODE ACTIVATED	(*7*)
INPUT MODULE ADDRESS RANGE	(*8*)
START XXXXX	
FINISH YYYYYY	(*9*)
REMOTE TTY TEST	(*10*)
BRUN SUMMARY - FILE X	(*11*)
PASS COUNT X	(*12*)
ERROR COUNT Y	(*13*)
LINE ERROR COUNT Z	(*14*)
RERUN OR LOAD FIELD TEST?	(*15*)

- 1• HEADING IDENTIFYING THE PROGRAM
A OF MAINDEC-11-DZIRA-A INDICATES
REVISION, BE SURE IT AGREES WITH
THIS DOCUMENT.
- 2• PROGRAM IS NOW GOING TO INDICATE
ALL ICR'S THAT ARE PRESENT ON
SYSTEM AND WILL RESPOND WHEN
ADDRESSED WITH SSYNC.
- 3• FILE BOX(ES) THAT ARE ACTUALLY PRESENT
ON SYSTEM, CHECK THAT ALL ICR(S) REPORTED
EXIST AND THAT ALL THAT EXIST ARE
REPORTED.
- 4• PROGRAM IS BEGINNING TO TEST ONE
SPECIFIC FILE BOX (ICR). ALL MESSAGES
PRINTED FROM THIS POINT ON REFER
TO THIS ONE FILE BOX.
- 5• ICR VECTOR ADDRESS IS THE ADDRESS THAT
THE FILE BOX INTERRUPTED TO WHEN A
INTERRUPT OCCURRED. COMPARE THIS VALUE WITH
THAT ONE EXPECTED, IF THEY DO
NOT AGREE INVESTIGATE JUMPER VX-VY
ON THE M8094.
- 6• PRIORITY LEVEL IS THAT LEVEL AT WHICH THE
ICR IS SET TO INTERRUPT AT. SIX (6) IS
THE STANDARD LEVEL. THIS LEVEL IS DETERMINED
BY THE PRIORITY CHIP ON THE M8094.
- 7• AT THIS POINT THE PROGRAM IS EXERCISING THE
MAINTENANCE MICROCODE WITHIN THE M8094
AND M8096. AT THIS TIME IT IS NOT RECOMMENDED
THAT THE REMOTE END OF THE ICR BE POWERED
DOWN NOR SHOULD THE PROGRAM BE HALTED. FOR
EXPLANATION OF PRINTOUTS AT THIS TIME REFER
TO SECTION 7.
- 8•,•9• THE INPUT MODULE RANGE IS THE RANGE THAT
JUMPERS OF THE M8096 WILL ALLOW THE M8096 TO
SCAN OR POLL. THIS IS DETERMINED BY THE PROGRAM
AND THE STANDARD IS 0000-0016.
- 10• THE PROGRAM IS PERFORMING TESTS TO THE ICR11
REMOTE TTY. THE SHORTING PLUG MUST BE PLUGGED IN FOR
THIS TEST TO RUN, OTHERWISE IT WILL ABORT THE TEST
AND INDICATE 80.
- 11• RUN SUMMARY OF TESTS THAT HAVE BEEN PERFORMED.
(SUMMARY IS PRINTED FOR EACH FILE)
- 12• PASS COUNT. DECIMAL VALUE OF NUMBER OF PASSES
COMPLETED BY PROGRAM

- *13* ERROR COUNT. DECIMAL VALUE OF ERRORS SEEN BY PROGRAM DURING RUNNING.
- *14* LINE ERROR COUNT. DECIMAL VALUE OF LINE ERRORS DETECTED DURING DIAGNOSTIC. (LINE ERRORS INDICATE ONLY THE NOISE LEVEL OF THE CABLE BETWEEN THE ICR AND POP-11, THEY HAVE NO BEARING ON ERRORS DETECTED UNLESS THEY ARE EXTREMELY HIGH.)

NOTE: IF ANY VALUES ARE PRECEDED BY A MINUS SIGN (-), AN OVERFLOW OF 2**16 (16,384) WAS SEEN.

- *15* RERUN OR LOAD FIELD TEST?

AT THIS POINT RESPONDING ON EITHER LOCAL OR REMOTE (IF SELECTED) TERMINALS WITH A "R" WILL RESTART THE PROGRAM AT *6* OF THIS SECTION.

RESPONDING WITH A "L" WILL INITIATE THE HIGH SPEED READER TO START LOADING. THIS LOADING CAPABILITY IS TO FACILITATE THE LOADING OF THE ICR-11 FIELD TEST (MAINDEC-11-DZIRB) ONLY.

DO NOT ATTEMPT TO LOAD OTHER

PROGRAMS BY THIS METHOD

5. OPERATING PROCEDURE

5.1 OPERATIONAL SWITCH SETTINGS

SEE SECTION 4.1

5.2 OPERATING FROM LOCAL END

5.2.1 TO RUN THIS DIAGNOSTIC FROM THE LOCAL END FOLLOW THIS PROCEDURE.

5.2.1.1 LOAD SWITCH REGISTER TO 000200, PRESS LOAD ADDRESS.

5.2.1.2 SET SWITCH REGISTER PER SECTION 4.1

IF SW10 IS SET TO A ZERO, CHECK THAT THE SHORTING PLUG IS IN THE REMOTE END. IF SW10 IS ZERO, AND THE SHORTING PLUG IS NOT IN, THEN THE REMOTE TTY TEST WILL NOT RUN AND WILL BE INDICATED AS SUCH.

IF SW10 IS SET TO A ONE, BE SURE THE REMOTE TERMINAL IS CONNECTED AND POWERED ON.

5.2.1.3 PRESS START

THE PROGRAM WILL NOW START TO RESPOND AS IN SECTION 4.3. ANY DEVIATION FROM THIS TYPEOUT IS EXPLAINED IN SECTION UNDER ERROR EXPLANATIONS.

5.3 GOING FROM LOCAL TO REMOTE USAGE

SEQ 0007

WHEN QUESTION "RERUN OR LOAD FIELD TEST?" IS ASKED, SET SW10 TO A ONE (1), THEN POWER DOWN ICR AND ATTACH REMOTE TTY. POWERING UP ICR WILL REASK QUESTION REMOTELY (AS WELL AS LOCALLY).

OR

IF ERROR IS OCCURRING, SET SCOPE LOOP SWITCH AND SW10 TO ONE (1). POWER DOWN ICR (REMOTE END), ATTACH REMOTE TTY. POWERING UP ICR (REMOTE END) WILL PRINT "RESTARTING DIAGNOSTIC".

5.4 OPERATING FROM REMOTE END

PROGRAM MUST INITIALLY BE STARTED AT LOCAL END PER SECTION 5.2.

5.4.1 ERROR REPORTING

SINCE ONCE THE MAINTENANCE MODE HAS BEEN ACTIVATED THE REMOTE TERMINAL IS INOPERATIVE, ALL ERRORS THAT ARE DETECTED DURING THIS PERIOD ARE BUFFERED AND REPORTED PRIOR TO THE END OF EACH PASS.

5.4.2 RUN INDICATION

IF SW09 IS SET TO LOOP ON DIAGNOSTIC, TESTING WILL FLASH (ON RT02 ONLY) DURING PASSES.

5.4.3 ABORTING FROM TEST

"C WILL EXIT TEST AND RETURN YOU TO QUESTION "RERUN OR LOAD FIELD TEST?"

"P WILL EXIT TEST, PRINT RUN SUMMARY AND RETURN YOU TO QUESTION "RERUN OR LOAD FIELD TEST?"

NOTE: "C AND "P ARE NOT INTERRUPT DRIVEN DUE TO MAINTENANCE MICRO CODE BEING EXECUTED SO HAVE PATIENCE, THE PROGRAM WILL RESPOND.

5.4.4 POWER FAIL ABORT

POWERING DOWN THE ICR MAY BE USED TO EXIT SCOPE LOOPS OR TO ABORT THE TEST ONCE THE POWER FAILURE HAS BEEN DETECTED BY THE PDP11, THE LOCAL END IS NOTIFIED, AND WILL BE KEPT INFORMED OF THE SITUATION EVERY MINUTE OR SO UNTIL THE LINK GOES ERROR FREE INDICATING POWER HAS BEEN RESTORED. AT THIS TIME THE DIAGNOSTIC WILL RESTART.

6. SCOPE LOOPS

SW14 AS A ONE(1) WILL LOCK THE PROGRAM INTO A SCOPE LOOP. THE SCOPE LOOP OPERATION VARIES WITH EACH TEST.

6.1.1 CSR TEST

SCOPE LOOPS IN THIS SECTION LOOP ON THE ONE ERROR INVOLVED AND ANY NECESSARY CODE TO SET UP THE ERROR CONDITION.

6.1.2 M8894 TEST

DUE TO THE MICROCODE AND HARDWARE STRUCTURE THE SCOPE LOOP IS FROM THE ERROR BACK TO THE BEGINNING OF THE TEST. THEREFORE FOR AN ERROR IN THE LATTER PART OF THE TEST ALL PREVIOUS SUBTESTS ARE PERFORMED WITHIN THE SCOPE LOOP. THE EXCEPTION IS THE M8898 TEST WHICH IS CONTROLLED BY SW88. WITH SW88 SET THE PROGRAM WILL LOOP ON SENDING SW87-00 UNTIL SW88 IS CLEARED.

6.1.3 M8896 TEST

SCOPE LOOPS IN THE M8896 TEST INVOLVE LOOPING ON THE WHOLE TEST, WITH THE EXCEPTION OF THE M8898 TEST WHICH IS CONTROLLED BY SW88. WITH SW88 SET THE PROGRAM WILL LOOP ON SENDING SW87-00 UNTIL SW88 IS CLEARED.

6.1.4 REMOTE TTY TEST

ALL SCOPE LOOPS RETURN TO THE LAST TRANSMISSION ATTEMPT.

6.1.5 ESCAPE FROM SCOPE LOOPS

LOCAL

"C, "P OR SW14 TO ZERO WITH ALLOW THE USER TO ESCAPE FROM SCOPE LOOPS.

REMOTE

"C, "P OR POWERING DOWN ICR WILL ALLOW ESCAPE FROM SCOPE LOOP BACK TO BEGINNING.

7.0 ERRORS

7.1 ERRONEOUS INFORMATION

DURING THE TEST CERTAIN INFORMATION WILL BE TYPED OUT INDICATING CERTAIN JUMPER CONFIGURATIONS, FILE BOX ADDRESSES. THESE MAY BE IN ERROR AND SHOULD BE CHECKED TO VERIFY THEIR CORRECTNESS. THEY ARE:

SYSTEM MAP
ICR VECTOR ADDRESS
PRIORITY LEVEL
INPUT MODULE RANGE

7.2 FATAL ERRORS

FATAL ERRORS ARE THOSE ERRORS WHICH UPON FINDING THE PROGRAM WILL HALT. TO RECOVER FROM THESE ERRORS A START OF THE PROGRAM IS NECESSARY.

THE FOLLOWING ERRORS ARE CONSIDERED FATAL.

SEQ 0009

"NO ICR'S-ABORTED" - WHEN THE PROGRAM WAS TRYING TO DETERMINE THE ICR CONFIGURATION, THERE WAS NO SSYNC RECEIVED FROM ANY OF THE LEGAL ICR ADDRESSES. SEE SECTION 9.3 FOR ADDRESSES.

"NON-EXISTANT FILE BOX" - IN SELECTING A SPECIFIC FILE BOX TO TEST VIA SW4 AND SW3-00, THE USER SELECTED A NON-EXISTANT FILE BOX.

"MOD. INT. WILL NOT INT-ABORTED" - WHEN TRYING TO DETERMINE THE INTERRUPT VECTOR ADDRESS AND INTERRUPT PRIORITY LEVEL, THE FORCED MODULE INTERRUPT WOULD NOT TAKE PLACE. (NOTE: DEPRESSING CONTINUE WILL FORCE A SCOPE LOOP).

"REMOTE TTY HUNG--DESELECT IT" - TEST OF TBMT OF THE REMOTE TTY WAS UNSUCCESSFUL, CHECK REMOTE TTY OR DESELECT IT BY SETTING SW10 TO A ZERO(0).

"SPUR ICR INT" - EXTRANEIOUS INTERRUPT FROM ICR OCCURED DURING TTY INTERRUPT TEST.

"UNEXP MOD INT" - UNEXPECTED MODULE INTERRUPT.

"TTY INTERRUPT TEST HUNG" - REMOTE TTY INTERRUPT TEST TIMED OUT WHILE WAITING FOR TBMT OR DA TO INTERRUPT.

7.3 RECOVERABLE ERRORS

ALL ERRORS ARE PRINTED WITH CORRESPONDING ERROR PC OF THE LISTING SO ACTUAL TEST PERFORMED MAY BE SEEN.

"CSR BIT 15 SET" - BIT 15 OF THE ICR CSR WAS SET WHEN NO TRANSMISSION WAS OCCURRING.

"RESET BIT SET" - BIT 6 OF THE ICR CSR WHICH IS USED TO RESET MODULES WITHIN FILE BOX. READ BACK AS A ONE(1) WHICH IT SHOULD NOT.

"TTY ENA NOT SET" - ICR CSR BIT 5 WOULD NOT SET (ONE).

"TTY ENA SET" - ICR CSR BIT 5 WOULD NOT CLEAR (ZERO).

"THOUT FLP NOT SET" - DURING M8094 MICRODIAGNOSTIC THE TIMEOUT FLOP ON THE M8094 DID NOT SET WITH SUFFICIENT TIME FOR IT TO OCCUR.

"SEQ COMPARE ERR" - DURING M8094 MICRODIAGNOSTIC THE SEQUENCE COMPARE FLOP ON THE M8094 WOULD NOT TEST TRUE.

"ERRONEOUS INT" - DURING M8094 MICRODIAGNOSTIC, INTERRUPT OTHER THAN INTERRUPT EXPECTED OCCURRED. CHECK LISTING AT ERRPC FOR FURTHER EXPLANATION.

"NO INT FROM ERR" - DURING M8094 MICRODIAGNOSTIC ERROR WAS FORCED BUT ERROR BIT DID NOT SET IN CSR (BIT 12).

"INT SET AFT RIF" - AFTER A MODULE INTERRUPT OCCURRED, THE RIF BIT WAS SET AND CLEARED BUT THE MODULE INTERRUPT WAS STILL POSTED.

"ERR AFT CLR" - ADDRESSING THE ICAR WOULD NOT CLEAR OUT THE ERROR INTERRUPT BIT.

"DATA VALID TRUE" - DATA VALID TESTED TRUE WITHIN M8894 MICRODIAGNOSTIC WHEN THE DATA SHOULD HAVE BEEN FALSE.

"INPUT ADDR ERR" - IN M8896 MICRODIAGNOSTIC WHEN WRAPPING THE INPUT MODULE ADDRESS BACK, THEY CAME BACK OUT OF SEQUENCE. CHECK EXP'D REC'D.

"NO MOD INT" - MODULE INTERRUPT WAS EXPECTED BUT NOT POSTED, CHECK ERRPC IN LISTING FOR FURTHER EXPLANATION.

"OUT BUSY STUCK" - OUTPUT BUSY POSTED LONGER THEN SPECIFIED TIME.

"FME ERROR" - FORCED MASTER ERROR IN M8894 MICRODIAGNOSTIC WAS INITIATED BUT IT DID NOT OCCUR, THAT IS A MODULE INTERRUPT WAS TO BE POSTED BY THE MICROCODE AT THIS TIME INDICATING THE FME EVENTS TOOK PLACE. THE MODULE INTERRUPT DID NOT OCCUR.

"FME NO TIMEOUT" - FORCE MASTER ERROR. SHOULD HAVE INITIATED A TIMEOUT ON THE M8894 BUT IT DID NOT.

"SL ACK ON BD CRC" - WHEN THE BAD CRC WAS GENERATED BY THE MASTER THE SLAVE SHOULD NOT HAVE ACKNOWLEDGED THE MESSAGE, BUT THE SLAVE DID RESPOND TO THE BAD CRC.

"FSE ERROR" - FORCED SLAVE ERROR IN M8894. MICRODIAGNOSTIC WAS INITIATED BUT IT DID NOT OCCUR, THAT IS A MODULE INTERRUPT WAS TO BE POSTED BY THE MICROCODE AT THIS TIME INDICATING THE FSE EVENTS TOOK PLACE. THE MODULE INTERRUPT DID NOT OCCUR.

"FSE TIMEOUT" - THE BAD CRC FROM THE SLAVE CAUSED THE MASTER TO TIMEOUT WHICH IT SHOULDN'T HAVE. THE MASTER SHOULD HAVE IGNORED THE BAD CRC AND REASK FOR THE MESSAGE.

"FSE NO ERROR" - THE SUPPOSED BAD CRC GENERATED BY THE SLAVE WAS GOOD AT THE MASTER END OR THE SLAVE WILL NOT GENERATE A BAD CRC.

"TIMEOUT ERROR" - A TIMEOUT OF THE MASTER OCCURRED IN THE M8898 LOOP BACK TEST. INDICATING THE M8898 (SLAVE) DID NOT LOOP BACK THE DATA.

"DATA VALID ERROR" - A BAD CRC WAS RETURNED BY THE M8898 (SLAVE) DURING THE M8898 LOOP BACK TEST.

"ICAR ERROR" - THE DATA LOOPED BACK AND LOADED INTO THE ICAR DURING THE M8898 TEST WAS INCORRECT. BITS 15 AND 12 ARE NOT CHECKED DUE TO THE FACT THEY ARE NOT DIRECTLY LOADED DURING THIS TEST.

DATA SENT = BIT 7-0 THAT WERE SENT OUT IN THE LAST BYTE OF THE OUTGOING MESSAGE.

EXP'D COUNTS = 16 BIT WORD THAT SHOULD HAVE BEEN LOADED INTO THE ICAR.

REC'D COUNTS = 16 BIT WORD THAT WAS ACTUALLY IN ICAR.

THE CORRELATION BETWEEN THE DATA SEND AND ICAR EXPECTED IS AS FOLLOWS. FOR THE 8 BIT BYTE OUT (BITS 7-0) THE EXPECTED IS:

BITS Y,1,0,Y,4,5,6,7,X,X,X,X,3,2,1,0

WHERE Y = NOT TESTED

WHERE X,X,X,X = FILE BOX UNDER TEST

"MOD ADDR ERROR" = DURING THE M8000 TEST THE DATA IS ALSO LOADED INTO THE 16 X 16 FILE IMAGE ON THE M8000, THIS DATA WAS IN ERROR.

MODULE ADDRESS = ADDRESS WITHIN RAM WHERE THE DATA WAS READ.

DATA SENT = 8 BIT BYTE SENT.

EXP'D COUNTS = 16 BIT EXP'D CONTENTS OF MODULE ADDRESS BITS 7-0, 7-0.

REC'D COUNTS = 16 BIT CONTENTS THAT WERE READ.

"DA NOT SET ON TTY TEST" = DATA AVAILABLE WAS NOT POSTED IN THE REMOTE TTY LOOP BACK TEST AFTER A BYTE WAS SENT OUT.

"TBMT WAS SET AFTER TTY TRANS" = UART TRANSMITTER BUFFER WAS EMPTY IMMEDIATELY AFTER IT WAS LOADED WITH A CHARACTER TO BE TRANSMITTED.

"TBMT WAS CLEAR AFTER TTY TRANS TIME" = UART TRANSMITTER BUFFER WAS STILL FULL AFTER TTY TRANSMISSION TIME.

"TTY SEND RECEIVE ERROR" = ERROR WAS DETECTED IN THE REMOTE TTY LOOP DATA TEST.

SENT = 8 BIT BYTE THAT WAS SENT

REC'D = 8 BIT BYTE THAT WAS RECEIVED

"TTY INTERRUPT SEND RECEIVE ERROR" = DATA ERROR IN REMOTE TTY INTERRUPT DRIVEN TEST.

"RIF BIT WOULD NOT SET" = RIF BIT OF CSR WOULD NOT SET.

"RIF BIT WOULD NOT CLEAR" = RIF BIT OF CSR WOULD NOT CLEAR.

"MAINT BIT 3 ON" - MAINTENANCE BIT 3 IS USED AS AN INITIALIZE ON THE M8894, UPON SETTING IT, IT SHOULD CLEAR ITSELF OUT.

"PWR FAIL BIT ON" - POWER FAIL INDICATOR BIT OF THE CSR IS SET.

"ICSR REG. ERROR" - BIT IN CSR IS IN ERROR.

EXP'D - WHAT THE CSR SHOULD BE
REC'D - WHAT WAS READ

"NO TBMT INTERRUPT" - WITH UART TRANSMITTER BUFFER EMPTY AND TBMT INTERRUPT ENABLE SET THERE WAS NO INTERRUPT.

"TBMT NOT SET" - TRANSMITTER EMPTY BUFFER NEVER SET.

"TBMT INT ERROR" - WITHIN MICRODIAGNOSTIC OF M8894 TEST OF TBMT WAS FALSE.

"NO BMT INT" - WITH UART TRANSMITTER BUFFER LOADED AND BMT INTERRUPT ENABLE SET THERE WAS NO INTERRUPT.

8. DIAGNOSTIC STRUCTURE

8.1 INITIAL DIALOGUE

THE INITIAL DIALOGUE IS AIMED TO GIVE THE USER A QUICK VERIFICATION OF HOW THE SYSTEM IS CONFIGURED AND HOW THE INDIVIDUAL FILE BOX(ES) ARE JUMPED WITH RESPECT TO INTERRUPT VECTOR AND INTERRUPT PRIORITY LEVEL. THIS SECTION PROVES THAT THE ICR FUNCTIONS PROPERLY AS A UNIBUS DEVICE IN AS MUCH AS ADDRESSING AND INTERRUPTING.

8.2 CSR TEST

THE TEST OF THE CSR TESTS THAT CSR BITS SET AND CLEAR PROPERLY AND INDIVIDUALLY.

8.3 M8894 TEST

THE MICRODIAGNOSTIC RESIDENT IN THE M8894 TESTS THAT FLOWS THROUGH THE M8894 ARE FUNCTIONING PROPERLY. IT WILL ALSO VERIFY THAT THE M8898 CRC CHECKING LOGIC IS WORKING CORRECTLY, AND THAT THE M8898 LOOPS DATA PROPERLY. SEE SECTION 9.1 FOR M8894 MICRODIAGNOSTIC CODE AND FLOWCHARTS.

8.4 M8896 TEST

THE M8896 MICRODIAGNOSTIC TESTS CERTAIN FLOWS ON THE M8896 WITHOUT INTERFERING WITH MODULES IN THE FILE BOX. THE INPUT MODULE RANGE JUMPERS ARE CHECKED AS WELL AS THE FACT THAT THE FOLLOWING CIRCUITRY IS FUNCTIONING CORRECTLY. THE MODULE ADDRESSES ARE ALSO VERIFIED THAT CERTAIN BIT PATTERNS LOAD AND READ PROPERLY. THIS TEST ALSO ALLOWS THE USER TO TRANSMIT A FIXED PATTERN VIA THE SWITCH REGISTER (SW00 AND SW07-00) OR VARY THE BITS FOR SCOPING PURPOSES AGAIN BY THE SWITCH REGISTER. SEE SECTION 9.2 FOR M8896 MICRODIAGNOSTIC CODE AND FLOWCHARTS.

THIS TEST EXERCISES THE UART AND ITS ASSOCIATED LOGIC, AS WELL AS THE WHOLE LINK, WITH ALL DATA PATTERNS IN BOTH FLAG AND INTERRUPT MODES. THIS TEST WILL ALSO RECORD ALL LINE ERRORS INDUCED BY SURROUNDING NOISES. (LINE ERRORS INDICATE ONLY THAT THE MASTER OR SLAVE HAD TO RESEND A MESSAGE NOT THAT ANY DATA WAS LOST).

9. MISCELLANEOUS

9.1 M8094 MICRODIAGNOSTIC

9.1.1 M8094 MICRODIAGNOSTIC STRUCTURE

THE MICRODIAGNOSTIC WITHIN THE M8094 IS CONTROLLED BY MAINTENANCE BIT 2 OF THE ICR'S CSR. SETTING THIS BIT TO A 1 WILL CAUSE THE MICROCODE TO ENTER THE MICRODIAGNOSTIC. TOGGING THIS BIT WILL THEN ALLOW THE MICRODIAGNOSTIC TO RUN IN SYNCHRONIZATION WITH THE POP11 DIAGNOSTIC.

THE M8094 MICRODIAGNOSTIC PERFORMS BASIC CHECKS OF THE M8094 SUCH AS MODULE INTERRUPT, TIMEOUT FLOP OPERATION, ERROR FLOP OPERATION, SEQUENCE COMPARE, DATA VALID AND TSM. NEXT THE M8094 CRC LOGIC IS TESTED AS BOTH MASTER AND SLAVE CRC ERRORS ARE FORCED AND VERIFIED. THESE ARE DONE BY SETTING THE M8094 MAINTENANCE BIT AND FORCING THE TT BITS TO CERTAIN CONDITIONS WITH DATA BITS 6,7 OF THE OUTGOING MESSAGE AS 0,0 OR 1,1 (SEE SECTION 9.1.2 FOR EXACT TT AND DATA BIT PATTERNS). M8094 IS THEN PUT INTO A LOOP BACK MODE, WHERE THE SLAVE TURNS THE DATA AROUND AND THE MICRODIAGNOSTIC LOADS IT INTO THE ICR AND ADDRESS RAM WHICH IS READ AND VERIFIED BY THE POP11 DIAGNOSTIC.

9.1.2 M8094 DIAGNOSTIC FEATURES

THE FOLLOWING CRC TEST FUNCTIONS ARE DEFINED IF THE MAINTENANCE BIT IS SET:

1. MASTER MODE:

- A. FORCE AN OUTGOING CRC ERROR IN THE MASTER IF:
TT=1.

2. SLAVE MODE:

- A. FORCE AN OUTGOING CRC ERROR IN THE SLAVE IF
BITS 6 AND 7 OF THE LAST DATA BYTE ARE BOTH ONE.
- B. INHIBIT CRC CHECK IF BITS 6 AND 7 OF THE LAST
DATA BYTE ARE BOTH ZERO.

MAINTENANCE -- THE MAINTENANCE BIT CAUSES THE SLAVE TO REPEAT THE MESSAGE BACK TO THE MASTER. IF DATA IS PART OF THE MESSAGE, THE LAST DATA BYTE RECEIVED IS SEND BACK 'N' TIMES WHERE 'N' EQUALS THE NUMBER OF DATA BYTES INDICATED BY THE RECEIVED LENGTH BITS.

ICR11 DIAGNOSTIC MICROCODE (M8094)

LOCATION	INSTRUCTION	CODE	COMMENT
0	TST MAINT	00000011	MAINT SET?
1	CJMP .+2	11110011	YES, CONT
2	CLR PC	1101XXXX	NO, START AGAIN
3	LOAD MODINT	00010001	CREATE INTERRUPT
4	TST MAINT	00000011	MAINT SET?
5	CJMP .-1	11110100	YES, HANG
6	TST TIMEOUT	00000000	TIMEOUT SET?
7	CJMP .+2	11111001	YES, CREATE INT.
10	JMP .+2	11101010	NO, DON'T INT
11	LOAD MODINT	00010001	CREATE INTERRUPT
12	TST MAINT	00000011	MAINT SET?
13	CJMP .+4	11111111	YES, CONT
14	JMP .-2	11101010	NO, HANG
15			
16			
17	INC SEQ	1010XXXX	INC SEQUENCE
0	TST SEQ	00000001	SEQUENCE COMP?
1	CJMP .+5	11110110	YES, CREATE INT.
2	INC SEQ	1010XXXX	INC SEQUENCE
3	TST SEQ	00000001	SEQUENCE COMP?
4	CJMP .+2	11110110	YES, CREATE INT
5	JMP .+2	11100111	NO, DON'T INT
6	LOAD MODINT	00010001	CREATE INTERRUPT
7	TST MAINT	00000011	MAINT SET?
10	CJMP .-1	11110111	YES, HANG
11	LOAD ERROR	0011XXXX	CREATE ERROR INTERRUPT
12	TST MAINT	00000011	MAINT SET?
13	CJMP .+4	11111111	YES, CONT
14	JMP .-2	11101010	NO, HANG
15			
16			
17	TST DATA VALID	00000010	DATA VALID TRUE?
0	CJMP .+2	11110010	YES, DON'T INT.
1	LOAD MODINT	00010001	CREATE INTERRUPT
2	TST MAINT	00000011	MAINT SET?
3	CJMP .-1	11110010	YES, HANG
4	CLK FLAGS	0100XXXX	CLOCK FLAGS
5	TST TBMT	00000101	TBMT TRUE
6	CJMP .+2	11111000	YES, INTERRUPT
7	JMP .+2	11101001	NO, DON'T INTR.
10	LOAD MODINT	00010001	CREATE INTERRUPT
11	TST MAINT	00000011	MAINT SET?
12	CJMP .+2	11111100	YES, R
13	JMP .-2	11101001	NO, HANG

14	TST TBMT	00000101	TBMT SET?
15	CJMP .-1	11111100	YES, WAIT
16	CLK FLAGS	0100XXXX	CLOCK FLAGS
17	TDP 1011	00101011	ISSUE TDP
0	TST RDP	00000111	RECV DATA PRESENT?
1	CJMP .+4	11110101	YES, CONT
2	TST TIMEOUT	00000000	TIMEOUT?
3	CJMP .+4	11110111	YES, INDICATE
4	JMP .-4	11100000	LOOP BACK
5	SET MODINT	00010001	SET MOD INT
6	JMP .+2	01101000	CONT
7	SET ERROR	0011XXXX	SET ERROR
10	TST MAINT	00000011	MAINT SET?
11	CJMP .+2	11111011	YES, THEN LOOP
12	JMP .+2	11101100	NO, CONT
13	CIF 12	10001010	LOOP
14	TST TBMT	00000101	TBMT SET?
15	CJMP .-1	11111100	YES, HANG
16	CLK FLAGS	0100XXXX	CLOCK FLAGS
17	TDP 1001	00101001	ISSUE TDP
0	TST TIMEOUT	00000000	TIMEOUT SET?
1	CJMP .+4	11110101	YES, SET DA
2	TST RDP	00000111	RECV DATA PRESENT?
3	CJMP .+4	11110111	YES, CONT
4	JMP .-4	11100000	LOOP
5	SET DA	01110000	SET DA
6	JMP .+4	11101010	CONT
7	TST DATA VALID	00000010	DATA VALID?
10	CJMP .+2	11111010	YES, CONT
11	SET MODINT	00010001	NO, SET MOD INT
12	JMP .+2	11101100	CONT
13	CIF 15	10001011	LOOP
14	TST MAINT	00000011	MAINT SET?
15	CJMP .+2	11111111	YES, CONT
16	JMP .+3	11101011	NO, LOOP
17	CLK FLAGS	0100XXXX	CLOCK FLAGS
0	CLR MODINT	00010000	CLEAR MOD INTR
1	TDP 1010	00101010	ISSUE TDP
2	TST RDP	00000111	RECV DATA PRESENT?
3	CJMP .+5	11111000	YES, CONT
3	CJMP .+5	11111000	YES, CONT
4	TST TIMEOUT	00000000	TEST TIMEOUT
5	CJMP .+2	11110111	SET, INDICATE
6	JMP .-4	11100010	LOOP ON TEST
7	CIF 16	10001110	INDICATE TIMEOUT
10	TST RDP	00000111	WAIT TIL RDP
11	CJMP .-1	11111000	GOES AWAY
12	TST DATA VALID	00000010	TEST DATA VALID
13	CJMP .+2	11111101	CONT
14	CIF 16	10001110	DATA INVALID
15	LD GEN	0110XXXX	LOAD ICAN
16	LD MEM	1001XXXX	LOAD MEM FILE
17	NOP	1011XXXX	NO GENERATION

0	LOAD MODINT	00010001	LOAD MOD INTR
1	TST TONT	00000101	TONT SET?
2	CJMP .-1	11110001	
3	TST MAINT	00000011	MAINT SET?
4	CJMP .+12	11111110	LOOP ON TEST
5	CLR PC	1101XXXX	RETURN
6			
7			
10	LD DA	01110000	TIMEOUT INDICATION
11	JMP .-11	11100000	CONT
12	LD ERROR	0011XXXX	DATA INVALID
13	JMP .-13	11100000	CONT
14			
15	JMP .-3	11101010	DATA INVALID
16	CIF 14	10001100	LOOP ON TEST
17			

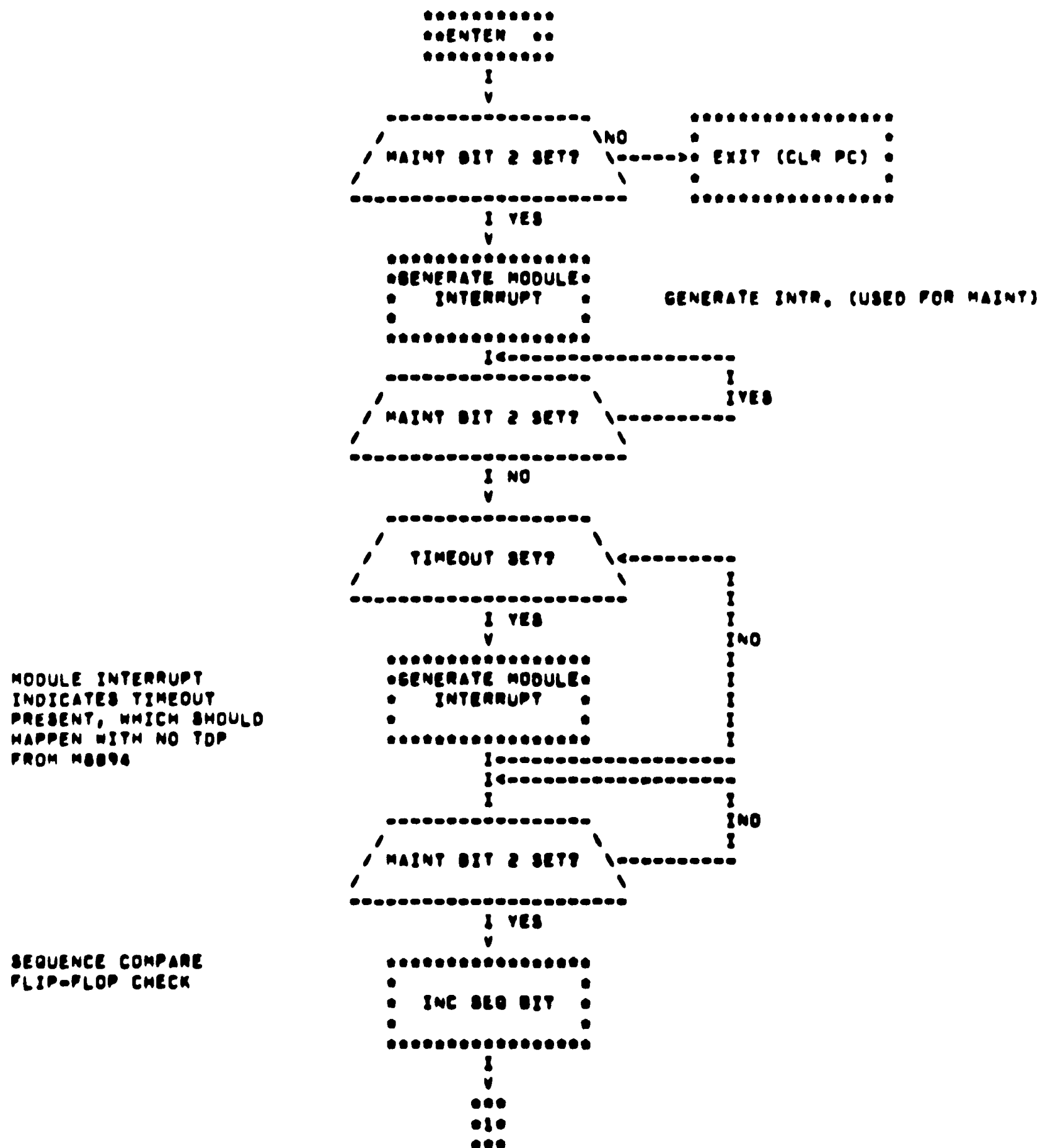
FLOW CHART

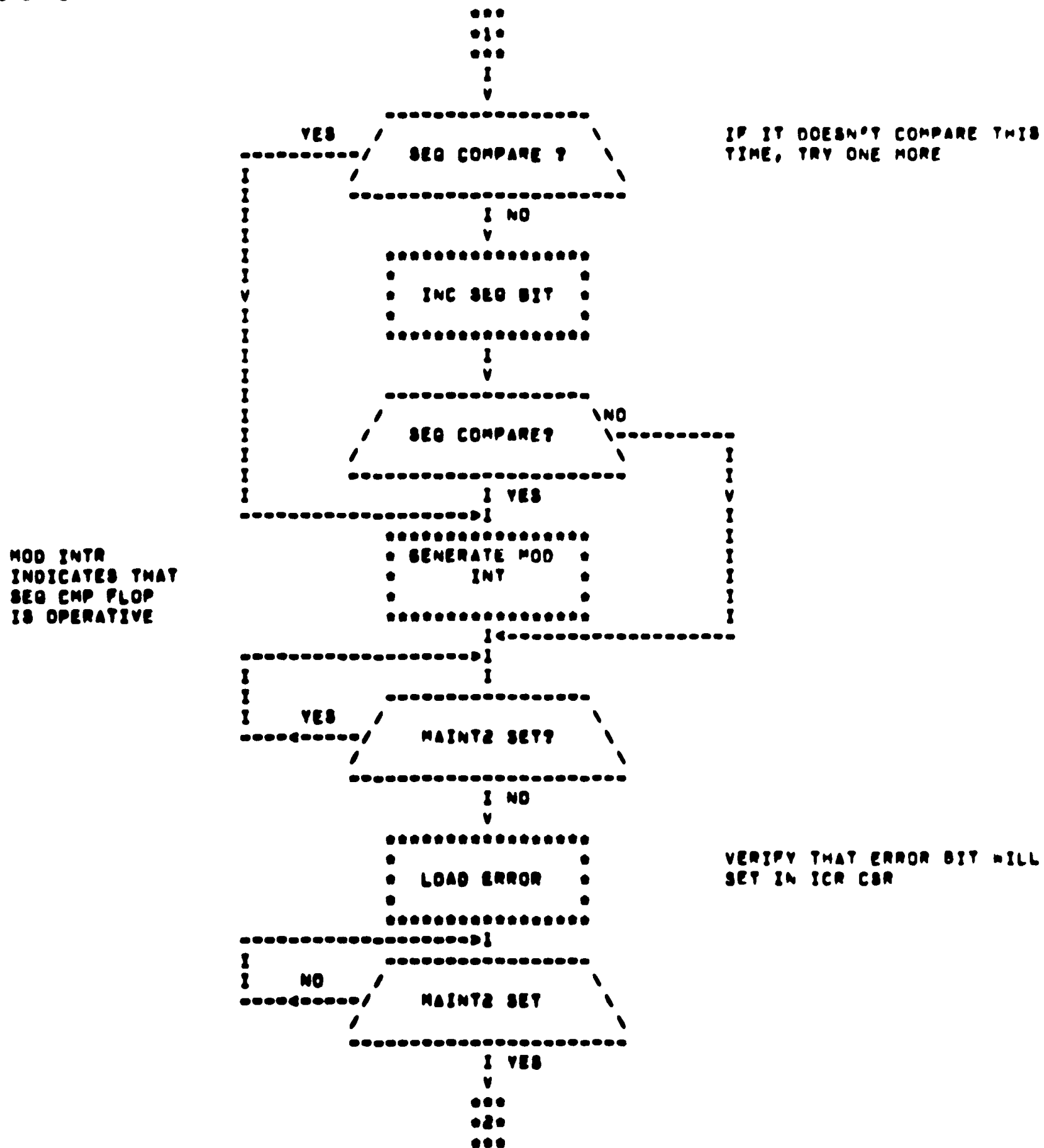
8894 DIAGNOSTIC MICRO-FLOW

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PAGE 01	MAINT INTR., TEST TIMEOUT
PAGE 02	TEST SEQ COMPARE AND ERROR
PAGE 03	TEST DATA VAILO AND TBMT
PAGE 04	FORCED MASTER CRC ERROR
PAGE 05	FORCED SLAVE CRC ERROR
PAGE 06	M8890 LOOP DATA TEST



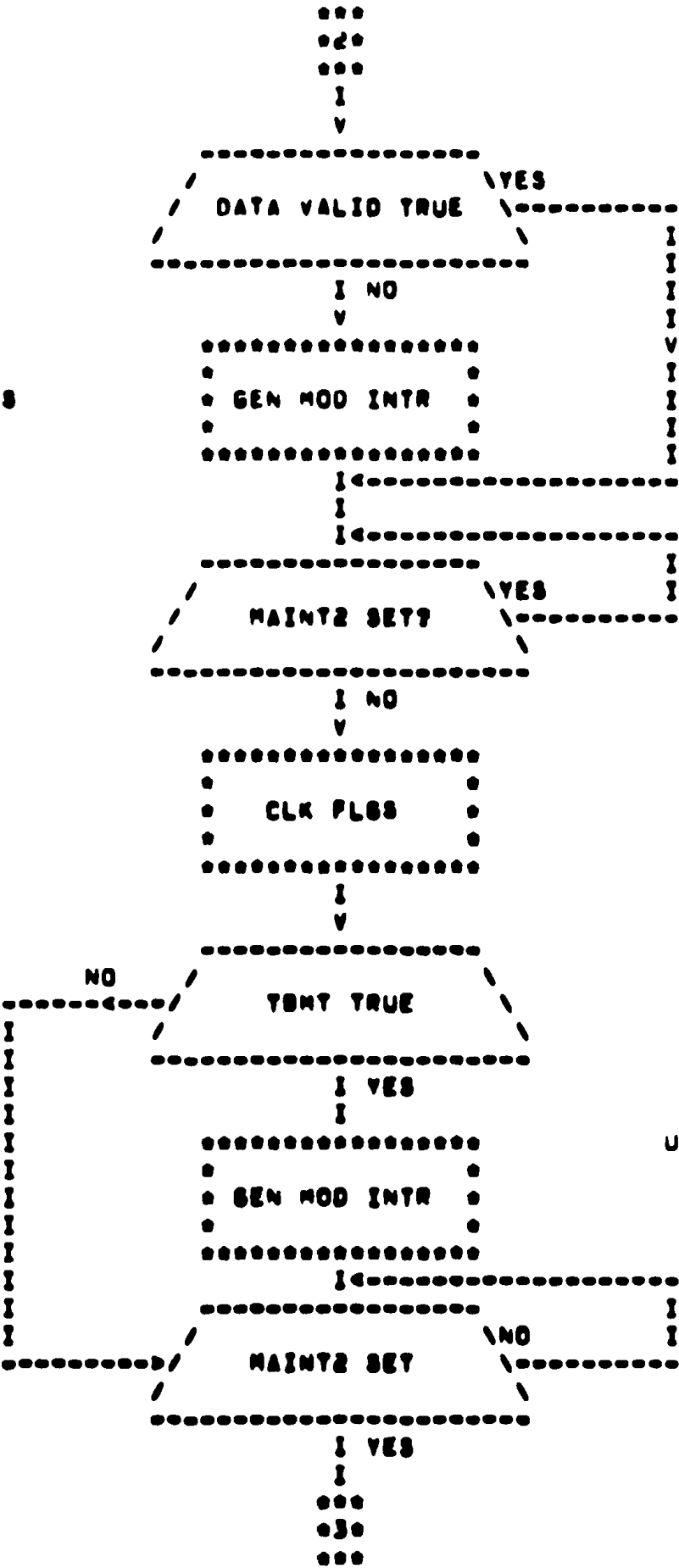


MOD INT DATA
VALID FALSE WHICH IS
CORRECT CONDITION

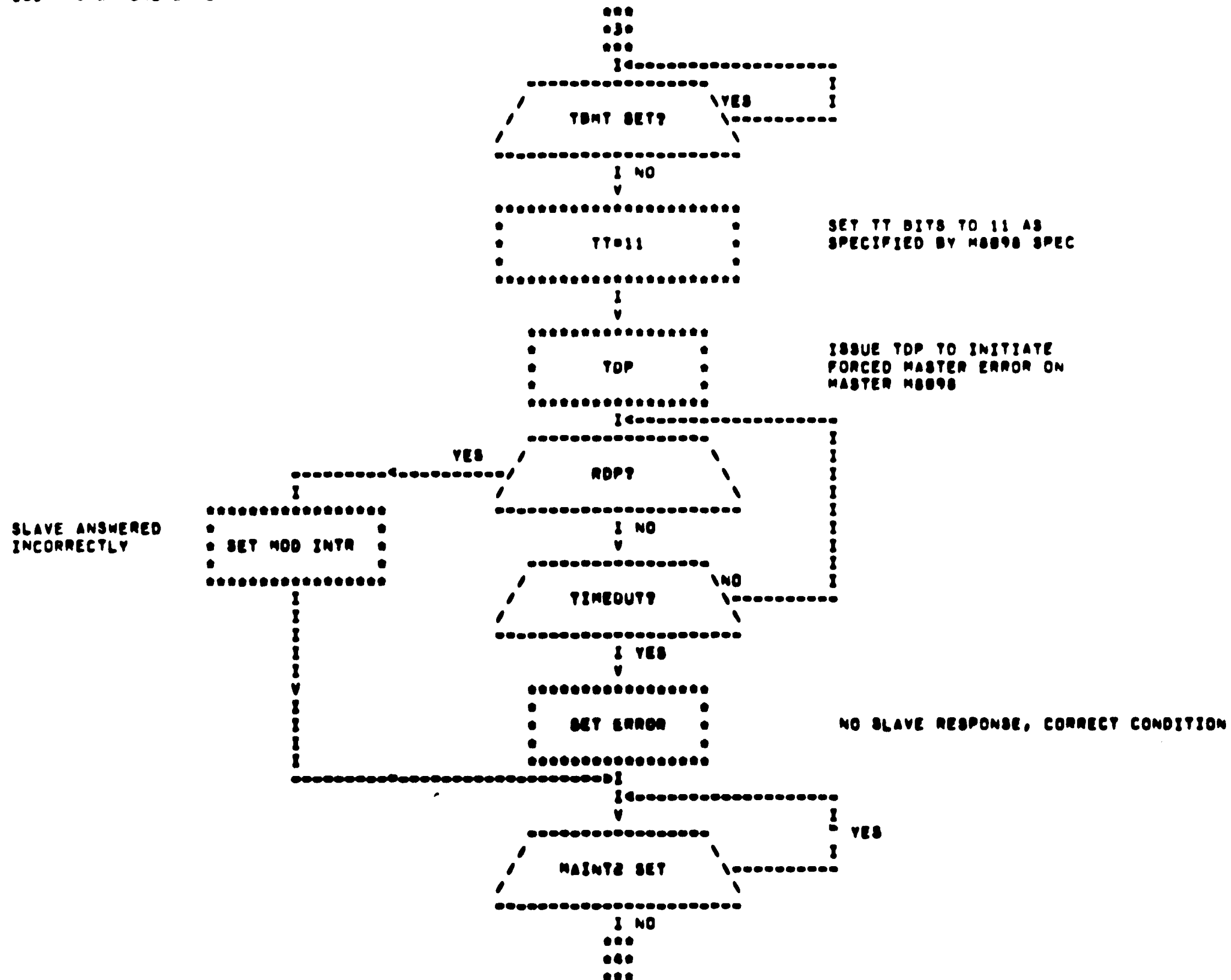
CLK FLAGS SIGNAL
WILL LATCH TBMT
FOR TESTING

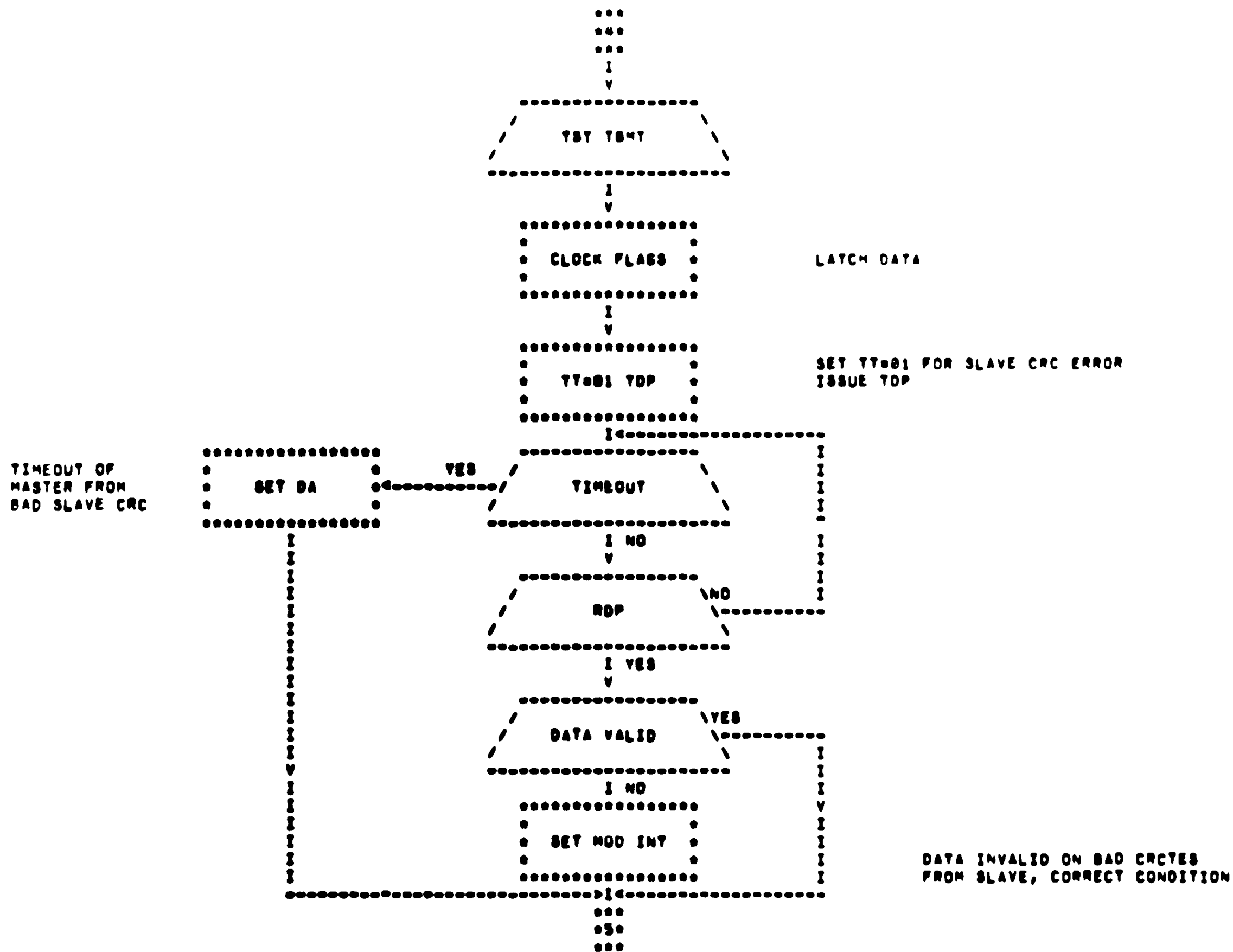
MOD INT
INDICATES
TBMT TRUE

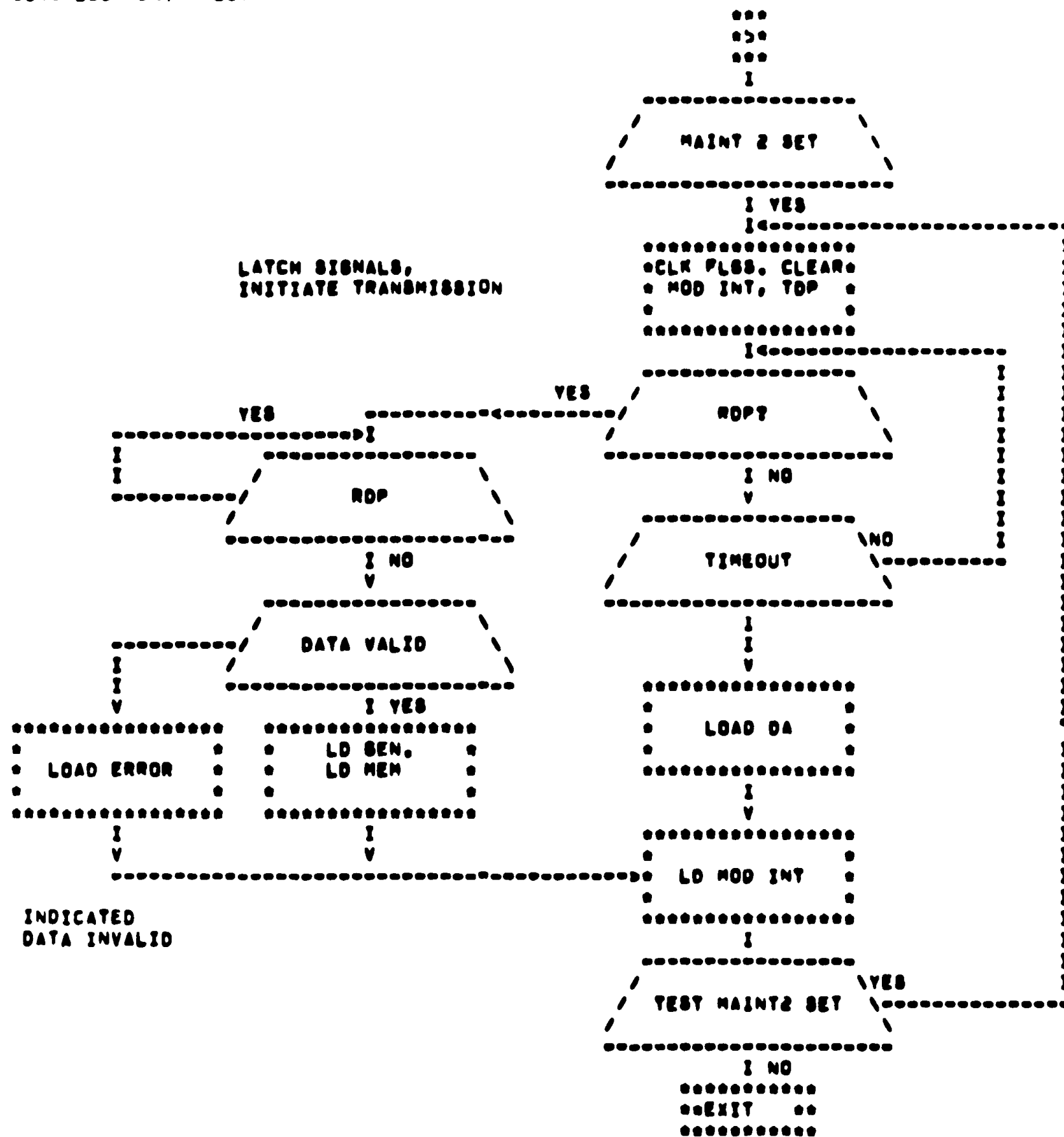
UART SHOULD BE EMPTY (I.E., TBMT)



Hi







9.2 M8096 MICRODIAGNOSTIC

SEC 0025

9.2.1 M8096 MICRODIAGNOSTIC STRUCTURE

THE M8096 MICRODIAGNOSTIC IS CONTROLLED BY MAINTENANCE BITS 0 AND 1. THESE BITS ARE PASTED TO M8096 WHICH THEN ENTERS THE MICRODIAGNOSTIC WHICH PERFORMS TWO BASIC CHECKS OF THE M8096. THESE CHECKS ARE TEST OF THE M8096 POLLING SCHEME AND THE ABILITY TO READ ALL MODULE ADDRESS AND CONTENTS OF THE FILE BOX.

9.2.2 M8096 MICRODIAGNOSTIC CODE

ICR11 DIAGNOSTIC CODE (M8096)

LOCATION	INSTRUCTION	CODE	COMMENT
0	NOP	1100XXXX	NOP
1	NOP	1100XXXX	NOP
2	TST DATA VALID	00000111	TEST DATA VALID
3	CJMP .+2	11110101	TRUE, CONT
4	JMP .-2	11100010	NO, HANG
5	TST MAINT	00001001	MAINT SET?
6	CJMP .+2	11111000	YES
7	CLR PC	1101XXXX	NO, RETURN
10	TST LMD	00000000	LMD SET? (INDICATING SYNC WITH PDP11 DIAGNOSTIC)
11	CJMP .+2	11111011	YES, CONT
12	JMP .+4	11101110	NO, JUST TOP
13	SET MODINT	01100001	SET MOD INTERRUPT
14	INC MOD ADDR	0101XXXX	INC INPUT ADDRESS
15	SEL M ADDR	00100000	SEL POLL ADDRESS
16	TDP	01110100	TRANS DATA PRESENT
17	NOP	1100XXXX	NOP
0	JMP .+2	11100010	SKIP CIF
1	CIF 14	10001100	CHANGE TO 14
2	TST DONE	00001000	DONE?
3	CJMP .+2	11110101	YES, CONT
4	JMP .-2	11100010	NO, WAIT
5	CLR MODINT	01100000	CLEAR MOD INT
6	TST DATA VALID	00000111	DATA VALID?
7	CJMP .+2	11111001	YES, CONT
10	JMP .-2	11100110	NO, WAIT
11	TST MAINT	00001001	MAINT SET?
12	CJMP .-11	11110001	YES, GO TO CIF
13	NOP	1100XXXX	NOP
14	NOP	1100XXXX	NOP
15	NOP	1100XXXX	NOP
16	NOP	1100XXXX	NOP
17	NOP	1100XXXX	NOP

0	TST RMD	00000001	RMD SET? (INDICATING SYNC WITH POP11 DIAGNOSTIC)
1	CJMP .+3	11110100	YES, JUST TDP
2	SET MOD INT	01100001	SET MOD INT
3	SEL L ADDR	00100001	SET INPUT ADDR
4	TDP	01110100	TRANS DATA PRESENT
5	TST DONE	00001000	DONE
6	CJMP .+2	11111000	YES, CONT
7	JMP .-2	11100101	NO, WAIT
10	CLR MODINT	01100000	CLR MOD INT
11	TST DATA VALID	00000111	DATA VALLID?
12	CJMP .+2	11111100	YES, CONT
13	JMP .-2	11101001	NO, WAIT
14	TST MAINT	00001001	MAINT SET?
15	CJMP .+2	11111111	YES, CONT
16	JMP .-16	11100000	NO, LOOP
17	NOP	1100XXXX	NOP
0	TDP	01110100	TRANS DATA PRESENT
1	TST DONE	00001000	DONE?
2	CJMP .+2	11110100	YES, CONT
3	JMP .-2	11100001	NO, WAIT
4	TST DATA VALID	00000111	DATA VALID?
5	CJMP .+2	11110111	YES, CONT
6	JMP .-2	11100100	NO, WAIT
7	TST MAINT	00001001	MAINT SET?
10	CJMP .-10	11110000	YES, HANG
11	TDP	01110100	NO, TRANS DATA PRES
12	TST DONE	00001000	DONE?
13	CJMP .+2	11111101	YES, CONT
14	JMP .-2	11101010	NO, WAIT
15	CLR PC	1101XXXX	RETURN
16			
17			

FLOW CHART

M8896 DIAGNOSTIC MICRO-FLOW

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PAGE 01	INPUT MODULE ADDRESS TEST
PAGE 03	OUTPUT MODULE ADDRESS WRAP AROUND
PAGE 04	EXIT ROUTINE

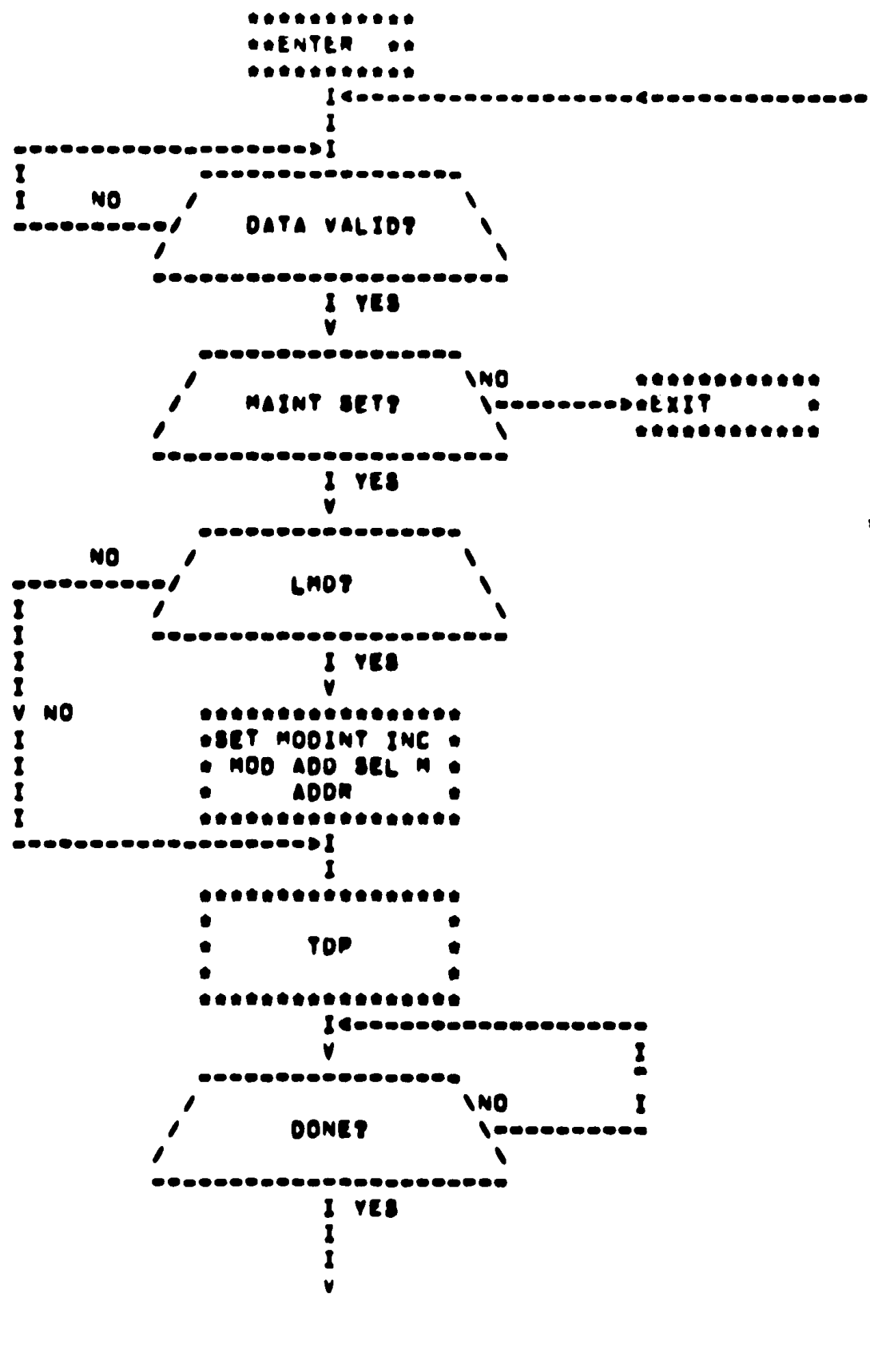
DON'T ALLOW ANY TESTS
TIL DATA IS VALID

MOD INT INDICATES THAT
M8896 PERFORMED MICRO-
DIAGNOSTIC

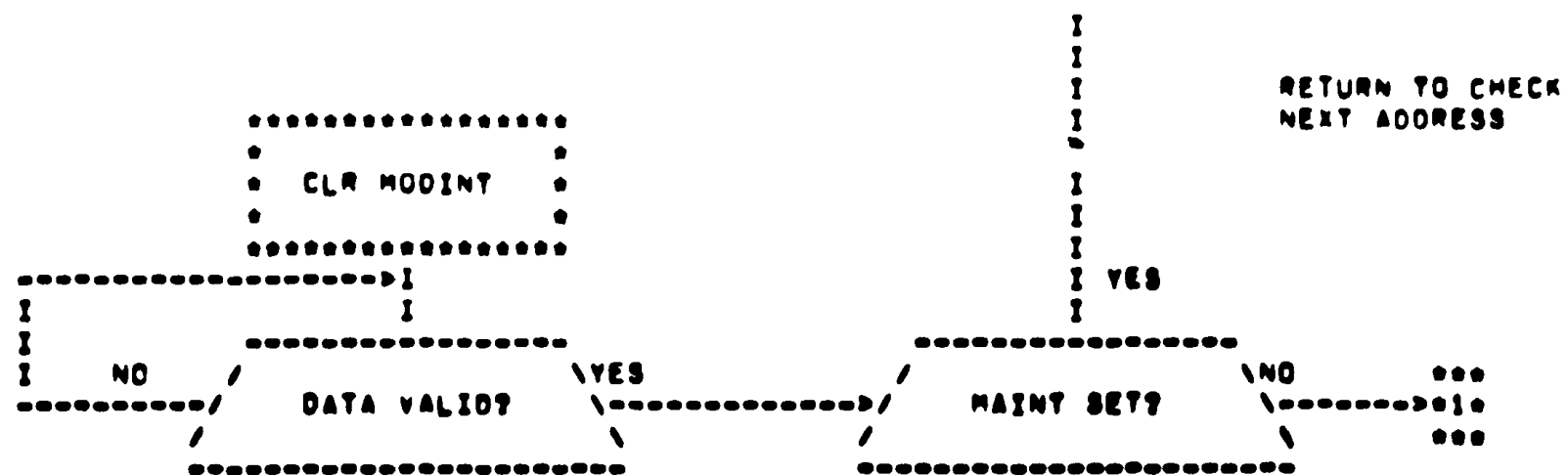
LMD IS USED TO
SYNC MICRO CODE
WITH DIAG. IN CPU
SINCE CPU IS SLOWER

DATA IS SET, SEND
BACK TO MASTER

WAIT FOR TRANSMISSION
TO FINISH BEFORE
CONTINUING



WAIT FOR VALID
DATA BEFORE TEST

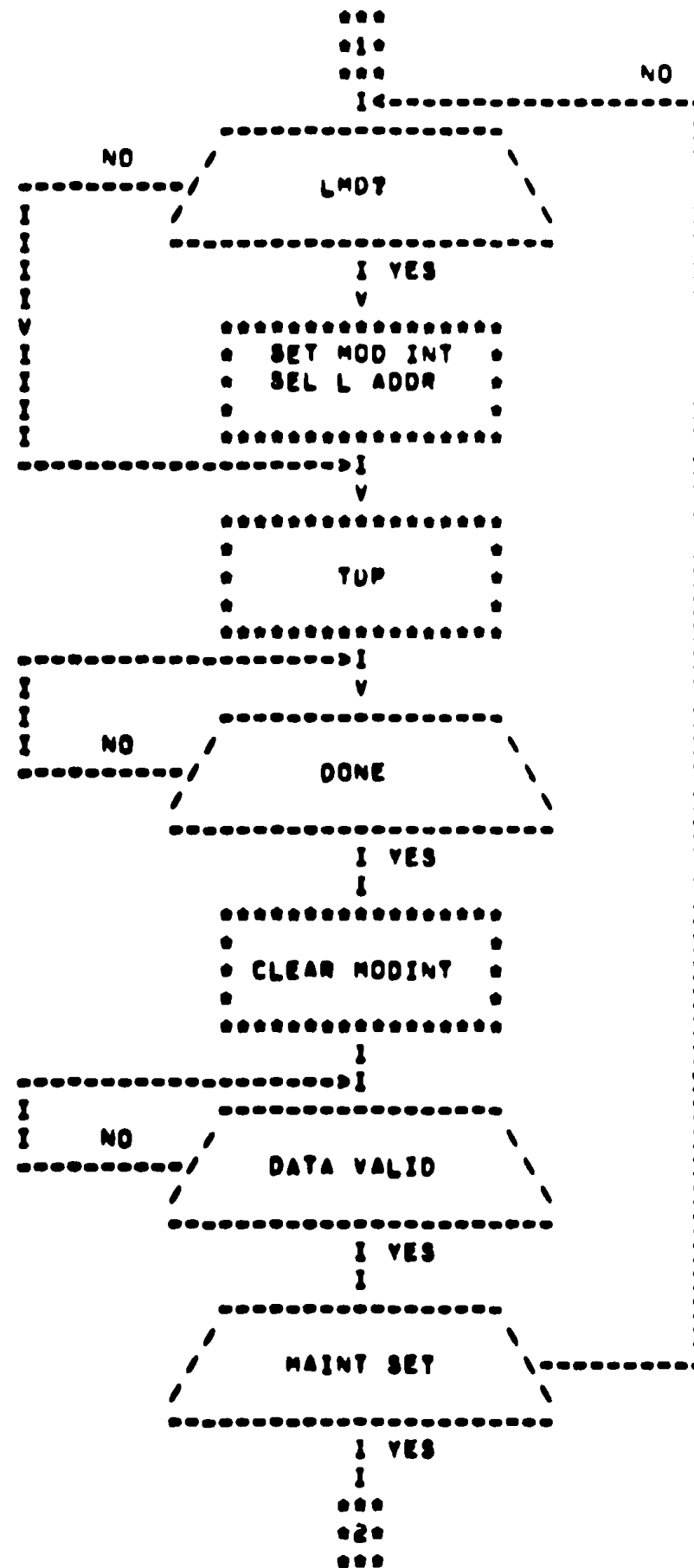


LMD IS USED TO SYNC
MICROCODE WITH CPU.

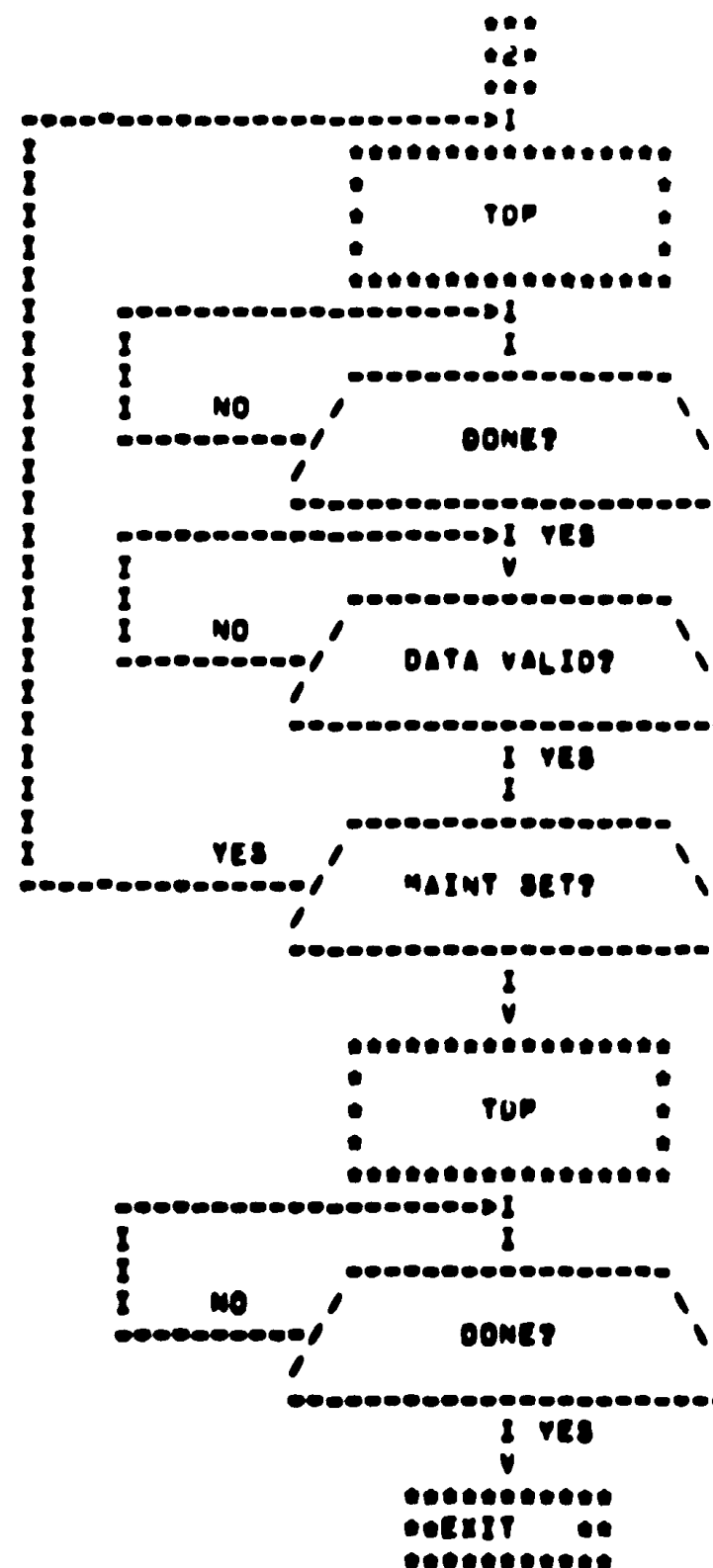
SEND BACK OUTPUT ADDRESS

WAIT FOR TRANSMISSION
COMPLETE

DATA MUST BE VALID
BEFORE TEST



RETURN FOR NEXT



DUMMY MESSAGE BACK

THIS EXIT SCHEME ALLOWS
SMOOTH RETURN TO M8896
MICROCODE

DUMMY MESSAGE

24	SWITCH REGISTER CONTROL SETTINGS
76	TRAP CATCHER
86	STARTING ADDRESS(ES)
114	BASIC DEFINITIONS
224	COMMON TAGS
263	ERROR POINTER TABLE
283	ERROR DEFINITIONS
656	ICSR/ICAR BIT EQUIVALENTS
711	ADDRESS MAP OF ICR
853	INITIAL SETUP FOR PROGRAM
972	TEST OF CSR
1111	ICR VECTOR ADDRESS AND PRIORITY LEVEL
1568	TEST OF MICRO-DIAGNOSTIC IN M8896
1862	TEST OF TTY LOOP BACK
2172	END OF PASS ROUTINE
2333	TEST OF M8896 MICRO-DIAGNOSTICS
2607	CHECK OF ICR11 ERROR GENERATION CAPABILITIES
3073	SCOPE LOOP ROUTINES
3184	TYPE ROUTINE
3283	ERROR HANDLER ROUTINE
3315	ERROR MESSAGE TIMEOUT ROUTINE
3367	BINARY TO OCTAL (ASCII) AND TYPE
3445	CONVERT BINARY TO DECIMAL AND TYPE ROUTINE
3513	POWER DOWN AND UP ROUTINES
3555	TRAP DECODER
3571	TRAP TABLE
3595	EXIT REQUEST ROUTINES(POWER FAIL AND CONTROL C)
3700	ICR-11 INTERRUPT SERVICE ROUTINE
3858	ASCII MESSAGES
3909	FIELD TEST LOAD ROUTINES/ABS LOADER

```

1      /
2      /ICR-11 DIAGNOSTIC
3      /
4
5      .TITLE  MAINDEC-11-DZIRA-A
6      /COPYRIGHT (C) 1975
7      /DIGITAL EQUIPMENT CORP.
8      /MAYNARD, MASS. 01754
9      /
10     /PROGRAM BY DAN DENNIS
11     /
12     /THIS PROGRAM WAS ASSEMBLED USING THE PDP-11 MAINDEC SYSMAC
13     /PACKAGE (MAINDEC-11-DZQAC-01), AUG 29, 1975.
14     /
15     000001  SYN=1
16     160000  SSNR=160000      /HALT ON ERROR, LOOP ON TEST, INHIBIT ERROR TYP0UT
17
18     .EVEN
19
20
21     .SBTTL  SWITCH REGISTER CONTROL SETTINGS
22
23     /SW00  - FILE
24
25     /SW01  - BOX
26
27     /SW02  - UNDER
28
29     /SW03  - TEST
30
31     /SW04  -0-      TEST ALL FILES ON SYSTEM
32     /        -1-      TEST FILE  SPECIFIED BY SW03-00
33
34     /SW05  -0-
35     /        -1-      LOOP ON TEST SPECIFIED BY SW07,06
36
37     /SW06  - TEST          SW07 = 0  SW06 = 0  CSR TEST
38     /        SW07 = 0  SW06 = 1  M0094 TEST
39     /SW07  - NUMBER        SW07 = 1  SW06 = 0  M0096 TEST
40     /        SW07 = 1  SW06 = 1  REMOTE TTY TEST
41
42     /SW08  -0-
43     /        -1-      LOOP ON M0096 DATA LOOP BACK TEST
44     /        (USES SW00-07 FOR DATA PATTERN)
45     /        NOTE:  SW06,07  SHOULD BE 0,1 OR 1,0
46     /        SW06,07 AS 0,0 WILL DEFAULT TO 0,1
47     /        SW06,07 AS 1,1 WILL DEFAULT TO 1,0
48
49     /SW09  -0-      HALT AT END OF PASS
50     /        -1-      LOOP ON DIAGNOSTIC
51
52     /SW10  -0-      PRINT ON LOCAL CONSOLE
53     /        -1-      PRINT ON LOCAL AND REMOTE TERMINAL
54
55     /SW11  -0-
56     /        -1-

```

```

57
58          JSW12  -0-    QUICK VERIFY
59          /      -1-    LONG TEST
60
61          JSW13  -0-
62          /      -1-    SUPPRESS ERROR TYPEOUT
63
64          JSW14  -0-
65          /      -1-    SCOPE LOOP
66
67          JSW15  -0-
68          /      -1-    HALT ON ERROR
69
70
71
72
73          .SBTTL  TRAP CATCHER
74
75          000000          .00
76          ;=ALL UNUSED LOCATIONS FROM 0 - 776 CONTAIN A ".+2,MALTY"
77          ;=SEQUENCE TO CATCH ILLEGAL TRAPS AND INTERRUPTS
78          ;=LOCATION 0 CONTAINS 0 TO CATCH IMPROPERLY LOADED VECTORS
79          000174          .0174
80          000174  000000          DISPREG1 ,WORD 0          ;/SOFTWARE DISPLAY REGISTER
81          000176  000000          SWREG1  ,WORD 0          ;/SOFTWARE SWITCH REGISTER
82
83          .SBTTL  STARTING ADDRESS(ES)
84          000200  000137  002070          JMP      00START          ;/JUMP TO STARTING ADDRESS OF PROGRAM
85
86
87          000204          .+204
88
89          000204  000137  005554          JMP      00TEST2
90
91          000210          .+210
92
93          000210  000137  003002          JMP      00START1
94
95          000214          .+214
96
97          000214  000137  011330          JMP      00TEST3
98
99          000220          .+220
100
101          000220  000137  007032          JMP      00TTVSTR
102
103          ;START IF POWER FAIL TEST WANTED
104
105          000224          .+224
106
107          000224  000137  002064          JMP      00SETPHF
108
109
110
111          .SBTTL  BASIC DEFINITIONS
112

```

113		1*INITIAL ADDRESS OF THE STACK POINTER *** 1100 ***
114	001100	STACK= 1100
115		.EQUIV EMT,ERROR 11BASIC DEFINITION OF ERROR CALL
116		.EQUIV IOT,SCOPE 11BASIC DEFINITION OF SCOPE CALL
117	177776	PS= 177776 11PROCESSOR STATUS WORD
118		.EQUIV PS,PS=
119	177774	SYKLMT= 177774 11STACK LIMIT REGISTER
120	177772	PIRQ= 177772 11PROGRAM INTERRUPT REQUEST REGISTER
121	177570	DSHR= 177570 11HARDWARE SWITCH REGISTER
122	177570	DDISP= 177570 11HARDWARE DISPLAY REGISTER
123		
124		1*GENERAL PURPOSE REGISTER DEFINITIONS
125	000000	R0= X0 11GENERAL REGISTER
126	000001	R1= X1 11GENERAL REGISTER
127	000002	R2= X2 11GENERAL REGISTER
128	000003	R3= X3 11GENERAL REGISTER
129	000004	R4= X4 11GENERAL REGISTER
130	000005	R5= X5 11GENERAL REGISTER
131	000006	R6= X6 11GENERAL REGISTER
132	000007	R7= X7 11GENERAL REGISTER
133		.EQUIV R6,SP 11STACK POINTER
134		.EQUIV R7,PC 11PROGRAM COUNTER
135		
136		1*PRIORITY LEVEL DEFINITIONS
137	000000	PR0= 0 11PRIORITY LEVEL 0
138	000040	PR1= 40 11PRIORITY LEVEL 1
139	000100	PR2= 100 11PRIORITY LEVEL 2
140	000140	PR3= 140 11PRIORITY LEVEL 3
141	000200	PR4= 200 11PRIORITY LEVEL 4
142	000240	PR5= 240 11PRIORITY LEVEL 5
143	000300	PR6= 300 11PRIORITY LEVEL 6
144	000340	PR7= 340 11PRIORITY LEVEL 7
145		
146		1*"SWITCH REGISTER" SWITCH DEFINITIONS
147	100000	SW15= 100000
148	040000	SW14= 40000
149	020000	SW13= 20000
150	010000	SW12= 10000
151	004000	SW11= 4000
152	002000	SW10= 2000
153	001000	SW09= 1000
154	000400	SW08= 400
155	000200	SW07= 200
156	000100	SW06= 100
157	000040	SW05= 40
158	000020	SW04= 20
159	000010	SW03= 10
160	000004	SW02= 4
161	000002	SW01= 2
162	000001	SW00= 1
163		.EQUIV SW09,SW9
164		.EQUIV SW08,SW8
165		.EQUIV SW07,SW7
166		.EQUIV SW06,SW6
167		.EQUIV SW05,SW5
168		.EQUIV SW04,SW4

169		.EQUIV	SW03,SW3	
170		.EQUIV	SW02,SW2	
171		.EQUIV	SW01,SW1	
172		.EQUIV	SW00,SW0	
173				
174		J=DATA	BIT DEFINITIONS (BIT00 TO BIT15)	
175	100000	BIT15=	100000	
176	040000	BIT14=	40000	
177	020000	BIT13=	20000	
178	010000	BIT12=	10000	
179	004000	BIT11=	4000	
180	002000	BIT10=	2000	
181	001000	BIT09=	1000	
182	000400	BIT08=	400	
183	000200	BIT07=	200	
184	000100	BIT06=	100	
185	000040	BIT05=	40	
186	000020	BIT04=	20	
187	000010	BIT03=	10	
188	000004	BIT02=	4	
189	000002	BIT01=	2	
190	000001	BIT00=	1	
191		.EQUIV	BIT09,BIT9	
192		.EQUIV	BIT08,BIT8	
193		.EQUIV	BIT07,BIT7	
194		.EQUIV	BIT06,BIT6	
195		.EQUIV	BIT05,BIT5	
196		.EQUIV	BIT04,BIT4	
197		.EQUIV	BIT03,BIT3	
198		.EQUIV	BIT02,BIT2	
199		.EQUIV	BIT01,BIT1	
200		.EQUIV	BIT00,BIT0	
201				
202		J=BASIC	"CPU" TRAP VECTOR ADDRESSES	
203	000004	ERRVEC=	4	TIME OUT AND OTHER ERRORS
204	000010	RESVEC=	10	RESERVED AND ILLEGAL INSTRUCTIONS
205	000014	TBITVEC=	14	"T" BIT
206	000014	TRTVEC=	14	TRACE TRAP
207	000014	BPTVEC=	14	BREAKPOINT TRAP (BPT)
208	000020	IOTVEC=	20	INPUT/OUTPUT TRAP (IOT) **SCOPE**
209	000024	PWRVEC=	24	POWER FAIL
210	000030	EMTVEC=	30	EMULATOR TRAP (EMT) **ERROR**
211	000034	TRAPVEC=	34	"TRAP" TRAP
212	000060	TKVEC=	60	TTY KEYBOARD VECTOR
213	000064	TPVEC=	64	TTY PRINTER VECTOR
214	000240	PIRQVEC=	240	PROGRAM INTERRUPT REQUEST VECTOR
215	000030	.	30	
216	000030		EDISPT	
217	000032		0	
218				

L3

```

258
259
260
261
262
263
264
265
266
267
268
269
270
271
272
273
274 001162
275
276
277
278
279
280
281
282
283
284 001162 022136
285 001164 000000
286 001166 000000
287 001170 000000
288
289
290
291 001172 022155
292 001174 000000
293 001176 000000
294 001200 000000
295
296
297
298 001202 022173
299 001204 000000
300 001206 000000
301 001210 000000
302
303
304
305 001212 022213
306 001214 000000
307 001216 000000
308 001220 000000
309
310
311
312 001222 022265
313 001224 000000

```

.SBTTL ERROR POINTER TABLE

THIS TABLE CONTAINS THE INFORMATION FOR EACH ERROR THAT CAN OCCUR.
THE INFORMATION IS OBTAINED BY USING THE INDEX NUMBER FOUND IN
LOCATION SITE#B. THIS NUMBER INDICATES WHICH ITEM IN THE TABLE IS PERTINENT.
NOTE1: IF SITE#B IS 0 THE ONLY PERTINENT DATA IS (SERRPC).
NOTE2: EACH ITEM IN THE TABLE CONTAINS 4 POINTERS EXPLAINED AS FOLLOWS:

EM	POINTS TO THE ERROR MESSAGE
DM	POINTS TO THE DATA HEADER
DT	POINTS TO THE DATA
DP	POINTS TO THE DATA FORMAT

SERRTD:

/

/

.SBTTL ERROR DEFINITIONS

ERROR 1 - OUTPUT IS BUSY (BIT 15) IS SET

EM1
0
0
0

ERROR 2 - RESET NOT READ AS 0

EM2
0
0
0

ERROR 3 - TTY ENABLE NOT SET

EM3
0
0
0

ERROR 4 - TTY ENABLE NOT CLEAR

EM4
0
0
0

ERROR 5 - TIMEOUT FLOP INOPERATIVE

EM5
0

314	001226	000000	0
315	001230	000000	0
316			
317			ERROR 6 - SEQUENCE COMPARE FLOP INOPERATIVE
318			
319	001232	022307	EM6
320	001234	000000	0
321	001236	000000	0
322	001240	000000	0
323			
324			ERROR 7 - TBMNT INTERRUPT DID NOT INTERRUPT
325			
326	001242	022327	EM7
327	001244	000000	0
328	001246	000000	0
329	001250	000000	0
330			
331			ERROR 10 - ERRONOUS CAUSING ERROR
332			
333	001252	022344	EM10
334	001254	000000	0
335	001256	000000	0
336	001260	000000	0
337			
338			ERROR 11 - ERROR BIT DID NOT INTERRUPT
339			
340	001262	022362	EM11
341	001264	000000	0
342	001266	000000	0
343	001270	000000	0
344			
345			ERROR 12 - MODULE INTERRUPT DID NOT CLEAR WITH RIF
346			
347	001272	022402	EM12
348	001274	000000	0
349	001276	000000	0
350	001300	000000	0
351			
352			ERROR 13 - ERROR INTERRUPT BIT DID NOT CLEAR WITH ADDRESSING ICAR
353			
354	001302	022422	EM13
355	001304	000000	0
356	001306	000000	0
357	001310	000000	0
358			
359			ERROR 14 - DATA VALID WAS TRUE WHEN IT WASN'T SUPPOSE TO BE
360			
361	001312	022442	EM14
362	001314	000000	0
363	001316	000000	0
364	001320	000000	0
365			
366			ERROR 15 - TBMNT WAS NOT SET
367			
368	001322	022462	EM15
369	001324	000000	0

370	001326	000000	0
371	001330	000000	0
372			
373			ERROR 16 - TBMT WOULD NOT INTERRUPT
374			
375	001332	022477	EM16
376	001334	000000	0
377	001336	000000	0
378	001340	000000	0
379			
380			ERROR 17 - BMT WILL NOT INTERRUPT
381			
382	001342	022513	EM17
383	001344	000000	0
384	001346	000000	0
385	001350	000000	0
386			
387			ERROR 20 - INPUT MODULE ADDRESS ERROR
388			
389	001352	023214	EM20
390	001354	025416	DM1
391	001356	025620	DT1
392	001360	000000	0
393			
394			ERROR 21 - MODULE INTERRUPT WILL NOT INTERRUPT
395			
396	001362	023233	EM21
397	001364	000000	0
398	001366	000000	0
399	001370	000000	0
400			
401			ERROR 22 - MODULE ADDRESS WRAP AROUND INCORRECT
402			
403	001372	023246	EM22
404	001374	025416	DM1
405	001376	025620	DT1
406	001400	000000	0
407			
408			ERROR 23 - TTY SEND RECEIVE ERROR
409			
410	001402	023266	EM23
411	001404	025416	DM1
412	001406	025620	DT1
413	001410	000000	0
414			
415			ERROR 24 - BMT INTERRUPTED WITH OUTPUT BUSY
416			
417	001412	023315	EM24
418	001414	000000	0
419	001416	000000	0
420	001420	000000	0
421			
422			ERROR 25 - NO INTERRUPT FROM MULTIPLE INTERRUPTS
423			
424	001422	023331	EM25
425	001424	000000	0

426	001426	000000	0
427	001430	000000	0
428			
429			ERROR 26 - MULTIPLE MODULE INTERRUPTS OCCURED
430			
431	001432	023346	EM26
432	001434	000000	0
433	001436	000000	0
434	001440	000000	0
435			
436			ERROR 27 - MODULE INTERRUPT ENABLE TOGGLE DID NOT CAUSE INTERRUPT
437			
438	001442	023363	EM27
439	001444	000000	0
440	001446	000000	0
441	001450	000000	0
442			
443			ERROR 30 - ERROR INTERRUPT ENABLE TOGGLE DID NOT CAUSE INTERRUPT
444			
445	001452	023363	EM30
446	001454	000000	0
447	001456	000000	0
448	001460	000000	0
449			
450			ERROR 31 - BMT INTERRUPT ENABLE TOGGLE DID NOT CAUSE INTERRUPT
451			
452	001462	023363	EM31
453	001464	000000	0
454	001466	000000	0
455	001470	000000	0
456			
457			ERROR 32 - OUTPUT NOT BUSY WITH MOV INSTRUCTION
458			
459	001472	023400	EM32
460	001474	000000	0
461	001476	000000	0
462	001500	000000	0
463			
464			ERROR 33 - DATA AVAILABLE NOT SET ON TTY TEST
465			
466	001502	023420	EM33
467	001504	000000	0
468	001506	000000	0
469	001510	000000	0
470			
471			ERROR 34 - MODULE INTERRUPT NOT POSTED
472			
473	001512	023233	EM34
474	001514	000000	0
475	001516	000000	0
476	001520	000000	0
477			
478			ERROR 35 - OUTPUT BUSY STUCK
479			
480	001522	023447	EM35
481	001524	000000	0

482	001526	000000	0
483	001530	000000	0
484			
485			ERROR 36 - TTY INTERRUPT SEND RECIEVE ERROR
486			
487	001532	023466	EM36
488	001534	025416	DM1
489	001536	025620	DT1
490	001540	000000	0
491			
492			ERROR 37 - FORCED MASTER ERROR FAILURE
493			
494	001542	023527	EM37
495	001544	000000	0
496	001546	000000	0
497	001550	000000	0
498			
499			ERROR 40 - FORCED MASTER ERROR DID NOT CAUSE TIMEOUT
500			
501	001552	023541	EM40
502	001554	000000	0
503	001556	000000	0
504	001560	000000	0
505			
506			ERROR 41 - SLAVE RESPONDED ON FORCED MASTER ERROR
507			
508	001562	023560	EM41
509	001564	000000	0
510	001566	000000	0
511	001570	000000	0
512			
513			ERROR 42 - FORCED SLAVE ERROR FAILURE
514			
515	001572	023601	EM42
516	001574	000000	0
517	001576	000000	0
518	001600	000000	0
519			
520			ERROR 43 - FORCED SLAVE CRC ERROR CAUSED TIMEOUT
521			
522	001602	023613	EM43
523	001604	000000	0
524	001606	000000	0
525	001610	000000	0
526			
527			ERROR 44 - FORCED SLAVE CRC ERROR DID NOT CAUSE ERROR
528			
529	001612	023627	EM44
530	001614	000000	0
531	001616	000000	0
532	001620	000000	0
533			
534			ERROR 45 - TIMEOUT ERROR IN M0090 LOOP TEST
535			
536	001622	023644	EM45
537	001624	000000	0

538	001626	000000	0
539	001630	000000	0
540			
541			ERROR 46 - DATA VALID WAS FALSE IN M0098 LOOP TEST
542			
543	001632	023662	EM46
544	001634	000000	0
545	001636	000000	0
546	001640	000000	0
547			
548			ERROR 47 - ICAR IN LOOP TEST WAS BAD
549			
550	001642	023703	EM47
551	001644	025532	DM3
552	001646	025642	DT3
553	001650	000000	0
554			
555			ERROR 50 - BAD DATA IN MODULE ADDRESS
556			
557	001652	023716	EM50
558	001654	025434	DM2
559	001656	025630	DT2
560	001660	000000	0
561			
562			ERROR 51 - TEN CONSECUTIVE LINE ERRORS IN INPUT MODULE RANGE TEST
563			
564	001662	023735	EM51
565	001664	000000	0
566	001666	000000	0
567	001670	000000	0
568			
569			ERROR 52 - TEN CONSECUTIVE LINE ERRORS IN MODULE WRAP AROUND TEST
570			
571	001672	024016	EM52
572	001674	000000	0
573	001676	000000	0
574	001700	000000	0
575			
576			ERROR 53 - TBMT WAS TRUE AFTER TTY TRANSMISSION
577			
578	001702	024105	EM53
579	001704	000000	0
580	001706	000000	0
581	001710	000000	0
582			
583			ERROR 54 - TBMT WAS FALSE AFTER TTY TRANSMISSION TIME
584			
585	001712	024124	EM54
586	001714	000000	0
587	001716	000000	0
588	001720	000000	0
589			
590			ERROR 55 - RIF BIT NOT SET
591			
592	001722	024142	EM55
593	001724	000000	0

594	001726	000000	0
595	001730	000000	0
596			
597			ERROR 56 - RIF BIT NOT CLEAN WITH MODULE
598			
599	001732	024162	EM56
600	001734	000000	0
601	001736	000000	0
602	001740	000000	0
603			
604			ERROR 57 - TTY INTERRUPT TEST MUNG
605			
606	001742	024176	EM57
607	001744	000000	0
608	001746	000000	0
609	001750	000000	0
610			
611			ERROR 60 - MAINTENANCE BIT 3 STUCK ON AFTER ISSUE
612			
613	001752	024226	EM60
614	001754	000000	0
615	001756	000000	0
616	001760	000000	0
617			
618			ERROR 61 - POWER FAIL BIT IS ON
619			
620	001762	024245	EM61
621	001764	000000	0
622	001766	000000	0
623	001770	000000	0
624			
625			ERROR 62 - ICR11 CDR IN ERROR
626			
627	001772	024265	EM62
628	001774	025416	DM1
629	001776	025620	DT1
630	002000	000000	0
631			ERROR 63 - UNEXPECTED MODULE INTERRUPT FROM ICR DURING REMOTE TTY TEST
632			
633	002002	024336	EM63
634	002004	000000	0
635	002006	000000	0
636	002010	000000	0
637			
638			ERROR 64 - SPURIOUS INTERRUPT IN REMOTE TTY TEST
639			
640	002012	024316	EM64
641	002014	000000	0
642	002016	000000	0
643	002020	000000	0
644			
645			
646			
647			
648			IR4 IS USED THROUGHOUT THIS TO KEEP TRACK OF WHICH FILE BOX IS UNDER
649			TEST. ALL PASS COUNTS, ERRORS AND LINE ERRORS ARE BUFFERED FOR EACH

```

650 JICR FILE BOX THAT IS BEING TESTED
651
652
653 .SOTTL ICSR/ICAR BIT EQUIVALENTS
654 /
655 100000 OUTBSY=BIT15 JICSR - OUTPUT BUSY
656 040000 MAINT3=BIT14 JICSR - MAINT BIT 03
657 020000 MAINT2=BIT13 JICSR - MAINT BIT 02
658 010000 ERROBIT=BIT12 JICSR - ERROR INTERRUPT
659 004000 MAINT1=BIT11 JICSR - MAINT BIT 01
660 002000 PWRFL=BIT10 JICSR - POWER FAIL INTERRUPT
661 001000 TBMTEN=BIT9 JICSR - TBMT INTERRUPT ENABLE
662 000400 MAINT0=BIT8 JICSR - MAINT BIT 00
663 000200 MODINT=BIT7 JICSR - MODULE INTERRUPT
664 000100 XRESET=BIT6 JICSR - RESET
665 000040 TTYEN=BIT5 JICSR - TTY ENABLE
666 000020 PWFEN=BIT4 JICSR - POWER FAIL INTERRUPT ENA.
667 000010 BMTEN=BIT3 JICSR - BMT INTERRUPT ENABLE
668 000004 MODEN=BIT2 JICSR - MODULE INTERRUPT ENABLE
669 000002 ERREN=BIT1 JICSR - ERROR INTERRUPT ENABLE
670 000001 XRIF=BIT0 JICSR - RESET INTERRUPT FLAG
671 022626 POP28P=022626 JPOP STACK
672 000000 PASCNT=0 JPASS COUNT OFFSET TO R4
673 000002 ERTOT=2 JERROR COUNT OFFSET TO R4
674 000004 ERRCNT=4 JLINE ERROR COUNT OFFSET TO R4
675 000006 PERNGH=6 JHIGH INPUT MODULE ADDRESS RANGE
676 000010 PERLOW=10 JLOW INPUT MODULE ADDRESS RANGE
677
678 /
679 /
680 100000 XTBMTE=BIT15 JICAR - TBMT
681 010000 DA=BIT12 JICAR - DA
682 /
683 /
684 /
685 /
686 002022 171000 ICMOD: 171000 JMODULE ADDRESS
687 002024 171776 ICSR: 171776 JICR CSR
688 002026 171774 ICAR: 171774 JICR ADDRESS REGISTER
689 002030 000000 ICRRUN: 0 JICR COUNT ON SYSTEM
690 002032 000000 PWFPLG: 0 JPWR FAIL TEST INDICATOR
691 002034 000000 ICRCNT: 0 JICR COUNT
692 002036 026502 MPR11K: 11506. JCONSTANT FOR 110 MSEC
693 002040 000474 MPR10K: 316. J1 MSEC
694 002042 000236 MPR500: 150. J500 USEC
695 002044 000077 MPR200: 63. J200 USEC
696 002046 000037 MPR100: 31. J100 USEC
697 002050 000006 MPR20: 6. J20 USEC
698 002052 000000 BOXCNT: 0
699 002054 000000 TENCNT: 0
700 002056 000000 SWOFF: 0 JSW9 PREVIOUSLY SET
701 002060 000000 SRTFF: 0 JPASS RUNNING FLOP
702 002062 000000 ERRFLR: 0
703
704 JSTART 224 BRINGS YOU HERE FOR TEST OF POWER FAIL
705

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706 002064 005237 002032      SETPHFI INC      PHFPLG      IPOWER FAIL TEST REQUIRED
707
708      .SRTTL ADDRESS MAP OF ICH
709
710
711      START:
712 002070 012706 001100      MOV      @SCHTAG,R6      IIFIRST LOCATION TO BE CLEARED
713 002074 005026      CLR      (R6)+      IICLEAR MEMORY LOCATION
714 002076 022706 001126      CMP      @BUDAT,R6      IIDONE?
715 002102 001374      BNE      ,=6      IIFLOOP BACK IF NO
716 002104 012706 001100      MOV      @STACK,SP      IIFSETUP THE STACK POINTER
717 002110 012737 015056 000030      MOV      @SEHNR,@SEHNTVEC IIFEMT VECTOR FOR ERROR ROUTINE
718 002116 012737 000340 000032      MOV      @340,@SEHNTVEC+2 IIFLEVEL 7
719 002124 012737 016154 000034      MOV      @STHAP,@STHAPVEC IITRAP VECTOR FOR TRAP CALLS
720 002132 012737 000340 000036      MOV      @340,@STHAPVEC+2 IIFLEVEL 7
721 002140 012737 016020 000024      MOV      @SPHNRN,@SPHNRVEC IIPOWER FAILURE VECTOR
722 002146 012737 000340 000026      MOV      @340,@SPHNRVEC+2 IIFLEVEL 7
723 002154 013746 000004      MOV      @64,-(SP)      IISAVE ERROR VECTOR
724 002160 013746 000006      MOV      @66,-(SP)
725 002164 012737 002200 000004      MOV      @64@,4      IIFSET UP TIME OUT VECTOR
726 002172 005777 176740      TST      @SWH      IIFTRY TO REFERENCE HARDWARE SWR
727 002176 000407      BR      @58      IIFBRANCH IF NO TIMEOUT TRAP OCCURS
728 002200 012737 000176 001136 6481      MOV      @SWREG,SWR      IIFPOINT TO SOFTWARE SWR
729 002206 012737 000174 001140      MOV      @DISPREG,DISPLAY IIFPOINT TO SOFTWARE DISPLAY REG
730 002214 022626      CMP      (SP)+,(SP)+      IIFRESTORE STACK
731 002216 012637 000006 6581      MOV      (SP)+,@66      IIFRESTORE ERROR VECTOR
732 002222 012637 000004      MOV      (SP)+,@64
733
734      IIFDETERMINE WHAT POP11 WE ARE RUNNING ON FOR TIMING CONSTANTS
735
736 002226 012737 000006 000004 FIND111 MOV      @6,@64
737 002234 012737 000002 000012      MOV      @RTI,@012
738 002242 000262      SEV
739 002244 074000      XOR      R0,R0
740 002246 102512      BVS      Z8
741 002250 013700 002050      MOV      MFR20,R0      IIMUST BE 11/40,11/45 RECAL CONSTANTS
742 002254 010037 014416      MOV      R0,FR20
743 002260 060037 014416      ADD      R0,FR2E
744 002264 060037 014416      ADD      R0,FR20
745 002270 013700 002046      MOV      MFR100,R0
746 002274 010037 014412      MOV      R0,FR100
747 002300 060037 014412      ADD      R0,FR100
748 002304 060037 014412      ADD      R0,FR100
749 002310 013700 002044      MOV      MFR200,R0
750 002314 010037 014414      MOV      R0,FR200
751 002320 060037 014414      ADD      R0,FR200
752 002324 060037 014414      ADD      R0,FR200
753 002330 013700 002042      MOV      MFR500,R0
754 002334 010037 014410      MOV      R0,FR500
755 002340 060037 014410      ADD      R0,FR500
756 002344 060037 014410      ADD      R0,FR500
757 002350 013700 002040      MOV      MFR10K,R0
758 002354 010037 014406      MOV      R0,FR1000
759 002360 060037 014406      ADD      R0,FR1000
760 002364 060037 014406      ADD      R0,FR1000
761 002370 013700 002036      MOV      MFR11K,R0

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762	002374	010037	014420		MOV	R0,FRM110		
763	002400	060037	014420		ADD	R0,FRM110		
764	002404	060037	014420		ADD	R0,FRM110		
765								
766					;NOW SEE IF RUNNING ON 11/70, IF SO CHANGE CONSTANTS BY 50X			
767								
768	002410	013746	000004		MOV	004,-(SP)	;SAVE TIMEOUT VECTOR	
769	002414	013746	000006		MOV	006,-(SP)	;SAVE	
770	002420	012737	002460	000004	MOV	038,004	;SETUP IF NOT 11/70	
771	002426	005737	177760		TST	00177760	;TRY TO ADDRESS 11/70 MEM SIZE REG	
772	002432	006337	014416		ASL	FR20	;SUCCESSFUL, SHIFT ALL CONSTANTS BY TWO	
773	002436	006337	014418		ASL	FR100		
774	002442	006337	014416		ASL	FR200		
775	002446	006337	014410		ASL	FR500		
776	002452	006337	014406		ASL	FR1000		
777	002456	000401			BR	,+4		
778	002460	022626		381	POP28P		;RESET STACK	
779	002462	012637	000006		MOV	(SP)+,006	;RESTORE 6	
780	002466	012637	000004		MOV	(SP)+,004	;RESTORE 4	
781	002472	000417			BR	18		
782	002474	013737	002050	014416	281	MOV	MFR20,FR20	;11/05 11/20 CONSTANTS
783	002502	013737	002044	014414		MOV	MFR200,FR200	
784	002510	013737	002046	014412		MOV	MFR100,FR100	
785	002516	013737	002040	014406		MOV	MFR10K,FR1000	
786	002524	013737	002036	014420		MOV	MFR11K,FRM110	
787	002532	005037	000012		181	CLR	0012	
788	002536	005037	014464			CLR	PRRMT1	
789	002542	005037	014462			CLR	PRRMT	;CLEAR PRINT TO REMOTE END
790	002546	104413	022656			TYPE,HEADER		
791	002552	012700	171774			MOV	0171774,R0	;START OF ICSR,ICAR
792	002556	005037	002034			CLR	ICRCNT	;CLEAR ICR COUNT
793	002562	005002				CLR	R2	
794	002564	005003				CLR	R3	;SET TABLE
795	002566	012737	002710	000004		MOV	0FILNFD,004	;SET TIMEOUT VECTOR
796	002574	005010				FILENFI CLR	(R0)	;TRY TO ADDRESS FILE
797								
798								
799								
800								
801	002576	010037	002024			MOV	R0,ICSR	
802	002602	062737	000002	002024		ADD	02,ICSR	;CREATE ICSR
803	002610	052777	000040	177206		BIS	040,0ICSR	;TRY TO SET BIT 5
804	002616	032777	000040	177200		BIS	040,0ICSR	;BIT 5 SET?
805	002624	001004				BNE	50	;1
806	002626	032777	020000	177170		BIS	020000,0ICSR	;IT DIDN'T WRITE BUT IT
807	002634	001026				BNE	FILNFD+2	;MAY BE BAD! CHECK BIT 13
808	002636	005237	002034		581	INC	ICRCNT	;INDICATE SUCCESS
809	002642	104413	022547			TYPE,FILE		
810	002646	010246				MOV	R2,-(SP)	;SAVE R2 FOR TYPEOUT
811								;FILE BOX
812	002650	104402				TYPOS		;GO TYPE--OCTAL ASCII
813	002652	002				.BYTE	2	;TYPE 2 DIGIT(S)
814	002653	000				.BYTE	0	;SUPPRESS LEADING ZEROS
815								;ICAR
816	002654	104413	022563			TYPE,ICARMO		
817	002660	010046				MOV	R0,-(SP)	;SAVE R0 FOR TYPEOUT

010	002662	104401		TYPOC		11GO TYPE--OCTAL ASCII(ALL DIGITS)
019	002664	104413	022572	TYPE,ICSHMD		
020						1ICSR
021	002670	062700	000002	ADD	#2,MB	
022	002674	010046		MOV	MB,-(SP)	11SAVE MB FOR TYPEOUT
023	002676	104401		TYPOC		11GO TYPE--OCTAL ASCII(ALL DIGITS)
024	002700	162700	000002	SUB	#2,MB	
025						
026						1ADDRESS
027	002704	005203		INC	M3	1INDICATE SUCCESS IN LIST
028	002706	000401		BR	,+4	1
029	002710	022626		FILNFD: POP2SP		1POP STACK
030	002712	006303		181 ASL	M3	1INDICATE NO ICR
031	002714	162700	000010	SUB	#10,MB	1UPDATE FOR NEW ICR
032	002720	005202		INC	M2	1INCREMENT FILE #
033	002722	022702	000014	CHP	#14,M2	1DONE?
034	002726	001322		BNE	FILFND	1NO
035	002730	010337	014436	MOV	M3,SYSHAP	1STORE FILE LIST
036	002734	104413	023010	TYPE,	STANMS	
037	002740	012737	000006 000004	MOV	#6,#04	1MOVE ,+2 BACK
038	002746	005737	002034	TST	ICRCNT	1ANY FILES FOUND
039	002752	001011		BNE	FILLST+2	
040	002754	005737	002052	GOOF: TST	BOXCNT	
041	002760	001006		BNE	CONST	
042	002762	104413	022601	TYPE,NOBOX		1BOX ASKED TO TEST DOES NOT EXIST
043	002766	000000		HALT		1HALT
044	002770	000137	002766	JMP	,+2	1
045						
046	002774	000000		FILLST: 0		1LIST FOR FILE INDICATION
047	002776			CONST:		
048	002776	104413	022000	TYPE,CRLF		
049						
050				.SBTTL	INITIAL SETUP FOR PROGRAM	
051						
052						
053						
054						
055						
056	003002	012706	001100	START: MOV	#STACK,SP	1SET STACK POINTER
057	003006	005037	002056	CLR	SW9FF	1CLEAR THAT SW9 IS SET
058	003012	032777	001000 176116	BIT	#SW9,#SWR	1TEST IF SW 9 IS SET
059	003020	001402		BEO	,+6	
060	003022	005237	002056	INC	SW9FF	1INDICATE PRESENCE OF SW 9
061				1		
062				1INITIAL CLEAR OF ALL FILE BOX(ES) INFORMATION I.E. PASS COUNTS, ERROR COUNTS		
063				1LINE ERROR COUNTS		
064						
065						
066	003026	012700	017210	MOV	#INFLST,MB	1BEGINNING OF BUFFER
067	003032	012701	000106	MOV	#70,,R1	1BUFFER LENGTH
068	003036	005020		CLR	(0)+	1CLEAR LOCATION IN BUFFER
069	003040	005301		DEC	M1	1DEC BUFFER LENGTH
070	003042	001375		BNE	,+4	1CONTINUE TILL DONE
071						
072						
073	003044	005037	017202	STARTA: CLR	TIMTRP	1CLEAR TIMEOUT INDICATOR

874	003050	005037	002060		CLR	SWTFF	IINDICATE FIRST BOX FOR PASS SUMMARY
875	003054	005037	017204		CLR	WRKFLP	IPRINT REMOTELY "TESTING"
876	003060	005037	014474		CLR	PRRFLP	IPOWER FAIL INDICATOR
877	003064	005037	002030		CLR	ICRRUN	
878	003070	012737	020000	014376	MOV	020000,XMASK	ISET UP MASK
879	003076	013737	014436	002774	MOV	SYSHAP,FILLST	ISET SYSTEM CONFIG.
880	003104	005037	014400		CLR	FILUTS	IFILE BOX UNDER TEST
881	003110	012704	017210		MOV	01NPLST,R4	IINITIAL ADDRESS OF INFORMATION BUFF
882	003114	012737	000015	014402	MOV	015,FILCNT	ISET MAXIMUM FILE TO 15(BASE 8)
883	003122	012737	171774	002026	MOV	0171774,ICAR	IINITIAL ICAR
884	003130	012737	171776	002024	MOV	0171776,ICSR	IINITIAL ICSR
885	003136	012737	171000	002022	MOV	0171000,ICMOD	IINITIAL MODULE ADDRESS
886							
887	003144	005037	002052		START2: CLR	BOXCNT	I CLEAR THAT BOXES EXIST
888	003150	005037	014426		CLR	MICFLP	I RUNNING MICRODIAGNOSTIC INDICATOR
889	003154	012737	000001	014454	MOV	01,PASLG	ISET FOR QUICK VERIFY
890	003162	032777	010000	175746	BIT	03W12,03WR	I LONG PASS WANTED
891	003170	001403			BEQ	28	I NO, THEN 28
892	003172	062737	000143	014454	ADD	099.,PASLG	I YES THEN SET LONG PASS
893							
894							I WRITE LOCATIONS "230-1000" WITH "+214", PC+2, IOT TRAP
895							I SINCE EACH PASS WILL OVER WRITE SOME LOCATIONS
896							
897	003200	012700	000230		20: MOV	0230,R0	
898	003204	012701	000232		MOV	0232,R1	
899	003210	010120			10: MOV	R1,(R0)+	
900	003212	012720	000004		MOV	04,(R0)+	
901	003216	022121			CMP	(R1)+,(R1)+	
902	003220	022700	001000		CMP	01000,R0	
903	003224	003371			SGT	18	
904	003226	012737	177777	014424	MOV	0-1,FIRST	ISET TO PRINT FILE BOX ID ONLY ON FIRST ERROR
905	003234	012737	000340	177776	MOV	0340,00PSW	
906							
907							
908							
909							
910	003242	032777	000020	175666	ONEBOX: BIT	03W4,03WR	I SINGLE BOX OR ALL TO BE TESTED?
911	003250	001430			BEQ	TEST1	I ALL THEN TEST1
912	003252	017700	175660		MOV	03WR,R0	I GET BOX TO BE TESTED
913	003256	017701	010000		MOV	010000,R1	I SET MASK TO FIRST BOX
914	003262	042700	177760		BIC	0177760,R0	I CLEAR ALL BUT BOX SWITCHES
915	003266	001412			BEQ	18	I FILE BOX 0, GO TEST
916	003270	020027	000015		CMP	R0,015	I IS BOX LEGAL
917	003274	002404			BLT	28	I YES, CONT AT 28
918	003276	104413	024533		TYPE,	NOEXIST	I BOX ASKED TO TEST DOES NOT EXIST
919	003302	000000			HALT		
920	003304	000776			BR	0-2	
921	003306	006201			20: ASR	R1	I SHIFT MASK RIGHT TIL BOX FOUND
922	003310	005300			DEC	R0	I HAS BOX BEEN FOUND YET
923	003312	001375			BNE	28	I NO, THEN KEEP LOOKING
924	003314	005037	002774		10: CLR	FILLST	I CLEAR SYSTEM CONFIGURATION SO AS TO
925	003320	050137	002774		BIS	R1,FILLST	I TO TEST ONLY BOX ON SYSTEM
926	003324	012737	000001	002034	MOV	01,ICRCNT	I SET ICRCNT TO ONE
927							
928							
929							

```

930 003332 012737 000340 177776 TEST11 MOV 0340,00PSW ;INHIBIT INTERRUPTS
931 003340 006237 014376 281 ASR XMASK ;ROTATE RIGHT TO FIND FILE BOX
932 003344 033737 014376 002774 BIT XMASK,FILLST ;FILE PRESENT
933 003352 001022 ONE 18 ;FILE PRESENT?
934 003354 162737 000010 002024 SUB 010,ICSR ;UPDATE ICSR
935 003362 162737 000010 002026 SUB 010,ICAR ;UPDATE ICAR
936 003370 062737 000040 002022 ADD 040,ICMOD ;UPDATE FILE BOX ADDRESS
937 003376 062704 000012 ADD 012,R4 ;MOVE INFORMATION POINTER
938 003402 005237 014400 INC FILUTS ;FILE UNDER TEST
939 003406 005337 014402 DEC FILCNT ;RUN OUT
940 003412 001352 ONE 28
941 003414 000137 002754 JMP GOOF
942 003420 000240 181 NOP
943 /
944 ;FILE BOX,ICAR,ICSR FOUND - START TEST
945 /
946 003422 005764 000000 TST PASCNT(4) ;DOING FIRST PASS FOR THIS FILE
947 003426 001402 BEQ .+6 ;PRINT "TESTING...."
948 003430 000137 004014 JMP VECTST ;NO, THEN JUST GET VECTOR
949 003434 012737 000001 002052 MOV 01,BOXCNT ;SET THAT BOX PRESENT
950 003442 005037 014402 CLR PRMT ;
951 003446 012737 000001 014464 MOV 01,PRMT1 ;PRINT TO REMOTE END
952 003454 104413 022630 TYPE,TESTIN ;PRINT "TESTING...."
953 003460 013700 014400 MOV FILUTS,R0
954 003464 010046 MOV R0,-(SP) ;SAVE R0 FOR TYPEOUT
955 ;FILE BOX
956 003466 104402 TYPOS ;GO TYPE--OCTAL ASCII
957 003470 002 .BYTE 2 ;TYPE 2 DIGIT(S)
958 003471 000 .BYTE 0 ;SUPPRESS LEADING ZEROS
959 003472 005000 CLR R0
960 003474 005300 DEC R0
961 003476 001376 BNE .-2
962
963
964
965
966 003500 000137 004014 JMP VECTST
967
968
969 .80TTL TEST OF CSR
970
971 003504 012737 017775 017774 LPTST1 MOV 00BUFREG-1,BUFHES ;RESET BUFFER FOR MESSAGES
972 003512 012737 000001 014464 MOV 01,PRMT1 ;ALLOW REMOTE PRINTING
973 003520 005037 014402 CLR PRMT
974
975 ;TEST OF POWER FAIL BIT
976
977 003524 012737 003524 014372 RWBIT1 MOV 0RWBIT,SCOLOP
978
979 003532 032777 002000 176264 BIT 0PHRFL,0ICSR ;IS PHR FAIL ON
980 003540 001401 BEQ 18
981
982 /
983 ///////////////////////////////////////////////////
984 /
985

```

```

986 003542 104061          ERROR  61          IPWR FALL BIT IN CSR IS SET
987
988
989
990
991
992 003544 104412          181      SCOPEX
993
994          /TEST THAT MAINT BIT 3 CLEARS ITSELF OUT
995
996 003546 012737 003546 014372 381      MOV      038,SCOLOP
997 003554 052777 040000 176242          DIS      MAINT3,0ICSR
998 003562 032777 040000 176234          BIT      MAINT3,0ICSR
999
1000 003570 001401          BEQ      28
1001
1002
1003
1004
1005
1006 003572 104060          ERROR  60          /MAINT3 BIT OF CSR SHOULD CLEAR CSR AND ITSELF OUT
1007          WHEN ISSUED
1008
1009
1010
1011
1012
1013 003574 104412          281      SCOPEX
1014
1015
1016 003576 005037 001124          MAINT3: CLR      $GDDAT          /SET EXPECTED
1017 003602 012737 003576 014372          MOV      MAINT3,SCOLOP /SET SCOPE
1018 003610 013700 014406          MOV      PR1000,R0
1019 003614 005777 176204          708:  TST      0ICSR          /IS OUTPUT BUSY?
1020 003620 100003          BPL      ,+10          /NO, CONT
1021 003622 005300          DEC      R0          /YES, INC TIMEOUT
1022 003624 001373          BNE      708
1023
1024 003626 104035          ERROR  35          /OUTPUT BUSY
1025
1026 003630 017700 176172          MOV      0ICAR,R0
1027
1028 003634 052777 040000 176162          DIS      MAINT3,0ICSR          /ISSUE MAINT RESET
1029 003642 017737 176156 001126          MOV      0ICAR,$GDDAT          /SEE IF CSR IS CLEAR AFTER RESET (MAINT3)
1030 003650 001401          BEQ      18
1031
1032
1033
1034
1035
1036 003652 104062          ERROR  62          /MAINT RESET DID NOT CLEAR ICR CSR
1037
1038
1039
1040
1041 003654 104412          181      SCOPEX

```

```

1042
1043
1044          ITEST THAT ALL ENABLES WILL SET AND CLEAR ICSR BITS
1045          INVOLVED ARE BITS 0,1,2,3,4,5,9
1046          I
1047
1048 003656 212700 003776 BITTST: MOV      0BITLST,R0      IGET LIST
1049 003662 012701 000007          MOV      07,H1      ISET LENGTH
1050 003666 012002          45: MOV      (0)+,R2      IGET BIT
1051 003670 012737 003670 014372 15: MOV      #18,SCLOOP    ISET SCOPE LOOP
1052 003676 005077 176122          CLR      0ICSR      ICLEAR CSR
1053 003702 005037 001124          CLR      8GDDAT      ICLEAR EXPECTED
1054 003706 005037 001126          CLR      80DDAT
1055 003712 050237 001124          BIS      R2,8GDDAT      ISET EXPECTED
1056 003716 050277 176102          BIS      R2,0ICSR      ISET BIT IN CSR
1057 003722 030277 176076          BIT      R2,0ICSR
1058 003726 001003          RNE      20
1059 003730 040237 001126          BIC      R2,80DDAT
1060          I
1061          I//////////
1062          I
1063
1064 003734 104062          ERROR 62          IBIT WAS NOT SET IN ICR CSR
1065
1066          I
1067          I//////////
1068          I
1069
1070 003736 104412          25: SCOPEX
1071
1072 003740 040237 001124          RIC      R2,8GDDAT      ICLEAR BIT
1073 003744 040277 176054          BIC      R2,0ICSR
1074 003750 030277 176050          BIT      R2,0ICSR      ITEST IF BIT IS CLEAR
1075 003754 001003          BEQ      38
1076 003756 050237 001126          BIS      R2,80DDAT
1077
1078          I
1079          I//////////
1080          I
1081
1082 003762 104062          ERROR 62          IBIT WAS NOT CLEAR IN ICR CSR
1083
1084          I
1085          I//////////
1086          I
1087
1088 003764 104412          35: SCOPEX
1089
1090 003766 005301          DEC      H1          IDONE TESTING
1091 003770 001336          BNE      48
1092
1093          I
1094
1095 003772 000137 004346          JMP      TENTST
1096
1097

```

```

1098
1099 003776 000001
1100 004000 000002
1101 004002 000004
1102 004004 000010
1103 004006 000020
1104 004010 000040
1105 004012 001000
1106
1107
1108
1109
1110
1111
1112
1113
1114 004014
1115
1116 004014 005237 014426 INC MICFLP
1117 004020 005037 004146 CLR CONTSW
1118 004024 012737 004150 000020 VECT1: MOV @VECFND,0020 ;MOVE VECTOR ROUTINE TO IOT TRAP
1119 004032 012737 000340 177776 MOV @340,00PSW ;PROCESS STATUS WORD - PRIOR = 7
1120 004040 012703 000007 MOV @7,R3 ;PRIORITY LEVEL IN R3
1121 004044 013700 014410 18: MOV FR300,R0
1122 004050 052777 000004 175746 B18 @MODEN,@ICSR ;MODULE INTERRUPT BIT
1123 004056 052777 020000 175740 B18 @MAINT2,@ICSR ;MAINTENANCE BIT 0
1124 004064 005300 DEC R0
1125 004066 001376 BNE .-2
1126 004070 052777 040000 175726 B18 @MAINT3,@ICSR ;NO INTERRUPT - RESET
1127 004076 005303 DEC R3 ;DECREMENT PRIORITY LEVEL
1128 004100 100404 BMI VECT2 ;
1129 004102 162737 000040 177776 SUB @40,00PSW
1130 004110 000755 BR 18 ;LOOP - LOWER PRIORITY
1131 004112 005737 004146 VECT2: TST CONTSW
1132 004116 001402 BEQ .+6
1133 004120 000137 004024 JMP VECT1
1134 004124 104413 022072 TYPE,VECMES ;TYPE THAT ICR WILL NOT INTERRUPT
1135 004130 000000 HALT ;HALT, CONT WILL FORCE SCOPE LOOP
1136 004132 104413 024775 TYPE, CONTOP
1137 004136 005237 004146 INC CONTSW ;SET CONTSW
1138 004142 000137 004024 JMP VECT1
1139
1140 004146 000000 CONTSW: 0
1141
1142
1143 ;VECTOR AND PRIORITY LEVEL FOUND, CONTINUE TESTING
1144
1145
1146
1147 004150 052777 040000 175646 VECFND: B18 @MAINT3,@ICSR
1148 004156 010337 017172 MOV R3,PRIVLV ;SAVE PRIORITY LEVEL FOUND
1149 004162 005203 INC R3 ;BUMP UP TO FORM BR LEVEL
1150 004164 011605 MOV (SP),R5 ;GET VECTOR ADDRESS
1151 004166 162705 000004 SUB @4,R5
1152 004172 010537 014404 MOV R5,VECTOR
1153 004176 022626 POP2SP ;POP STACK

```

1154	004200	022626		POP28P		
1155	004202	005764	000000	TST	PASCNT(4)	IDOING FIRST PAS FOR THIS FILE
1156	004206	001013		BNE	18	INO, CONT DON'T PRINT INFORMATION
1157	004210	104413	022004	TYPE,	VECHO	IPRINT VECTOR
1158	004214	010546		MOV	R3, -(SP)	ISAVE R3 FOR TYPEOUT
1159	004216	104401		TYPOC		IGO TYPE--OCTAL ASCII(ALL DIGITS)
1160	004220	104413	022034	TYPE,PRIOR		IPRIORITY
1161	004224	010346		MOV	R3, -(SP)	ISAVE R3 FOR TYPEOUT
1162	004226	104401		TYPOC		IGO TYPE--OCTAL ASCII(ALL DIGITS)
1163	004230	005001		CLR	R1	
1164	004232	005301		DEC	R1	
1165	004234	001376		BNE	.-2	
1166	004236	012737	000340 177776 181	MOV	0340,00PSW	IPRIORITY LEVEL = 7
1167						
1168	004244	012700	000230	VECREY: MOV	0230,R0	IWRITE OVER WITH .+2, HALT
1169	004250	012701	000232	MOV	0232,R1	
1170	004254	010120	988:	MOV	R1,(R0)+	
1171	004256	012720	000000	MOV	00,(R0)+	
1172	004262	022121		CMF	(R1)+,(R1)+	
1173	004264	022700	001000	CMF	01000,R0	
1174	004270	003371		BGT	988	
1175						
1176						
1177	004272	012777	016714 010104	MOV	0ICRSRV,0VECTOR	IMOVE ICR SERVICE ROUTINE
1178	004300	013700	014404	MOV	VECTOR,R0	IMOV
1179	004304	005720		TST	(R0)+	
1180	004306	012710	000340	MOV	0340,(R0)	IMOV 340 IN PSW PICKUP
1181	004312	006337	017172	ASL	PRILVL	
1182	004316	006337	017172	ASL	PRILVL	
1183	004322	006337	017172	ASL	PRILVL	
1184	004326	006337	017172	ASL	PRILVL	
1185	004332	006337	017172	ASL	PRILVL	IALIGN PRIORITY LEVEL
1186						
1187						
1188						
1189	004336	005037	014472	CLR	REMOTE	
1190	004342	000137	003504	JMP	LPTST	
1191						
1192						
1193						
1194						
1195						
1196	004346			TENTST:		
1197	004346	012700	017776	MOV	0BUFBEQ,R0	ICLEAR OUT ERROR STORAGE BUFFER
1198	004352	012720	100601	998: MOV	0100601,(0)+	
1199	004356	020027	021750	CMF	R0,0BUFEND	IDONE WITH BUFFER
1200	004362	001373		BNE	998	
1201	004364	005037	014462	CLR	PRRMT	IDON'T BUFFER
1202	004370	012737	000001 014464	MOV	01,PRRMT1	ISSET PRINT TO REMOTE END
1203	004376	005237	014426	INC	*ICFLP	
1204	004402	013737	014454 014456	MOV	PASLG,PASRUN	
1205		004410				
1206	004410	012737	004410 014372	LOOP1: MOV	078,8COLOP	
1207	004416	052777	000040 175400	BIS	0TTYEN,0ICSR	ISSET TTY ENABLE
1208	004424	032777	000040 175372	BIT	0TTYEN,0ICSR	ISIT SET
1209	004432	001001		BNE	48	

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DZIRAA.P11 ICR VECTOR ADDRESS AND PRIORITY LEVEL

SEQ 0056

1210

```

1211      /
1212      //////////////////////////////////////////////////////////////////
1213      /
1214 004434 104003      ERROR 3      JTTY ENABLE NOT SET
1215
1216      /
1217      //////////////////////////////////////////////////////////////////
1218      /
1219
1220 004436 104412      481      SCOPEX
1221
1222 004440 042777 000040 175356      BIC      0TTYEN,0ICSR      JCLEAR TTY ENABLE
1223 004446 032777 000040 175350      BIT      0TTYEN,0ICSR      JIS IT CLEAR
1224 004454 001401      BEQ      55
1225
1226      /
1227      //////////////////////////////////////////////////////////////////
1228      /
1229 004456 104004      ERROR 4      JTTY ENABLE NOT CLEAR
1230
1231      /
1232      //////////////////////////////////////////////////////////////////
1233      /
1234
1235 004460 104412      581      SCOPEX
1236
1237      /
1238 JTEST THAT OUTPUT BUSY IS CLEAR
1239      /
1240 004462 012737 004462 014372 681      MOV      068,SCOLOP
1241
1242 004470 005777 175330      TST      0ICSR      JCHECK BIT 15, OUTPUT BUSY
1243 004474 100001      BPL      18
1244
1245      /
1246      //////////////////////////////////////////////////////////////////
1247      /
1248 004476 104001      ERROR 1      JOUTPUT BUSY IS SET WITH NO PRIOR TRANSMISSION
1249
1250      /
1251      //////////////////////////////////////////////////////////////////
1252      /
1253
1254 004500 104412      181      SCOPEX
1255
1256 004502 052777 040000 175314      BIS      0MAINT3,0ICSR
1257      /
1258 JCHECK THAT RIF BIT WILL SET
1259      /
1260
1261 004510 012737 004510 014372 7381     MOV      0738,SCOLOP
1262 004516 052777 000001 175300      BIS      0XRIF,0ICSR
1263 004524 032777 000001 175272      BIT      0XRIF,0ICSR
1264 004532 001001      BNE      718
1265
1266      /

```

```

1267      ;
1268      ;
1269 004534 104055      ;          ERROR    55          ;RIF BIT NOT SET
1270      ;
1271      ;
1272      ;
1273      ;
1274 004536 104412      ;          SCOPEX
1275      ;
1276      ;
1277      ;CHECK THAT RIF WILL CLEAR WITH ADDRESSING MODULE
1278      ;
1279      ;
1280 004540 012737 004540 014372 7481  MOV      0748,SCOLOP
1281 004546 052777 000001 175250      BIS      0XRIF,0ICSR
1282 004554 017700 175242      MOV      0ICMOD,R0
1283 004560 032777 000001 175236      BIT      0XRIF,0ICSR
1284 004566 001401      BEQ      728
1285      ;
1286      ;
1287      ;
1288      ;
1289 004570 104056      ;          ERROR    56          ;RIF WOULD NOT CLEAR
1290      ;
1291      ;
1292      ;
1293      ;
1294 004572 104412      ;          SCOPEX
1295      ;
1296      ;
1297      ;
1298      ;CHECK THAT BMT WILL INTERRUPT WHEN ENABLED
1299      ;
1300      ;
1301 004574 104415      BMTTST: CKCNC
1302 004576 012737 004576 014372 1081  MOV      0108,SCOLOP      ;SET SCOPE LOOP
1303 004604 005037 017206      CLR      INTPLG      ;CLEAR INTERRUPT OCCURANCE FLAG
1304 004610 013700 014414      MOV      PR200,R0
1305 004614 005777 175204 7081  TST      0ICSR      ;IS OUTPUT BUSY
1306 004620 100003      BPL      0+10      ;IF NO CONT
1307 004622 005300      DEC      R0      ;INC WATCHDOG
1308 004624 001373      BNE      708      ;NOT TIMED OUT THEN 708
1309      ;
1310      ;
1311      ;
1312      ;
1313 004626 104035      ;          ERROR    35          ;OUTPUT BUSY IS STUCK ON
1314      ;
1315      ;
1316      ;
1317      ;
1318 004630 104412      ;          SCOPEX
1319      ;
1320 004632 013700 014416      MOV      PR20,R0
1321 004636 005077 175162      CLR      0ICSR      ;CLEAR ICR CSR
1322 004642 052777 000010 175154      BIS      0BMTEN,0ICSR      ;SET BMT INTERRUPT ENABLE
  
```

Address	Hex	Hex	Hex	Hex	Hex	Assembly	Comments
1323	004650	013737	017172	177776		MOV PRILVL,00PSW	FLOWER PRIORITY LEVEL
1324	004656	005300				DEC R0	
1325	004660	001376				BNE ,-2	
1326	004662	005737	017206			TST INTPLG	IF DID INTERRUPT OCCUR?
1327	004666	001001				BNE 93	IF YES, OKAY GO TO 93
1328							
1329							
1330							
1331							
1332	004670	104017				ERROR 17	IF BMT WOULD NOT INTERRUPT
1333							
1334							
1335							
1336							
1337	004672	104412				981 SCOPEX	IF SCOPE LOOP
1338							
1339							
1340							
1341							
1342							
1343							
1344	004674	042777	000010	175122	1481	BIC 00MTEN,0ICSR	IF CLEAR BMT ENABLE
1345	004702	052777	000001	175114		BIS 0XRIIP,0ICSR	IF SET RIF BIT
1346	004710	005777	175106			TST 0ICMOD	IF CLEAR RIF BIT
1347	004714	005037	017206			CLR INTPLG	IF CLEAR INT PLG
1348	004720	012737	004674	014372		MOV 0140,SCOLOP	
1349	004726	005077	175072			CLR 0ICSR	IF CLEAR ICSR
1350	004732	052777	000010	175064		BIS 00MTEN,0ICSR	IF SET BMT ENABLE
1351	004740	013737	017172	177776		MOV PRILVL,00PSW	IF LOWER PSW
1352	004746	013700	014416			MOV FR20,R0	
1353	004752	005300				DEC R0	
1354	004754	001376				BNE ,-2	
1355	004756	012737	000340	177776		MOV 0340,00PSW	
1356	004764	005737	017206			TST INTPLG	IF DID INTERRUPT OCCUR
1357	004770	001001				BNE 153	IF YES OK, GO TO 153
1358							
1359							
1360							
1361							
1362	004772	104031				ERROR 31	IF BMT WOULD NOT INTERRUPT
1363							
1364							
1365							
1366							
1367	004774	104412				1581 SCOPEX	
1368							
1369							
1370	004776	012737	004776	014372	881	MOV 000,SCOLOP	
1371							
1372	005004	032777	000100	175012		BIT 0XRESET,0ICSW	IF RESET IS READ AS "0"
1373	005012	001401				BEO 25	
1374							
1375							
1376							
1377							
1378	005014	104002				ERROR 2	IF RESET READ AS "1"

```

1379      /
1380      /
1381      /
1382      /
1383      005016    104412      281      SCOPEX
1384      /
1385      /THE FOLLOWING SECTION IS DEPENDENT ON THE MICROCODE FOR THE
1386      /INTERRUPTS. ICR CSW BIT 13 (MAINT2) IS THE KEY BIT THAT THE
1387      /MICROCODE FOLLOWS AS THE 11 CODE PROGRESSES
1388      /
1389      /
1390      /TEST THAT BOUNCING MODULE INTERRUPT ENABLE WILL CAUSE
1391      /ANOTHER INTERRUPT
1392      /
1393
1394      005020    012737    000001    01446A      MOV      $1,PRMT1      /ALLOW PRINT TO REMOTE END
1395      005026    012737    000001    014462      MOV      $1,PRMT      /BUFFER ERRORS THAT OCCUR
1396      005034    012737    005034    014372      INTST1:  MOV     @INTST,SCOLOP   /SET SCOPE LOOP
1397      005042    052777    040000    174754      B18       @MAINT3,@ICSR    /ISSUE MAINT RESET
1398      005050    005077    174750      CLR        @ICSR          /CLEAR ICR CSR
1399      005054    005037    017206      CLR        INTPLG         /
1400      005060    013737    017172    177776      MOV      PRILVL,$OPSW     /ALLOW INTERRUPTS
1401      005066    052777    000004    174730      B18       @MODEN,@ICSR    /SET MOD INT ENABLE
1402      005074    052777    020000    174722      B18       @MAINT2,@ICSR   /SET MAINT BIT TO START MICROCODE
1403      005102    013700    014410      MOV      PR$UE,R0
1404      005106    005300      DEC        R0
1405      005110    001376      ONE        -2
1406      005112    005737    017206      TST       INTPLG          /INTERRUPT OCCUR?
1407      005116    001001      ONE        10
1408
1409      /
1410      /
1411      /
1412      005120    104021      ERROR 21      /MODULE INTERRUPT WOULD NOT INTERRUPT
1413      /MODULE INTERRUPT SHOULD HAVE BEEN CAUSED
1414      /BY THE MICROCODE
1415
1416      /
1417      /
1418      /
1419
1420      005122    104412      181      SCOPEX
1421
1422      005124    023727    017206    000001      CMP      INTPLG,$1      /DID MULTIPLE INTERRUPTS OCCUR
1423      005132    001401      BEQ        28
1424
1425      /
1426      /
1427      /
1428      005134    104026      ERROR 26      /MODULE INTERRUPT OCCURED INDICATING BOJNCE
1429
1430      /
1431      /
1432      /
1433      005136    104412      281      SCOPEX
1434

```

```

1435      ;
1436      ;CHECK THAT TOGGING MOD EN W/O RIF DOES CAUSE INTERRUPT
1437      ;
1438
1439      005140 013700 014416      MOV      FR20,R0
1440      005144 005037 017206      CLR      INTPLG
1441      005150 042777 000004 174646  BIC      @MODEN,@ICSR      ;TOGGLE MODULE INTERRUPT ENABLE
1442      005156 052777 000004 174640  BIS      @MODEN,@ICSR
1443      005164 005300      DEC      R0
1444      005166 001376      BNE      ,=2
1445      005170 005737 017206      TST      INTPLG
1446      005174 001001      BNE      35
1447
1448      ;
1449      ;////////////////////////////////////
1450      ;
1451      005176 104027      ERROR 27      ;MODULE INTERRUPT DID NOT HAPPEN
1452
1453      ;
1454      ;////////////////////////////////////
1455      ;
1456      005200 104412      35:      SCOPEX
1457
1458      005202 042777 000004 174614  BIC      @MODEN,@ICSR
1459      005210 052777 000001 174606  BIS      @RIF,@ICSR      ;SET RIF BIT
1460      005216 005777 174600      TST      @ICMOD      ;CLEAR RIF BIT
1461      005222 052777 040000 174574  BIS      @MAINT3,@ICSR      ;INITIALIZE ICR CONTROLLER
1462      005230 005077 174570      CLR      @ICSR      ;EXIT MICROCODE
1463
1464      ;
1465      ;TEST OF INTERRUPT LOGIC WITH MULTIPLE INTERRUPTS
1466      ;BMT AND MODULE INTERRUPTS ARE USED FOR THIS TEST
1467      ;ONCE EITHER INTERRUPT OCCURS TOGGING EITHER ENABLE
1468      ;SHOULD CAUSE ANOTHER INTERRUPT
1469      ;MICROCODE IS USED IN THIS SECTION TO CAUSE INTERRUPTS
1470
1471      005234 012737 005234 014372 INTST1: MOV      @INTST1,SCOLOP      ;SET SCOPE LOOP
1472      005242 012737 000340 177776      MOV      @340,@SPSW      ;INHIBIT INTERRUPTS
1473      005250 005077 174550      CLR      @ICSR      ;CLEAR ICR CSR
1474      005254 013700 014416      MOV      FR20,R0
1475      005260 005777 174540      48:      TST      @ICSR      ;OUTPUT BUSY?
1476      005264 100003      BPL      58      ;NO, CONTINUE
1477      005266 005300      DEC      R0
1478      005270 001373      BNE      48
1479
1480      ;
1481      ;////////////////////////////////////
1482      ;
1483      005272 104035      ERROR 35      ;OUTPUT BUSY STUCK ON
1484
1485      ;
1486      ;////////////////////////////////////
1487      ;
1488      005274 104412      58:      SCOPEX
1489
1490      005276 052777 020000 174520  BIS      @MAINT2,@ICSR      ;SET MICROCODE MAINT BIT
1490      005304 005037 017206      CLR      INTPLG      ;CLEAR INTERRUPT OCCURANCE FLAG

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```

1491 005310 013737 017172 177776      MOV      PR1VL,00PSW      IALLOW INTERRUPTS
1492 005316 013700 014416              MOV      FR20,R0
1493 005322 052777 000014 174474      BIS      @MODEN+@MTEN,@ICSR      ISET BMT AND MODULE INTERRUPT ENABLES
1494 005330 005300              DEC      R0
1495 005332 001376              BNE      ,-2
1496 005334 005737 017206              TST      INTPLG      IDID INTERRUPT OCCUR?
1497 005340 001001              BNE      18
1498
1499
1500
1501
1502 005342 104025              ERROR 25      INO INTERRUPT WITH MULTIPLE ENABLES
1503
1504
1505
1506 005344 104412              18:      SCOPEX
1507
1508      IINTERUPT OCCURED! LET'S BOUNCE MOD ENABLE
1509      IN/O RIF
1510
1511 005346 013700 014416      MOV      FR20,R0
1512 005352 005037 017206      CLR      INTPLG
1513 005356 042777 000004 174440      BIC      @MODEN,@ICSR      IBOUNCE MODULE INTERRUPT ENABLE
1514 005364 052777 000004 174432      BIS      @MODEN,@ICSR
1515 005372 005300              DEC      R0
1516 005374 001376              BNE      ,-2
1517 005376 005737 017206              TST      INTPLG      IINTERUPT OCCUR?
1518 005402 001401              BEQ      28
1519
1520
1521
1522
1523 005404 104027              ERROR 27      IBOUNCED MODULE INTERRUPT ENABLE--NO INTERRUPT
1524
1525
1526
1527 005406 104412              28:      SCOPEX
1528
1529 005410 013700 014416      MOV      FR20,R0
1530 005414 005037 017206      CLR      INTPLG
1531 005420 042777 000010 174376      BIC      @MODEN+@MTEN,@ICSR      IBOUNCE BMT ENABLE
1532 005426 052777 000010 174370      BIS      @MTEN,@ICSR
1533 005434 005300              DEC      R0
1534 005436 001376              BNE      ,-2
1535 005440 005737 017206              TST      INTPLG      IINTERUPT OCCUR?
1536 005444 001001              BNE      38
1537
1538
1539
1540
1541 005446 104031              ERROR 31      IBOUNCED BMT INTERRUPT ENABLE - NO INTERRUPT
1542
1543
1544
1545 005450 104412              38:      SCOPEX
1546

```

```

1547 005452 042777 000014 174344 BIC 0MOUEN+0MTEN,0ICSR ICLR ENABLER
1548 005460 052777 000001 174336 BIR 0XRIF,0ICSR ISET RIF BIT
1549 005466 005777 174330 TST 0ICMOD ICLR RIF BIT
1550 005472 052777 040000 174324 BIR 0MAINT3,0ICSR IRESET MICROCODE IN CONTROLLER
1551 005500 005077 174320 CLR 0ICSR
1552 005504 005337 014456 DEC PASMUN IDEC PASS COUNT
1553 005510 001402 BEQ .+6 IDONE, .+6
1554 005512 000137 004410 JMP LOOP1 ILOOP BACK
1555 005516 032777 000040 173412 BIT 0SN5,0SWR ILOOP ON TEST SET
1556 005524 001002 BNE .+6 IYES, SEE IF THIS ONE
1557 005526 000137 011330 JMP TEST3 INO, CONT
1558 005532 017700 173400 MOV 0SNH,R0 IPICK UP SWR
1559 005536 042700 177477 BIC 0177477,R0 ICLR UNWANTED BITS
1560 005542 001002 BNE .+6 IRESULT 0, FOR TEST 0
1561 005544 000137 003504 JMP LPTST IYES, LOOP ON TEST 0
1562 005550 000137 011330 JMP TEST3
1563
1564
1565 .80TTL TEST OF MICRO-DIAGNOSTIC IN M8896
1566
1567 ITHIS SECTION USES THE MAINTENANCE MICROCODE OF THE REMOTE
1568 ICONTROL BOARD (M8896). M8896 IS RUNNING ITS OWN CODE.
1569 IMICROCODE IS KEYED ON ICR CSR BITS 8 AND 11
1570
1571
1572 005554 012737 000340 177776 TEST2: MOV 0340,00PSW IINHIBIT INTERRUPTS
1573 005562 000240 NOP
1574 005564 000240 NOP
1575 005566 000240 NOP
1576 005570 005037 014466 CLR REMPRES
1577 005574 005637 014452 CLR PRIIND
1578 005600 012737 000001 014462 MOV 01,PRMT IBUFFER ERRORS
1579 005606 012737 000001 014464 MOV 01,PRMT1 IDON'T ALLOW PRINT TO REMOTE
1580 005614 104419 CKCNC
1581 005616 013737 014454 014456 MOV PASLE,PASRUN
1582 005624 016437 000002 014442 MOV ERRTOT(4),ERTTL ISAVE PRESENT ERROR LEVEL FOR SCOPE PURPOSES
1583 005632 005037 014422 LOOP2=.
1584 005636 012737 000012 014460 CLR FLAG1 ICLR FIRST GOOD FLAG
1585 005644 012737 005644 014372 181 MOV 010,,ERRLOP
1586 005652 052777 004400 174144 958: MOV 0958,SCOLOP
1587 005660 012705 004000 BIR 0MAINT0+MAINT1,0ICSR ISET MAINT BITS
1588 005664 000240 MOV 04000,R5 ISET MAINT1 BIT IN R5
1589
1590
1591 ITEST FOR MODULE INPUT RANGE
1592
1593 005666 012701 000050 MOV 040,,R1
1594 005672 012702 017532 MOV 0ADDYAS,R2
1595 005676 013700 014410 628: MOV PR500,R0 ISET TIMEOUT FOR TESTING
1596 005702 005777 174116 TST 0ICSR IOF OUTPUT BUSY
1597 005706 100003 BPL .+10
1598 005710 005300 DEC R0
1599 005712 001373 BNE .-10
1600
1601
1602

```

```

1603
1604 205714 104035          /          ERROR 35          IOUT
1605
1606
1607 //////////////////////////////////////////////////////////////////
1608 /
1609 005716 013700 014410      MOV      PR50P,R0
1610 005722 010077 174074      MOV      R0,PICMOD
1611 005726 032777 000200 174070 608:  BIT      SMODINT,PICSR      ;MODINT INDICATES M8896 HAS EXECUTED PROPER CODE
1612 205734 001014          BNE      018
1613 205736 005300          DEC      R0          ;INC WATCHDOG
1614 005740 001372          BNE      608
1615
1616 005742 052777 000001 174054      B18      SXRIF,PICSR      ;SET RIF
1617 005750 005777 174046      TST      PICMOD      ;INITIATE RIF
1618 005754 040577 174044      BIC      RS,PICSR      ;CLEAR MAINT 1 TO STALL 96 MICROCODE
1619
1620 /
1621 //////////////////////////////////////////////////////////////////
1622 /
1623 005760 104034          /          ERROR 34          ;MODULE INTERRUPT NOT POSTED BY M8896
1624
1625 /
1626 //////////////////////////////////////////////////////////////////
1627 /
1628 005762 000137 006344          JMP      158
1629
1630
1631 005766 017722 174032      018:  MOV      PICSR,(2)+      ;STORE RESULTS
1632 005772 017722 174030      MOV      ICAR,(2)+
1633 005776 052777 000001 174020      B18      SXRIF,PICSR      ;SET RIF
1634 006004 005777 174012      TST      PICMOD      ;INITIATE RIF
1635 006010 005301          DEC      R1          ;DONE?
1636 006012 001331          BNE      628          ;LOOP
1637
1638 /
1639 /ALL READS ARE DONE LET'S CLEAR MAINT BIT AND VERIFY
1640 /THAT EVERY THING IS ALL DONE
1641 /
1642
1643 006014 040577 174004          BIC      RS,PICSR      ;CLEAR MAINT1 TO STALL 96 MICROCODE
1644 006020 012705 000046      MOV      030.,R5
1645 006024 012702 017542      MOV      @ADDTAB+10,R2
1646 006030 012200      008:  MOV      (2)+,R0          ;GET READ
1647 006032 032700 010000      BIT      ERRBIT,R0          ;ERR BIT SET
1648 006036 001402          BEQ      028          ;NO, CCNT
1649 006040 005264 000004          INC      ERRCNT(4)      ;YES, INDICATE IT
1650 006044 012200      028:  MOV      (2)+,R0          ;GET ICAR
1651 006046 005305          DEC      R5          ;DONE
1652 006050 001454          BEQ      118          ;YES, EXIT
1653
1654 006052 042700 177760          BIC      0177760,R0      ;CLEAR UNWANTED BITS
1655 006056 005737 014422      TST      FLAG1          ;FIRST GOOD READ?
1656 006062 001012          BNE      98          ;NO, THEN 98
1657 006064 010001          MOV      R0,R1          ;R1 IS FIRST ADDR
1658 006066 010037 001124          MOV      R0,@GDDAT      ;GDDAT IS LAST RECV ADDR

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1659	006072	010037	014432		MOV	R0,HGH	ISTORE AS HIGH VALUE
1660	006076	010037	014434		MOV	R0,LOW	ISTORE AS LOW VALUE
1661	006102	005237	014422		INC	FLAG1	ISSET FIRST RECEPTION FLAG
1662	006106	000431			BR	108	IBRANCH
1663							
1664	006110	020001		981	CMP	R0,R1	IS NEW READ TO FIRST READ
1665	006112	001433			BEQ	118	IYES, 118
1666	006114	020037	014434		CMP	R0,LOW	IS NEW LOW
1667	006120	002002			SGE	998	INO, DON'T SWAP
1668	006122	010037	014434		MOV	R0,LOW	IYES, SWAP
1669	006126	020037	014432	998:	CMP	R0,HGH	IS NEW HIGH
1670	006132	003402			BLE	988	INO, DON'T SWAP
1671	006134	010037	014432		MOV	R0,HGH	IYES, SWAP
1672	006140	010003		988:	MOV	R0,R3	ILETS CHECK IF GOOD
1673	006142	163703	001124		SUB	SGDDAT,R3	ITHAT POLL ADDRESSES
1674	006146	022703	000001		CMP	R1,R3	IOCCUR IN SUCCESSION
1675	006152	001407			BEQ	108	IYES THEN 108
1676	006154	005700			TST	R0	IREPEAT?
1677	006156	001405			BEQ	108	IYES
1678	006160	005237	001124		INC	SGDDAT	
1679	006164	010037	001126		MOV	R0,SGDDAT	
1680							
1681							
1682							
1683							
1684	006170	104020					
1685							
1686							
1687							
1688							
1689	006172	010037	001124		108:	MOV	R0,SGDDAT
1690	006176	000137	000030		968:	JMP	008
1691							
1692							
1693							
1694							
1695							
1696	006202	042777	004405	173614	118:	BIC	MAINT1+MAINT0+XRI+MODEN,0ICSR
1697	006210	005737	014466			TST	REMPRE
1698	006214	001043				BNE	128
1699	006216	005764	000000			TST	PASCNT(4)
1700	006222	001040				BNE	128
1701	006224	005737	014452			TST	PRIIND
1702	006230	001035				BNE	128
1703	006232	013702	014432		148:	MOV	HGH,R2
1704	006236	013701	014434			MOV	LOW,R1
1705	006242	013764	014432	000006		MOV	HGH,PERHGH(4)
1706	006250	013764	014434	000010		MOV	LOW,PERLOW(4)
1707	006256	005037	017200			CLR	WRKFLP
1708	006262	032777	020000	172646		BIT	0SW13,0SWR
1709	006270	001030				BNE	138
1710	006272	104413	023124			TYPE,	RESULT
1711	006276	010146				MOV	R1,-(SP)
1712	006300	104401				TYPOC	
1713	006302	104413	023173			TYPE,	FINMES
1714	006306	010246				MOV	R2,-(SP)

ERROR 20 INPUT ADDRESSES NOT IN SUCCESSION

MOVE THIS ADDRESS TO LOOP BACK

PRINT RESULTS OF TEST

MAINT1+MAINT0+XRI+MODEN,0ICSR ICLEAR MAINT BITS RIP MOD INT ENA

IREMOTE PRESENT

IYES CONT

IFIRST PASS

INO, DON'T PRINT RESULTS

IARE WE LOOPING ON THIS TEST

IYES, DON'T PRINT

ISET UP TO PRINT

ISAVE R1 FOR TYPEOUT

ISGO TYPE--OCTAL ASCII(ALL DIGITS)

ISAVE R2 FOR TYPEOUT

```

1715 206310 104401          TYP0C          ;IGO TYPE--OCTAL ASCII(ALL DIGITS)
1716 006312 104413 022000  TYPE,      CRLF
1717 006316 005237 014466  INC        REMPH
1718 006322 000413        OR          138
1719 006324 023764 014432 000006 125:  CMP      HIGH,PERHIGH(4)  ;RESULTS PRINTED ONLY
1720 206332 001337        RNE        148          ;IF DIFFERENT FROM 1ST PASS
1721 206334 023764 014434 000010  CMP      LOW,PERLOW(4)
1722 206342 001333        BNE        148
1723 006344 042777 004405 173452 155:  BIC      @MAINT0+MAINT1+XRIFF+MODEN,@ICSR
1724
1725          ;TEST OF ADDRESS WRAP AROUND CAPABILITY IN M8896
1726
1727
1728 206352 013737 002022 001124 138:  MOV      ICM00,SGDDAT  ;SET UP GOOD DATA
1729 006360 012702 000020        MOV      @20,R2          ;SET UP COUNT
1730 006364 012737 000012 014460 ADNR1:  MOV      @10,,ERRLOP
1731 006372 012737 006372 014372 ADNR2:  MOV      @ADNR2,SCOLOP
1732 006400 052777 000007 173416        BIS      @XRIFF+MODEN+ERREN,@ICSR
1733 006406 013700 014414        MOV      FR200,R0          ;SET TIMEOUT
1734 006412 005777 173406 708:  TST      @ICSH          ;IS OUTPUT BUSY
1735 006416 100003        BPL      .+10          ;IF NO CONT
1736 206420 005300        DEC      R0          ;INC WATCHDOG
1737 006422 001373        BNE      708          ;NOT TIMED OUT THEN 708
1738
1739          ;
1740          ;////////////////////////////////////////
1741          ;
1742 006424 104035          ERROR 35          ;OUTPUT BUSY ERROR
1743
1744          ;
1745          ;////////////////////////////////////////
1746          ;
1747 006426 052777 004000 173378        BIS      @MAINT1,@ICSH  ;SET MAINT BIT FOR NEXT TEST
1748 006434 000240        ADDWRP:  NOP
1749 006436 000240        NOP
1750 006440 000240        NOP
1751 006442 010077 172456        MOV      R2,@SGDDAT  ;SEND TRANSMISSION
1752 006446 013700 014410        MOV      FR500,R0          ;SET TIMEOUT
1753 006452 032777 000200 173344 608:  BIT      @MODINT,@ICSR  ;MOD INT KEYS M8896 HAS EXECUTED CODE
1754 006460 001003        BNE      .+10
1755 206462 005300        DEC      R0          ;INC WATCH DOG
1756 206464 201372        RNE      608
1757
1758          ;
1759          ;////////////////////////////////////////
1760          ;
1761 006466 104034          ERROR 34          ;MODULE INTERRUPT NOT POSTED BY M8896
1762
1763          ;
1764          ;////////////////////////////////////////
1765          ;
1766 006470 000240        NOP
1767 006472 013700 014414        MOV      FR200,R0          ;SET TIMEOUT
1768 006476 005777 173322 708:  TST      @ICSH          ;IS OUTPUT BUSY
1769 006502 100003        BPL      .+10          ;IF NO CONT
1770 006504 005300        DEC      R0          ;INC WATCHDOG
  
```

```

1771 006506 001373          BNE      703          ;NOT TIMED OUT THEN 703
1772
1773          ;
1774          ;////////////////////////////////////////
1775          ;
1776 006510 104035          ERROR    35          ;OUTPUT BUSY ON
1777
1778          ;
1779          ;////////////////////////////////////////
1780          ;
1781
1782 006512 032777 010000 173304      BIT      @RMBIT,@ICSR      ;ERROR SET
1783 006520 001415          BEQ      978
1784 006522 005264 000004          INC      ERRCNT(4)          ;INDICATE ERROR ON LINE
1785 006526 017700 173274          MOV      @ICAR,R0
1786 006532 042777 004000 173264      BIC      @MAINT1,@ICSR
1787 006540 013700 014410          MOV      @R500,R0
1788 006544 005300          DEC      R0
1789 006546 001376          BNE      ,+2
1790 006550 000137 006646          JMP      18
1791
1792
1793 006554 017737 173246 001126 978:  MOV      @ICAR,@BDDAT      ;READ ICAR
1794 006562 042777 004000 173234      BIC      @MAINT1,@ICSR      ;CLEAR MAINT BIT
1795 006570 013701 014410          MOV      @R500,R1
1796 006574 005301          DEC      R1
1797 006576 001376          BNE      ,+2
1798 006600 042737 177760 001126      BIC      @177760,@BDDAT      ;CLEAR BITS
1799 006606 006337 001126          ASL      @BDDAT          ;SHIFT LEFT TO ALIGN
1800 006612 053737 002022 001126      BIS      @CMOD,@BDDAT      ;BIT SET IN OFFSET
1801 006620 023737 001126 001124      CMP      @BDDAT,@BDDAT      ;DID WE GET RIGHT ADDRESS
1802 006626 001401          BEQ      28
1803
1804          ;
1805          ;////////////////////////////////////////
1806          ;
1807 006630 104022          ERROR    22          ;ADDRESS THAT CAME BACK IS NOT CORRECT
1808
1809          ;
1810          ;////////////////////////////////////////
1811          ;
1812
1813 006632 062737 000002 001124 28:  ADD      @2,@BDDAT      ;SETUP FOR NEXT ADDRESS
1814 006640 005302          DEC      R2
1815 006642 001250          BNE      @DWH1      ;LOOP BACK
1816
1817
1818 006644 000240          NOP
1819
1820          ;TEST IS DONE RELEASE
1821          ;
1822 006646 052777 000400 173150 18:  BIS      @MAINT0,@ICSR      ;SET MAINT BIT
1823 006654 013700 014410          MOV      @R500,R0
1824 006660 005300          DEC      R0
1825 006662 001376          BNE      ,+2
1826 006664 042777 000400 173132      BIC      @MAINT0,@ICSR      ;CLEAR MAINT BIT

```

1827	006672	013700	014410	MOV	FR500,R0	
1828	006676	005300		DEC	R0	
1829	006700	001376		BNE	.-2	
1830	006702	052777	040000 173114	BIS	SHAINY3,0ICSR	IRESET M8894
1831	006710	013700	014410	MOV	FR500,R0	
1832	006714	005300		DEC	R0	WAIT
1833	006716	001376		BNE	.-2	
1834	006720	017700	173102	MOV	0ICAR,R2	ICLEAR ANY ERRORS PENDING DUE TO RELEASE
1835						
1836	006724	005237	014452	INC	PRIND	
1837	006730	005337	014456	DEC	PASRUN	
1838	006734	001402		BEO	.+6	
1839	006736	000137	005632	JMP	LOOP2	
1840	006742	026437	000002 014442	CMP	ERRTOT(4),ERTTL	IS ERROR COUNT SAME AS WHEN WE ENTERED
1841	006750	001406		BEO	998	YES EXIT
1842	006752	032777	040000 172156	BIT	0SW14,0SWR	NO, THEN CHECK FOR POSSIBLE SCOPE LOOP
1843	006760	001402		BEO	.+6	
1844	006762	000137	005632	JMP	LOOP2	
1845	006766	032777	000040 172142 9981	BIT	0SW5,0SWR	LOOP ON TEST SET
1846	006774	001411		BEO	38	NO, CONT
1847	006776	017700	172134	MOV	0SWR,R0	GET SWR
1848	007002	042700	177477	BIC	0177477,R0	ICLEAR UNWANTED BITS
1849	007006	022700	000200	CMP	0200,R0	TEST 2 DESIRED
1850	007012	001002		BNE	.+6	
1851	007014	000137	005554	JMP	TEST2	
1852	007020	000240		NOP		
1853	007022	000240		NOP		
1854	007024	000240		NOP		
1855	007026	000137	007036	JMP	TTYTST	GO TO NEXT TEST
1856						
1857						
1858						
1859						
1860						
1861						
1862						
1863						
1864	007032	005064	000000	TTYSTR: CLR	PASCNT(4)	
1865	007036	032777	002000 172072	TTYTST: BIT	0SW10,0SWR	RUNNING REMOTELY?
1866	007044	001402		BEO	.+6	NO, DO TTY TEST
1867	007046	000137	010304	JMP	ENDPAS	YES, CAN'T DO TTY TEST
1868	007052	012706	001100	MOV	01100,SP	SET STACK
1869	007056	005037	014464	CLR	PRRMT1	DON'T ALLOW REMOTE TYPE
1870	007062	005037	014462	CLR	PRRMT	DON'T BUFFER ERRORS
1871	007066	005737	014472	TST	REMOTE	DID OPERATOR SET UP TEST WRONG?
1872	007072	001402		BEO	.+6	NO, CONT
1873	007074	000137	010304	JMP	ENDPAS	YES, DON'T DO TEST
1874	007100	005764	000000	TST	PASCNT(4)	FIRST PASS
1875	007104	001002		BNE	TTYL	YES, DON'T TYPE HEADER
1876	007106	104413		TYPE		
1877	007110	025035		TSTTTY		
1878		007112				
1879	007112	012737	000001 014466	MOV	01,REMPRE	
1880	007120	052777	000041 172676	BIS	0TTYEN+XRI,0ICSR	ICLEAR ANY PENDING DA
1881	007126	017700	172670	MOV	0ICMOD,R0	
1882	007132	005000		CLR	R0	WAIT

TTYL=.

1883	007134	005200			INC	R0	
1884	007136	001376			BNE	.-2	
1885	007140	017700	172656		MOV	01CMOD,R0	ICLEAR AGAIN
1886	007144	005000			CLR	R0	IWAIT
1887	007146	005200			INC	R0	
1888	007150	001376			BNE	.-2	
1889	007152	042777	000040	172644	BIC	0TTYEN,0ICSR	ICLEAR ENABLE
1890	007160	012737	000340	177776	188	MOV	0340,00PSW
1891	007166	005037	014460		CLR	ERRLOP	
1892	007172	005037	001124		588	CLR	SGDDAT
1893	007176	012737	007176	014372	388	MOV	038,SCOLOP
1894	007204	052777	001041	172612		BIS	0TTYEN+0TMTEN+0XRIIF,0ICSR
1895	007212	013700	014410			MOV	PR500,R0
1896	007216	032777	100000	172602		BIT	0XTMT,0ICAR
1897	007224	001003				BNE	.-10
1898	007226	005300				DEC	R0
1899	007230	001372				BNE	.-12
1900							
1901							
1902							
1903							
1904	007232	104015					
1905							
1906							
1907							
1908							
1909	007234	042777	001000	172562		BIC	0TMTEN,0ICSR
1910							
1911	007242	013700	014410			MOV	PR500,R0
1912	007246	005777	172552			TST	0ICSR
1913	007252	100003				BPL	.-10
1914	007254	005300				DEC	R0
1915	007256	001373				BNE	.-10
1916							
1917							
1918							
1919							
1920	007260	104035					
1921							
1922							
1923							
1924							
1925	007262	104411					
1926							
1927	007264	013777	001124	172530		MOV	SGDDAT,0ICMOD
1928	007272	052777	001000	172524		BIS	0TMTEN,0ICSR
1929	007300	032777	100000	172520		BIT	0XTMT,0ICAR
1930	007306	001401				REQ	968
1931							
1932							
1933							
1934							
1935	007310	104053					
1936							
1937							
1938							

1939						/			
1940	007312	104411			9681	SCOTTY			
1941	007314	042777	001000	172502		BIC	#TBM TEN, #ICSH		
1942	007322	017700	172474			MOV	#ICMOD, R0		
1943									
1944	007326	013700	014420			MOV	FRM110, R0		
1945	007332	032777	010000	172464	9981	BIT	#ERRBIT, #ICSH	/ERROR BIT SET?	
1946	007340	001402				BEO	978	IND, THEN 978	
1947	007342	005264	000004			INC	ERRCNT(4)	/YES, THEN ACCOUNT FOR IT	
1948	007346	032777	010000	172452	9781	BIT	#DA, #ICAR	/DA SET?	
1949	007354	001016				BNE	988		
1950	007356	005300				DEC	R0	/INC WATCHDOG	
1951	007360	001364				BNE	998		
1952									
1953	007362	005737	014460			TST	REMPRE	/IT MAY BE OPERATOR ERROR, DON'T FLAG	
1954	007366	001012				BNE	988+2	/YET	
1955	007370	005237	014460			INC	ERRLOP		
1956									
1957	007374	013700	014420			MOV	FRM110, R0	/SET TO DELAY 110 MSEC	
1958	007400	005300				DEC	R0	/TO ALLOW ANY LATE DA'S	
1959	007402	001376				BNE	.-2		
1960	007404	017700	172412			MOV	#ICMOD, R0	/CLEAR DA IF THERE	
1961									
1962									
1963						/			
1964						/	////////////////////////////////////		
1965						/			
1966	007410	104033					ERROR 33	/DA NOT SET IN TTY LOOP TEST	
1967									
1968						/			
1969						/	////////////////////////////////////		
1970						/			
1971									
1972	007412	104411			9681	SCOTTY			
1973									
1974									
1975	007414	052777	001000	172402		BIS	#TBM TEN, #ICSH		
1976	007422	032777	100000	172376		BIT	#XTBMT, #ICAR	/TRANSMITTER EMPTY?	
1977	007430	001001				BNE	958	/YES, CONT	
1978									
1979						/			
1980						/	////////////////////////////////////		
1981						/			
1982	007432	104054					ERROR 54	/TBM NOT SET	
1983									
1984						/			
1985						/	////////////////////////////////////		
1986						/			
1987	007434	104411			9581	SCOTTY			
1988									
1989	007436	042777	001000	172360		BIC	#TBM TEN, #ICSR		
1990	007444	052777	000001	172352		BIS	#XRI F, #ICSR	/SET RIF BIT	
1991	007452	017737	172344	001126		MOV	#ICMOD, #BDDAT	/READ TTY	
1992									
1993	007460	023737	001124	001126		CMP	#BDDAT, #BDDAT	/READ OKAY	
1994	007466	001425				BEO	28	/YES CONT?	

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1995
1996 007470 005737 001124      TST      3GDUAT      IIS GOOD DATA 27
1997 007474 001016      BNE      48          INO PRINT ERROR
1998 007476 023727 001126 000377  CMP      3GDUAT,0377 IIS BAD DATA 3777
1999 007504 001012      BNE      48          INO, PRINT ERROR
2000                                IGOOD DATA = 0    BAD DATA = 337
2001                                IAPPEARS LIKE PLUG OT IN END
2002                                IOPERATOR ERROR, TELL AND SKIP TEST
2003
2004 007506 005764 000000      TST      PASCNT(4)    IFIRST PASS7
2005 007512 001005      BNE      005          INO, SKIP MESSAGE
2006 007514 012737 000001 014472  MOV      01,REMOTE    ISET OPERATOR ERROR INDICATOR
2007 007522 104413 024567      TYPE,    NOPLUG       ITYPE MESSAGE
2008 007526 000137 010304 0081    JMP      ENDPAS       IEND PASS
2009
2010 007532 005737 014460 481    TST      ERRLOP
2011 007536 001001      BNE      28
2012
2013      /
2014      /
2015      /
2016 007540 104023      /
2017                                ERROR 23          IINCORRECT DATA REC'D FROM TTY
2018      /
2019      /
2020      /
2021 007542 104411 281    SCOTTY
2022 007544 005037 014466      CLR      REMPRES
2023
2024 007550 005237 001124      INC      3GDUAT
2025 007554 005037 014460      CLR      ERRLOP
2026 007560 032737 000400 001124  BIT      0400,3GDUAT  IDONE WHOLE TEST (0-377)
2027 007566 001003      BEQ      38          INO, CONT
2028 007570 000137 007574      JMP      TTYINT      IDO INTERRUPT TEST
2029
2030      /
2031      ITTY INTERRUPT TEST      TEST OF REMOTE TTY UNDER INTERRUPT CONTROL
2032      /
2033
2034 007574 005037 014426  TTYINT1 CLR      MICFLP      ICLEAR MICRO CODE FLOP
2035 007600 005037 017174      CLR      DATSNT      IDATA ON IT'S WAY FLOP
2036 007604 005237 017176      INC      TTYFLP      ISET TTY FLOP
2037 007610 005037 001124      CLR      3GDUAT      ICLEAR PATTERN
2038 007614 005077 172204      CLR      0ICSR      ICLEAR ICR CSR
2039 007620 052777 000040 172176  TTY21  BIS      0TTVEN,0ICSR  IENABLE TTY
2040 007626 013700 014410      MOV      PR500,R0
2041 007632 005777 172166      TST      0ICSR
2042 007636 100003      BPL      .+10
2043 007640 005300      DEC      R0
2044 007642 001373      BNE      .-10
2045
2046      /
2047      /
2048      /
2049 007644 104035      /
2050                                ERROR 35          IOUTPUT BUSY STUCK

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```

2051
2052
2053
2054 007646 013777 001124 172146      MOV      3GDUAT,PICMOD      ISTART THE TRANSMISSION
2055
2056 007654 052777 000000 172142 TTY11  BIS      0MODEN+ERRREN,PICSR      ISET INTERRUPT ENABLES
2057 007662 013737 017172 177776      MOV      PRILVL,00PSW      IALLOW INTERRUPTS
2058 007670 005000
2059 007672 032737 000400 001124 201  CLR      R0
2060 007700 001003      BIT      0400,3GDUAT      IDONE
2061 007702 005200      BNE      10
2062 007704 001372      INC      R0
2063      BNE      20
2064
2065
2066
2067 007706 104057      ERROR      57      ITTY TEST HUNG
2068
2069
2070
2071
2072      007710      TTYEND=.
2073
2074 007710 012737 000340 177776 101  MOV      0300,00PSW      IINHIBIT INTERRUPTS
2075 007716 005077 172102      CLR      0ICSR      ICLEAR CSR
2076 007722 005037 017176      CLR      TTYFLP      ICLEAR TTY FLAG
2077 007726 032777 000040 171202      BIT      0SWD,0SWR      IFLOOP ON TEST SW SET
2078 007734 001411      BEQ      50      INO, CONT
2079 007736 017700 171174      MOV      0SWR,R0 IGET SWR
2080 007742 042700 177477      BIC      0177477,R0
2081 007746 022700 000300      CMP      0300,R0
2082 007752 001002      BNE      .+6
2083 007754 000137 007112      JMP      TTYL      IYES
2084 007760 005764 000000 501  TST      PASCNT(4)      IFIRST PASS
2085 007764 001404      BEQ      60
2086 007766 005037 002032      CLR      PWRFLG      ICLEAR PWR FLG
2087 007772 000137 010304      JMP      ENDPAS
2088 007776 005737 002032 601  TST      PWRFLG      IPERFORM POWER FAIL TEST
2089 010002 001002      BNE      .+6      IYES, GO DO IT
2090 010004 000137 010304      JMP      ENDPAS      INO, PRINT END PASS
2091
2092      ITEST OF POWER FAIL BIT ON ICR
2093
2094 010010 104413 025245      TYPE,    PWRMS1      IPRINT "POWER DOWN.....
2095 010014 005037 014464      CLR      PWRMT1      IDONT PRINT TO REMOTE END
2096 010020 005037 014462      CLR      PWRMT
2097 010024 032777 002000 171772      BIT      0PWRFL,0ICSR      ISENSE POWER FAIL
2098 010032 001774      BEQ      .+6      IWAIT FOR IT
2099 010034 104413 025161      TYPE,    PWRMS      IPRINT POWER FAIL SENSED
2100 010040 052777 040000 171756      BIS      0MAINT3,0ICSR
2101 010046 104413 025332      TYPE,    PWRMS2
2102 010052 032777 010000 171744 401  BIT      0ERNBIT,0ICSR      IIS IT UP
2103 010060 001010      BNE      30      INO, CLEAR ERROR AND TRY AGAIN
2104 010062 052777 040000 171734      BIS      0MAINT3,0ICSR      ISYSTEM RESET
2105 010070 012737 000001 014464      MOV      01,PWRMT1      IALLOW REMOTE PRINT
2106 010076 000137 010304      JMP      ENDPAS      IGO DO END PRINT

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2107 010102 005777 171720
 2108 010106 013700 014414
 2109 010112 005300
 2110 010114 001376
 2111 010116 000755

381 TST P1CAN
 MOV FR200,RP
 DEC R0
 BNE -2
 BR 48

ICLEAR ERRCR

2112
 2113
 2114
 2115
 2116
 2117
 2118
 2119
 2120

ROUTINE TO PRINT SUMMARY

2121
 2122 010120 104413 024405
 2123 010124 013700 014400
 2124 010130 010046

SUMPRY: TYPE, RUNSUM
 MOV FILUTS,R0
 MOV R0,-(SP)

IGET FILE UNDER TEST
 IISAVE R0 FOR TYPEOUT
 IIFILE BOX
 IIGO TYPE--OCTAL ASCII
 IITYPE 2 DIGIT(S)
 IISUPPRESS LEADING ZEROS

2125
 2126 010132 104402
 2127 010134 002
 2128 010135 000
 2129 010136 104413 024436
 2130 010142 016401 000000
 2131 010146 016402 000002
 2132 010152 016403 000004
 2133 010156 005064 000000
 2134 010162 005064 000002
 2135 010166 005064 000004
 2136 010172 005237 002060
 2137 010176 104413 024442

TYPEOS
 .BYTE 2
 .BYTE 0
 TYPE, RUNCON
 MOV PASCNT(4),R1
 MOV ERRTOT(4),R2
 MOV ERRCNT(4),R3
 CLR PASCNT(4)
 CLR ERRTOT(4)
 CLR ERRCNT(4)
 INC BRTFF
 TYPE, PASHES
 MOV R1,-(SP)
 TYPEOS
 JSR PC,WATROU
 TYPE, ERHES
 MOV R2,-(SP)
 TYPEOS
 JSR PC,WATROU
 TYPE, TREHH
 MOV R3,-(SP)
 TYPEOS
 JSR PC,WATROU
 TYPE, CRLF
 TYPE, CRLF
 RTS PC

IINDICATE PAS REPORT START
 IISAVE R1 FOR TYPEOUT
 IIGO TYPE--DECIMAL ASCII WITH SIGN
 IISAVE R2 FOR TYPEOUT
 IIGO TYPE--DECIMAL ASCII WITH SIGN
 IISAVE R3 FOR TYPEOUT
 IIGO TYPE--DECIMAL ASCII WITH SIGN

2138 010202 010146
 2139 010204 104404
 2140 010206 004737 010254
 2141 010212 104413 024463
 2142 010216 010246
 2143 010220 104404
 2144 010222 004737 010254
 2145 010226 104413 024507
 2146 010232 010346
 2147 010234 104404
 2148 010236 004737 010254
 2149 010242 104413 022000
 2150 010246 104413 022000
 2151 010252 000207

ROUTINE TO WAIT BETWEEN DISPLAYING RUN SUMMARY

2152
 2153
 2154
 2155
 2156 010254 032777 002000 170654
 2157 010262 001407
 2158 010264 012700 000010
 2159 010270 005001
 2160 010272 005301
 2161 010274 001376
 2162 010276 005300

WATROU: BIT 0SW10,0SWH
 BEQ 28
 MOV 010,R0
 CLR R1
 181 DEC R1
 BNE -2
 DEC R0

2163	010300	001374			BNE	15	
2164	010302	000207		251	RTS	PC	
2165							
2166							
2167							
2168							
2169							
2170							
2171							
2172							
2173	010304	004737	010720		ENDPAS1	JSR	PC,PRTHES
2174	010310	005264	000000			INC	PASCNT(4)
2175	010314	005037	014462			CLR	PRRMT
2176	010320	012737	000001	014464		MOV	01,PRRMT1
2177	010326	032777	000020	170602	181	BIT	0SW4,0SWR
2178	010334	001502				BEO	SYSTST
2179		010336			ENDPS10		
2180	010336	032777	001000	170572		BIT	0SW9,0SWR
2181	010344	001440				BEO	PRYSUM
2182	010346	032777	002000	170562		BIT	0SW10,0SWR
2183	010354	001432				BEO	28
2184	010356	005737	017204			TST	WRKFLP
2185	010362	001002				BNE	38
2186	010364	104413	025146			TYPE,	WRKHE3
2187	010370	032777	010000	170540	381	BIT	0SW12,0SWR
2188	010376	001404				BEO	58
2189	010400	104413	025146			TYPE,	WRKHE3
2190	010404	000137	003504			JMP	LPTST
2191	010410	005237	017204		581	INC	WRKFLP
2192	010414	112737	000216	017200		MOVB	0210,BLINK
2193	010422	032737	000001	017204		BIT	01,WRKFLP
2194	010430	001402				BEO	48
2195	010432	005237	017200			INC	BLINK
2196	010436	104413	017200		481	TYPE,	BLINK
2197	010442	000137	003504		281	JMP	LPTST
2198	010446	004737	010120		PRYSUM1	JSR	PC,SUMPRT
2199	010452	000240			WAIT21	NOP	
2200	010454	012777	011116	003722		MOV	0ICMNT,0VECTOR
2201	010462	012737	011316	000060		MOV	0TTYMT,0060
2202	010470	052777	000040	171326		BIS	0TTYEN,0ICSR
2203	010476	017700	171320			MOV	0ICMOD,00
2204	010502	042777	000040	171314		BIC	0TTYEN,0ICSR
2205	010510	104413	024736			TYPE,	WAITIN
2206	010514	052777	000026	171302	WAIT11	BIS	0ERRN+MODEN+PWFEN,0ICSR
2207	010522	052777	000100	170412		BIS	0100,0STKS
2208	010530	005037	177776			CLR	00PSW
2209	010534	000001				WAIT	
2210	010536	000000				HALT	
2211	010540	000776				OR	0-2
2212	010542	022737	000001	002034	SYSTST1	CMP	01,ICRCNT
2213	010550	001002				BNE	18
2214	010552	000137	010336			JMP	ENDPS1
2215	010556	032777	001000	170352	181	BIT	0SW9,0SWR
2216	010564	001013				BNE	28
2217	010566	005737	002056			TST	0W0FF
2218	010572	001406				BEO	58

.SBTTL END OF PASS ROUTINE

I

PRINT ANY ERRORS BUFFERED
 INC PASS COUNT
 ALLOW PRINT TO REMOTE TTY
 TESTING ONE FILE BOX?
 NO, THEN CHECK ENTIRE SYSTEM

LOOP ON DIAGNOSTIC
 NO, THEN PRINT SUMMARY
 REMOTE TTY REQUESTED
 NO, THEN GO TO 28
 IS "TESTING" DISPLAYED
 YES, THEN GO FLASH IT
 PRINT TESTING

BLINK WORKING IF RT02
 IF NOT SEND NULLS

LOOP
 PRINT SUMMARY

SET UP FOR ICR TTY AND
 CONSOLE TTY INTERRUPTS,

ALLOW ICR INTERRUPTS
 ALLOW TTY INTERRUPTS
 CLEAR PSW

ONE BOX ON SYSTEM
 NO, MORE THEN 18

LOOPING
 YES DO NOT PRINT SUMMARY
 WAS SW 9 EVER SET
 NO, ALLOW PRINT

2219	010574	005737	002030			TST	ICRHUN		IFIRST SUMMARY
2220	010600	001403				BEQ	38		IYES, ALLOW PRINT
2221	010602	005737	002060			TST	8HTFP		IIN MIDDLE OF BOXES
2222	010606	001402				BEQ	28		IYES, DONT PRINT YET
2223	010610	004737	010120	581		JSR	PC,SUMPRT		IPRINT SUMMARY FOR THIS BOX
2224	010614	005237	002030	281		INC	ICRHUN		IINC RUN COUNT
2225	010620	023737	002030	002034		CMP	ICRRUN,ICRCNT		IDONE ALL BOXES
2226	010626	001421				BEQ	38		
2227	010630	062737	000040	002022		ADD	040,ICMOD		ISET TO NEXT FILE BOX MODULE
2228	010636	162737	000010	002024		SUB	010,ICSR		ISET TO NEXT ICR CSR
2229	010644	162737	000010	002026		SUB	010,ICAR		ISET TO NEXT ICR ADDR BUFFER
2230	010652	062704	000012			ADD	012,R4		IMOVE FILE BOX ID POINTER
2231	010656	005337	014402			DEC	FILCNT		IDECREASE FILE COUNT
2232	010662	005237	014400			INC	FILUTS		IBUMP FILE UNDER TEST
2233	010666	000137	003144			JMP	START2		
2234	010672	032777	001000	170236	381	BIT	08W9,08WR		ILOOP SWITCH SET
2235	010700	001005				BNE	48		IYES, CONT
2236	010702	005764	000000			TST	PASCNT(4)		IPASS COUNT 0, INDICATING PRINT
2237	010706	001002				BNE	.+6		INO, THEN FORCE LOOP
2238	010710	000137	010452			JMP	WAIT2		INO, SET UP TO LOAD OR RERUN
2239	010714	000137	003044	481		JMP	STANTA		ILOOP ON DIAGNOSTIC
2240									
2241									
2242									
2243									
2244									
2245									
2246									
2247									
2248									
2249	010720	032777	002000	170210	PRTHES1	BIT	00110,08WR		IREMOTE REQUESTED
2250	010726	001001				BNE	.+4		IYES, CONT
2251	010730	000207			181	RTS	PC		INO, EXIT
2252	010732	012700	017776			MOV	00UF0EG,R0		ISET UP START
2253	010736	022710	100601			CMP	0100601,(0)		IANYTHING THERE
2254	010742	001772				BEQ	18		INO, EXIT
2255									
2256	010744	052777	001040	171052	281	BIS	0TTYEN+Y0MTEN,0ICSR		IThis IS JUST A SIMPLE
2257	010752	032777	010000	171046		BIT	0DA,0ICAR		ITYPE ROUTINE TO THE ICR TTY
2258	010760	001407				BEQ	78		
2259	010762	017702	171034			MOV	0ICMOD,R2		
2260	010766	020227	000203			CMP	R2,02R3		
2261	010772	001002				BNE	.+6		
2262	010774	000137	016270			JMP	XCKPW1		
2263	011000	013702	014420	781		MOV	FRM110,R2		
2264	011004	032777	100000	171014	581	BIT	0XT0MT,0ICAR		
2265	011012	001004				BNE	68		
2266	011014	005302				DEC	R2		
2267	011016	001372				BNE	58		
2268	011020	000137	016270			JMP	XCKPW1		
2269	011024	042777	001000	170772	681	BIC	0T0MTEN,0ICSR		
2270	011032	112001				MOV0	(0)+,R1		
2271	011034	010177	170762			MOV	R1,0ICMOD		
2272	011040	121027	000015			CMP0	(0),015		
2273	011044	001404				BEQ	38		
2274	011046	121027	000201			CMP0	(0),0201		

2275	011052	001334				BNE	28	
2276	011054	000414				BR	48	
2277	011056	012702	000004	381		MOV	B4,M2	
2278	011062	005001				CLR	R1	
2279	011064	005201				INC	R1	
2280	011066	001376				BNE	,=2	
2281	011070	005302				DEC	R2	
2282	011072	001374				BNE	,=6	
2283	011074	020027	021773			CMP	R0,00UFFIN-1	
2284	011100	001321				BNE	28	
2285	011102	005037	017204			CLR	WRRFLP	
2286	011106	042777	000040	170710	481	BIC	0TTYEN,0ICSR	
2287	011114	000207				RTS	PC	
2288								
2289								
2290	011116	022626			ICRWT1	POP28P		ICR INTERRUPTS HERE (FROM QUESTION R OR L?)
2291	011120	032777	002000	170676		BIT	0PWRFL,0ICSR	IPWR FAIL INTERRUPT
2292	011126	001405				BEQ	18	INO, CONTINUE
2293	011130	012737	000001	014474		MOV	01,PWRFLP	INDICATE POWER FAIL
2294	011136	000137	016530			JMP	RSTRT	IGO TYPE MESSAGE
2295	011142	032777	000200	170654	181	BIT	0MOUINT,0ICSR	IMOD INT?
2296	011150	001445				BEQ	ICRWT2	INO, CONT (CHECK ERROR)
2297	011152	032777	002000	167756		BIT	0SW10,0SWR	IS REMOTE TTY ON SYSTEM
2298	011160	001441				BEQ	ICRWT2	INO, THEN GO SKIP DA
2299	011162	032777	010000	170636		BIT	0DA,0ICAR	IDO SET
2300	011170	001435				BEQ	ICRWT2	INO, GO CHECK ERROR
2301	011172	032777	000041	170624		BIS	0TTYEN+XRIF,0ICSR	IGET TO READ ICR TTY
2302	011200	017700	170616			MOV	0ICMOD,R0	
2303	011204	042777	000040	170612		BIC	0TTYEN,0ICSR	
2304	011212	042700	000240		ICRWT31	BIC	0200,R0	ILOOK FOR 'R' OR 'L'
2305	011216	022700	000114			CMP	0'L,R0	
2306	011222	001407				BEQ	ICRWT1	I'L' GO LOAD
2307	011224	022700	000122			CMP	0'R,R0	
2308	011230	001002				BNE	,=6	
2309	011232	000137	016634			JMP	RST1	I'R' GO START
2310	011236	000137	010514			JMP	WAIT1	IWAIT FOR NEXT
2311	011242	005037	014462		ICRWT11	CLR	PRRMT	IPRINT 'LOADING'
2312	011246	012737	000001	014464		MOV	01,PRRMT1	
2313	011254	104413	024657			TYPE,	LOADIN	
2314	011260	000137	033000			JMP	GOLOAD	IGO TO ABS LOADER
2315	011264	032777	010000	170532	ICRWT21	BIT	0ERNBIT,0ICSR	ICHECK FOR ERROR
2316	011272	001402				BEQ	28	
2317	011274	017700	170526			MOV	0ICAR,R0	
2318	011300	032777	000001	170516	281	BIS	0XRIF,0ICSH	ICLEAR INT, EXIT
2319	011306	005777	170510			TST	0ICMOD	
2320	011312	000137	010514			JMP	WAIT1	
2321								
2322								
2323								
2324	011316	022626			TTYWT1	POP28P		ICONSOLE TTY INTERRUPTS HERE
2325	011320	017700	167620			MOV	0STKB,R0	
2326	011324	000137	011212			JMP	ICRWT3	
2327								
2328								
2329								
2330								

.80TTL TEST OF M8094 MICRO-DIAGNOSTICS

```

2331      /
2332      /LET'S START TEST OF MICRO-CODE
2333      /ON THE M8894 - MAINTENANCE BIT 2, BIT 13 OF ICSR
2334
2335      /
2336      /
2337      /THIS SECTION RUNS IN SYNCH WITH THE MICROCODE IN THE M8894
2338      /
2339      011330 012737 000001 014464 TEST31 MOV      01,PRRMT1      /BUFFER ERRORS
2340      011336 005037 014462          CLR      PRRMT          /REMOTE PRINT
2341      011342 104415          CXNC
2342      011344 003764 000000          TST      PASCNT(4)      /FIRST PASS?
2343      011350 001002          BNE      .+6          /NO, CONT
2344      011352 104413          TYPE          /TYPE HEADER
2345      011354 022227          M8894
2346      011356 012737 000001 014462          MOV      01,PRRMT      /NO REMOTE PRINT
2347      011364 012737 011364 014372 TEST3L1 MOV      0TEST3L,SCOLOP /SET SCOPE LOOP
2348      011372 013737 014454 014456          MOV      PASLG,PASRUN /GET RUN LENGTH
2349      011400          LOOP30.
2350      011400 052777 040000 170416          BIS      0MAINT3,0ICSR /ISSUE MICRO INIT
2351      011406 012737 000340 177776          MOV      0340,00PSW /SET LEVEL TO 7
2352      011414 052777 020000 170402          BIS      0MAINT2,0ICSR /SET MAINT BIT
2353      011422 052777 000001 170374          BIS      01,0ICSR /SET RIF BIT
2354      011430 005777 170366          TST      0ICMOD /CLEAR RIF BIT
2355      011434 013700 014410          MOV      PRS00,R0 /WAIT 10 US
2356      011440 005300          DEC      R0
2357      011442 001376          BNE      .-2
2358      011444 013737 017172 177776          MOV      PRILVL,00PSW /SET PRIORITY LEVEL
2359      011452 005037 017206          CLR      INTFLG /CLEAR INTERRUPT OCCURRENCE FLAG
2360      011456 013700 014416          MOV      PR20,R0
2361      011462 052777 000004 170334          BIS      0MODEN,0ICSR /ENABLE MODULE TO INTERRUPT
2362      011470 042777 020000 170326          BIC      0MAINT2,0ICSR /CLEAR MAINT. MODE
2363      011476 005300          DEC      R0
2364      011500 001376          BNE      .-2
2365      011502 005737 017206          TST      INTFLG /TEST IF INTERRUPT OCCURRED
2366      011506 001001          BNE      18 /YES
2367                                     /NO, INTERRUPT
2368
2369      /
2370      /
2371      /
2372      011510 104005          ERROR 5 /INTERRUPT FROM MICRO CODE DID NOT OCCUR
2373                                     /TIMEOUT FLOP ON M8894 WAS FALSE
2374                                     /WHEN IT SHOULD HAVE BEEN TRUE
2375
2376      /
2377      /
2378      /
2379      011512 104407          181 SCOP94
2380      011514 032777 000200 170302          BIT      0MODINT,0ICSR /CHECK THAT MODULE CAUSED
2381      011522 001001          BNE      20 /INTERRUPT
2382      011524 104010          ERROR 18 /INTERRUPT WAS NOT CAUSED BY MODULE INTERRUPT
2383      011526 104407          201 SCOP94
2384      011530 052777 000001 170266          BIS      01,0ICSR /SET RIF BIT
2385      011536 005777 170260          TST      0ICMOD /CLEAR RIF BIT
2386

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```

2387 011542 032777 000200 170254      BIT      MODINT,0ICSR      ;CHECK IF MOD INT IS STILL SET
2388 011550 001401                      BEQ        .+4              ;NO, OK
2389
2390
2391
2392
2393 011552 104012                      ;
                ERROR 12                      ;MOD INT SET AFTER RIF
2394
2395
2396
2397
2398 011554 104407                      ;
                SCOP94
2399
2400 011556 005037 017206      CLR      INTPLG      ;CLEAR INTERRUPT OCCURANCE FLAG
2401 011562 015700 014416      MOV      FR20,R0
2402 011566 052777 000004 170230      BIS      MODEN,0ICSR      ;ENABLE MODULE INTERRUPT
2403 011574 052777 020000 170222      BIS      MAINT2,0ICSR    ;SET MAINT MODE
2404 011602 005300                      DEC      R0
2405 011604 001376                      BNE      .-2
2406 011606 005737 017206      TST      INTPLG      ;INTERRUPT OCCUR?
2407 011612 001001                      BNE      J0
2408
2409
2410
2411
2412
2413 011614 104006                      ;
                ERROR 6                      ;INTERRUPT NOT PRESENT
2414
2415
2416
2417
2418
2419
2420
2421 011616 104407 000200 170176 381    SCOP94
2422 011620 032777                      BIT      MODINT,0ICSR      ;CHECK FOR MODULE INTERRUPT
2423 011626 001001                      BNE      TEST3A
2424
2425
2426
2427
2428
2429 011630 104010                      ;
                ERROR 10                      ;MODULE INTERRUPT DIDN'T CAUSE INTERRUPT
2430
2431
2432
2433
2434 011632 104407                      ;
                TEST3A: SCOP94
2435 011634 052777 000001 170162      BIS      01,0ICSR      ;SET RIF BIT
2436 011642 005777 170154      TST      0ICMOD      ;CLEAR RIF BIT
2437
2438 011646 032777 000200 170150      BIT      MODINT,0ICSR      ;CHECK IF MOD INT IS STILL SET
2439 011654 001401                      BEQ        .+4              ;NO, OK
2440
2441
2442

```

```

2443
2444 311656 104012          ERROR 12          IMOD INT SET AFTER RIF
2445
2446      /
2447      /
2448      /
2449 011660 104407          SCOP94
2450
2451      /
2452      /TEST ERROR BIT IS CAPABLE OF INTERRUPTING
2453      /
2454
2455 011662 005037 017206    CLR      INTFLG      ICLEAR INTERRUPT OCCURRENCE FLAG
2456 011666 042777 000004 170130  HIC      #MODEN,#PICS# ICLEAR MOD INT ENABLE BIT
2457 011674 052777 000002 170122  RIS      #ERREN,#PICS# ISET ERROR INT ENABLE BIT
2458 011702 013730 014416      MOV      PR20,R0
2459 011706 042777 020000 170110  RIC      #MAINT2,#PICS# ICLEAR MAINT BIT
2460 011714 005300      DEC      #0
2461 011716 001376      BNE      #=2
2462 011720 005737 017206      TST      INTFLG      DID INTERRUPT OCCUR
2463 011724 001001      BNE      10          YES, THEN 10
2464
2465      /
2466      /
2467      /
2468 211726 104011          ERROR 11          IERROR BIT DID NOT INTERRUPT
2469
2470      /
2471      /
2472      /
2473 211730 104407          101      SCOP94
2474
2475      /
2476      /TEST ERROR BIT ACTUALLY CAUSED INTERRUPT
2477      /
2478
2479 011732 005037 017206    CLR      INTFLG      ICLEAR INTERRUPT OCCURRENCE FLAG
2480 011736 032777 010000 170060  BIT      #ERRBIT,#PICS# ITEST ERROR BIT
2481 011744 001001      BNE      20          ISET, THEN 20
2482
2483      /
2484      /
2485      /
2486 011746 104010          ERROR 10          IERROR BIT WAS NOT CAUSE OF INTERRUPT
2487
2488      /
2489      /
2490      /
2491 011750 104407          201      SCOP94
2492
2493      /
2494      /
2495      /CHECK THAT BOUNCING ERROR INTERRUPT ENABLE DOES CAUSE
2496      / ANOTHER INTERRUPT
2497      /
2498

```

```

2499 011752 013700 014416      MOV      PR20,R0
2500 011756 042777 000002 170040  BIC      0ERHEN,0ICSR
2501 011764 052777 000002 170032  BIS      0ERHEN,0ICSR
2502 011772 005300      DEC      R0
2503 011774 001376      BNE      .-2
2504 011776 005737 017206      TST      INTFLG
2505 012002 001001      BNE      998
2506
2507      /
2508      /
2509      /
2510 012004 104030      /
2511      /
2512      /
2513      /
2514      /
2515 012006 104407      998:      SCOP94
2516
2517      /CHECK ERROR BIT CLEARS WITH ADDRESSING ICAR
2518      /
2519
2520 012010 005777 170012      TST      0ICAN      /ACCESS ICAR
2521 012014 032777 010000 170002  BIT      0ERNBIT,0ICSR /ERROR BIT STILL SET
2522 012022 001401      BEQ      38      /NO, THEN 38
2523
2524      /
2525      /
2526      /
2527 012024 104013      /
2528      /
2529      /
2530      /
2531      /
2532      /
2533 012026 104407      38:      SCOP94
2534 012030 052777 000001 167766  BIS      0XRIF,0ICSR      /SET RIF BIT
2535 012036 005777 167760      TST      0ICMOD      /ACCESS MODULE TO CLEAR RIF BIT
2536
2537      /
2538      /DATA VALID SHOULD BE FALSE, LETS CHECK IT
2539      /
2540
2541 012042 042777 000002 167756      BIC      0ERHEN,0ICSR      /CLEAR ERROR INT ENABLE
2542 012050 052777 000004 167746  BIS      0MODEN,0ICSR      /SET MODULE INTERRUPT ENABLE
2543 012056 013700 014416      MOV      PR20,R0
2544 012062 052777 020000 167734  BIS      0MAINT2,0ICSR      /SET MAINT BIT
2545 012070 005300      DEC      R0
2546 012072 001376      BNE      .-2
2547 012074 005737 017206      TST      INTFLG      /INTERRUPT OCCUR
2548 012100 001001      BNE      48
2549
2550      /
2551      /
2552      /
2553 012102 104014      /
2554      /
2555      /
  
```

```

2555      /
2556      /
2557      /
2558      012104 104407      481      SCOP94
2559      /
2560      /
2561      /
2562      /
2563      /
2564      012106 005037 017206      CLR      INTPLG      /CLEAR INTERRUPT OCCURRENCE FLAG
2565      012112 052777 000001 167704      BIS      0XRIF,0ICSR      /SET RIF
2566      012120 005777 167676      TST      0ICMOD      /CLEAR RIF
2567      012124 052777 001004 167672      BIS      0MODEN+0BMTEN,0ICSR      /SET MOD. INT. ENABLE
2568      012132 013700 014416      MOV      FR20,R0
2569      012136 042777 020000 167660      BIC      0MAINT2,0ICSR      /SET MAINT BIT
2570      012144 005300      DEC      R0
2571      012146 001376      BNE      58
2572      012150 005737 017206      TST      INTPLG      /INTERRUPT TAKE PLACE?
2573      012154 001001      BNE      58      /YES, THEN 58
2574      /
2575      /
2576      /
2577      /
2578      012156 104015      /
2579      /
2580      /
2581      /
2582      /
2583      012160 104407      581      SCOP94
2584      /
2585      /
2586      012162 005037 017206      CLR      INTPLG      /CLEAR INTERRUPT OCCURRENCE FLAG
2587      012166 032777 100000 167632      BIT      0100000,0ICAR      /DID TBMT REALLY CAUSE THE INTERRUPT
2588      012174 001001      BNE      78
2589      /
2590      /
2591      /
2592      /
2593      012176 104015      /
2594      /
2595      /
2596      /
2597      /
2598      012200 104407      781      SCOP94
2599      /
2600      012202 052777 000001 167614      BIS      0XRIF,0ICSR
2601      012210 005777 167606      TST      0ICMOD
2602      012214 042777 001000 167602      BIC      0TBMTEN,0ICSR
2603      /
2604      /
2605      /
2606      /
2607      /
2608      /
2609      /
2610      /
  
```

.SBTTL CHECK OF ICR11 ERROR GENERATION CAPABILITIES

/TEST OF ICR11 TO FORCE CRC ERRORS

/MASTER END IS DONE FIRST, MICROCODE IS CAPABLE OF CAUSEING
 /MASTER TO SEND BAD CRC TO SLAVE AND SLAVE SHOULD NOT RESPOND
 /

```

2611
2612 012222 005037 017206 TEST301 CLR INTPLG IFCLEAR INTERRUPT OCCURANCE
2613 012226 012737 000001 017202 MOV 01,TIMTRP
2614 012234 012777 000000 167560 MOV 00,0ICMOD ISEND OUT
2615 012242 052777 000006 167554 B10 0MODEN+ERREN,0ICSR ISET ERROR ENABLE AND MODULE ENABLE
2616 012250 013700 014410 MOV FR500,R0
2617 012254 052777 020000 167542 B10 0MAINT2,0ICSR ISET MAINT BIT FOR MICROCODE
2618 012262 005300 DEC W0 IWAIT FOR INTERRUPT, INC WATCH DOG
2619 012264 001376 BNE .-2
2620
2621 012266 005737 017206 TST INTPLG IDID INTERRUPT OCCUR?
2622 012272 001001 BNE 18
2623
2624 /
2625 /
2626 /
2627 012274 104037 ERROR 37 IMASTER CRC ERROR FAILURE
2628
2629 /
2630 /
2631 /
2632 012276 104407 181 SCOP94
2633
2634 012300 032777 010000 167516 BIT 0ERNBIT,0ICSR IDID ERROR BIT INTERRUPT INDICATING
2635 012306 001001 BNE 29 ITIMEOUT OF MASTER
2636
2637 /
2638 /
2639 /
2640 /
2641 012310 104040 ERROR 40 INO TIMEOUT FROM MASTER
2642
2643 /
2644 /
2645 /
2646 012312 104407 281 SCOP94
2647
2648 012314 032777 000200 167502 BIT 0MODINT,0ICSR IDID MODULE INTERRUPT INDICATING
2649 012322 001401 BEQ 38 ITHAT DATA WAS PRESENT
2650
2651 /
2652 /
2653 /
2654 012324 104041 ERROR 41 ISLAVE RESPONDED TO BAD CRC
2655
2656 /
2657 /
2658 /
2659 012326 104407 381 SCOP94
2660
2661 /
2662 INOW CHECK THAT A BAD CRC FROM THE SLAVE WILL NOT FUNCTION PROPERLY
2663 IAT THE MASTER END
2664 /
2665
2666 012330 005737 014374 TST TENCN1
  
```

2667	012334	001003		BNE	TEST3C	
2668	012336	012737	000012 014374	MOV	#10,,TENCN1	
2669	012344	005037	017206	TEST3C1 CLR	INTFLG	ICLEAR INTERRUPT OCCURANCE
2670	012350	052777	000001 167446	BIS	#XRIFF,0ICSR	ICLEAR RIF BIT
2671	012356	005777	167440	TST	0ICMOD	ICLEAR RIF BIT
2672	012362	017700	167440	MOV	0ICAN,R0	ICLEAR ERROR BIT
2673	012366	052777	000040 167430	BIS	0TTYEN,0ICSR	
2674	012374	017700	167422	MOV	0ICMOD,R0	ICLEAR DA
2675	012400	042777	000040 167416	BIC	0TTYEN,0ICSR	
2676	012406	013700	014410	MOV	FR500,R0	
2677	012412	012777	000300 167402	MOV	0J00,0ICMOD	ICLEAR DA
2678	012420	042777	020000 167376	BIC	0MAINT2,0ICSR	ICLEAR DA
2679	012426	005300		DEC	R0	ICLEAR DA
2680	012430	001376		BNE	.-2	ICLEAR DA
2681						
2682	012432	005737	017206	TST	INTFLG	ICLEAR DA
2683	012436	001003		BNE	10	ICLEAR DA
2684						
2685	012440	005337	014374	DEC	TENCN1	ICLEAR DA
2686	012444	001401		BEO	50	ICLEAR DA
2687	012446	000426		BR	00	ICLEAR DA
2688						
2689						
2690						
2691	012450	104042		501	ERROR 42	ICLEAR DA
2692						
2693						
2694						
2695						
2696	012452	104007		101	SCOP94	ICLEAR DA
2697						
2698	012454	032777	010000 167344	BIT	0DA,0ICAR	ICLEAR DA
2699	012462	001411		BEO	20	ICLEAR DA
2700						
2701	012464	052777	000040 167332	BIS	0TTYEN,0ICSR	ICLEAR DA
2702	012472	017700	167324	MOV	0ICMOD,R0	
2703	012476	042777	000040 167320	BIC	0TTYEN,0ICSR	
2704						
2705						
2706						
2707						
2708	012504	104043			ERROR 43	ICLEAR DA
2709						
2710						
2711						
2712						
2713	012506	104037		201	SCOP94	ICLEAR DA
2714						
2715	012510	032777	000200 167306	BIT	0MODINT,0ICSR	ICLEAR DA
2716						
2717	012516	001001		BNE	40	ICLEAR DA
2718						
2719						
2720						
2721						
2722	012520	104044			ERROR 44	ICLEAR DA

```

2723
2724
2725
2726
2727
2728 012522 104407 48: SCOP94
2729
2730 012524 052777 000041 167272 88: B18 0XRIFF+TTVEN,0ICSR
2731 012532 017700 167264 MOV 0ICMOD,R0
2732 012536 042777 000040 167260 BIC 0TTVEN,0ICSR
2733 012544 017700 167256 MOV 0ICAR,R0
2734
2735
2736
2737
2738
2739
2740
2741
2742 012550 012737 000012 002054
2743 012556 005037 014444
2744 012562 005037 014460
2745 012566 012737 000340 177776
2746 012574 052777 001000 167222
2747 012602 012737 000001 014446
2748 012610 052737 000100 014444
2749 012616 052777 000006 167200
2750 012624 013777 014444 167170 38: MOV TEMPI,0ICMOD
2751 012632 052777 020000 167164 B18 0MAINT2,0ICSR
2752 012640 013700 014410 18: MOV FR500,R0
2753 012644 032777 000200 167152 BIT 0MODINT,0ICSR
2754 012652 001003 BNE .+10
2755 012654 005300 DEC R0
2756 012656 001372 BNE 18+4
2757
2758
2759
2760
2761 012660 104034
2762
2763
2764
2765
2766 012662 104407
2767
2768
2769
2770
2771
2772
2773
2774
2775
2776 012664 032777 010000 167132 BIT 0ERRBIT,0ICSR
2777 012672 001404 BEQ 48
2778
  
```

ITEST OF M8098'S ABILITY TO TURN LAST DATA BYTE AROUND AND REPEAT
 IT 4 TIMES. ALL PATTERNS OF BITS 0-5
 WILL BE SENT AND READ BACK IN THE ICAR AND MODULE ADDRESSES
 BITS 7 AND 6 CANNOT BE 11 OR 00

MOV 010.,TENCNT
 TEST3D1 CLR TEMPI ICLEAR STARTING PATTERN
 CLR ERRLOP ERROR INDICATOR FOR THIS LOOP
 MOV 0340,00PSW INHIBIT INTERRUPTS
 B18 0TBMTEN,0ICSR ISET TBMT ENABLE
 MOV 01,TRACK ISET LOOP INDICATOR
 B18 0BIT0,TEMPI ISET BIT 10 FOR FIRST LOOP
 B18 0MODEN+ERRREN,0ICSR ISET ENABLER
 38: MOV TEMPI,0ICMOD ISEND PATTERN
 B18 0MAINT2,0ICSR ISET MAINT BIT TO START MICROCODE
 18: MOV FR500,R0
 BIT 0MODINT,0ICSR
 BNE .+10
 DEC R0
 BNE 18+4

ERROR 34

SCOP94

ITEST FOR ERRORS WITHIN MICRO CODE
 IIF DA IS POSTED THEN TIMEOUT WAS DETECTED
 IIF ERROR INTERRUPT IS POSTED THEN DATA VALID WAS FALSE

BIT 0ERRBIT,0ICSR ITEST FOR ERROR INTERRUPT
 BEQ 48

```

2779
2780 012674 005237 014460 INC ERRLOP
2781 012700 005264 000004 INC ERRCNT(4)
2782 012704 032777 010000 167114 431 RIT 00A,0ICAR ITEST FOR OA
2783 012712 001421 BEQ 25
2784
2785 012714 052777 000040 167102 RIS 0TTVEN,0ICSR ICLEAR OA
2786 012722 017700 167074 MOV 0ICMOD,RR
2787 012726 042777 000040 167070 BIC 0TTVEN,0ICSR
2788
2789 012734 104414 CKPWF
2790
2791
2792 012736 005337 002054 7181 DEC TENCNT IFOR NOISE IMMUNITY
2793 012742 001011 BNE 638
2794 012744 005237 014460 INC ERRLOP
2795 012750 005264 000004 INC ERRCNT(4)
2796
2797
2798
2799 012754 104045 ERROR 45 ITIMEOUT ERROR
2800
2801
2802
2803
2804 012756 104407 281 SCOP94
2805
2806 012760 005737 014460 TST ERRLOP
2807 012764 001426 BEQ 828
2808 012766 017700 167034 6381 MOV 0ICAR,RR ICLEAR ERROR
2809 012772 052777 000001 167024 BIS 0XRI,0ICSR ISET RIF
2810 013000 017700 167016 MOV 0ICMOD,RR ICLEAR RIF , MOD INTERRUPT
2811 013004 005037 014460 CLR ERRLOP
2812 013010 032777 000400 166120 BIT 0SW0,0SWR
2813 013016 001402 BEQ .+6
2814 013020 000137 013360 JMP SWLOOP
2815 013024 005737 002054 TST TENCNT
2816 013030 001002 BNE .+6
2817 013032 000137 013570 JMP 728
2818 013036 000137 013504 JMP 995 IERROR SENSED, RE-SEND MESSAGE
2819
2820
2821
2822
2823 I DATA HAS BEEN LOADED INTO THE ICAR IN THE FOLLOWING PATTERN
2824 I (BITS 15-0), WITH THOSE BITS OF THE OUTGOING MESSAGE
2825 I PATTERN IS 6,1,0,7,4,5,6,7,X,X,X,X,3,2,1,0.
2826 I IT HAS ALSO BEEN LOADED INTO THE MODULE ADDRESS AS 7-0,7-0
2827 I X,X,X,X IS THE FILE BOX ADDRESS UNDER TEST
2828
2829 ICHECK ICAR FOR IT BEING CORRECT
2830 013042 012737 000012 002054 8281 MOV 010.,TENCNT
2831 013050 013737 014444 001124 MOV TEMP1,SGDDAT ICALCULATE GOOD DATA,
2832
2833 013056 042737 177760 001124 BIC 0177760,SGDDAT IGOOD LUCK IN FOLLOWING THIS
2834 013064 013700 002022 MOV ICMOD,RR ICLEAR 15-4
I GET BITS 7-4
  
```

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2835 013070 006200          ASR      R0          IDIVIDE FILE BOX BY 2
2836 013072 042700 177417    RLC      #177417,R0    ICLEAR 15-8, 3-2
2837 013076 050037 001124    RLS      R0,SGDDAT    IBITS 7-8 ARE FORMED
2838 013102 032737 000200 014444 BIT      #BIT7,TEMP1  ITEST BIT 7 OF MESSAGE SENT
2839 013110 001403          BEQ      58          INOT SET, THEN 58
2840 013112 052737 010400 001124 RLS      #10402,SGDDAT  ISET, THEN SET REQ'D BITS
2841 013120 031737 000100 014444 58:    BIT      #BIT6,TEMP1  ITEST BIT 6 OF MESSAGE SENT
2842 013126 001403          BEQ      68          INOT SET, THEN 68
2843 013130 052737 101000 001124 RLS      #101002,SGDDAT  ISET, THEN SET REQ'D BITS
2844 013136 032737 000040 014444 68:    BIT      #BIT5,TEMP1  ITEST BIT 5
2845 013144 001403          BEQ      78          INOT SET, THEN 78
2846 013146 052737 002000 001124 RLS      #2000,SGDDAT    ISET, THEN SET REQ'D BITS
2847 013154 032737 000020 014444 78:    BIT      #BIT4,TEMP1  ITEST BIT 12
2848 013162 001403          BEQ      88          INOT SET, THEN 88
2849 013164 052737 004000 001124 RLS      #4000,SGDDAT    ISET, THEN SET REQ'D BITS
2850 013172 032737 000002 001124 88:    BIT      #BIT1,SGDDAT  ITEST BIT 1
2851 013200 001403          BEQ      98          INOT SET, THEN 98
2852 013202 052737 040000 001124 RLS      #BIT14,SGDDAT  ISET, THEN SET REQ'D BITS
2853 013210 032737 000001 001124 98:    BIT      #BIT0,SGDDAT  ITEST BIT 0
2854 013216 001403          BEQ      108         INOT SET, THEN 108
2855 013220 052737 020000 001124 RLS      #BIT13,SGDDAT  ISET, THEN SET REQ'D BITS
2856
2857
2858          IGOOD ICAR IS FORMED LET'S GET ACTUAL ICAR AND COMPARE
2859
2860
2861 013226 017737 100574 001126 108: MOV      #ICAR,SGDDAT
2862 013234 042737 110000 001124    RLC      #BIT15+BIT12,SGDDAT
2863 013242 042737 110000 001126    RLC      #BIT15+BIT12,SGDDAT
2864 013250 023737 001124 001126    CMP      SGDDAT,SGDDAT  ICOMPARE READ WITH THAT FORMED
2865 013256 001401          BEQ      118
2866
2867
2868          I//////////
2869
2870 013260 104047          ERROR 47          IBAD ICAR ON READ
2871
2872
2873          I//////////
2874
2875 013262 104407          118: SCOP94
2876
2877          IREAD MODULE DATA FOR PROPER DATA
2878
2879 013264 013737 014444 001124    MOV      TEMP1,SGDDAT  IFORM SGDDAT OUT OF TEMP1
2880 013272 013700 014444          MOV      TEMP1,R0    ISGDDAT = TEMP1 BITS 7-8 TWICE
2881 013276 000300          SWAB     R0
2882 013300 050037 001124          RLS      R0,SGDDAT
2883 013304 013737 001124 014450    MOV      SGDDAT,ADDR  INOW CALCULATE MODULE ADDRESS
2884 013312 042737 177760 014450    RLC      #177760,ADDR  IOF WHERE DATA SHOULD BE
2885 013320 006337 014450          ASL      ADDR
2886 013324 053737 002022 014450    RLS      ICMOD,ADDR    IADD IN FILE BOX OFFSET
2887 013332 005137 001124          COM      SGDDAT    ICOMPLIMENT DATA PATTERN
2888 013336 017737 001106 001126    MOV      #ADDR,SGDDAT  IREAD DATA
2889 013344 023737 001124 001126    CMP      SGDDAT,SGDDAT  ICOMPARE
2890 013352 001401          BEQ      128

```

2891						/			
2892						/			
2893						/			
2894						/			
2895	013354	104E5D				ERROR 50		IBAD DATA IN MODULE ADDRESS	
2896						/			
2897						/			
2898						/			
2899						/			
2900	013356	104407			123:	SCNP94			
2901						/			
2902						/			
2903						/			
2904						/			
2905						/			
2906		013360				SWLOOP=.			
2907									
2908	213360	032777	000400	165550		RIT	03WB,03WR	ILOOP ON DATA TEST	
2909	013366	001434				BEG	013	JNO THEN 013	
2910	013370	117737	165542	017174		MOVB	03WH,DATSNT	IGET SWR LOW BYTE	
2911	013376	117737	165534	014444		MOVB	03WH,TEMP1		
2912	013404	042737	177477	017174		BIC	0177477,DATSNT	IGET BITS 6,7	
2913	013412	001004				RNE	04B	JNOT ZERO THEN 04B	
2914	013414	052737	000200	014444		BIS	00107,TEMP1	IZERO, DEFAULT TO SET BIT 7	
2915	013422	000412				BR	03B	JCONT	
2916	013424	022737	000300	017174	040:	CMP	030J,DATSNT	IBITS 6,7 =11	
2917	013432	001006				BNE	03B	JNO THEN 03B	
2918	013434	042737	000300	014444		BIC	030J,TEMP1		
2919	013442	052737	000100	014444		BIS	00106,TEMP1	ISET BIT 6	
2920	013450	013737	014444	017174	038:	MOV	TEMP1,DATSNT	ISET DATA SENT	
2921	013456	000412				BR	99B		
2922	013460	005737	014444		010:	TST	TRACK	I FIRST OR SECOND LOOP?	
2923	013464	001432				BEG	13B	I SECOND, THEN 13B	
2924	013466	062737	000001	014444		ADD	0010,TEMP1	I INC NEW PATTERN	
2925	013474	032737	000100	014444		BIT	0016,TEMP1	IDONE?	
2926	013502	001413				BEG	14B	I YES, THEN 14B, NEXT LOOP	
2927	013504	013777	014444	166310	998:	MOV	TEMP1,01CHOD	IMOVE OUT NEXT PATTERN	
2928	013512	042777	001000	166304		BIC	0TBMTEN,0ICSR	ITOGGLE TBMT ENABLE TO ALLOW	
2929	013520	052777	001000	166276		BIS	0TBMTEN,0ICSR	IMICRO CODE TO PROGRESS	
2930	013526	000137	012640			JMP	1B	I LOOP	
2931	013532	005037	014444		145:	CLR	TEMP1	ICLR PATTERN	
2932	013536	005037	014444			CLR	TRACK	I INDICATE SECOND LOOP	
2933	013542	052737	000200	014444		BIS	0017,TEMP1	ICREATE NEXT PATTERN	
2934	013550	000755				BR	99B	ISEND PATTERN	
2935	013552	062737	000001	014444	138:	ADD	0010,TEMP1	IINCREMENT PATTERN	
2936	013560	032737	000100	014444		BIT	0016,TEMP1	IDONE?	
2937	013566	001746				BEG	99B	JNO, THEN SEND NEXT PATTERN	
2938	013570	042777	021000	166226	728:	BIC	0TBMTEN+MAINT2,0ICSR	IYES,, CLEAR TBMTEN AND MAINT2 TO EXIT MICROCODE	
2939									
2940	013576	005037	017206			CLR	INTFLG		
2941	013602	005077	166216			CLR	0ICSR		
2942	013606	052777	040000	166210		BIS	0MAINT3,0ICSR		
2943	013614	005037	017202			CLR	TIMTRP		
2944	013620	104415				CKCNC			</

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2947 013630 000137 011400          JMP      LOOP3
2948
2949
2950 013634 017700 166166          MOV      0ICAR,R2
2951 013640 032777 000040 165270      BIT      0SW5,0SWR
2952 013646 001002          BNE      .+6
2953 013650 000137 013676          JMP      908
2954 013654 017700 165256          MOV      0SWR,R0
2955 013660 042700 177477          RLC      0177477,R0
2956 013664 022700 000100          CMP      0100,R0
2957 013670 001002          BNE      .+6
2958 013672 000137 011364          JMP      TEST3L
2959
2960          ;
2961          ;CHECK THAT A MOV INSTRUCTION TO AN ICR OUTPUT MODULE WILL SET
2962          ;OUTPUT BUSY
2963          ;
2964
2965
2966
2967 013676 012737 013676 014372 9081  MOV      0908,SCOLP
2968 013704 013700 014414          MOV      PR200,R0
2969 013710 005777 166110      7081  TST      0ICSR          ;IS OUTPUT BUSY
2970 013714 100003          BPL      .+10          ;IF NO CONT
2971 013716 005300          DEC      R0          ;INC WATCHDOG
2972 013720 001373          BNE      708          ;NOT TIMED OUT THEN 708
2973
2974          ;
2975          ;////////////////////////////////////
2976          ;
2977 013722 104035          ERROR 35          ;LINE ACTIVE TOO LONG
2978
2979          ;
2980          ;////////////////////////////////////
2981          ;
2982 013724 104412          SCOPEX
2983 013726 013700 014412          MOV      PR100,R0
2984 013732 052777 000040 166064      BIS      0TTYEN,0ICSR          ;SET TTY ENABLE
2985 013740 012777 000000 166054          MOV      00,0ICMOD
2986 013746 005777 166052      9081  TST      0ICSR
2987 013752 100403          BMI      978
2988 013754 005300          DEC      R0
2989 013756 001373          BNE      908
2990
2991          ;
2992          ;////////////////////////////////////
2993          ;
2994 013760 104032          ERROR 32          ;LINE DID NOT GO ACTIVE WITH MOV INSTRUCTION
2995
2996          ;
2997          ;////////////////////////////////////
2998          ;
2999 013762 104412      9781  SCOPEX
3000 013764 042777 000040 166032      BIC      0TTYEN,0ICSR          ;CLEAR TTY ENABLE
3001
3002          ;

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3003          ICHECK THAT BMT WILL NOT INTERRUPT WITH LINE BUSY
3004          /
3005
3006 013772      BMTINT:
3007 013772 012737 013772 014372 1201 MOV 0125,SCOLOP      / SET SCOPE LOOP
3008 014000 005077 166020          CLR 0ICSR          /CLEAR ICR CSR
3009 014000 013700 014000          MOV FR1000,R0
3010 014010 005777 166010 7031 TST 0ICSR          /IS OUTPUT BUSY
3011 014014 100003          BPL .+10          /IF NO CONT
3012 014016 005300          DEC R0          /INC WATCHDOG
3013 014020 001373          BNE 703          /NOT TIMED OUT THEN 703
3014
3015          /
3016          /
3017          /
3018 014022 104035          ERROR 35          /OUTPUT BUSY STUCK
3019
3020          /
3021          /
3022          /
3023 014024 104412          SCOPEX
3024 014026 005037 017206          CLR INTFLG          /CLEAR INTERRUPT FLAG
3025 014032 052777 000040 165764          BIS 0TTYEN,0ICSR      /SET TTY ENABLE
3026 014040 012777 000000 165754          MOV 00,0ICMOD          /CAUSE .INE TO GO ACTIVE
3027 014046 042777 000040 165750          BIC 0TTYEN,0ICSR      /CLEAR TTY ENABLE
3028                                /WAIT FOR IT TO GO ACTIVE
3029 014054 013700 014412          MOV FR100,R0
3030 014060 005777 165740 0031 TST 0ICSR
3031 014064 100403          BHI .+10
3032 014066 005300          DEC R0
3033 014070 001373          BNE 003
3034
3035          /
3036          /
3037          /
3038 014072 104032          ERROR 32          /OUTPUT BUSY WOULD NOT GO ACTIVE
3039
3040          /
3041          /
3042          /
3043
3044 014074 013700 014416          MOV FR20,R0
3045 014100 013737 017172 177776          MOV PR1VL,00PSW          /LOWER PSW
3046 014106 052777 000010 165710          BIS 0BMTEN,0ICSR          /ALLOW INTERRUPT IF PENDING
3047 014114 005300          DEC R0
3048 014116 001376          BNE .-2
3049 014120 042777 000010 165676          BIC 0BMTEN,0ICSR          /CLEAR BMT ENABLE
3050 014126 012737 000340 177776          MOV 0340,00PSW
3051 014134 005737 017206          TST INTFLG          /INTERRUPT OCCUR
3052 014140 001401          BEQ 118          /NO, OKAY THEN GO TO 118
3053
3054          /
3055          /
3056          /
3057 014142 104024          ERROR 24          /BMT INTERRUPTED WITH LINE BUSY
3058

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3059      /
3060      /
3061      /
3062      014144 104412      1181      SCOPEX
3063      014146 005037 017206      CL0      INTFLG
3064      014152 000137 005554      JMP      TEST2
3065      /
3066      /
3067      /
3068      /
3069      /
3070      .SBTTL SCOPE LOOP ROUTINES
3071
3072      /SCOPE LOOP ROUTINE FOR M8894 MICRO DIAGNOSTICS
3073      /
3074
3075      014156 104414      XSC094: CKPWF
3076      014160 032777 040000 164750      BIT      08W14,09WR      ISW 14 SET
3077      014166 001001      SNE      .+4
3078      014170 000002      RTI
3079      014172 011637 014232      MOV      (SP),SCTMP      JNO EXIT
3080      014176 162737 000004 014232      SUB      04,SCTMP      JGET SCOPE LOCATION
3081      014204 023737 001116 014232      CMP      0ERRPC,SCTMP      JSUB 4 TO LOOK LIKE ERR LOC
3082      014212 001401      BEQ      .+4      JEQUAL TO ERR PC
3083      014214 000002      RTI
3084
3085      014216 022626      POP2SP
3086      014220 052777 040000 165576      BIS      0MAINT3,0ICSR      IPIX STACK
3087      014226 000137 011364      JMP      TEST3L      IRESET 94
3088
3089      014232 000000      SCTMP: 0      ILOOP
3090      /
3091      /SCOPE LOOP FOR M8896 MICRO DIAGNOSTICS
3092      /
3093
3094      014234 104414      XSC096: CKPWF
3095      014236 032777 040000 164672      BIT      08W14,09WR      ISW 14 SET
3096      014244 001001      SNE      .+4
3097      014246 000002      RTI
3098      014250 022626      POP2SP      JNO EXIT
3099      014252 000177 000114      JMP      0SCOLOP      IPIX STACK
3100
3101      /
3102      /SCOPE LOOP FOR TTY TEST
3103      /
3104
3105      014256 104414      XSCTTY: CKPWF
3106      014260 032777 040000 164650      BIT      08W14,09WR      ICHECK FOR TTY INPUT
3107      014266 001001      SNE      .+4      ISW 14 SET
3108      014270 000002      RTI
3109      014272 011637 014232      MOV      (SP),SCTMP      JNO EXIT
3110      014276 162737 000004 014232      SUB      04,SCTMP      JGET SCOPE LOCATION
3111      014304 023737 001116 014232      CMP      0ERRPC,SCTMP      JSUB 4 TO LOOK LIKE ERR LOC
3112      014312 001401      BEQ      .+4      JEQUAL TO ERR PC
3113      014314 000002      RTI
3114

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3115	014316	022626		POP2SP		IFIX STACK
3116	014320	000177	000046	JMP	0SCULOP	!LOOP
3117						
3118				/		
3119				/REGULAR SCOPE LOOP FOR REMAINDER OF TEST		
3120				/		
3121						
3122	014324	104414		XSCOPE1	CKPWF	
3123	014326	032777	040000 164602	BIT	03W14,03WR	!SW 14 SET
3124	014334	001001		BNE	.+4	
3125	014336	000002		RTI		!NO EXIT
3126	014340	011637	014232	MOV	(SP),SCTMP	!SET SCOPE LOCATION
3127	014344	162737	000004 014232	SUB	04,SCTMP	!SUB 4 TO LOOK LIKE ERR LOC
3128	014352	023737	001116 014232	CMP	0ERRPC,SCTMP	!EQUAL TO ERR PC
3129	014360	001401		BEG	.+4	
3130	014362	000002		RTI		
3131						
3132	014364	022626		POP2SP		IFIX STACK
3133	014366	000177	000000	JMP	0SCULOP	!LOOP
3134						
3135				/		
3136	014372	000000		SCOPE1	0	
3137						
3138						
3139						
3140	014374	000000		TENCN11	0	
3141	014376	000000		XMASK1	0	!MASK TO FIND BOX
3142	014400	000000		FILUTS1	0	!FILE UNDER TEST
3143	014402	000000		FILCNT1	0	!FILE COUNT
3144	014404	000000		VECTOR1	0	!ICR VECTOR
3145	014406	000474		FR10001	316.	!TIME CONSTANTS
3146	014410	000236		FR5001	150.	/
3147	014412	000037		FR1001	31.	/
3148	014414	000077		FR2001	63.	/
3149	014416	000006		FR201	6.	/
3150	014420	026502		FRM1101	11506.	/
3151						
3152	014422	000000		FLAG11	0	!SOFT FF
3153	014424	000000		FIRST1	0	!SOFT FF
3154	014426	000000		MICFLP1	0	!MICROCODE INDICATOR
3155	014430	000000		FLAG1	0	!SOFT FF
3156	014432	000000		HGM1	0	!HGM ADDRESS ON '96
3157	014434	000000		LOW1	0	!LOW ADDRESS ON '96
3158	014436	000000		SYSHAP1	0	!SYSTEM CONFIGARATION
3159	014440	000000		ERRFLP1	0	!ERROR FF
3160	014442	000000		ERTYL1	0	!ERROR TOTAL
3161	014444	000000		TEMP11	0	!TEMP STORAGE
3162	014446	000000		TRACK1	0	!USED BY '98 LOOP
3163	014450	000000		ADDR1	0	!USED BY '98 LOOP
3164	014452	000000		PRIIND1	0	!USED FOR '96 RANGE
3165	014454	000000		PASLG1	0	!PASS LENGTH
3166	014456	000000		PASRUN1	0	!PASS COUNT (LOOP)
3167	014460	000000		ERRLOP1	0	!ERROR FF
3168	014462	000000		PRRMT1	0	!TTY REMOTE - DATA TO BE BUFFERED 01 YES 00 NO
3169	014464	000000		PRRMT11	0	!TTY REMOTE - DATA ALLOWED AT ALL 1=YES 0=NO
3170	014466	000000		REMPRE1	0	!REMOTE FF

3171	014470	000000		TTTTMP: 0		ITIMER
3172	014472	000000		REMOTE: 0		IOperator SW REG ERROR FF
3173	014474	000000		PRRFLP: 0		IPWR FAIL FF
3174	014476	000000		TEMP: 0		ITEMP STORAGE
3175						
3176						
3177	014500	000000		EDISPT: 0		
3178						
3179						
3180						
3181						
3182						
3183						
3184						
3185						
3186						
3187						
3188						
3189						
3190						
3191						
3192						
3193						
3194						
3195						
3196						
3197						
3198						
3199						
3200						
3201	014502	105737	001155	STYPE: TSTB	STPFLG	IS THERE A TERMINAL?
3202	014506	100002		RPL	IS	IF YES
3203	014510	000000		HALT		HALT HERE IF NO TERMINAL
3204	014512	000407		BR	JS	LEAVE
3205	014514	010006		18: MOV	R2, -(SP)	SAVE R0
3206	014516	017600	000002	98: MOV	02(SP), R0	GET ADDRESS OF ASCIZ STRING
3207	014522	112006		28: MOVB	(R0)+, -(SP)	PUSH CHARACTER TO BE TYPED ONTO STACK
3208	014524	001005		BNE	48	IF IT ISN'T THE TERMINATOR
3209	014526	005726		TST	(SP)+	IF TERMINATOR POP IT OFF THE STACK
3210	014530	012600		MOV	(SP)+, R0	RESTORE R0
3211	014532	062716	000002	38: ADD	02, (SP)	ADJUST RETURN PC
3212	014536	000002		RTI		RETURN
3213	014540	004737	014572	48: JSR	PC, 75	GO TYPE THIS CHARACTER
3214	014544	123726	001154	58: CMPB	SPILLC, (SP)+	IS IT TIME FOR FILLER CHARS.?
3215	014550	001364		BNE	28	IF NO GO GET NEXT CHAR.
3216	014552	013746	001152	MOV	0NULL, -(SP)	GET # OF FILLER CHARS. NEEDED
3217						AND THE NULL CHAR.
3218	014556	105366	000001	68: DECB	1(SP)	DOES A NULL NEED TO BE TYPED?
3219	014562	002770		RLT	58	IF NO--GO POP THE NULL OFF OF STACK
3220	014564	004737	014572	JSR	PC, 75	GO TYPE A NULL
3221	014570	000772		BR	68	LOOP
3222	014572	122766	000216 000002	78: CMPB	0216, 2(SP)	
3223	014600	001412		BEQ	988	
3224	014602	122766	000217 000002	CMPB	0217, 2(SP)	
3225	014610	001406		BEQ	988	
3226	014612	105777	164330	988: TSTB	08TPS	WAIT UNTIL PRINTER IS READY

3227	014616	100375				OPL	998	
3228	014620	116677	000002	164322		MOV8	2(SP),0STPB	ILOAD CHAR TO BE TYPED INTO DATA REG.
3229	014626	032777	002000	164302	9881	BIT	0BIT10,0SWR	
3230	014634	001507				BEQ	08	
3231	014636	005737	014464			TST	PRRMT1	IREMOTE TTY ALLOWED AT THIS TIME
3232	014642	001504				BEQ	08	
3233	014644	005737	014462			TST	PRRMT	ISHOULD WE BUFFER?
3234	014650	001412				BEQ	108	IND, CONT
3235	014652	005237	017774			INC	BUFMES	INC FOR CORRECT STORAGE
3236	014656	022737	021747	017774		CMF	0BUFEND-1,BUFMES	IAT END?

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3237 014664 003473      BLE      88      IYES DONE1
3238 014666 116677 000002 003100      MOV      2(SP),@BUFME8      IBUFFER
3239 014674 000467      RR      88      ICONT
3240 014676 017746 165122      MOV      @ICSR,-(SP)      ISAVE OLD ICSR
3241 014702 052777 001040 165114 1081  B1S      @TMTEN+TTYEN,@ICSR      ISET TTY ENABLE, TMT READ ENABLE
3242 014710 016677 000004 165104      MOV      4(SP),@ICMOD      ISEND DATA TO ICR TTY
3243 014716 013737 014420 014470      MOV      PRM110,TTYTMP
3244 014724 005037 002062      CLR      ERRFLR      ICLEAR ERROR COUNT
3245 014730 032777 010200 165066 1381  BIT      @ERRBIT,@ICSR      IERROR BIT SET
3246 014736 001413      BEO      148      INO, THEN 148
3247 014740 005237 002062      INC      ERRFLR      ILOG ERROR
3248 014744 005777 165056      TST      @ICAR      ICLEAR ERROR
3249 014750 022737 000012 002062      CMP      @10.,ERRFLR      ITEN (10) CONSECUTIVE LINE ERRORS
3250 014756 001364      BNE      138      INO, THEN CHECK LINE AGAIN
3251 014760 022626      POP2SP      IADJUST STACK
3252 014762 000137 016474      JMP      ERRLIN
3253 014766 005037 002062 1481  CLR      ERRFLR      ICLEAR ERROR COUNT
3254 014772 032777 002000 165024      BIT      @PWRFL,@ICSR      IIS PWR FAIL BIT SET
3255 015000 001403      BEO      158      INO, THEN 158
3256 015002 022626      POP2SP
3257 015004 000137 016530      JMP      R8TRY
3258 015010 032777 100000 165010 1581  BIT      @XTMT,@ICAR      ITRANSMITTER BUFFER EMPTY
3259 015016 001014      BNE      128
3260 015020 005337 014470      DEC      TTYTMP
3261 015024 001341      BNE      138
3262 015026 005037 014464      CLR      PRMT1
3263 015032 022626      POP2SP
3264 015034 012600      MOV      (SP)+,RC
3265 015036 022626      POP2SP
3266 015040 104413 024676      TYPE,      TMTMS
3267 015044 000000      HALT
3268 015046 000776      BR      -2
3269 015050 012677 164750 1281  MOV      (SP)+,@ICSR      ISEND OLD CSR
3270 015054 000207 081  RTS      PC

3271
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3286 015056
3287 015056 105237 001103
3288 015062 001775
3289 015064 013737 001102 001140
3290 015072 005264 000002
3291 015076 011637 001116
3292 015102 162737 000002 001116

      .SBTTL  ERROR HANDLER ROUTINE

      I=8W15=1      HALT ON ERROR
      I=8W13=1      INHIBIT ERROR TYPEOUTS
      I=80 TO 8ERRTYP ON TYPEOUTS

      8ERROR:
      781  INCB      8ERRFLG      ISET THE ERROR FLG
      BEO      78      IDON'T LET FLAG GO TO ZERO
      MOV      @STNM,@DISP1AY      IDISPLAY TEST NUMBER AND ERROR
      INC      ERRTOT(4)      INC THE ERROR COUNT
      MOV      (SP),8ERRPC      IGET ADDRESS OF ERROR
      SUB      @2,8ERRPC

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3293 015110 117737 164002 001114      MOVB    0SEHRPC, SITEMB      ISTRIP AND SAVE THE ITEM CODE
3294 015116 032777 020000 164012      BIT     0SW13, 0SWR        ISKIP TYPEOUT IF SET
3295 015124 001010                      RNE     20
3296 015126 005237 014424      INC     FIRST              I HAVE WE PRINTED FILE BOX ASSOCIATED WITH ERROR
3297 015132 001007                      BNE     10                  IYES CONTINUE
3298 015134 104413 024357      TYPE,   FILET
3299 015140 013746 014400      MOV     FILUTS, -(SP)      IISAVE FILUTS FOR TYPEOUT
3300 015144 104401                      TYPDC                      IIGO TYPE--OCTAL ASCII(ALL DIGITS)
3301 015146 104413 022000      TYPE    ,CRLF
3302 015152 004737 015174      JSR     PC, 00SERRTYP    101
3303 015156 104413 022000      TYPE,   CRLF
3304 015162 005777 163750      TST     0SWR            201
3305 015166 100001                      BPL     30
3306 015170 000000                      HALT
3307 015172 000002      RTI            301

;*****
;SBTTL ERROR MESSAGE TYPEOUT ROUTINE
SERRTYP:
3314 015174                      CLR     WRKFLP
3315 015174 005037 017204      TYPE    ,CRLF              I"CARRIAGE RETURN" & "LINEFEED"
3316 015200 104413 022000      MOV     R0, -(SP)          ISAVE R0
3317 015204 010046                      CLR     R0              IPICKUP THE ITEM INDEX
3318 015206 005000                      B100    00SITEMB, R0
3319 015210 153700 001114      BNE     10
3320 015214 001004                      10
3321                      IIF ITEM NUMBER IS ZERO, JUST
3322                      ITYPE THE PC OF THE ERROR
3323 015216 013746 001116      MOV     SERRPC, -(SP)      IISAVE SERRPC FOR TYPEOUT
3324                      IERROR ADDRESS
3325                      IIGO TYPE--OCTAL ASCII(ALL DIGITS)
3326 015224 000433                      BR     60
3327 015226 005300      101    DEC     R0              IADJUST THE INDEX SO THAT IT WILL
3328 015230 006300                      ASL     R0              IWORK FOR THE ERROR TABLE
3329 015232 006300                      ASL     R0
3330 015234 006300                      ASL     R0
3331 015236 062700 001162      ADD     0SERRTB, R0          IFORM TABLE POINTER
3332 015242 012037 015252      MOV     (R0)+, 20          IPICKUP "ERROR MESSAGE" POINTER
3333 015246 001411                      BEQ     30              ISKIP TYPEOUT IF NO POINTER
3334 015250 104413                      TYPE                      ITYPE THE ERROR MESSAGE
3335 015252 000000      201    ,WORD    0              IERROR MESSAGE POINTER GOES HERE
3336 015254 104413 024305      TYPE,   PCPRT
3337 015260 013746 001116      MOV     SERRPC, -(SP)      IISAVE SERRPC FOR TYPEOUT
3338                      IERROR PC
3339 015264 104401                      TYPDC                      IIGO TYPE--OCTAL ASCII(ALL DIGITS)
3340 015266 104413 022000      TYPE    ,CRLF              I"CARRIAGE RETURN" "LINEFEED"
3341 015272 012037 015302      MOV     (R0)+, 40          IPICK UP "DATA HEADER" POINTER
3342 015276 001404                      BEQ     50              ISKIP TYPEOUT IF ZERO
3343 015300 104413                      TYPE                      ITYPE THE "DATA HEADER"
3344 015302 000000      401    ,WORD    0              I"DATA HEADER" POINTER GOES HERE
3345 015304 104413 022000      TYPE    ,CRLF              I"CARRIAGE RETURN" "LINEFEED"
3346 015310 011000      501    MOV     (R0), R0          IPICKUP "DATA TABLE POINTER"
3347 015312 001004                      BNE     70              IGO TYPE THE DATA
3348 015314 012600      601    MOV     (0P)+, R0          IRESTORE R0

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3349 015316 104413 022000      TYPE      ,CRLF      ;TYPE CARRIAGE RETURN LF
3350 015322 000207      RTS      PC
3351 015324      781      MOV      0(R0)+,-(SP)      ;SAVE 0(R0)+ FOR TYPEOUT
3352 015324 013046      TYPOC      ;GO TYPE--OCTAL ASCII(ALL DIGITS)
3353 015326 104401      TST      (R0)      ;IS THERE ANOTHER NUMBER
3354 015330 005710      BEO      63
3355 015332 001770      TYPE      ,03      ;TYPE 2 SPACES
3356 015334 104413 015342      BR      78
3357 015340 000771      681      ,ASCIIZ / /
3358 015342 020040 000
3359
3360      015346      ,EVEN
3361
3362      ;*****
3363
3364      .SBTTL  BINARY TO OCTAL (ASCII) AND TYPE
3365
3366      ;THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 6-DIGIT
3367      ;OCTAL (ASCII) NUMBER AND TYPE IT.
3368      ;STYPOS---ENTER HERE TO SETUP SUPPRESS ZEROS AND NUMBER OF DIGITS TO TYPE
3369      ;CALL:
3370      ;      MOV      NUM,-(SP)      ;NUMBER TO BE TYPED
3371      ;      TYPOS      ;CALL FOR TYPEOUT
3372      ;      ,BYTE  N      ;N=1 TO 6 FOR NUMBER OF DIGITS TO TYPE
3373      ;      ,BYTE  M      ;M=1 OR 0
3374      ;      ;1=TYPE LEADING ZEROS
3375      ;      ;0=SUPPRESS LEADING ZEROS
3376      ;
3377      ;STYPON---ENTER HERE TO TYPE OUT WITH THE SAME PARAMETERS AS THE LAST
3378      ;STYPOS OR STYPOC
3379      ;CALL:
3380      ;      MOV      NUM,-(SP)      ;NUMBER TO BE TYPED
3381      ;      TYPON      ;CALL FOR TYPEOUT
3382      ;
3383      ;STYPOC---ENTER HERE FOR TYPEOUT OF A 16 BIT NUMBER
3384      ;CALL:
3385      ;      MOV      NUM,-(SP)      ;NUMBER TO BE TYPED
3386      ;      TYPOC      ;CALL FOR TYPEOUT
3387
3388 015346 017646 000000      STYPOS: MOV      0(SP),-(SP)      ;PICKUP THE MODE
3389 015352 116637 000001 015571      MOV      1(SP),80FILL      ;LOAD ZERO FILL SWITCH
3390 015360 112637 015573      MOV      (SP)+,80MODE+1      ;NUMBER OF DIGITS TO TYPE
3391 015364 062716 000002      ADD      02,(SP)      ;ADJUST RETURN ADDRESS
3392 015370 000406      BR      STYPON
3393 015372 112737 000001 015571      STYPOC: MOV      01,80FILL      ;SET THE ZERO FILL SWITCH
3394 015400 112737 000006 015573      MOV      06,80MODE+1      ;SET FOR SIX(6) DIGITS
3395 015406 112737 000005 015570      STYPON: MOV      05,80CNT      ;SET THE ITERATION COUNT
3396 015414 010346      MOV      R3,-(SP)      ;SAVE R3
3397 015416 010446      MOV      R4,-(SP)      ;SAVE R4
3398 015420 010546      MOV      R5,-(SP)      ;SAVE R5
3399 015422 113704 015573      MOV      80MODE+1,R4      ;GET THE NUMBER OF DIGITS TO TYPE
3400 015426 005404      NEG      R4
3401 015430 062704 000006      ADD      06,R4      ;SUBTRACT IT FOR MAX. ALLOWED
3402 015434 110437 015572      MOV      R4,80MODE      ;SAVE IT FOR USE
3403 015440 113704 015571      MOV      80FILL,R4      ;GET THE ZERO FILL SWITCH
3404 015444 016605 000012      MOV      12(SP),R5      ;PICKUP THE INPUT NUMBER

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3405	015450	005003		CLR	R3	11CLEAR THE OUTPUT WORD
3406	015452	006105	181	ROL	R5	11ROTATE MSB INTO "C"
3407	015454	000404		BR	38	11GO DO MSR
3408	015456	006105	281	ROL	R5	11FORM THIS DIGIT
3409	015460	006105		ROL	R5	
3410	015462	006105		ROL	R5	
3411	015464	010503		MOV	R5,R3	
3412	015466	006103	381	ROL	R3	11GET LSB OF THIS DIGIT
3413	015470	105337	015572	DECB	SOMODE	11TYPE THIS DIGIT?
3414	015474	100016		BPL	78	11BR IF NO
3415	015476	042703	177770	BIC	#177770,R3	11GET RID OF JUNK
3416	015502	001002		BNE	48	11TEST FOR 0
3417	015504	005704		TST	R4	11SUPPRESS THIS 0?
3418	015506	001403		BEO	58	11BR IF YES
3419	015510	005204		INC	R4	11DON'T SUPPRESS ANYMORE 0'S
3420	015512	052703	000060	BIS	0'0,R3	11MAKE THIS DIGIT ASCII
3421	015516	052703	000040	BIS	0' ,R3	11MAKE ASCII IF NOT ALREADY
3422	015522	110337	015566	MOVB	R3,08	11SAVE FOR TYPING
3423	015526	104413	015566	TYPE	,08	11GO TYPE THIS DIGIT
3424	015532	105337	015570	781	DECB	SOCNT
3425	015536	003347		BGT	28	11COUNT BY 1
3426	015540	002402		BLT	68	11BR IF MORE TO DO
3427	015542	005204		INC	R4	11BR IF DONE
3428	015544	000744		BR	28	11INSURE LAST DIGIT ISN'T A BLANK
3429	015546	012605	681	MOV	(SP)+,R5	11GO DO THE LAST DIGIT
3430	015550	012604		MOV	(SP)+,R4	11RESTORE R5
3431	015552	012603		MOV	(SP)+,R3	11RESTORE R4
3432	015554	016606	000002 000004	MOV	2(SP),4(SP)	11RESTORE R3
3433	015562	012616		MOV	(SP)+,(SP)	11SET THE STACK FOR RETURNING
3434	015564	000002		RTI		11RETURN
3435	015566	000	881	.BYTE	0	11STORAGE FOR ASCII DIGIT
3436	015567	000		.BYTE	0	11TERMINATOR FOR TYPE ROUTINE
3437	015570	000	SOCNT:	.BYTE	0	11OCTAL DIGIT COUNTER
3438	015571	000	SOFILL:	.BYTE	0	11ZERO FILL SWITCH
3439	015572	000000	SOMODE:	.WORD	0	11NUMBER OF DIGITS TO TYPE
3440						1*****
3441						
3442						.SOTTL CONVERT BINARY TO DECIMAL AND TYPE ROUTINE
3443						
3444						1*THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 5-DIGIT
3445						1*SIGNED DECIMAL (ASCII) NUMBER AND TYPE IT. DEPENDING ON WHETHER THE
3446						1*NUMBER IS POSITIVE OR NEGATIVE A SPACE OR A MINUS SIGN WILL BE TYPED
3447						1*BEFORE THE FIRST DIGIT OF THE NUMBER. LEADING ZEROS WILL ALWAYS BE
3448						1*REPLACED WITH SPACES.
3449						1*CALL:
3450				1*	MOV	NUM,-(SP)
3451				1*	TYPDS	
3452						11PUT THE BINARY NUMBER ON THE STACK
3453	015574					11GO TO THE ROUTINE
3454	015574	010046		STYPDS:	MOV	R0,-(SP)
3455	015576	010146			MOV	R1,-(SP)
3456	015600	010246			MOV	R2,-(SP)
3457	015602	010346			MOV	R3,-(SP)
3458	015604	010546			MOV	R5,-(SP)
3459	015606	012746	020200		MOV	020200,-(SP)
3460	015612	016605	000020		MOV	20(SP),R5
						11SET BLANK SWITCH AND SIGN
						11GET THE INPUT NUMBER

3461	015616	100004			BPL	18	11BR IF INPUT IS POS.
3462	015620	005405			NEG	R5	11MAKE THE BINARY NUMBER POS.
3463	015622	112766	000055	000001	MOVB	0'-,1(SP)	11MAKE THE ASCII NUMBER NEG.
3464	015630	005000		181	CLR	R0	11ZERO THE CONSTANTS INDEX
3465	015632	012703	016010		MOV	80BLK,R3	11SETUP THE OUTPUT POINTER
3466	015636	112723	000040		MOVB	0' ,(R3)+	11SET THE FIRST CHARACTER TO A BLANK
3467	015642	005002		281	CLR	R2	11CLEAR THE BCD NUMBER
3468	015644	016001	016000		MOV	80TBL(R0),R1	11GET THE CONSTANT
3469	015650	160105		381	SUB	R1,R5	11FORM THIS BCD DIGIT
3470	015652	002402			BLT	45	11BR IF DONE
3471	015654	005202			INC	R2	11INCREASE THE BCD DIGIT BY 1
3472	015656	000774			OR	38	
3473	015660	060105		481	ADD	R1,R5	11ADD BACK THE CONSTANT
3474	015662	005702			TST	R2	11CHECK IF BCD DIGIT=0
3475	015664	001002			BNE	58	11FALL THROUGH IF 0
3476	015666	105716			TSTB	(SP)	11STILL DOING LEADING 0'S
3477	015670	100407			RMI	78	11BR IF YES
3478	015672	106316		581	ASLB	(SP)	11MS07
3479	015674	103003			RCC	68	11BR IF NO
3480	015676	116663	000001	177777	MOVB	1(SP),-1(R3)	11YES--SET THE SIGN
3481	015704	052702	000060	681	BIS	0'0,R2	11MAKE THE BCD DIGIT ASCII
3482	015710	052702	000040	781	BIS	0' ,R2	11MAKE IT A SPACE IF NOT ALREADY A DIGIT
3483	015714	110223			MOVB	R2,(R3)+	11PUT THIS CHARACTER IN THE OUTPUT BUFFER
3484	015716	005720			TST	(R0)+	11JUST INCREMENTING
3485	015720	020027	000010		CMP	R0,R10	11CHECK THE TABLE INDEX
3486	015724	002746			BLT	28	11GO DO THE NEXT DIGIT
3487	015726	003002			BGT	08	11GO TO EXIT
3488	015730	010502			MOV	R5,R2	11GET THE LSD
3489	015732	000764			OR	68	11GO CHANGE TO ASCII
3490	015734	105726		881	TSTB	(SP)+	11HAS THE LSD THE FIRST NON-ZERO?
3491	015736	100003			BPL	98	11BR IF NO
3492	015740	116663	177777	177776	MOVB	-1(SP),-2(R3)	11YES--SET THE SIGN FOR TYPING
3493	015746	105013		981	CLRB	(R3)	11SET THE TERMINATOR
3494	015750	012605			MOV	(SP)+,R5	11POP STACK INTO R5
3495	015752	012603			MOV	(SP)+,R3	11POP STACK INTO R3
3496	015754	012602			MOV	(SP)+,R2	11POP STACK INTO R2
3497	015756	012601			MOV	(SP)+,R1	11POP STACK INTO R1
3498	015760	012600			MOV	(SP)+,R0	11POP STACK INTO R0
3499	015762	104413	016010		TYPE	,80BLK	11NOW TYPE THE NUMBER
3500	015766	016666	000002	000004	MOV	2(SP),4(SP)	11ADJUST THE STACK
3501	015774	012616			MOV	(SP)+,(SP)	
3502	015776	000002			RTI		11RETURN TO USER
3503	016000	023420			80TBL:	10000,	
3504	016002	001750				1000,	
3505	016004	000144				100,	
3506	016006	000012				10,	
3507	016010	000004			80BLK:	.BLKW 4	
3508					1*****		
3509							
3510					.SBTTL POWER DOWN AND UP ROUTINES		
3511							
3512					1POWER DOWN ROUTINE		
3513	016020	012737	016146	000024	SPHRDN:	MOV	88ILLUP,88PWRVEC 11SET FOR FAST UP
3514	016026	012737	000340	000026		MOV	8340,88PWRVEC+2 11PRI017
3515	016034	010046				MOV	R0,-(SP) 11PUSH R0 ON STACK
3516	016036	010146				MOV	R1,-(SP) 11PUSH R1 ON STACK

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3517 016040 010246      MOV      R2, -(SP)      ;PUSH R2 ON STACK
3518 016042 010346      MOV      R3, -(SP)      ;PUSH R3 ON STACK
3519 016044 010446      MOV      R4, -(SP)      ;PUSH R4 ON STACK
3520 016046 010546      MOV      R5, -(SP)      ;PUSH R5 ON STACK
3521 016050 010637 016152  MOV      SP, SSAVE6    ;SAVE SP
3522 016054 012737 016066 000024  MOV      SPPHRUP, SPPHRVEC ;SET UP VECTOR
3523 016062 000000      HALT
3524 016064 000776      BR      .-2          ;HANG UP
3525
3526      ;POWER UP ROUTINE
3527 016066 013706 016152  SPPHRUP: MOV      SSAVE6, SP      ;GET SP
3528 016072 005037 016152      CLR      SSAVE6      ;WAIT LOOP FOR THE TTY
3529 016076 005237 016152 18:      INC      SSAVE6      ;WAIT FOR THE INC
3530 016102 001375      BNE      18          ;OF WORD
3531 016104 012605      MOV      (SP)+, R5      ;POP STACK INTO R5
3532 016106 012604      MOV      (SP)+, R4      ;POP STACK INTO R4
3533 016110 012603      MOV      (SP)+, R3      ;POP STACK INTO R3
3534 016112 012602      MOV      (SP)+, R2      ;POP STACK INTO R2
3535 016114 012601      MOV      (SP)+, R1      ;POP STACK INTO R1
3536 016116 012600      MOV      (SP)+, R0      ;POP STACK INTO R0
3537 016120 012737 016020 000024  MOV      SPPHRDN, SPPHRVEC ;SET UP THE POWER DOWN VECTOR
3538 016126 012737 000340 000026  MOV      0340, SPPHRVEC+2 ;PRI017
3539 016134 104413      TYPE
3540 016136 023060      SPPHRMG: .WORD  MESS9      ;REPORT THE POWER FAILURE
3541 016140 012716      MOV      (PC)+, (SP)    ;POWER FAIL MESSAGE POINTER
3542 016142 003002      SPPHRAD: .WORD  STANT1    ;RESTART AT START1
3543 016144 000002      RTI
3544 016146 000000      SILLUP: HALT
3545 016150 000776      BR      .-2          ;THE POWER UP SEQUENCE WAS STARTED
3546 016152 000000      SSAVE6: 0          ;BEFORE THE POWER DOWN WAS COMPLETE
3547                                     ;INPUT THE SP HERE
3548
3549
3550      ;*****
3551
3552      .SBTTL  TRAP DECODER
3553
3554      ;THIS ROUTINE WILL PICKUP THE LOWER BYTE OF THE "TRAP" INSTRUCTION
3555      ;AND USE IT TO INDEX THROUGH THE TRAP TABLE FOR THE STARTING ADDRESS
3556      ;OF THE DESIRED ROUTINE. THEN USING THE ADDRESS OBTAINED IT WILL
3557      ;GO TO THAT ROUTINE.
3558
3559 016154 010046      STRAP:  MOV      R0, -(SP)      ;SAVE R0
3560 016156 016600 000002      MOV      2(SP), R0      ;GET TRAP ADDRESS
3561 016162 005740      TST      -(R0)          ;BACKUP BY 2
3562 016164 111000      MOVB     (R0), R0      ;GET RIGHT BYTE OF TRAP
3563 016166 006300      ASL      R0          ;POSITION FOR INDEXING
3564 016170 016000 016176      MOV      STRPAD(R0), R0    ;INDEX TO TABLE
3565 016174 000200      RTS      R0          ;GO TO ROUTINE
3566
3567
3568      .SBTTL  TRAP TABLE
3569
3570      ;THIS TABLE CONTAINS THE STARTING ADDRESSES OF THE ROUTINES CALLED
3571      ;BY THE "TRAP" INSTRUCTION.
3572

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						ROUTINE	

3573							
3574							
3575	016176				STRPAD:		
3576	016176	014502			STYPE	11CALL=TYPE	TRAP+0(104400) TTY TYPEOUT ROUTINE
3577	016200	015372			STYPOC	11CALL=TYPOC	TRAP+1(104401) TYPE OCTAL NUMBER (WITH LEADING ZEROS)
3578	016202	015346			STYPOS	11CALL=TYPOS	TRAP+2(104402) TYPE OCTAL NUMBER (NO LEADING ZEROS)
3579	016204	015406			STYPON	11CALL=TYPON	TRAP+3(104403) TYPE OCTAL NUMBER (AS PER LAST CALL)
3580	016206	015574			STYPOD	11CALL=TYPOD	TRAP+4(104404) TYPE DECIMAL NUMBER (WITH SIGN)
3581	016210	017372			XSAVRE	11CALL=SAVREG	TRAP+5(104405) ROUTINE TO SAVE REGISTER
3582	016212	017446			XRESRG	11CALL=GETREG	TRAP+6(104406) ROUTINE TO RESTORE REGISTERS
3583	016214	014156			XSC094	11CALL=SCOP94	TRAP+7(104407) M0094 MICRO CODE SCOP94 ROUTINE
3584	016216	014234			XSC096	11CALL=SCOP96	TRAP+10(104410) M0096 MICRO CODE SCOPE ROUTINE
3585	016220	014256			XSC098	11CALL=SCOP98	TRAP+11(104411) TTY SCOPE ROUTINE
3586	016222	014324			XSCOPE	11CALL=SCOPEX	TRAP+12(104412) GENERAL SCOPE ROUTINE
3587	016224	014502			STYPE	11CALL=TYPE	TRAP+13(104413) TTY & REMOTE TTY TYPE ROUTINE
3588	016226	016232			XCKPWF	11CALL=CKPWF	TRAP+14(104414) PWR FAIL SENSE ROUTINE
3589	016230	016302			XCKCNC	11CALL=CKCNC	TRAP+15(104415) CNTRL C CHECK
3590							
3591							
3592							
3593							
3594							
3595	016232	032777	002000	162676	XCKPWF:	BIT 00IT10,0SHR	11S BIT 10 SET
3596	016240	001001			BNE	,+4	1YES CONTINUE
3597	016242	000002			RTI		1NO, RETURN
3598	016244	005737	017202		TST	TIMTRP	
3599	016250	001401			BEQ	,+4	
3600	016252	000002			RTI		
3601	016254	032777	002000	163542	BIT	0PWRFL,0ICSR	11S POWER FAIL BIT SET
3602	016262	001001			BNE	,+4	1YES, CONTINUE
3603	016264	000002			RTI		1NO, EXIT
3604	016266	022626			POP2SP		
3605	016270	052777	040000	163526	XCKPWF:	BIT 0MAINT3,0ICSH	11ISSUE "RESET"
3606	016276	000137	016530		JMP	RSTMT	1GO AND RESTART PROGRAM
3607							
3608							
3609							
3610	016302	032777	002000	162626	XCKCNC:	BIT 0SN10,0SHR	
3611	016310	001006			BNE	38	
3612	016312	105777	162624		TSTB	0STKS	
3613	016316	001403			BEQ	38	
3614	016320	017700	162620		MOV	0STKB,R0	
3615	016324	000423			RR	48	
3616	016326	032777	002000	162602	38:	BIT 00IT10,0SHR	11S BIT 10 SET
3617	016334	001001			BNE	,+4	1YES, CONTINUE
3618	016336	000002			RTI		1NO, EXIT
3619	016340	013700	014420		MOV	FRM110,R0	
3620	016344	005300			DEC	R0	
3621	016346	001376			BNE	,+2	
3622	016350	032777	010000	163450	BIT	0DA,0ICAR	1REMOTE TTY DATA AVAILABLE
3623	016356	001001			BNE	,+4	1YES CONTINUE
3624	016360	000002			RTI		1NO,EXIT
3625	016362	052777	000041	163434	BIT	0TTYEN+XNIF,0ICSR	1ENABLE TTY READ
3626	016370	017700	163426		MOV	0ICMOD,R0	1READ
3627	016374	042700	000200	48:	BIC	0200,R0	
3628	016400	042777	000040	163416	BIC	0TTYEN,0ICSR	1CLEAR READENABLE

3629	016406	022700	000003			CMF	03,R0		
3630	016412	001416				BEO	18		IFAS IT A CNTL C
3631	016414	022700	000020			CMF	020,R0		IFES SERVICE IT
3632	016420	001401				BEO	28		ICNTL P
3633	016422	000002				RTI			IFES, SERVICE IT
3634	016424	012737	000001	014464	281	MOV	01,PRRMT1		INO, EXIT
3635	016432	005037	014462			CLR	PRRMT		
3636	016436	104413	025132			TYPE,	CNTNLP		
3637	016442	022626				POP28P			
3638	016444	000137	010446			JMP	PRTSUM		
3639	016450	012737	000001	014464	181	MOV	01,PRRMT1		IFSET UP TO PRINT TO REMOTE
3640	016456	005037	014462			CLR	PRRMT		
3641	016462	104413	025140			TYPE,	CNTNLC		IFECHO "C
3642	016466	022626				POP28P			IFADJUST STACK
3643	016470	000137	010452			JMP	WAIT2		
3644									
3645	016474	032777	002000	163322	ERRLINE	BIF	0PHRFL,0ICSR		IFIS PWR FAIL BIT ALSO SET
3646	016502	001402				BEO	.+0		INO, THEN IT MUST BE A BAD LINE
3647	016504	000137	016530			JMP	RSTRT		IFRESTART
3648	016510	005037	014464			CLR	PRRMT1		
3649	016514	005037	014462			CLR	PRRMT		
3650	016520	104413	025367			TYPE,	NOISY		
3651	016524	000137	016544			JMP	RST4		
3652									
3653									
3654									
3655									
3656									
3657	016530	005037	014464		RSTRT1	CLR	PRRMT1		IFINHIBIT TYPEOUT TO REMOTE TTY
3658	016534	005037	014462			CLR	PRRMT		
3659	016540	104413	025161			TYPE,	PHRMB		IFPRINT POWER FAIL SENSED
3660	016544	052777	040000	163252	RST41	BIS	0MAINT3,0ICSR		IFISSUE RESET
3661	016552	013700	014420			MOV	PRM110,R0		
3662	016556	005300				DEC	R0		
3663	016560	001376				BNE	.-2		
3664	016562	012700	000002		RST31	MOV	02.,R0		IFSET UP DELAY
3665	016566	005001				CLR	R1		
3666	016570	032777	010000	163226	RST21	BIF	0ERRBIT,0ICSR		IFERROR BIT SET
3667	016576	001416				BEO	RST1		INO, CONT
3668	016600	005777	163222			TST	0ICAR		IFCLEAR ERROR
3669	016604	013702	014414			MOV	PR200,R2		
3670	016610	005302				DEC	R2		
3671	016612	001376				BNE	.-2		
3672	016614	005301				DEC	R1		
3673	016616	001364				BNE	RST2		
3674	016620	005300				DEC	R0		
3675	016622	001362				BNE	RST2		
3676	016624	104413	025212			TYPE,	ICROWN		
3677	016630	000137	016562			JMP	RST3		
3678	016634	052777	040000	163162	RST11	BIS	0MAINT3,0ICSR		
3679	016642	012737	000001	014464		MOV	01,PRRMT1		
3680	016650	012737	000000	014462		MOV	00,PRRMT		
3681	016656	013700	014420			MOV	PRM110,R0		
3682	016662	005300				DEC	R0		
3683	016664	001376				BNE	.-2		
3684	016666	005737	014474			TST	PHRFLP		IFWHEN ANSWERING QUES DID

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3685
3686 016672 001404      BEQ      15      IPWR FAIL CAUSE US TO GET HERE
3687 016674 005037 014474 CLR      PWRFLP    INO, THEN RESTART DIAGNOSTIC
3688 016700 000137 010452 JMP      WAIT2    ICLEAR INDICATOR
3689 016704 104413 025076 151 TYPE,  RSTHES  IREASK QUESTION
3690 016710 000137 003002 JMP      STANT1
3691
3692
3693
3694
3695
3696
3697
3698
3699
3700 016714 005237 017206 ICRSRV: INC      INTFLG    IINDICATE INTERRUPT
3701 016720 005737 014426 TST      MICFLP    IIN MICRO CODE SECTION?
3702 016724 001401      BEQ      .+4      INO, 48
3703 016726 000002      RTI          IYES, EXIT
3704 016730 005737 017176 TST      TTYFLP    IIN TTY SECTION
3705 016734 001001      BNE      .+4      IYES CONT
3706 016736 000002      RTI          INO,EXIT
3707 016740 032777 010000 163056 BIT      0ERHBIT,0ICSR I0ID ERROR CAUSE INTERRUPT
3708 016746 001405      BEQ      15      INO, THEN CHECK FOR OTHERS
3709 016750 017700 163052 MOV      0ICAR,R0    IREMOVE ERROR
3710 016754 005264 000004 INC      ERRCNT(4)  IRECORD ERROR
3711 016760 000002      RTI          IRETURN FROM ERROR INTERRUPT
3712 016762 032777 000001 163034 151 BIT      0XRIF,0ICSR ISET RIF BIT TO CLEAR INTERRUPT
3713 016770 032777 000200 163026 BIT      0MODINT,0ICSR IMODULE INTERRUPT THE CAUSE
3714 016776 001416      BEQ      28      INO, THEN 28.....BAD
3715 017000 032777 010000 163020 BIT      0DA,0ICAR   I0ID DA CAUSE IT
3716 017006 001016      BNE      38      IYES, THEN GO SERVICE DA AT 38
3717 017010 032777 100000 163010 BIT      0XTBMT,0ICAR IAS IT TBM
3718 017016 001040      BNE      48      IYES THEN GO SERVICE TBM AT 48
3719
3720
3721
3722
3723 017020 005777 162776 TST      0ICMOD    IREAD TO CLEAR RIF BIT AND INTERRUPT
3724 017024 017700 162776 MOV      0ICAR,R0
3725
3726
3727 017030 104063      ERROR    63      IUNEXPECTED MODULE INTERRUPT, INPUT PROBABLY
3728
3729 017032 000401      BR       998
3730
3731
3732 017034 104064      251 ERROR    64      ISPURIOUS ICR INTERRUPT
3733
3734 017036 022626      998: POP2SP
3735 017040 000137 007620 JMP      TTY2
3736
3737
3738
3739
3740

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3741 017044 017737 162752 001126 38: MOV 0ICMOD,SRODAT IREAD
3742 017052 023737 001124 001126 CMP SGODAT,SRODAT ICOMPARE
3743 017060 001401 BEQ 08
3744
3745 017062 104036 ERROR 36 IERROR BAD READ
3746
3747 017064 000240 68: NOP
3748 017066 005237 001124 INC SGODAT
3749 017072 005037 017174 CLR DATSNT
3750 017076 032737 000400 001124 BIT 0400,SGODAT
3751 017104 001405 BEQ 48
3752 017106 022626 78: POP2SP
3753 017110 017700 162712 MOV 0ICAR,R0
3754 017114 000137 007710 JMP TTYEND
3755
3756 /
3757 /
3758 /TBM TRUE SEND NEW PATTERN
3759 /
3760
3761 017120 005737 017174 48: TST DATSNT
3762 017124 001015 BNE 08
3763 017126 013700 014410 MOV FR500,R0
3764
3765 017132 005777 162666 TST 0ICAR
3766 017136 100003 RPL .+10
3767 017140 005300 DEC R0
3768 017142 001373 BNE .-10
3769
3770 017144 104035 ERROR 35
3771
3772 017146 013777 001124 162646 MOV SGODAT,0ICMOD
3773 017154 005237 017174 INC DATSNT
3774 017160 017700 162642 88: MOV 0ICAR,R0
3775 017164 022626 POP2SP
3776 017166 000137 007654 JMP TTY1
3777
3778
3779 017172 000000 PRILVL: 0
3780 017174 000000 DATSNT: 0
3781 017176 000000 TTYFLP: 0
3782 017200 000000 BLINK: 0
3783 017202 000000 TIMTRP: 0
3784 017204 000000 WRKFLP: 0
3785 017206 000000 INTPLG: 0
3786
3787
3788 /
3789
3790 /ICR INFORMATION FOR EACH ICR FILE UNDER TEST
3791
3792 017210 000000 INFLST: .WORD 0
3793
3794 017212 000070 .BLKW 56.
3795
3796 /SAVE REGISTERS
  
```

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3797
3798 017372 012637 017530      /
3799 017376 012637 017526      XSAVEG: MOV      (SP)+,SAVEPC
3800 017402 012637 017524      MOV      (SP)+,SAVPSW
3801 017406 012637 017522      MOV      (SP)+,SAV2PC
3802 017412 010146              MOV      (SP)+,SAV2SW
3803 017414 010246              MOV      R1,-(SP)
3804 017416 010346              MOV      R2,-(SP)
3805 017420 010446              MOV      R3,-(SP)
3806 017422 010546              MOV      R4,-(SP)
3807 017424 013746 017522      MOV      R5,-(SP)
3808 017430 013746 017524      MOV      SAV2SW,-(SP)
3809 017434 013746 017526      MOV      SAV2PC,-(SP)
3810 017440 013746 017530      MOV      SAVPSW,-(SP)
3811 017444 000002              MOV      SAVEPC,-(SP)
3812                                RTI
3813      /
3814      IRESTORE REGISTERS
3815      /
3815 017446 012637 017530      XRESRG: MOV      (SP)+,SAVEPC
3816 017452 012637 017526      MOV      (SP)+,SAVPSW
3817 017456 012637 017524      MOV      (SP)+,SAV2PC
3818 017462 012637 017522      MOV      (SP)+,SAV2SW
3819 017466 012605              MOV      (SP)+,R5
3820 017470 012604              MOV      (SP)+,R4
3821 017472 012603              MOV      (SP)+,R3
3822 017474 012602              MOV      (SP)+,R2
3823 017476 012601              MOV      (SP)+,R1
3824 017500 013746 017522      MOV      SAV2SW,-(SP)
3825 017504 013746 017524      MOV      SAV2PC,-(SP)
3826 017510 013746 017526      MOV      SAVPSW,-(SP)
3827 017514 013746 017530      MOV      SAVEPC,-(SP)
3828 017520 000002              RTI
3829 017522 000000              SAV2SW: 0
3830 017524 000000              SAV2PC: 0
3831 017526 000000              SAVPSW: 0
3832 017530 000000              SAVEPC: 0
3833
3834 017532 000000              ADDTAB: 0
3835
3836              017774              .+.160.
3837
3838
3839 017774 000000              BUFHEB: 0
3840 017776 000000              BUFBEG: 0
3841
3842              021750              .+.1000.
3843
3844 021750 005015 051105 047522  BUFEND: .ASCII <15><12>/ERROR BUFFER FULL/
3845 021756 020122 052502 043106
3846 021764 051105 043040 046125
3847 021772              114
3848 021773              201
3849 021774 100601              BUFIN: 100601
3850
3851              .EVEN
3852

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ML

3853 721776 000000
 3854
 3855
 3856
 3857
 3858

.SBTTL ASCII MESSAGES

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022200 006415 000012 CRLF: .ASCIZ <15><15><12>
022204 006415 044412 051103 VECMD: .ASCIZ <15><15><12>/ICR VECTOR ADDRESS /
022208 006415 044412 052116 PRIOR: .ASCIZ <15><15><12>/INTERRUPT PRIORITY LEVEL /
022212 006415 046412 042117 VECMES: .ASCIZ <15><15><12>/MOD. INT. WILL NOT INT - ABORTED/
022216 051503 020122 044502 EM1: .ASCIZ /CSH BIT 15 SET/
022220 122 051505 052105 EM2: .ASCIZ /RESET BIT SET/
022224 124 054524 042440 EM3: .ASCIZ /TTY ENA NOT SET/
022228 124 054524 042440 EM4: .ASCIZ /TTY ENA SET/
022232 015 005019 040519 M0094: .ASCIZ <15><15><12>/MAINTENANCE MODE ACTIVATED/
022236 124 047515 052125 EM5: .ASCIZ /TMOUT FLP NOT SET/
022240 123 050505 041440 EM6: .ASCIZ /SEQ COMPARE ERR/
022244 124 046502 020124 EM7: .ASCIZ /TBMT INT ERR/
022248 051105 047522 042516 EM10: .ASCIZ /ERRONEOUS INT/
022252 047516 044440 052116 EM11: .ASCIZ /NO INT FROM ERR/
022256 047111 020124 042523 EM12: .ASCIZ /INT SET APT RIP/
022260 051105 020122 042523 EM13: .ASCIZ /ERR SET APT CLR/
022264 040504 040524 053040 EM14: .ASCIZ /DATA VALID TRUE/
022268 041124 052115 047040 EM15: .ASCIZ /TBMT NOT SET/
022272 116 020117 041124 EM16: .ASCIZ /NO TBMT INT/
022276 116 020117 046502 EM17: .ASCIZ /NO BMT INT/
022280 006415 050012 051501 PASS: .ASCIZ <15><15><12>/PASS COUNT = /
022284 015 043012 046111 FILE: .ASCIZ <15><12>/FILE BOX /
022288 040 041511 051101 ICARMD: .ASCIZ / ICAR=/
022292 044440 051503 036522 ICSRMD: .ASCIZ / ICSR=/
022296 015 047012 020117 NOBOX: .ASCIZ <15><12>/NO ICR'S - ABORTED/<15><12>
022300 026416 005015 042524 TESTINI: .ASCIZ <16><15><15><12>/TESTING FILE BOX /
022304 005015 041511 030522 HEADER: .ASCIZ <15><12>/ICR11 CONTROLLER DIAGNOSTIC MAINDEC-11-DZIRA-A/<15><12>
022308 005015 025052 025052 .ASCIZ <15><12>/*****ICR11 SYSTEM MAP*****/<15><12>
022312 005015 005015 025052 STARMS: .ASCIZ <15><12><15><12>/*****/
022316 006415 051012 041505 MES39: .ASCIZ <15><15><12>/RECOVERED FROM POWER FAILURE /<15><15><12>
022320 005015 047111 052520 RESULT: .ASCIZ <15><12>/INPUT MODULE ADDRESS RANGE/<15><12>
022324 052123 051101 020124 .ASCIZ /START /
022328 015 005015 044506 FINMES: .ASCIZ <15><15><12>/FINISH /
022332 040 020040 000040 BLANK: .ASCIZ / /
022336 047111 052520 020124 EM20: .ASCIZ /INPUT ADDR ERR/
022340 116 020117 047515 EM21: .ASCIZ /NO MOD INT/
022344 052517 050124 052125 EM22: .ASCIZ /OUTPUT ADDR ERR/
022348 052124 020131 042523 EM23: .ASCIZ /TTY SEND RECEIVE ERROR/
022352 102 052115 044440 EM24: .ASCIZ /BMT INT ERR/
022356 115 046125 020124 EM25: .ASCIZ /MULT INT ERR/
022360 052515 052114 044440 EM26: .ASCIZ /MULT INT OCC/
022364 EM27:
022368 EM30:
022372 111 052116 020122 EM31: .ASCIZ /INTR ENA ERR/
022376 047516 020124 052502 EM32: .ASCIZ /NOT BUSY W/ MOVX
022380 040504 047040 052117 EM33: .ASCIZ /OA NOT SET ON TTY TEST/
022384 023233 EM34=EM21
022388 117 052125 041040 EM35: .ASCIZ /OUT BUSY STUCK/
022392 052124 020131 047111 EM36: .ASCIZ /TTY INTERRUPT SEND RECEIVE ERROR/
022396 106 042515 042440 EM37: .ASCIZ /PME ERROR/

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023541	106	042515	047040	EM401	.ASCIZ	/PME NO TIMEOUT/
023560	046123	040440	045503	EM411	.ASCIZ	/SL ACK ON BD CRC/
023601	106	042523	042440	EM421	.ASCIZ	/FSE ERROR/
023613	106	042523	052040	EM431	.ASCIZ	/FSE TIMEOUT/
223627	106	042523	047040	EM441	.ASCIZ	/FSE NO ERROR/
023644	044524	042515	052517	EM451	.ASCIZ	/TIMEOUT ERROR/
023662	040504	040524	053040	EM461	.ASCIZ	/DATA VALID ERROR/
023703	111	040503	020122	EM471	.ASCIZ	/ICAR ERROR/
023716	047515	020104	042101	EM501	.ASCIZ	/MOD ADDR ERROR/
023735	124	047105	041440	EM511	.ASCIZ	/TEN CONSECUTIVE LINE ERRORS IN MODULE RANGE TEST/
024016	042524	020116	047503	EM521	.ASCIZ	/TEN CONSECUTIVE LINE ERRORS IN MODULE WRAP AROUND TEST/
024105	124	046502	020124	EM531	.ASCIZ	/TGMT TTY TRANS/
024124	041124	052115	052040	EM541	.ASCIZ	/TGMT TTY TIME/
024142	044522	020106	044502	EM551	.ASCIZ	/RIF BIT NOT SET/
024162	044522	020106	044502	EM561	.ASCIZ	/RIF BIT SET/
024176	052124	020131	047111	EM571	.ASCIZ	/TTY INTERRUPT TEST HUNG/
024226	040515	047111	020124	EM601	.ASCIZ	/MAINT BIT 3 ON/
024245	120	051127	043040	EM611	.ASCIZ	/PHR FAIL BIT ON/
024265	111	051503	020122	EM621	.ASCIZ	/ICR REG. ERROR/
024305	040	042440	051122	PCPRT1	.ASCIZ	/ERRPC /
024316	006415	051412	052520	EM641	.ASCIZ	<15><15><12>/SPUR ICR INT/
024336	006415	052412	042516	EM631	.ASCIZ	<15><15><12>/UNEXP MOD INT/
024357	015	005015	044506	FILEY1	.ASCIZ	<15><15><12>/FILE BOX IN ERROR /
024405	015	005015	025012	RUNSUM1	.ASCIZ	<15><15><12><12>/RUN SUMMARY - FILE /
024436	006452	000012		RUNCON1	.ASCIZ	/<15><12>
024442	040520	051523	041440	PASMES1	.ASCIZ	/PASS COUNT /
024463	015	005015	051105	ERMES1	.ASCIZ	<15><15><12>/ERROR COUNT /
024507	015	005015	044514	TRERR1	.ASCIZ	<15><15><12>/LINE ERROR COUNT/
024533	015	005015	047516	NOEXST1	.ASCIZ	<15><15><12>/NON-EXISTENT FILE BOX/
024564	020040	000		SPACE1	.ASCIZ	/ /
024567	015	005015	044123	NOPLUG1	.ASCIZ	<15><15><12>/SHORTING PLUG NOT IN REMOTE END - TTY TEST ABORTED/<15><12>
024657	015	005015	047514	LOADIN1	.ASCIZ	<15><15><12>/LOADING..../
024676	006415	051012	046505	TGMTM81	.ASCIZ	<15><15><12>/REMOTE TTY HUNG--DESELECT IT/
024736	006415	051012	051105	WAITIN1	.ASCIZ	<15><15><12>/RERUN OR LOAD FIELD TEST? /
024775	015	005015	047503	CONTOPI	.ASCIZ	<15><15><12>/CONT BY OPERATOR...LOOPING/<15><12>
025035	015	005015	042522	T8TTYV1	.ASCIZ	<15><15><12>/REMOTE TTY WRAP AROUND TEST/<15><12>
025076	006416	005015	005015	RSTMES1	.ASCIZ	<16><15><15><12><15><12>/RESTARTING DIAGNOSTIC/
025132	006415	057012	000120	CNTRLPI	.ASCIZ	<15><15><12>/P/
025140	006415	057012	000103	CNTRLC1	.ASCIZ	<15><15><12>/C/
025146	006415	052012	051505	WRKMES1	.ASCIZ	<15><15><12>/TESTING/
025161	015	005015	041511	PHRMES1	.ASCIZ	<15><15><12>/ICR POWER FAIL SENSED/
025212	006415	044412	051103	ICRDWNI	.ASCIZ	<15><15><12>XICR POWER OFF/LINE OPENX
025245	015	005015	041511	PHRM811	.ASCIZ	<15><15><12>/ICR POWER FAIL TEST/
025273	015	050012	053517		.ASCIZ	<15><12>/POWER DOWN REMOTE END OF ICR/
025332	005015	047520	042527	PHRM821	.ASCIZ	<15><12>/POWER REMOTE END BACK UP/<15><12>
025367	015	005015	047516	NOISY1	.ASCIZ	<15><15><12>XNOISY/OPEN LINEX

3859					.EVEN	
3860						
3861	025412	006415	000012	DH01	.ASCIZ	<15><15><12>
3862	025416	054105	023520	DH11	.ASCIZ	/EXP'D REC'D/
3863	025424	020040	042522			
3864	025432	000104				

3865	025434	047515	052504	042514	DM2:	.ASCII	/MODULE	DATA	EXP'D	REC'D/<15><15><12>
3866	025442	020040	042040	052101						
3867	025450	020101	020040	054105						
3868	025456	023520	020104	020040						
3869	025464	042522	023503	006504						
3870	025472	005015								
3871	025474	042101	051104	051505		.ASCIZ	/ADDRESS	SENT	CONTS	CONTS/
3872	025502	020123	051440	047105						
3873	025510	020124	020040	047503						
3874	025516	052116	020123	020040						
3875	025524	047503	052116	000123						
3876	025532	042040	052101	020101	DM3:	.ASCII	/ DATA	EXP'D	REC'D/<15><15><12>	
3877	025540	020040	042440	050130						
3878	025546	042047	020040	020040						
3879	025554	042522	023503	006504						
3880	025562	005015								
3881	025564	051440	047105	020124		.ASCIZ	/ SENT	CONTS	CONTS/	
3882	025572	020040	041440	047117						
3883	025600	051524	020040	020040						
3884	025606	047503	052116	000123						
3885										
3886						.EVEN				
3887										
3888	025614	000000			DM4:	0				
3889										
3890	025616	000000			DT0:	0				
3891	025620	001124	001126	000000	DT1:	SGDDAT,SBDDAT,0,0				
3892	025626	000000								
3893	025630	014450	014444	001124	DT2:	ADDR,TEMP1,SGDDAT,SBDDAT,0				
3894	025636	001126	000000							
3895	025642	014444	001124	001126	DT3:	TEMP1,SGDDAT,SBDDAT,0				
3896	025650	000000								
3897	025652	000000			DT4:	0				
3898										
3899										
3900										
3901										
3902										
3903										
3904		033000				.033000				
3905										
3906						.8BTL	FIELD TEST LOAD ROUTINES/ABS LOADER			
3907										
3908										
3909										
3910										
3911										
3912										
3913	033000	052777	040000	147016	GOLOAD:	018	0MAINT3,0ICSR	IRESET		
3914	033006	013737	002024	033154		MOV	ICSR,SVCSR	ISAVE PRESENT CSR IN CASE OF CKSUM ERROR		
3915	033014	013737	002026	033156		MOV	ICAR,SVCAR			
3916	033022	013737	014404	033152		MOV	VECTOR,SVVEC			
3917	033030	013737	002022	033160		MOV	ICMOD,SVMOD			
3918	033036	013737	001136	033150		MOV	SWR,TSWR			
3919										
3920	033044	000137	033232			JMP	L01			

```

3921
3922
3923
3924
3925
3926 033050 010046
3927 033052 010146
3928 033054 012700 033166
3929 033060 112001
3930 033062 001426
3931 033064 010177 000072
3932 033070 105777 000070
3933 033074 100375
3934 033076 032777 002000 000044
3935 033104 001765
3936 033106 052777 001040 000040
3937 033114 032777 100000 000034
3938 033122 001774
3939 033124 010177 000030
3940 033130 042777 001040 000016
3941 033136 000750
3942 033140 012601
3943 033142 012600
3944 033144 000137 033246
3945
3946
3947 033150 000000
3948 033152 000000
3949 033154 000000
3950 033156 000000
3951 033160 000000
3952 033162 177566
3953 033164 177564
3954
3955 033166 006415 041012 042101
3956 033174 041440 042510 045503
3957 033202 052523 000115
3958
3959
3960
3961
3962
3963
3964
3965
3966
3967
3968
3969
3970 000000
3971 000001
3972 000002
3973 000003
3974 000004
3975 000005
3976 000006

/PRINT BAD CHECKSUM MESSAGE
/
CKSMOD: MOV R0, -(SP) /SAVE R2
MOV R1, -(SP) /SAVE R1
MOV CKMES, R0 /GET MESSAGE
38: MOVB (0)+, R1 /GET CHAR
BEQ 28 /ZERO TERMINATOR
MOV R1, 0TPB
18: TSTB 0TPB
RPL 18
BIT 0SW10, 0TSHR
BEQ 38
BIS 0TBMTEN+0TTYEN, 0SVCSR
BIT 0XTBMT, 0SVCAR
BEQ 46
MOV R1, 0SVMOD
BIC 0TTYEN+0TBMTEN, 0SVCSR
BR 38
28: MOV (SP)+, R1
MOV (SP)+, R0
JMP LD2

TSHR: 0
SVVEC: 0
SVCSR: 0
SVCAR: 0
SVMOD: 0
TPB: 177566
TPB: 177564

CKMES: .ASCIZ <15><15><12>/BAD CHECKSUM/

.EVEN

/PDP-11 ABSOLUTE BINARY LOADER -- V085A MODIFIED FOR THE
/PURPOSE OF LOADING ICR11 FIELD TEST PROGRAM (MD-11-DZIRB)
/REMOVELY, LOADER WILL SELF START THE FIELD TEST IF THE CHECKSUM
/IS OK . IF THERE IS A CHECKSUM ERROR, IT WILL INDICATE SO ON BOTH
/LOCAL AND REMOTE TTYS.

/DEFINITIONS FOR THE ABS LOADER ONLY

CKSM= X0 /CHECKSUM IS KEPT IN R0
ADR= X1 /LOAD ADDRESS
BC= X2 /BYTE COUNT
BYT= X3 /CONTENTS OF BYTE
R4= X4 /SCRATCH
PTR= X5 /READ SUBR PNTR
SP= X6 /STACK POINTER

```

3977	000007		PC=	87		PROGRAM COUNTER
3978						
3979	000200		LOAD=	200		
3980	017776		DEV=	17776		
3981	000162		ICRVEC=	162		VECTOR FOR FIELD TEST
3982	000164		REHFF=	164		REMOTE LOAD INDICATOR
3983	000166		ICARLD=	166		ICAR FOR FIELD TEST
3984	000170		ICSRLO=	170		ICSR FOR FIELD TEST
3985	000172		ICSMLO=	172		MODULE ADDRESS FOR FIELD TEST
3986						
3987						
3988						
3989						
3990	033206	000012		.BLKW	10.	
3991						
3992	033232	010700	LD11	MOV	PC,SP	SET STACK POINTER
3993	033234	024646		CMF	-(SP),-(SP)	TO START AT LD1-4
3994	033236	012705		MOV	BREAD,PTR	
3995	033242	005001		CLR	ADR	CLEAR LOAD ADDRESS
3996	033244	005016	LD1B1	CLR	OSP	USING ADDRESS ON TAPE
3997						
3998						
3999						
4000						
4001						
4002	033246	005000	LD21	CLR	CKSM	INIT CHECK SUM
4003	033250	004715		JSR	PC,OPTR	CHECK FOR +1 (START OF BLOCK)
4004	033252	105303		DECB	BYT	LOOP UNTIL +1 FOUND
4005	033254	001374		BNE	LD2	
4006	033256	004715		JSR	PC,OPTR	READ ANOTHER FRAME
4007						
4008						
4009						
4010						
4011						
4012	033260	004737		JSR	PC,GWRD	GET FULL BYTE COUNT
4013	033264	010402		MOV	R4,BC	
4014	033266	162702		SUB	R4,BC	SUB 4 TO BYTE COUNT CORRECT
4015	033272	022702		CMF	02,BC	WAS IT SIX (6)
4016	033276	001440		BEQ	JMP1	JUMP BLOCK
4017	033300	004737		JSR	PC,GWRD	GET LOAD ADDRESS
4018	033304	061604		ADD	OSP,R4	ACTUAL ADDRESS
4019	033306	010401		MOV	R4,ADR	PUT ADDRESS IN PROPER CELL
4020						
4021						
4022						
4023						
4024						
4025						
4026	033310	004715	LD31	JSR	PC,OPTR	READ A FRAME
4027	033312	002003		BGE	LD4	IF MORE DATA REMAINS
4028	033314	105700		TSTB	CKSM	CHECKSUM CORRECT
4029	033316	001753		BEQ	LD2	
4030	033320	000464	BAD1	OR	DOCKSM	CHECK SUM ERROR
4031						
4032	033322	110321	LD41	MOVB	BYT,(ADR)+	STORE 8 BITS

```

4033 033324 000771          BR      L03
4034
4035      ;
4036      ;INPUT A FRAME, DECREMENT BYTE COUNT, AND ACCUMULATE CHECKSUM
4037      ;
4038
4039 033326 012703 177550      READ1  MOV      #177550,RYT          ;DEVICE ADDRESS TO BYT
4040 033332 105213          INCB      #BYT          ;HEADER RUN
4041 033334 105713      R121  TSTB      #BYT
4042 033336 100376          RPL      R12
4043 033340 116303 000002      MOVH      2(BYT),BYT
4044 033344 060300          ADD      BYT,CKSM
4045 033346 042703 177400      BIC      #177400,BYT
4046 033352 005302          DEC      BC
4047 033354 000207          RTS      PC
4048
4049      ;
4050      ;ASSEMBLE ONE FULL WORD OF DATA
4051      ;
4052
4053 033356 012637 033426      GHRD1  MOV      (SP)+,TMP
4054 033362 004715          JSR      PC,OPTR
4055 033364 010304          MOV      BYT,R4
4056 033366 004715          JSR      PC,OPTR
4057 033370 000303          SWAB      BYT
4058 033372 050304          BIS      BYT,H4
4059 033374 013707 033426      MOV      TMP,PC
4060
4061      ;
4062      ;CHECK CORRECTNESS OF JUMP ADDRESS
4063      ;
4064
4065 033400 004737 033356      JMP11  JSR      PC,GHRD
4066 033404 004715          JSR      PC,OPTR
4067 033406 105700          TSTB      CKSM
4068 033410 001343          BNE      BAD
4069 033412 006204          ASR      R4
4070 033414 103002          BCC      JMP11
4071 033416 000404          BR      FLDST
4072 033420 000711          BR      LD10
4073 033422 006204      JMP111  ASR      R4
4074 033424 000114          JMP      OR4
4075
4076 033426 000000      TMP:      .WORD      0
4077
4078 033430 012737 000001 000164  FLDST:  MOV      #1,REMPF          ;SETUP ICSR,VECTOR,ICAR FOR FIELD TEST
4079 033436 013737 033154 000170      MOV      SVCBR,ICARLO
4080 033444 013737 033156 000166      MOV      SVCAR,ICARLO
4081 033452 013737 033160 000172      MOV      SVMOD,ICSMLO
4082 033460 013737 033152 000162      MOV      SVVEC,ICRVEC
4083 033466 000137 000200          JMP      LOAD          ;GO START FIELD TEST
4084 033472 000137 033050      B0CKSM: JMP      CKSM00
4085
4086          033476      SENDAD=.
4087          000001          .END

```

ADDR	014450	CKSMBO	033052	EM4	022213	FR1000	014406	MFR100	002046
ADDTAB	017532	CNTRLC	025142	EM40	023541	FR20	014416	MFR11K	002036
ADDWRP	006434	CNTRLP	025132	EM41	023560	FR200	014410	MFR20	002050
ADR	=X000001	CONTOP	024775	EM42	023601	FR500	014412	MFR200	002044
ADWR1	006364	CONTRST	002776	EM43	023613	GETREC	104406	MFR500	002042
ADWR2	006372	CONTRSW	004146	EM44	023627	GOLOAD	033000	MICFLP	014426
BAD	033320	CRLP	022000	EM45	023644	GOOF	002754	MODEN	=000004
BC	=X000002	DA	=010000	EM46	023662	GWRD	033356	MODINT	=000200
BOCKSM	033472	DATENT	017174	EM47	023703	HEADER	022656	M0004	022227
BITLEST	003776	DDISP	=177570	EM5	022265	HGM	014432	NO00X	022601
BITYST	003656	DEV	=017776	EM50	023716	ICAR	002026	NOEXST	024533
BIT0	=000001	DH0	025412	EM51	023735	ICARMD	022563	NOISV	025367
BIT00	=000001	DH1	025416	EM52	024016	ICARLD	000166	NOPLUG	024567
BIT01	=000002	DH2	025434	EM53	024125	ICMOD	002022	ONE00X	003242
BIT02	=000004	DH3	025532	EM54	024124	ICRCNT	002034	OUT0SY	=100000
BIT03	=000010	DH4	025614	EM55	024142	ICRDWN	025212	PASCNT	=000000
BIT04	=000020	DISPLA	001140	EM56	024162	ICRRUN	002030	PASLG	014454
BIT05	=000040	DISPRE	000174	EM57	024176	ICRSRV	016714	PASMES	024442
BIT06	=000100	D8WR	=177570	EM6	022307	ICRVEC	000162	PASRUN	014456
BIT07	=000200	DT0	025616	EM60	024226	ICRWT	011116	PASS	022526
BIT08	=000400	DT1	025620	EM61	024245	ICRWT1	011242	PC	=X000007
BIT09	=001000	DT2	025630	EM62	024265	ICRWT2	011264	PCPRT	024305
BIT1	=000002	DT3	025642	EM63	024336	ICRWT3	011212	PERHGM	=000006
BIT10	=002000	DT4	025652	EM64	024316	ICSMLO	000172	PERLON	=000010
BIT11	=004000	EDISPT	014500	EM7	022327	ICSR	002024	PIRO	=177772
BIT12	=010000	EMTVEC	=000030	ENDPAS	010304	ICSRMD	022572	PIROVE	=000240
BIT13	=020000	EM1	022136	ENDPS1	010336	ICSRLO	000170	POP2SP	022626
BIT14	=040000	EM10	022344	ERMES	024463	INFLST	017210	PRIND	014452
BIT15	=100000	EM11	022362	ERRBIT	010000	INTFLG	017206	PRILVL	017172
BIT2	=000004	EM12	022402	ERRCNT	=000004	INTST	005034	PRIOR	022034
BIT3	=000010	EM13	022422	ERREN	=000002	INTST1	005234	PRMT	014462
BIT4	=000020	EM14	022442	ERRFLP	014440	IOTVEC	000020	PRMT1	014464
BIT5	=000040	EM15	022462	ERRFLR	002062	JMP1	033400	PRMES	010720
BIT6	=000100	EM16	022477	ERRLIN	016474	JMP11	033422	PRTSUM	010446
BIT7	=000200	EM17	022513	ERRLOP	014460	LD1	033232	PR0	=000000
BIT8	=000400	EM2	022155	ERRTOT	=000002	LD10	033244	PR1	=000040
BIT9	=001000	EM20	023214	ERRVEC	=000004	LD2	033246	PR2	=000100
BLANK	023207	EM21	023233	ERTTL	014442	LD3	033310	PR3	=000140
BLINK	017200	EM22	023246	FILECNT	014402	LD4	033322	PR4	=000200
BMTEN	=000010	EM23	023266	FILE	022547	LOAD	=000200	PR5	=000240
BMTINT	013772	EM24	023315	FILET	024357	LOADIN	024657	PR6	=000300
BMTYST	004574	EM25	023331	FILEND	002574	LOOP1	=004410	PR7	=000340
BOXCNT	002052	EM26	023346	FILLST	002774	LOOP2	=005632	PS	=177776
BPTVEC	000014	EM27	023363	FILNFD	002710	LOOP3	=011400	PSW	=177776
BUF0EG	017776	EM3	022173	FILUT8	014400	LOW	014434	PTR	=X000005
BUFEND	021750	EM30	023363	FIND11	002226	LPTST	003504	PWFEN	=000020
BUFFIN	021774	EM31	023363	FINMES	023173	MAINT3	003576	PWFFLG	002032
BUFMES	017774	EM32	023400	FIRST	014424	MAINT0	=000400	PWFPL	=002000
BYT	=X000003	EM33	023420	FLAG	014430	MAINT1	=004000	PWRFLP	014474
CKCNC	=104415	EM34	=023233	FLAG1	014422	MAINT2	=020000	PWRMES	025161
CKMES	033166	EM35	023447	FLOST	033430	MAINT3	=040000	PWRMS1	025245
CKPWF	=104414	EM36	023466	FRM10	014420	MES39	023060	PWRMS2	025332
CKSM	=X000000	EM37	023527	FR10P	014412	MFR1PK	002040	PWRVEC	=000024

READ 033326	STARTA 003044	TENTEN 001000	TYPON 124403	SERATY 015174
REMPF 000104	START1 003002	TENTM 024676	TYP08 104402	SERTTL 001112
REMOTE 014472	START2 003144	TEMP 014476	VECFND 004150	SFILLC 001154
REMPRE 014466	STKLMT 177774	TEMP1 014444	VECHD 022004	SFILLB 001153
RESULT 023124	SUMPRT 010120	TENCNT 002054	VECHES 022072	SGOADR 001120
RESVEC 000010	SVCAR 033156	TENCN1 014374	VECRET 004244	SGODAT 001124
RSTMS 025076	SVCOR 033154	TENTST 004346	VECTOR 014404	SMD 000003
RSTRT 016530	SVMOD 033160	TESTIN 022630	VECTST 004014	SICNT 001104
RST1 016634	SVVEC 033152	TEST1 003332	VECT1 004024	SILLUP 016146
RST2 016570	SWLOOP 013300	TEST2 005554	VECT2 004112	SITEMB 001114
RST3 016562	SWR 001136	TEST3 011330	WAITIN 024736	SLF 001160
RST4 016544	SWREG 000176	TEST3A 011632	WAIT1 010514	SLPADR 001106
RUNCON 024436	SMD 000001	TEST3B 012222	WAIT2 010452	SLPERR 001110
RUNSUM 024405	SMD0 000001	TEST3C 012344	WATROU 010254	SNUL 001152
RWBIT 003524	SMD1 000002	TEST3D 012556	WRKFLP 017204	SOCNT 015570
R0 0000000	SMD2 000004	TEST3L 011364	WRKRES 025146	SOMODE 015572
R1 0000001	SMD3 000010	TIMEPR 017202	XCKCNC 016302	SPASS 001100
R12 033334	SMD4 000020	TKVEC 000060	XCKPWF 016232	SPWRAD 016142
R2 0000002	SMD5 000040	THP 033426	XCKPW1 016270	SPWRDN 016020
R3 0000003	SMD6 000100	TP0 033162	XMASK 014376	SPWRMG 016136
R4 0000004	SMD7 000200	TPS 033164	XRESET 000100	SPWRUP 016066
R5 0000005	SMD8 000400	TPVEC 000064	XRESRC 017446	SQUES 001156
R6 0000006	SMD9 001000	TRACK 014446	XRIF 000001	SSAVR6 016152
R7 0000007	SW1 000002	TRAPVE 000034	XSAVRE 017372	SSETUP 000016
SAVEPC 017530	SW10 002000	TRERR 024507	XSCOPE 014324	STUP 177777
SAVPSW 017526	SW11 004000	TRTVEC 000014	XSC094 014156	SSWR 160000
SAVREG 104405	SW12 010000	TSITTY 025035	XSC096 014234	STKB 001144
SAV2PC 017524	SW13 020000	TSWR 033150	XSCITY 014256	STKS 001142
SAV2SW 017522	SW14 040000	TYEN 000040	XTMT 100000	STN 000001
SCOLOP 014372	SW15 100000	TYEND 007710	SODADR 001122	STPD 001150
SCOPEX 104412	SW2 000004	TYVFLP 017176	SODDAT 001126	STPFLG 001155
SCOP94 104407	SW3 000010	TYVINT 007574	SCHTAG 001100	STPS 001146
SCOP96 104410	SW4 000020	TYVL 007112	SCH3 000000	STRAP 016154
SCOTTY 104411	SW5 000040	TYVSTR 007032	SCNLF 001157	STRP 000016
SCTMP 014232	SW6 000100	TYVTMP 014470	SDBLK 016010	STRPAD 016176
SETPWF 002064	SW7 000200	TYVTST 007036	SDTBL 016000	STSTNM 001102
SP 0000006	SW8 000400	TYVNT 011316	SENDAD 033476	STYPOS 015574
SPACE 024564	SW9 001000	TYV1 007654	SERPLG 001103	STYPE 014502
SRTFF 002060	SWOFF 002056	TYV2 007620	SERMAX 001115	STYPOC 015372
STACK 001100	SYMAP 014436	TYPDS 104404	SERROR 015056	STYPON 015406
STARMS 023010	SYSTST 010542	TYPE 104413	SERRPC 001116	STYPOS 015346
START 002070	TBITVE 000014	TPOC 104401	SERRTB 001162	SOFILL 015571
033476				

ERRORS DETECTED: 0
DEFAULT GLOBALS GENERATED: 0

*DZIRAA,DZIRAA/SOL_DZIRAA
RUN-TIME: 36 24 1 SECONDS
RUN-TIME RATIO: 190/62=3.0
CORE USED: 16K (31 PAGES)