

RP07

RP07 FE/HOST ISOLATOR
CZRJMBO

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AH-F961B-MC
FICHE 1 OF 2

APR 1984
digital
Made In USA

Table with multiple columns and rows of data, including headers like 'ADDRESS', 'DATA', and 'CONTROL'. The content is highly repetitive and difficult to read due to the low resolution and high density of the data.

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Microfiche grid containing multiple frames of data.

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IDENTIFICATION

PRODUCT CODE: AC-F9608-MC
PRODUCT NAME: CZRJMB0 RP07 FRONT-END/ISOLATOR TEST
PRODUCT DATE: DECEMBER 1, 1983
MAINTAINER: CX DIAGNOSTIC ENGINEERING
AUTHOR: MIKE LEAVITT

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1.0 GENERAL INFORMATION

1.1 PROGRAM ABSTRACT

THE RPO7 FRONT END DIAGNOSTIC IS A PROGRAM WHICH PARTIALLY AUTOMATES THE PATHFINDER DOCUMENT TO ALLOW COMPUTERIZED SEQUENTIAL DIAGNOSIS OF AN RPO7. THE PROGRAM INITIALLY DEMONSTRATES HARDWARE INTEGRITY BETWEEN THE RHXX CONTROLLER, ASSOCIATED CABLING AND THE DISK CONTROL LOGIC (DCL). SATISFACTORY COMPLETION OF THIS PHASE OF TESTING THEN PERMITS "HOST" INVOCATION OF THE RPO7 RESIDENT MICRODIAGNOSTICS, THOSE SPECIFICALLY ALLOWING REMOTE EXECUTION, TO ASCERTAIN A REASONABLE LEVEL OF CONFIDENCE IN THE DISK DRIVE.

THIS DIAGNOSTIC HAS BEEN WRITTEN FOR USE WITH THE DIAGNOSTIC RUNTIME SERVICES SOFTWARE (SUPERVISOR). THESE SERVICES PROVIDE THE INTERFACE TO THE OPERATOR AND TO THE SOFTWARE ENVIRONMENT. THIS PROGRAM CAN BE USED WITH XXDP+, ACT, APT, SLIDE AND PAPER TAPE. FOR A COMPLETE DESCRIPTION OF THE RUNTIME SERVICES, REFER TO THE XXDP+ USER'S MANUAL. THERE IS A BRIEF DESCRIPTION OF THE RUNTIME SERVICES IN SECTION 2 OF THIS DOCUMENT.

1.2 SYSTEM REQUIREMENTS

THIS PROGRAM, IN ORDER TO EXECUTE, WILL REQUIRE THE FOLLOWING SYSTEM HARDWARE:

1. AN XXDP+ LOAD MEDIUM,
2. A CONSOLE KEYBOARD/PRINTER,
3. A MINIMUM OF 28K WORD OF MAIN MEMORY,
4. A PDP11 PROCESSOR AND APPROPRIATE MASSBUS CONTROLLER WHICH CONFORMS TO (DEC STD 159) AND WHICH HAS A THROUGHPUT CAPACITY OF 2.2 MBYTES /SEC OR GREATER.
5. AT LEAST ONE RPO7 WITH RHXX CONTROLLER

1.3 RELATED DOCUMENTS AND STANDARDS

XXDP+ USER'S MANUAL - CHQUS

1.4 DIAGNOSTIC HIERARCHY PREREQUISITES

ALL CPU, MEMORY, AND TERMINAL DIAGNOSTICS MUST RUN SUCCESSFULLY TO COMPLETION.

1.5 ASSUMPTIONS

NONE

2.0 OPERATING INSTRUCTIONS

THIS SECTION CONTAINS A BRIEF DESCRIPTION OF THE RUNTIME SERVICES. FOR DETAILED INFORMATION, REFER TO THE XXDP+ USER'S MANUAL (CHQUS).

2.1 COMMANDS

THERE ARE ELEVEN LEGAL COMMANDS FOR THE DIAGNOSTIC RUNTIME SERVICES (SUPERVISOR). THIS SECTION LISTS THE COMMANDS AND GIVES A VERY BRIEF DESCRIPTION OF THEM. THE XXDP USER'S MANUAL HAS MORE DETAILS.

COMMAND	EFFECT
START	START THE DIAGNOSTIC FROM AN INITIAL STATE
RESTART	START THE DIAGNOSTIC WITHOUT INITIALIZING
CONTINUE	CONTINUE AT TEST THAT WAS INTERRUPTED (AFTER ↑C)
PROCEED	CONTINUE FROM AN ERROR HALT
EXIT	RETURN TO XXDP MONITOR (XXDP OPERATION ONLY!)
ADD	ACTIVATE A UNIT FOR TESTING (ALL UNITS ARE CONSIDERED TO BE ACTIVE AT START TIME)
DROP	DEACTIVATE A UNIT
PRINT	PRINT STATISTICAL INFORMATION (IF IMPLEMENTED BY THE DIAGNOSTIC - SECTION 4.0)
DISPLAY	TYPE A LIST OF ALL DEVICE INFORMATION
FLAGS	TYPE THE STATE OF ALL FLAGS (SEE SECTION 2.3)
ZFLAGS	CLEAR ALL FLAGS (SEE SECTION 2.3)

A COMMAND CAN BE RECOGNIZED BY THE FIRST THREE CHARACTERS. SO YOU MAY, FOR EXAMPLE, TYPE "STA" INSTEAD OF "START".

2.2 SWITCHES

THERE ARE SEVERAL SWITCHES WHICH ARE USED TO MODIFY SUPERVISOR OPERATION. THESE SWITCHES ARE APPENDED TO THE LEGAL COMMANDS. ALL OF THE LEGAL SWITCHES ARE TABULATED BELOW WITH A BRIEF DESCRIPTION OF EACH. IN THE DESCRIPTIONS BELOW, A DECIMAL NUMBER IS DESIGNATED BY "DDDD".

SWITCH	EFFECT
/TESTS:LIST	EXECUTE ONLY THOSE TESTS SPECIFIED IN THE LIST. LIST IS A STRING OF TEST NUMBERS, FOR EXAMPLE - /TESTS:1:5:7-10. THIS LIST WILL CAUSE TESTS 1,5,7,8,9,10 TO BE RUN. ALL OTHER TESTS WILL NOT BE RUN.
/PASS:DDDD	EXECUTE DDDDD PASSES (DDDD = 1 TO 64000)
/FLAGS:FLGS	SET SPECIFIED FLAGS. FLAGS ARE DESCRIBED IN SECTION 2.3.
/EOP:DDDD	REPORT END OF PASS MESSAGE AFTER EVERY DDDDD PASSES ONLY. (DDDD = 1 TO 64000)
/UNITS:LIST	TEST/ADD/DROP ONLY THOSE UNITS SPECIFIED IN THE LIST. LIST EXAMPLE - /UNITS:0:5:10-12 USE UNITS 0,5,10,11,12 (UNIT NUMBERS = 0-63)

EXAMPLE OF SWITCH USAGE:

START/TESTS:1-5/PASS:1000/EOP:100

THE EFFECT OF THIS COMMAND WILL BE: 1) TESTS 1 THROUGH 5 WILL BE EXECUTED, 2) ALL UNITS WILL TESTED 1000 TIMES AND 3) THE END OF PASS MESSAGES WILL BE PRINTED AFTER EACH 100 PASSES ONLY. A

SWITCH CAN BE RECOGNIZED BY THE FIRST THREE CHARACTERS. YOU MAY, FOR EXAMPLE, TYPE "/TES:1 5" INSTEAD OF "/TESTS:1-5".

BELOW IS A TABLE THAT SPECIFIES WHICH SWITCHES CAN BE USED BY EACH COMMAND.

	TESTS	PASS	FLAGS	EOP	UNITS
START	X	X	X	X	X
RESTART	X	X	X	X	X
CONTINUE		X	X	X	
PROCEED			X		
DROP					X
ADD					X
PRINT					
DISPLAY					X
FLAGS					
ZFLAGS					
EXIT					

2.3 FLAGS

FLAGS ARE USED TO SET UP CERTAIN OPERATIONAL PARAMETERS SUCH AS LOOPING ON ERROR. ALL FLAGS ARE CLEARED AT STARTUP AND REMAIN CLEARED UNTIL EXPLICITLY SET USING THE FLAGS SWITCH. FLAGS ARE ALSO CLEARED AFTER A START COMMAND UNLESS SET USING THE FLAG SWITCH. THE ZFLAGS COMMAND MAY ALSO BE USED TO CLEAR ALL FLAGS. WITH THE EXCEPTION OF THE START AND ZFLAGS COMMANDS, NO COMMANDS AFFECT THE STATE OF THE FLAGS; THEY REMAIN SET OR CLEARED AS SPECIFIED BY THE LAST FLAG SWITCH.

FLAG	EFFECT
HOE	HALT ON ERROR - CONTROL IS RETURNED TO RUNTIME SERVICES COMMAND MODE
LOE	LOOP ON ERROR
IER*	INHIBIT ALL ERROR REPORTS
IBR*	INHIBIT ALL ERROR REPORTS EXCEPT FIRST LEVEL (FIRST LEVEL CONTAINS ERROR TYPE, NUMBER, PC, TEST AND UNIT)
IXR*	INHIBIT EXTENDED ERROR REPORTS (THOSE CALLED BY PRINTX MACRO'S)
PRI	DIRECT MESSAGES TO LINE PRINTER
PNT	PRINT TEST NUMBER AS TEST EXECUTES
BOE	"BELL" ON ERROR
UAM	UNATTENDED MODE (NO MANUAL INTERVENTION)
ISR	INHIBIT STATISTICAL REPORTS (DOES NOT APPLY TO DIAGNOSTICS WHICH DO NOT SUPPORT STATISTICAL REPORTING)
IDR	INHIBIT PROGRAM DROPPING OF UNITS
ADR	EXECUTE AUTODROP CODE
LOT	LOOP ON TEST
EVL	EXECUTE EVALUATION (ON DIAGNOSTICS WHICH HAVE EVALUATION SUPPORT)

* ERROR MESSAGES ARE DESCRIBED IN SECTION 3.1

SEE THE XXDP+ USER'S MANUAL FOR MORE DETAILS ON FLAGS. YOU MAY SPECIFY MORE THAN ONE FLAG WITH THE FLAG SWITCH. FOR EXAMPLE, TO CAUSE THE PROGRAM TO LOOP ON ERROR, INHIBIT ERROR REPORTS AND TYPE A "BELL" ON ERROR, YOU MAY USE THE FOLLOWING STRING:

```
/FLAGS:LOE:IER:BOE
```

2.4 HARDWARE QUESTIONS

WHEN A DIAGNOSTIC IS STARTED, THE RUNTIME SERVICES WILL PROMPT THE USER FOR HARDWARE INFORMATION BY TYPING "CHANGE HW (L) ?" YOU MUST ANSWER "Y" AFTER A START COMMAND UNLESS THE HARDWARE INFORMATION HAS BEEN "PRELOADED" USING THE SETUP UTILITY (SEE CHAPTER 6 OF THE XXDP+ USER'S MANUAL). WHEN YOU ANSWER THIS QUESTION WITH A "Y", THE RUNTIME SERVICES WILL ASK FOR THE NUMBER OF UNITS (IN DECIMAL). YOU WILL THEN BE ASKED THE FOLLOWING QUESTIONS FOR EACH UNIT.

```
UNIT 0  
RPCS1 ADRS (0) 176700 ?  
VECTOR ADRS (0) 254 ?  
BR LEVEL (0) 5 ?  
DRIVE # (0) 0 ?
```

THE 1ST QUESTION "RPCS1 ADRS" REQUIRES THAT THE USER INPUT THE ADDRESS OF RPCS1 OF THE CONTROLLER WHICH IS CONNECTED TO THE DRIVE UNDER TEST. DEFAULT IS 176700 (OCTAL).

THE 2ND QUESTION "VECTOR ADRS" REQUIRES THE USER TO INPUT THE INTERRUPT VECTOR ADDRESS OF THE RHXX CONTROLLER. DEFAULT IS 254 (OCTAL).

THE 3RD QUESTION "BR LEVEL" REQUIRES THE USER TO INPUT THE CONTROLLER INTERRUPT PRIORITY LEVEL. DEFAULT IS LEVEL 5.

THE 4TH QUESTION "DRIVE #" REQUIRES THE USER TO SPECIFY THE DRIVE NUMBER OF THE DRIVE TO BE TESTED. DEFAULT IS 0 (OCTAL).

2.5 SOFTWARE QUESTIONS

AFTER YOU HAVE ANSWERED THE HARDWARE QUESTIONS OR AFTER A RESTART OR CONTINUE COMMAND, THE RUNTIME SERVICES WILL ASK FOR SOFTWARE PARAMETERS. THESE PARAMETERS WILL GOVERN SOME DIAGNOSTIC SPECIFIC OPERATION MODES. YOU WILL BE PROMPTED BY "CHANGE SW (L) ?" IF YOU WISH TO CHANGE ANY PARAMETERS, ANSWER BY TYPING "Y". THE SOFTWARE QUESTIONS AND THE DEFAULT VALUES ARE DESCRIBED IN THE NEXT PARAGRAPH(S).

THE FOLLOWING QUESTION ASKS IF THE USER WANTS TO EXECUTE THE MASSBUS INTERFACE SWITCH TEST. THIS IS USEFUL IF THE USER IS RUNNING MULTIPLE PASSES AND DOES NOT WISH TO SLOW DOWN TESTING IN ORDER TO 'SWITCH' THE MASSBUS INTERFACE SWITCH.

"EXECUTE TEST 25., MASSBUS INTERFACE SWITCH TEST (L) Y ?"

THE FOLLOWING QUESTION ASKS IF THE USER WANTS THE RP07 INTERNAL ERROR LOG CONTENTS. THE ERROR LOG IN THE RP07 MAY BE USEFUL AS A TROUBLESHOOTING TOOL, AND AS SUCH MAY BE OUTPUT UPON REQUEST.

"EXECUTE TEST 52., PRINT CONTENTS OF INTERNAL ERROR LOG (L) Y ?"

THE FOLLOWING QUESTION ASKS THE USER IF THE INTERNAL RP07 READ/WRITE ROUTINE SHOULD BE LIMITED ONLY TO ONE TRACK. THIS MAY BE USEFUL TO HELP ISOLATE A SELECTED HEAD/CHIP FAILURE.

"SELECT A TRACK FOR THE RP07 INTERNAL RD-WRT TESTS (L) N ?"

THE FOLLOWING QUESTION ASKED ONLY IF THE ABOVE QUESTION IS ANSWERED "YES", ALLOWS A USER TO SELECT ONE HEAD FOR THE INTERNAL READ/WRITE TESTS.

"TRACK ADDRESS (D) 0 ?"

THE FOLLOWING QUESTION ASKS IF THE USER DESIRES TO RUN ONLY ONE MICRODIAGNOSTIC. IF THE ANSWER IS YES, AND THE MANUAL MODE OF OPERATION IS ENABLED, THE USER WILL BE INTERROGATED AS TO WHICH ROUTINE TO SELECT FOR EXECUTION.

"EXECUTE TEST 60., SELECT A MICRO-DIAGNOSTIC FOR EXECUTION (L) N ?"

NOTE

ONCE THIS QUESTION HAS BEEN ANSWERED 'YES' AND THE ROUTINE HAS BEEN RUN AT LEAST ONCE, PROVIDING THAT THE USER HAS CORRECTLY INPUT A ROUTINE NUMBER WHICH IS VALID, THE SELECTED ROUTINE WILL ALWAYS RUN WHEN THE TEST IS SELECTED FOR EXECUTION. THE ONLY WAY THE USER MAY CHANGE THE ROUTINE SELECTED FOR EXECUTION IS TO HALT THE PROGRAM VIA THE CONTROL C (^C) MECHANISM AND ISSUE A NEW 'START' COMMAND. ANY OTHER METHOD OF RESUMING PROGRAM OPERATION WILL CONTINUE TO EXECUTE THE ROUTINE PREVIOUSLY ACCEPTED AS INPUT FROM THE USER.

2.6 EXTENDED P-TABLE DIALOGUE

WHEN YOU ANSWER THE HARDWARE QUESTIONS, YOU ARE BUILDING ENTRIES IN A TABLE THAT DESCRIBES THE DEVICES UNDER TEST. THE SIMPLEST WAY TO BUILD THIS TABLE IS TO ANSWER ALL QUESTIONS FOR EACH UNIT TO BE TESTED. IF YOU HAVE A MULTIPLEXED DEVICE SUCH AS A MASS STORAGE CONTROLLER WITH SEVERAL DRIVES OR A COMMUNICATION DEVICE WITH SEVERAL LINES, THIS BECOMES TEDIOUS SINCE MOST OF THE ANSWERS ARE REPETITIOUS.

TO ILLUSTRATE A MORE EFFICIENT METHOD, SUPPOSE YOU ARE TESTING A FICTIONAL DEVICE, THE XY11. SUPPOSE THIS DEVICE CONSISTS OF

A CONTROL MODULE WITH EIGHT UNITS (SUB-DEVICES) ATTACHED TO IT. THESE UNITS ARE DESCRIBED BY THE OCTAL NUMBERS 0 THROUGH 7. THERE IS ONE HARDWARE PARAMETER THAT CAN VARY AMONG UNITS CALLED THE Q-FACTOR. THIS Q-FACTOR MAY BE 0 OR 1. BELOW IS A SIMPLE WAY TO BUILD A TABLE FOR ONE XY11 WITH EIGHT UNITS.

* UNITS (0) ? 8<CR>

UNIT 1
CSR ADDRESS (0) ? 160000<CR>
SUB-DEVICE # (0) ? 0<CR>
Q-FACTOR (0) 0 ? 1<CR>

UNIT 2
CSR ADDRESS (0) ? 160000<CR>
SUB-DEVICE # (0) ? 1<CR>
Q-FACTOR (0) 1 ? 0<CR>

UNIT 3
CSR ADDRESS (0) ? 160000<CR>
SUB-DEVICE # (0) ? 2<CR>
Q-FACTOR (0) 0 ? <CR>

UNIT 4
CSR ADDRESS (0) ? 160000<CR>
SUB-DEVICE # (0) ? 3<CR>
Q-FACTOR (0) 0 ? <CR>

UNIT 5
CSR ADDRESS (0) ? 160000<CR>
SUB-DEVICE # (0) ? 4<CR>
Q-FACTOR (0) 0 ? <CR>

UNIT 6
CSR ADDRESS (0) ? 160000<CR>
SUB-DEVICE # (0) ? 5<CR>
Q-FACTOR (0) 0 ? <CR>

UNIT 7
CSR ADDRESS (0) ? 160000<CR>
SUB-DEVICE # (0) ? 6<CR>
Q-FACTOR (0) 0 ? 1<CR>

UNIT 8
CSR ADDRESS (0) 160000<CR>
SUB-DEVICE # (0) ? 7<CR>
Q-FACTOR (0) 1 ? <CR>

NOTICE THAT THE DEFAULT VALUE FOR THE Q-FACTOR CHANGES WHEN A NON-DEFAULT RESPONSE IS GIVEN. BE CAREFUL WHEN SPECIFYING MULTIPLE UNITS!

AS YOU CAN SEE FROM THE ABOVE EXAMPLE, THE HARDWARE PARAMETERS DO NOT VARY SIGNIFICANTLY FROM UNIT TO UNIT. THE PROCEDURE SHOWN IS NOT VERY EFFICIENT.

THE RUNTIME SERVICES CAN TAKE MULTIPLE UNIT SPECIFICATIONS HOWEVER.

LET'S BUILD THE SAME TABLE USING THE MULTIPLE SPECIFICATION FEATURE.

```
◆ UNITS (D) ? 8<CR>

UNIT 1
CSR ADDRESS (0) ? 160000<CR>
SUB-DEVICE # (0) ? 0,1<CR>
Q-FACTOR (0) 0 ? 1,0<CR>

UNIT 3
CSR ADDRESS (0) ? 160000<CR>
SUB-DEVICE # (0) ? 2-5<CR>
Q-FACTOR (0) 0 ? 0<CR>

UNIT 7
CSR ADDRESS (0) ? 160000<CR>
SUB-DEVICE # (0) ? 6,7<CR>
Q-FACTOR (0) 0 ? 1<CR>
```

AS YOU CAN SEE IN THE ABOVE DIALOGUE, THE RUNTIME SERVICES WILL BUILD AS MANY ENTRIES AS IT CAN WITH THE INFORMATION GIVEN IN ANY ONE PASS THROUGH THE QUESTIONS. IN THE FIRST PASS, TWO ENTRIES ARE BUILT SINCE TWO SUB-DEVICES AND Q-FACTORS WERE SPECIFIED. THE SERVICES ASSUME THAT THE CSR ADDRESS IS 160000 FOR BOTH SINCE IT WAS SPECIFIED ONLY ONCE. IN THE SECOND PASS, FOUR ENTRIES WERE BUILT. THIS IS BECAUSE FOUR SUB-DEVICES WERE SPECIFIED. THE "-" CONSTRUCT TELLS THE RUNTIME SERVICES TO INCREMENT THE DATA FROM THE FIRST NUMBER TO THE SECOND. IN THIS CASE, SUB-DEVICES 2, 3, 4 AND 5 WERE SPECIFIED. (IF THE SUB-DEVICE WERE SPECIFIED BY ADDRESSES, THE INCREMENT WOULD BE BY 2 SINCE ADDRESSES MUST BE ON AN EVEN BOUNDARY.) THE CSR ADDRESSES AND Q-FACTORS FOR THE FOUR ENTRIES ARE ASSUMED TO BE 160000 AND 0 RESPECTIVELY SINCE THEY WERE ONLY SPECIFIED ONCE. THE LAST TWO UNITS ARE SPECIFIED IN THE THIRD PASS.

THE WHOLE PROCESS COULD HAVE BEEN ACCOMPLISHED IN ONE PASS AS SHOWN BELOW.

```
◆ UNITS (D) ? 8<CR>

UNIT 1
CSR ADDRESS (0) ? 160000<CR>
SUB-DEVICE # (0) ? 0-7<CR>
Q-FACTOR (0) 0 ? 0,1,0,...,1,1<CR>
```

AS YOU CAN SEE FROM THIS EXAMPLE, NULL REPLIES (COMMAS ENCLOSING A NULL FIELD) TELL THE RUNTIME SERVICES TO REPEAT THE LAST REPLY.

2.7 QUICK START-UP PROCEDURE (XXDP+)

TO START-UP THIS PROGRAM:

1. BOOT XXDP+
2. GIVE THE DATE AND ANSWER THE LSI AND 50HZ (IF THERE

IS A CLOCK) QUESTIONS

3. TYPE "R NAME", WHERE NAME IS THE NAME OF THE BIN OR BIC FILE FOR THIS PROGRAM
4. TYPE "START"
5. ANSWER THE "CHANGE HW" QUESTION WITH "Y"
6. ANSWER ALL THE HARDWARE QUESTIONS
7. ANSWER THE "CHANGE SW" QUESTION WITH "N"

WHEN YOU FOLLOW THIS PROCEDURE YOU WILL BE USING ONLY THE DEFAULTS FOR FLAGS AND SOFTWARE PARAMETERS. THESE DEFAULTS ARE DESCRIBED IN SECTIONS 2.3 AND 2.5.

3.0 ERROR INFORMATION

3.1 TYPES OF ERROR MESSAGES

THERE ARE THREE LEVELS OF ERROR MESSAGES THAT MAY BE ISSUED BY A DIAGNOSTIC: GENERAL, BASIC AND EXTENDED. GENERAL ERROR MESSAGES ARE ALWAYS PRINTED UNLESS THE "IER" FLAG IS SET (SECTION 2.3). THE GENERAL ERROR MESSAGE IS OF THE FORM:

```
NAME TYPE NUMBER ON UNIT NUMBER TST NUMBER PC:XXXXXX  
ERROR MESSAGE
```

WHERE: NAME = DIAGNOSTIC NAME
TYPE = ERROR TYPE (SYS FATAL, DEV FATAL, HARD OR SOFT)
NUMBER = ERROR NUMBER
UNIT NUMBER = 0 - N (N IS LAST UNIT IN PTABLE)
TST NUMBER = TEST AND SUBTEST WHERE ERROR OCCURRED
PC:XXXXXX = ADDRESS OF ERROR MESSAGE CALL

BASIC ERROR MESSAGES ARE MESSAGES THAT CONTAIN SOME ADDITIONAL INFORMATION ABOUT THE ERROR. THESE ARE ALWAYS PRINTED UNLESS THE "IER" OR "IBR" FLAGS ARE SET (SECTION 2.3). THESE MESSAGES ARE PRINTED AFTER THE ASSOCIATED GENERAL MESSAGE.

EXTENDED ERROR MESSAGES CONTAIN SUPPLEMENTARY ERROR INFORMATION SUCH AS REGISTER CONTENTS OR GOOD/BAD DATA. THESE ARE ALWAYS PRINTED UNLESS THE "IER", "IBR" OR "IXR" FLAGS ARE SET (SECTION 2.3). THESE MESSAGES ARE PRINTED AFTER THE ASSOCIATED GENERAL ERROR MESSAGE AND ANY ASSOCIATED BASIC ERROR MESSAGES.

3.2 SPECIFIC ERROR MESSAGES

- COMPOSITE ERROR SET WHEN NOT EXPECTED -

THIS MESSAGE IS GENERATED WHEN COMPOSITE ERROR IS FOUND TO BE SET WHEN IT SHOULD HAVE BEEN RESET.

DRIVE HUNG, DRY NOT SET IN TIME

THIS MESSAGE IS GENERATED WHEN GO IS FOUND TO BE SET. THE FUNCTION IS TIMED, AND WHEN THE TIMING FUNCTION EXPIRES, THE ABOVE MESSAGE IS PRODUCED.

- DRIVE WRITE LOCKED -

THIS MESSAGE IS PRODUCED WHEN THE PROGRAM PREPARES TO EXECUTE A WRITE FUNCTION AND THE WRITE LOCK BIT (RPDS:WRL) IS FOUND TO BE ASSERTED.

- DRIVE OFFLINE -

THIS MESSAGE IS GENERATED WHEN THE PROGRAM PREPARES TO EXECUTE A COMMAND AND THE MEDIUM ON LINE BIT (RPDS:MOL) IS FOUND TO BE RESET.

- RPCS2: OR FAILED TO SET IN TIME -

THIS MESSAGE IS GENERATED WHEN WHILE USING A TIMER, THE OUTPUT READY BIT (RPCS2:OR) IS FOUND TO BE RESET UNTIL THE TIMER FUNCTION EXPIRES.

- RPCS2:OR FAILED TO CLEAR IN TIME -

THIS MESSAGE IS GENERATED WHEN WHILE USING A TIMER, THE OUTPUT READY BIT (RPCS2:OR) IS FOUND TO BE SET UNTIL THE TIMER FUNCTION EXPIRES.

- RH CONTROLLER DIDN'T RESPOND (NO SSYNC). -

THIS MESSAGE IS GENERATED WHEN THE PROGRAM ATTEMPTS TO ACCESS THE CONTROLLER AT THE USER SPECIFIED ADDRESS, AND IT DOESN'T RESPOND.

- BIT(S) UNDER TEST DIDN'T CHANGE STATE -

THIS MESSAGE IS GENERATED WHEN THE REGISTER RESULTS ARE NOT THE COMPLIMENT OF THE REGISTER STATE AT THE START OF THE TEST.

- RPCS2:CLR DIDN'T FUNCTION PROPERLY -

THIS MESSAGE IS GENERATED WHEN THE PROGRAM FINDS THAT THE CONTROLLER

CLEAR FUNCTION DID NOT FUNCTION PROPERLY.

- REG CONTENTS DON'T MATCH EXPECTED DATA -

THIS MESSAGE IS PRODUCED WHEN EXTRA BITS SET OR CLEAR WHEN THEY ARE NOT EXPECTED TO FUNCTION IN THIS MANNER.

- REG DIDN'T CLEAR WHEN EXPECTED -

THIS MESSAGE IS GENERATED WHEN A REGISTER DOESN'T RESET WHEN EXPECTED.

- SC OR TRE SET WHEN NOT EXPECTED -

THIS MESSAGE IS GENERATED AS A RESULT OF DETECTING A TRANSFER ERROR (RPCS1:TRE) OR DETECTING AN UNEXPECTED ATA (RPCS1:SC)

- RPCS2:IR FAILED TO SET IN TIME -

THIS MESSAGE IS GENERATED WHEN USING A TIMER, INPUT READY (RPCS2:IR) IS FOUND TO BE RESET AFTER THE TIMING FUNCTION HAS EXPIRED.

- RPCS1, MCPE DIDN'T SET WHEN EXPECTED -

THIS MESSAGE IS GENERATED WHEN THE PROGRAM FAILS TO DETECT A MASSBUS CONTROL PARITY ERROR (RPCS1, MCPE).

- RPCS1, SC OR TRE DIDN'T SET WHEN EXPECTED -

THIS MESSAGE IS GENERATED WHEN THE PROGRAM FORCES AN ERROR OR ATTENTION, AND THE RESULTING TRE OR SC IN RPCS1 DOES NOT SET.

- BIT(S) UNDER TEST DIDN'T SET WHEN EXPECTED -

THIS MESSAGE IS GENERATED WHEN THE STIMULUS AND THE RESULT DO NOT MATCH, AND THE RESULT WAS EXPECTED TO FORCE REGISTER BIT(S) TO TOGGLE FROM 0 TO 1.

- BIT(S) UNDER TEST DIDN'T CLEAR WHEN EXPECTED -

THIS MESSAGE IS GENERATED WHEN THE STIMULUS AND THE RESULT DO NOT MATCH, AND THE RESULT WAS EXPECTED TO FORCE REGISTER BITS TO TOGGLE FROM

1 TO 0.

- RH INTERRUPTED AT WRONG PRIORITY -

THIS MESSAGE IS PRODUCED WHEN THE RH CONTROLLER INTERRUPTS AT A PRIORITY HIGHER THAN THE EXPECTED PRIORITY.

- RH GENERATED FALSE INTERRUPT

THIS MESSAGE IS PRODUCED WHEN THE RH IS TESTED TO HAVE NO PREREQUISITE CONDITIONS WHICH COULD GENERATE AN INTERRUPT, YET DOES GENERATE AN INTERRUPT ANYWAY.

- RH DIDN'T INTERRUPT WHEN EXPECTED -

THIS MESSAGE IS GENERATED WHEN THE PROGRAM EXPECTS AN INTERRUPT BUT DOESN'T GET ONE.

- DRIVE NOT PRESENT, TEST INVALID -

THIS MESSAGE IS GENERATED WHEN THE UNIT UNDER TEST IS FOUND TO BE NOT PRESENT.

- COMMAND EXECUTION INCORRECT -

THIS MESSAGE IS GENERATED WHEN A COMMAND IS EXECUTED AND THE DRIVE DOESN'T RETURN THE CORRECT STATUS FOR THE COMPLETED OPERATION.

- DATA LINES STUCK LOW -

THIS MESSAGE IS GENERATED WHEN, DURING A "READ ALL TRACK DESCRIPTOR" OPERATION, THE DATA RECEIVED DOESN'T FORCE ALL 16 DATA LINES FROM A 0 TO 1.

- FAILED TO SEEK PROPERLY -

THIS MESSAGE IS GENERATED WHEN THE PROGRAM FAILS TO RECEIVE THE CORRECT STATUS FROM THE DRIVE UPON THE COMPLETION OF A SEEK OPERATION.

- DETECTED ERROR DURING WRITE DATA OPERATION -

THIS MESSAGE IS PRODUCED TO ENABLE THE USER TO DISCERN BETWEEN READ

AND WRITE ERRORS.

- FAILED TO CORRECTLY DETECT A WRITE CHECK ERROR -

THIS MESSAGE IS GENERATED WHEN THE PROGRAM FORCES A WRITE CHECK ERROR, BUT THE DRIVE FAILS TO POST THE CORRECT STATUS.

- DETECTED ERROR DURING FORMAT OPERATION -

THIS MESSAGE IS GENERATED TO ENABLE THE USER TO ISOLATE PROBLEMS WHICH OCCUR ONLY DURING A FORMAT OPERATION.

- DETECTED ERROR DURING DATA TRANSFER -

THIS MESSAGE IS GENERATED ANYTIME AN ERROR IS DETECTED DURING A DATA TRANSFER OPERATION OTHER THAN THE ONES MENTIONED ABOVE.

- FAILED AN RP07 INTERNAL MICRODIAGNOSTIC TEST -

THIS MESSAGE IS GENERATED ANYTIME THE PROGRAM DETECTS AN ERROR DURING THE MICRODIAGNOSTIC EXECUTION IN THE DRIVE.

- RMX REGISTER SELECTION FAILURE -

THIS MESSAGE IS GENERATED WHEN THE RM REGISTER SELECT TESTS FAIL. IT IS INDICATIVE OF A MULTIPLEXOR OR SELECT LOGIC FAILURE.

- DATA RECEIVED DOESN'T MATCH EXPECTED DATA -

THIS MESSAGE IS GENERATED WHEN THE PROGRAM COMPARES EXPECTED WITH RECEIVED DATA AND FINDS THAT THEY DON'T MATCH, INDICATING A READ ERROR.

- DETECTED A PERMANENT ERROR -

THIS MESSAGE IS GENERATED WHEN RPD5, ERR=1 AND RPER1, RPER2 AND RPER3 ARE ALL 0.

- INTERNAL RP07 DIAGNOSTIC TIME-OUT -

THIS MESSAGE IS GENERATED WHEN THE PROGRAM FINDS, USING A MAINTENANCE

TIMER, THAT THE DIAGNOSTIC EXECUTION DID NOT COMPLETE WHEN THE TIMER FUNCTION EXPIRED.

4.0 PERFORMANCE AND PROGRESS REPORTS

AT THE END OF EACH PASS, THE PASS COUNT IS GIVEN ALONG WITH THE TOTAL NUMBER OF ERRORS REPORTED SINCE THE DIAGNOSTIC WAS STARTED. THE "EOP" SWITCH CAN BE USED TO CONTROL HOW OFTEN THE END OF PASS MESSAGE IS PRINTED. SECTION 2.2 DESCRIBES SWITCHES.

5.0 DEVICE INFORMATION TABLES

THE DEFAULT HARDWARE P-TABLE CONTAINS DEFAULT VALUES OF THE TEST-DEVICE PARAMETERS. THE STRUCTURE OF THIS TABLE IS IDENTICAL TO THE STRUCTURE OF THE HARDWARE P-TABLES.

```
.WORD 176700 ;RPCS1 BASE REGISTER ADDRESS
.WORD 254    ;VECTOR ADDRESS
.WORD 240    ;BR LEVEL 5 DEVICE
.WORD 0      ;DRIVE NUMBER
```

THE SOFTWARE P-TABLE CONTAINS THE VALUES OF THE PROGRAM PARAMETERS THAT CAN BE CHANGED BY THE OPERATOR.

```
SWTST: .WORD 1      ;USED TO SELECT MASSBUS INTERFACE TEST;
                ;DISABLED= 0, ENABLED= 1
ERRDMP: .WORD 1      ;USED TO ENABLE THE RP07 ERROR LOG DUMP
SELTRK: .WORD 0      ;USED TO SELECT A TRACK ADDRESS IN THE MICRO-
                ;DIAGNOSTIC TEST
TRAKAD: .WORD 0      ;USED TO GET THE USER TRACK ADDRESS
SELRUN: .WORD 0      ;USED TO DETERMINE IF USER SELECTED A MICRO-
                ;DIAGNOSTIC TEST
```

IN THE BASIC DRIVE TEST, THERE IS A USER PROMPT WHICH ASKS THE OPERATOR TO DISABLE SWITCH A12-501 IN THE DRIVE. IF THE USER RESPONDS "NO", THE TEST IS BYPASSED. IF THE USER RESPONDS "YES", THE PROGRAM EXPECTS THE SWITCH TO BE DISABLED WHEN THE USER RESPONDS. THE PROGRAM, UPON COMPLETION OF THE TEST, ASKS THE USER TO RE-ENABLE THE SWITCH. IF THE USER RESPONDS "NO" THE PROGRAM LOOPS UNTIL THE SWITCH HAS BEEN RE-ENABLED AND THE USER RESPONDS "YES".

IF THE MANUAL MODE OF OPERATION IS ENABLED AND THE USER HAS, THROUGH THE SOFTWARE QUESTIONS, INDICATED THAT ONE MICRO-DIAGNOSTIC IS TO BE SELECTED FOR EXECUTION, THE USER WILL BE ASKED TO INPUT A 2 CHARACTER HEX ENTRY WHICH WILL ALLOW SELECTION AND EXECUTION OF THAT PARTICULAR MICRO-DIAGNOSTIC.

6.0 TEST SUMMARIES

THE FOLLOWING REPRESENT A GENERAL LIST OF TESTS WHICH WILL BE PERFORMED TO THE RH70 CONTROLLER. THOSE TESTS MARKED WITH AN ASTERISK (*) WILL NOT BE EXECUTED WHEN AN RH11 CONTROLLER IS DETERMINED TO BE THE RP07 INTERFACE.

TEST 1: UNIT UNDER TEST

SELECTS A USER SPECIFIED CONTROLLER AND ASCERTAINS THAT THE CONTROLLER DOES INDEED EXIST, IE VALID SSYN RESPONSE

TEST 2: RP CLEAR TEST

THIS TEST ASCERTAINS CORRECTNESS OF THE DEVICE CLEAR FUNCTION BY WRITTING RPBA TO ALL ONES, SETTING RP CLR (BIT 5) IN RPCS2 AND PROVING THAT AT LEAST SOME OF THE BITS DID CLEAR IN RPBA. IT IS NOT THE INTENT OF THE PROGRAM, AT THIS TIME, TO PROVE THE CORRECTNESS OF THE RPBA REGISTER, IT IS JUST TO PROVE THAT THE RPCLR FUNCTION DOES WORK.

TEST 3: RPCS2 STATIC FUNCTIONAL TEST

THIS WALKS A ONE, ZERO, ALL ZEROS, ALL ONES THROUGH RPCS2. THE RANGE WILL BE FROM BIT 0 TO BIT 2. EXECUTE A DEVICE CLEAR (RPCS2: CLR) AND ENSURE THAT REGISTER DID RESET.

TEST 4: RPWC STATIC FUNCTIONAL TEST

THIS TEST WALKS A ONE, ZERO, ALL ONES THROUGH RPWC. WRITE REGISTER TO ZERO, AND ENSURE THAT REGISTER DID RESET. BITS TO TEST = BIT 0 - BIT 15.

TEST 5: RPBA STATIC FUNCTIONAL TEST

THIS TEST WALKS A ONE, ZERO, ALL ZER/A, ALL ONES THROUGH RPBA. ALLOW A DEVICE CLEAR AND CHECK THAT REGISTER DID RESET. BITS TO TEST = BIT 1 - BIT 15.

TEST 6: SC AND TRE TEST #1 (RH11 ONLY)

THIS TEST WILL TEST RPCS2, MXF (BIT 09) TO PROPERLY SET AND CLEAR. ONCE PROVEN FUNCTIONALLY CORRECT, SET THE BIT (RPCS2, MXF) = 1 AGAIN AND OBSERVE RPCS1, SC AND RPCS1, TRE. BOTH BITS SHOULD BE SET DUE TO MISSED TRANSFER (RPCS2, MXF - BIT09) BEING SET. SET RPCS2, CLR = 1 AND ENSURE THAT BITS CLEARED.

TEST 7: IR AND OR TEST

THIS TEST WILL TEST RPCS2, IR TO SET AND ENSURE THAT IT DOES WITHIN A FIXED TIME LIMIT. WHEN IT SETS, WRITE RPDB ONCE AND THEN TEST FOR RPCS2, OR TO SET WITHIN A FIXED TIME LIMIT.

TEST 8: RPDB READ/WRITE TEST #1

THIS TEST WRITES RPDB WITH 3 DATA PATTERNS INTERLOCKED WITH THE CORRECT TRANSITION OF RPCS2, IR. WHEN RPCS2, OR SET, READ RPDB AND CHECK DATA FOR CORRECTNESS.

TEST 9: RPDB READ/WRITE TEST #2

THIS TEST WRITES RPDB TWICE WITH THE SAME DATA PATTERN, INTERLOCKED WITH THE CORRECT TRANSITION OF RPCS2, IR. READ RPDB TWICE, INTERLOCKED WITH THE CORRECT TRANSITION OF RPCS2, OR, AND ENSURE THAT DATA IS CORRECT.

TEST 10: RPDB READ/WRITE TEST #3

THIS TEST WRITES DATA TO RPDB USING 8 DIFFERENT DATA PATTERNS, INTERLOCKED WITH THE CORRECT TRANSITIONS OF RPCS2, IR. READ RPDB AND VERIFY CORRECTNESS OF DATA, INTERLOCKED WITH THE CORRECT TRANSITIONS OF RPCS2, OR.

TEST 11: *MDPE, SC AND TRE TEST #2

THIS TEST WILL SET RPCS2, PAT=1. ENSURE THAT SC AND TRE IN RPCS1 = 0. ENSURE THAT RPCS2, MDPE DID NOT SET. WRITE RPDB ONCE AND VERIFY THAT RPCS1 SC AND TRE=1, DUE TO THE INVERTED (WRONG) PARITY. CHECK RPCS2, MDPE = 1. SET RPCS2, CLR AND ENSURE THAT BITS DID CLEAR.

TEST 12: *RPCS3 STATIC FUNCTIONAL TEST

THIS TEST WALKS A ONE, ZERO, ALL ZEROS, ALL ONES THROUGH RPCS3, FOR THE RANGE OF BITS 0-3 AND BIT 6. EXECUTE A DEVICE CLEAR AND ENSURE THAT REGISTER DID RESET.

TEST 13: *RPBAE STATIC FUNCTIONAL TEST

THIS TEST WALKS A ONE, ZERO, ALL ZEROS, ALL ONES THROUGH RPBAE. ISSUE DEVICE CLEAR AND ENSURE THAT REGISTER DID RESET.

TEST 14: *TEST DUPLICATED ADDRESS BIT 16

THIS TEST WILL RESET DEVICE AND SET RPCS1 A16 = 1, TEST THAT A16 ONLY SET. ENSURE THAT CORRESPONDING BIT IN RPBAE (BIT 0) ALSO = 1. ISSUE DEVICE CLEAR AND ENSURE THAT CORRESPONDING BITS DID CLEAR.

TEST 15: *TEST DUPLICATED ADDRESS BIT 17

THIS TEST WILL RESET THE DEVICE AND SET RPCS1 A17 = 1. TEST THAT A17 ONLY SET. ENSURE THAT CORRESPONDING BIT IN RPBAE (BIT 1) ALSO = 1. ISSUE DEVICE CLEAR AND ENSURE THAT CORRESPONDING BITS DID CLEAR.

TEST 16: TEST RPCS1 INTERRUPT ENABLE BIT

THIS TEST WILL RESET DEVICE AND SET RPCS1 IE (BIT 6) = 1. ENSURE THAT THE BIT UNDER TEST DID SET. ISSUE DEVICE CLEAR AND ENSURE THAT CORRESPONDING BITS DID CLEAR.

TEST 17: *TEST DUPLICATED INTERRUPT ENABLE BIT

THIS TEST SETS RPCS1, IE (BIT 06) = 1 ENSURE THAT RPCS3:IE ALSO SETS. ISSUE DEVICE CLEAR AND ENSURE THAT APPROPRIATE BITS CLEAR.

TEST 18: *IPCK0 TEST

THIS TEST WILL ISSUE DEVICE CLEAR, THEN SET IPCK0 (RPCS3 BIT 0)=1. CHECK THAT (RPCS2 IR (BIT 6) = 1) WITHIN A TIME PERIOD. WHEN IT DOES, WRITE 0'S (ONCE) INTO RPDB. THIS SHOULD FORCE (RPCS1 TRE AND SC = 1). READ RPDB WITH (RPCS2 OR = 1) AND (RPCS2 MOPE SHOULD = 1). DO SECOND INITIALIZATION AND DEVICE SHOULD CLEAR OUT.

TEST 19: *IPCK1 TEST

THIS TEST WILL ISSUE DEVICE CLEAR, THEN SET IPCK1 (RPCS3 BIT 1)=1. CHECK THAT (RPCS2 IR = 1) WITHIN A TIME PERIOD.

WHEN IT DOES, WRITE 0'S (ONCE) INTO RPDB. THIS SHOULD FORCE (RPCS1 TRE AND SC = 1). READ RPDB WITH (RPCS2 OR = 1) AND (RPCS2 MOPE (BIT 7) SHOULD = 1). DO SECOND INITIALIZATION AND DEVICE SHOULD CLEAR OUT.

TEST 20: *IPCK2 TEST

THIS TEST WILL ISSUE DEVICE CLEAR THEN SET IPCK2 (RPCS3 BIT 2)=1. CHECK THAT (RPCS2 IR = 1) WITHIN A TIME LIMIT. WHEN IT DOES, WRITE 0'S (TWICE) INTO RPDB. THIS SHOULD FORCE (RPCS1 TRE AND SC = 1). READ RPDB WITH (RPCS2 OR = 1) AND (RPCS2 MOPE SHOULD = 1). DO SECOND INITIALIZATION AND DEVICE SHOULD CLEAR OUT.

TEST 21: *IPCK3 TEST

THIS TEST WILL ISSUE DEVICE CLEAR, THEN SET IPCK3 (RPCS3 BIT 3)=1. CHECK THAT (RPCS2 IR = 1). WHEN IT DOES, WRITE RPDB WITH 0'S (TWICE). CHECK FOR SAME ERRORS AS 14 ABOVE. ISSUE DEVICE CLEAR AND ENSURE THAT DEVICE DID CLEAR OUT.

TEST 22: RHXX INTERRUPT TEST # 1

THIS TEST FORCES THE RHXX CONTROLLER TO INTERRUPT FROM THE HIGHEST PRIORITY LEVEL DOWN TO AND INCLUDING THE USER SPECIFIED PRIORITY LEVEL. IF THE DEVICE DOES ACTUALLY GENERATE AN INTERRUPT WHICH DOES GET RECOGNIZED BY THE PROGRAM, THE CONTROLLER PRIORITY CIRCUITRY IS SUSPECT.

TEST 23: RHXX INTERRUPT TEST #2

THIS TEST ASSUMES THAT SC=0 AND RPDS, ATA ALSO=0. IT THEN

ARMS THE CONTROLLER FOR AN INTERRUPT WHICH IT DOES NOT EXPECT TO RECEIVE. IF IT DOES, AND THERE IS NO APPARENT REASON FOR HAVING RECEIVED IT, IE SC=0 AND RDY DID NOT TOGGLE, THEN A HARDWARE MALFUNCTION MAY BE ASSUMED.

TEST 24: RMX INTERRUPT TEST #3

THIS TEST SETS THE PRIORITY TO ONE LESS THAN THE USER SPECIFIED PRIORITY. IT THEN ARMS AN INTERRUPT AND FORCES THE CONTROLLER TO TOGGLE RDY. THESE ACTIONS SHOULD GENERATE AN INTERRUPT TO THE CORRECT VECTOR ADDRESS. IF THE INTERRUPT DOESN'T OCCUR, OR OCCURS AT THE WRONG ADDRESS, A HARDWARE MALFUNCTION IS ASSUMED.

TEST 25: BASIC DRIVE SELECT TEST

THIS TEST REQUIRES MANUAL INTERVENTION. IT WILL BE SKIPPED IF THE DIAGNOSTIC IS RUN IN UNATTENDED MODE, OR THE USER RESPONDS "N" TO THE QUESTION: "FOR DRIVE) N, WILL YOU PLACE THE MASSBUS DISABLE SWITCH J12-S01 IN THE 'DISABLED' (DOWN) POSITION?" TO RUN THIS TEST, USE THE DISABLE SWITCH (J12-S01) TO DISCONNECT THE "DRIVE UNDER TEST" FROM THE MASSBUS. NOW READ REG 06 (RPDT) AND VERIFY THAT NO DRIVE RESPONDS TO THIS DRIVE'S ADDRESS (REGISTER SHOULD = 0). WHEN THE TEST IS COMPLETE, THE USER WILL BE REQUIRED TO RE-ENABLE THE MASSBUS DISABLE SWITCH IN ORDER TO RUN ALL OTHER TESTS.

TEST 26: DEMAND AND TRANSFER TEST

THIS TEST WILL READ DRIVE TYPE REGISTER (SHOULD NOT EQUAL 0), BUT IGNORE DATA AND ERRORS. THE DRIVE TYPE REGISTER SHOULD NOT =0, ELSE THE TEST WILL FAIL.

TEST 27: UNIQUE UNIT UNDER TEST

THIS TEST WILL GUARANTEE THAT A UNIT UNDER TEST DOES NOT RESPOND TO ANY OTHER DRIVE ADDRESS ON THE MASSBUS.

WRITE DATA PATTERN 46(8) TO REGISTER 0 OF DRIVE UNDER TEST

WRITE 0'S TO REGISTER 0 OF ALL OTHER DRIVES ON THE BUS.

AFTER WRITING EACH DRIVE ON THE BUSS, READ AND VERIFY THAT REGISTER 0 IN THE DRIVE UNDER TEST HAS NOT BEEN MODIFIED.

TEST 28: READ DRIVE TYPE TEST

THIS TEST WILL READ DRIVE TYPE REGISTER AND ACCEPT 20042, 24042. ANY OTHER VALUE WILL PRODUCE AN ERROR MESSAGE.

TEST 29: RPDA CONSTANT'S TEST

THIS TEST WILL WRITE-READ-VERIFY 1'S AND 0'S IN RPDA, AND AND FLOAT 1'S AND 0'S THROUGH RPDA.

TEST 30: PARITY BIT TRANSITION TEST

THIS TEST WILL VERIFY THAT PARITY BIT SENT FROM DRIVE TO RMX IS

NOT STUCK AT 1 OR 0. (USE RPDA REGISTER),
WRITE 000000 => P=1 READ/CHECK FOR PARITY
(SHOULD NOT GET A CONTROLLER PARITY ERROR),
WRITE 000001 => P=0 READ/CHECK FOR PARITY
(SHOULD NOT GET A CONTROLLER PARITY ERROR)

TEST 31: FLOATING DATA PARITY TEST

THIS TEST WILL WRITE ALL 1'S AND ALL 0'S, THEN FLOAT 1'S AND 0'S
THROUGH RPDA, READING RPER1 AFTER EACH WRITE, AND
VERIFY THAT NO PARITY ERROR SET IN RPER1.

TEST 32: REGISTER SELECT TEST 1

THIS TEST WILL WRITE EACH WRITEABLE REGISTER WITH THE PATTERN
70(8)
READ IT BACK AND VERIFY FOR CORRECTNESS. REGISTERS USED IN THE
TEST ARE; RPCS1, RPDA, RPDC, RPOF.

TEST 33: REGISTER SELECT TEST 2

ENSURE THAT EACH WRITEABLE REGISTER HAS A UNIQUE ADDRESS.
WRITEABLE REGISTERS 0, 5, 11, 12
DATA = 70(8) REF REGISTERS.
DATA = 0 OTHER REGISTERS
WRITE 70(8) INTO SOME MASSBUS WRITEABLE REGISTER
WRITE 0'S TO EVERY OTHER ADDRESSABLE REGISTER ON THE MASSBUS.
AFTER EACH WRITE (STOP-2), READ AND VERIFY THAT THE REFERENCE
REGISTER HAS NOT BEEN MODIFIED (IF SO, IDENTIFY CONTROL LINE PAIR BY
REGISTER NUMBERS)
REPEAT 1 - 3 FOR ALL WRITEABLE REGISTERS.

TEST 34: DATA TEST RPMR1

THIS TEST WILL WRITE, READ/VERIFY THE MAINTENANCE REGISTER (RPMR1)
USING PATTERNS:
ALL 0'S
ALL 1'S
FLOAT 0'S
FLOAT 1'S

POSSIBLE FAULT: J8

TEST 35: MASSBUS INITIALIZE DRIVE CLEAR TEST

THIS TEST WILL SET RPMR1: DMD = 1, THEN ISSUE RPCS2, CLR. CHECK
DMD = 0. IF 0, MARK THE EVENT. SET DMD = 1 AGAIN,
THEN ISSUE DRIVE CLEAR COMMAND. VERIFY THAT DMD
DID AGAIN CLEAR.
IF DMD DIDN'T CLEAR WITH EITHER RPCS2, CLR OR
DRIVE CLEAR COMMAND, POSSIBLE FAULTS ARE: J12 OR J8.
IF DMD DIDN'T CLEAR WITH RPCS2, CLR, BUT DID CLEAR
WITH DRIVE CLEAR COMMAND, POSSIBLE FAULTS ARE J12,
CABLE, OR THE RHXX.
IF DMD DIDN'T CLEAR WHEN DRIVE CLEAR COMMAND WAS
EXECUTED, BUT DID CLEAR WHEN RPCS2, CLR WAS ASSERTED.

POSSIBLE FAULTS ARE J11, OR J12.

TEST 36: PARITY INITIALIZE TEST

THIS TEST WILL CHECK PARITY FOLLOWING MASSBUS INITIALIZE.
PROGRAM WILL THEN READ RPER1 AND VERIFY THAT RPER1, PAR AND ILF
ARE CLEAR. !

TEST 37: PARITY ERROR DETECTION TEST

IMPLIED IN THIS TEST IS THAT THE PREVIOUS TEST DID
SUCCESSFULLY PASS. THIS TEST CREATES A "DOUBLE
FAULT", WHICH IS USED TO DETERMINE THAT THE PARITY
DETECTION CIRCUITS WORK PROPERLY, AND THAT ANY COMMAND IS
REJECTED WHEN A PARITY ERROR IS DETECTED.
THE PROGRAM WILL SET RPCS2, PAT AND ISSUE A KNOWN ILLEGAL COMMAND,
CHECK RPCS1 AND VERIFY THAT GO (BIT 0) DID RESET
READ RPER1 AND CHECK FOR FOLLOWING:

1. IF RPER1, PAR IS THE ONLY ERROR BIT SET,
THERE WAS NO ERROR.
2. IF RPER1, ILF IS THE ONLY ERROR BIT FOUND,
REPLACE J12.
3. IF RPER1, ILF AND PAR ARE BOTH SET OR BOTH
CLEAR, REPLACE EITHER J9, J10, OR J12.
(THERE IS A GOOD CHANCE THAT THE 2901 IS BROKEN.)

TEST 38: CORRECT PARITY TEST

THIS TEST CHECKS A VARIETY OF DATA PATTERNS AND
VERIFIES THAT NO PARITY ERRORS OCCURRED. THE OPERATING
SEQUENCE IS AS FOLLOWS:

1. LOAD DATA PATTERNS INTO THE RPDA REGISTER.
2. READ THE RPDA REGISTER AND ENSURE THAT RHXX
DOES NOT DETECT ANY PARITY ERRORS.
PATTERNS:
ALL ONES
ALL ZEROS
FLOAT 1'S
FLOAT 0'S

TEST 39: CLEAR COMPOSITE ERROR BIT TEST

THIS TEST ENSURES THAT RPDS, ERR IS NOT STUCK AT A
ONE. IF IT IS (1) AND RPER1, RPER2 AND RPER3 ARE 0, A PERMANENT
ERROR IS REPORTED, ELSE A COMPOSITE ERROR IS REPORTED. OPERATING
SEQUENCE IS AS FOLLOWS:

1. ISSUE A CONTROLLER CLEAR.
2. READ RPDS AND ENSURE THAT ERR (BIT 14) IS CLEAR.

TEST 40: SET AND CLEAR COMPOSITE ERROR TEST

THIS TEST ENSURES THAT COMPOSITE ERROR RPDS, BIT
14 WILL SET AND CLEAR. SEQUENCE IS AS FOLLOWS:

1. SET PAT IN RPCS2, THEN WRITE DATA TO RPDA. THIS SHOULD CAUSE A PARITY ERROR.
2. READ RPDS AND CHECK THAT RPDS, ERR=1. ALSO CHECK THAT RPER1, PAR IS ALSO SET.
3. ISSUE A CONTROLLER CLEAR.
4. READ RPDS AND ENSURE THAT ERR (BIT 14)=0. READ RPER1 AND ENSURE THAT PAR (BIT 3)=0.

TEST 41: CLEAR ATA TEST

THIS TEST ENSURES THAT RPDS, ATA (BIT 15) IS NOT STUCK AT 1. SEQUENCE IS AS FOLLOWS:

1. ISSUE CONTROLLER CLEAR.
2. READ RPDS, ATA AND VERIFY THAT IT IS CLEAR.

TEST 42: SET AND CLEAR ATA TEST

THIS TEST, BY FORCING AN ERROR, TESTS THE CORRECT FUNCTIONALITY OF RPDS, ATA. SEQUENCE FOLLOWS:

1. SET RPCS2, PAT (BIT 04)=1, THEN WRITE DATA TO RPDA, FORCING A PARITY ERROR.
2. READ RPDS AND CHECK ATA (BIT 15) AND ERR (BIT 14) TO BOTH BE SET.
3. ISSUE A DRIVE CLEAR.
4. READ RPDS AND VERIFY THAT ATA (BIT 15) AND ERR (BIT 14) DID BOTH CLEAR.
5. REPEAT STEP 1.
6. SET RPCS2, CLR (BIT 5).
7. REPEAT STEP 4.

TEST 43: CLEAR RPAS TEST

THIS TEST ENSURES THAT NO BITS ARE SET IN RPAS. SEQUENCE IS AS FOLLOWS:

1. SET RPCS2, CLR (BIT 5)=1.
2. READ RPAS AND ENSURE THAT IT IS CLEAR.

NOTE

IF THIS TEST IS FAILED, THE CONTENTS OF THE PSEUDO REGISTER (RPAS) WILL BE PRINTED OUT, AND THE CONTENTS OF THE STATUS REGISTER FOR EVERY OTHER DRIVE ON THE MASSBUS. IF THE CAUSE OF THE FAILURE IS ANOTHER DRIVE ON THE BUS, EACH DRIVE MAY NEED TO BE POWERED DOWN ONE AT A TIME, UNTIL THE BAD DRIVE IS FOUND.

TEST 44: RPAS CORRECT POSITION DECODE TEST

THIS TEST CHECKS FOR THE CORRECT POSITION OF THE BIT DECODED IN THE PSEUDO REGISTER. SEQUENCE OF TEST FOLLOWS:

1. SET RPCS2, CLR (BIT 05)=1.
2. SET PAT IN RPCS2, THEN WRITE DATA TO RPDA, FORCING A PARITY ERROR,
3. READ RPAS AND VERIFY THAT BIT POSITION IS CORRECT FOR THE DRIVE UNDER TEST. ALSO VERIFY THAT RPDS, ATA AND ERR IS ALSO SET.
4. WRITE RPAS WITH THE CORRECT BIT FOR THE DRIVE UNDER TEST.
5. READ RPAS AND VERIFY THAT IT DID CLEAR. READ RPDS AND ENSURE THAT ATA CLEARED, BUT ERR DID NOT CLEAR.

TEST 45: RPAS UNIQUE POSITION DECODE TEST

THIS TEST VERIFIES THE UNIQUENESS OF THE PSEUDO REGISTER'S BIT WHICH CORRESPONDS TO THE UNIT-UNDER-TEST. SEQUENCE IS AS FOLLOWS:

1. SET RPCS2, CLR=1.
2. SET RPCS2, PAT=1, AND WRITE DATA TO RPDA, FORCING YET ANOTHER PARITY ERROR,
3. READ RPAS AND ENSURE THAT THE PROPER BIT IS SET. ENSURE THAT RPDS, ATA AND ERR ARE ALSO SET.
4. WRITE THE PSEUDO REGISTER WITH THE COMPLIMENT OF THE EXPECTED DATA IN ITEM 3.
5. READ RPAS AND ENSURE THAT THE BIT FOUND IN ITEM 3 DID NOT CLEAR. VERIFY THAT RPDS, ATA AND ERR DID NOT CLEAR.

TEST 46: CLEAR MASSBUS ATTN TEST

THIS TEST VERIFIES THAT MASSBUS ATTN IS NOT STUCK AT A 1. SEQUENCE IS AS FOLLOWS:

1. SET RPCS2, CLR=1.
2. READ RPCS1 AND VERIFY THAT SC (BIT 15) DID NOT SET (FOR RH20, ENSURE THAT ATTN=0).

NOTE

IF ANOTHER DRIVE IS SUSPECTED TO BE CAUSING THE MALFUNCTION, EACH DRIVE ON THE BUS MUST BE POWERED DOWN, ONE AT A TIME, UNTIL THE OFFENDING UNIT IS LOCATED.

TEST 47: SET AND CLEAR MASSBUS ATTN

THIS TEST VERIFIES THAT THE MASSBUS LINE "ATTN" CAN BE SET AND CLEARED. SEQUENCE FOLLOWS:

1. SET RPCS2, PAT=1, AND WRITE RPDA WITH DATA, FORCING A PARITY ERROR,
2. READ RPCS1, SC (BIT 15) AND VERIFY THAT IT SET. (USE "ATTN" IN RH20.),
3. SET RPCS2, CLR = 1, AND ENSURE THAT RPCS1, SC DID CLEAR.

TEST 48: READ-IN-PRESET COMMAND TEST

THIS IS THE FIRST TEST TO ISSUE A VALID COMMAND TO THE RP07. IT ENSURES THAT COMPOSITE ERROR DOES NOT SET AS A RESULT OF THE COMMAND EXECUTION. SEQUENCE FOLLOWS:

1. SET RPCS2, CLR=1,
2. ISSUE READ-IN-PRESET COMMAND,
3. VERIFY THAT RPDS, ERR=0.

TEST 49: RHXX UNIQUE REGISTER TEST

THIS TEST LOADS EACH WRITABLE RHXX REGISTER WITH A UNIQUE DATA PATTERN, AND EXPECTS THAT THE PATTERN WILL NOT CHANGE AS FURTHER REGISTERS ARE WRITTEN.

TEST 50: RPLA STATIC TEST

THIS TEST CHECKS RPLA FOR EVERY VALID SECTOR ADDRESS. IF, WHILE USING A MAINTENANCE TIMER, A SECTOR ADDRESS IS NOT FOUND IN TIME, AN ERROR IS REPORTED.

TEST 51: RPMR1 - RPER2 WRAP AROUND TEST

THIS TEST WRITE RPMR1 - LOW BYTE AND, AFTER WAITING A REASONABLE AMOUNT OF TIME FOR HARDWARE AND FIRMWARE LATENCY, EXPECTS RPER2, LOW BYTE, TO CONTAIN THE SAME DATA AS JUST WRITTEN INTO RPMR1. IF THE DATA IS NOT THE SAME, A HARDWARE MALFUNCTION MAY BE ASSUMED.

TEST 52: ERROR LOG DUMP

THIS ROUTINE UNLOADS THE RP07 INTERNAL ERROR LOG WHEN IT WAS REQUESTED BY THE USER. CONTENTS ARE NOT CHECKED, JUST REPORTED TO THE USER.

TEST 53: COMPOSITE MICROCODE TEST

THIS TEST IS A COMPOSITE TEST WHICH RUNS ALL OF THE AVAILABLE RP07 MICRODIAGNOSTICS. THE ROUTINE EMULATES THE RP07 POWER UP SEQUENCE. ERROR CODES ARE REPORTED IN HEX AS ARE THE ROUTINE NUMBERS WHICH WERE RUNNING AT THE TIME OF THE FAILURE.

TEST 54: READ-IN-PRESET FUNCTIONAL TEST

THIS TEST SETS UP RPDC, RPDA = -1, AND SETS RPOF:FMT16=1. IT THEN ISSUES A RIP AND EXPECTS RPDC AND RPDA TO BE ZERO. IT ALSO EXPECTS RPDC AND RPDA TO BE ZERO. IT ALSO EXPECTS RPOF:FMT TO BE RESET.

TEST 55: COMMAND REJECT TEST

THIS TEST, INVERTS PARITY AND ISSUES A RIP COMMAND. IF THE COMMAND EXECUTED WITH A PARITY ERROR PRESENT, IE RPDC OR RPDA=0 OR FMT16=0, THEN A HARDWARE MALFUNCTION MAY BE ASSUMED.

TEST 56: DATA TEST # 1

THIS TEST EXECUTES IN THE FOLLOWING MANNER;
READ TRACK DESCRIPTORS FROM ANYWHERE ON THE

PACK. THE PURPOSE IS TO ENSURE THAT THE DATA LINES TOGGLE. REPEAT PROCESS UNTIL ALL TESTABLE LINES HAVE TOGGLED (BITS 0 THROUGH 15). IGNORE ALL ERRORS; THEY MAY BE CAUSED BY CORRUPTED TRACK DESCRIPTOR RECORDS.

IF AFTER READING EVERY TRACK AND CYLINDER ON THE DRIVE, ALL DATA LINES STILL HAVE NOT TOGGLED FROM 0 TO 1, AN ERROR WILL BE REPORTED.

TEST 57: DATA TEST #2

THIS TEST EXECUTES IN THE FOLLOWING MANNER:

1. ATTEMPT TO ACCESS A C.E. CYLINDER WITHOUT SETTING RPER1:DMD (BIT 15). EXPECT RPER1, IAE TO SET.
2. ISSUE A RECAL COMMAND, THEN CHECK RPCC = 0.
3. ATTEMPT TO ACCESS A C.E. CYLINDER WITH RPER1: DMD=1, VERIFY CORRECT POSITION BY COMPARING RPDC WITH RPCC.

TEST 58: DATA TEST #3

THIS TEST EXECUTES IN THE FOLLOWING MANNER:

1. ATTEMPT TO FIND A DEFECT FREE C.E. TRACK BY DETERMINING PRESENCE OF A TD WITH NULL SET INFORMATION. IF ONE IS NOT FOUND DISPATCH MESSAGE STATING THAT C.E. TRACK #0 WILL BE FORMATTED PRIOR TO PERFORMING OPERATION.
2. FORMAT TRACK AND VERIFY SAME (USING NULLSET INFORMATION).
3. PERFORM SIMPLE DATA TESTING ON THE FORMATTED TRACK.

SIMPLE DATA TESTING TO INCLUDE:

1. WRITING DATA PATTERNS WITHOUT ERROR. RPWC WILL BE TESTED TO = 0, RPBA WILL BE TESTED TO INCREMENT.
2. WRITE CHECK DATA FORCING A WRITE CHECK ERROR. BUFFER POSITION OF THE ERROR WILL BE VERIFIED USING THE RPBA REGISTER.
3. WRITE CHECK DATA WITHOUT ERROR.
4. ISSUE A RIP COMMAND, FOLLOWED BY A READ HEADER AND DATA COMMAND ON CYL 630 TRACK JUST FORMATTED. VERIFY THAT RPER1, FER DID SET.

TEST 59: RPER1 NEGATIVE BIT TEST

THIS TEST ISSUES AN ILLEGAL FUNCTION AND EXPECTS RPER1, ILF TO SET. IT THEN ISSUES A COMMAND WITH THE WRONG SECTOR, WRONG TRACK ADDRESS AND EXPECTS RPER1, IAE TO SET AFTER EACH COMMAND.

TEST 60: USER SELECTED MICRODIAGNOSTIC ROUTINE

THIS TEST, IF MANUAL INTERVENTION IS ALLOWED AND THE USER; THROUGH USE OF THE SOFTWARE QUESTIONS, DID ANSWER 'YES' TO THE QUESTION 'DO YOU WANT TO SELECT ONE MICRODIAGNOSTIC FOR EXECUTION?', WILL

ALLOW THE USER TO SPECIFY A MICRODIAGNOSTIC ROUTINE FOR EXECUTION. ONLY LEGAL 'HEX' CHARACTERS WILL BE ACCEPTED AS INPUT. ANY PAIR OF HEX CHARACTERS WILL BE ACCEPTED. IT IS UP TO THE USER TO INSURE THAT A VALID ROUTINE IS SELECTED, OTHERWISE THE DRIVE WILL PRODUCE AN ERROR FOR AN INVALID ROUTINE SELECTION. THIS ROUTINE IS INTENDED PRIMARILY FOR DEBUG OF A PROBLEM, NOT SYSTEM ACCEPTANCE.

ONE APPLICATION OF THIS ROUTINE COULD BE TO LOOP 'FOREVER' ON A USER SELECTED MICRO DIAGNOSTIC ROUTINE, POSSIBLY TO DETECT INTERMITTENT PROBLEMS. THE COMMAND STRING TO PERFORM THIS WOULD BE AS FOLLOWS: 'STA/TES:60/FLA:<OPTION LIST>'. THE OPTION IN THIS CASE WOULD BE 'LOT' (LOOP ON TEST). TO CHANGE THE ROUTINE, THE USER WOULD AGAIN USE THE 'START' COMMAND: 'STA/TES:60/FLA:LOT'. THIS ACTION WOULD PERMIT THE USER TO CHANGE THE ROUTINE SELECTED FOR EXECUTION. ANY OTHER COMMAND, IE 'RES' OR 'CON', ETC, WILL USE THE ROUTINE PREVIOUSLY SELECTED BY THE USER, AND WILL NOT PERMIT THE USER TO CHANGE THE SELECTED ROUTINE.

TEST 61: NOP FUNCTIONAL TEST

THIS TEST VERIFIES THE CORRECT FUNCTIONALITY OF THE NOP COMMAND. INITIALLY, THE TEST VERIFIES THAT RPDS, DRY = 1, THEN ISSUES THE COMMAND. RPDS, DRY IS AGAIN CHECKED TO BE SET WITHIN A FIXED TIME LIMIT. IF THE LIMIT EXPIRES AND RPDS, DRY IS NOT SET, A 'DRIVE HUNG' MESSAGE WILL BE GENERATED. COMPOSITE ERROR AND TRANSFER ERROR ARE ALSO CHECKED AND VERIFIED TO NOT BE ASSERTED.

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VERSION (CZRJM A 0)

1. THIS VERSION IS THE STARTING POINT FOR CX DIAGNOSTIC SUPPORT OF THE RP07 DISK DRIVE.

VERSION (CZRJM-B-0)

1. CORRECTED A DIAGNOSTIC COMMAND TERMINATION PROBLEM IN TEST 51, WRAP AROUND TEST. THE TEST NOW ISSUES AN "FF" EXIT DIAGNOSTIC COMMAND AFTER EVERY "FE" DIAGNOSTIC COMMAND.

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 367
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 395 000000
 396 002000
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 002000 103
 002001 132
 002002 122
 002003 112
 002004 115
 002005 000
 002006 000
 002007 000
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 002026
 002026 045666
 002030
 002030 000000
 002032
 002032 000000
 002034
 002034 000000
 002036
 002036 000000
 002040
 002040 002124
 002042
 002042 000000
 002044
 002044 000000
 002046

```

; *LAST REVISION 25 MAY 83

.TITLE CZRJMB0 RP07 FE/HOST ISOLATOR
.SBTTL PROGRAM HEADER

.ENABL AMA,ABS
      .      2000

; **
; THE PROGRAM HEADER IS THE INTERFACE BETWEEN
; THE DIAGNOSTIC PROGRAM AND THE SUPERVISOR.
;

L#NAME::      ;DIAGNOSTIC NAME
              .ASCII /C/
              .ASCII /Z/
              .ASCII /R/
              .ASCII /J/
              .ASCII /M/
              .BYTE 0
              .BYTE 0
              .BYTE 0

L#REV::      ;REVISION LEVEL
              .ASCII /B/

L#DEPO::      ;0
              .ASCII /O/

L#UNIT::      ;NUMBER OF UNITS
              .WORD T#PTHV

L#TIML::      ;LONGEST TEST TIME
              .WORD 200

L#HPCP::      ;POINTER TO H.W. QUES.
              .WORD L#HARD

L#SPCP::      ;POINTER TO S.W. QUES.
              .WORD L#SOFT

L#HPTP::      ;PTR. TO DEF. H.W. PTABLE
              .WORD L#HW

L#SPTP::      ;PTR. TO S.W. PTABLE
              .WORD L#SW

L#LADP::      ;DIAG. END ADDRESS
              .WORD L#LAST

L#STA::      ;RESERVED FOR APT STATS
              .WORD 0

L#CO::      ;DIAGNOSTIC TYPE
              .WORD 0

L#DTP::      ;APT EXPANSION
              .WORD 0

L#APT::      ;PTR. TO DISPATCH TABLE
              .WORD L#DISPATCH

L#PRIO::      ;DIAGNOSTIC RUN PRIORITY
              .WORD 0

L#ENVI::      ;FLAGS DESCRIBE HOW IT WAS SETUP
              .WORD 0

L#EXP1::      ;EXPANSION WORD
    
```

002046	000000			
002050		L\$MREV::	.WORD 0	;SVC REV AND EDIT #
002050	003		.BYTE C\$REVISION	
002051	003		.BYTE C\$EDIT	
002052		L\$EF::	.WORD 0	;DIAG. EVENT FLAGS
002052	000000		.WORD 0	
002054	000000		.WORD 0	
002056		L\$SPC::	.WORD 0	
002056	000000		.WORD 0	
002060		L\$DEVP::	.WORD L\$DVTYP	; POINTER TO DEVICE TYPE LIST
002060	006354		.WORD 0	
002062		L\$REPP::	.WORD 0	;PTR. TO REPORT CODE
002062	000000		.WORD 0	
002064		L\$EXP4::	.WORD 0	
002064	000000		.WORD 0	
002066		L\$EXP5::	.WORD 0	
002066	000000		.WORD 0	
002070		L\$AUT::	.WORD 0	;PTR. TO ADD UNIT CODE
002070	000000		.WORD 0	
002072		L\$DUT::	.WORD 0	;PTR. TO DROP UNIT CODE
002072	000000		.WORD 0	
002074		L\$LUN::	.WORD 0	;LUN FOR EXERCISERS TO FILL
002074	000000		.WORD 0	
002076		L\$DESP::	.WORD L\$DESC	;POINTER TO DIAG. DESCRIPTION
002076	006362		.WORD L\$DESC	
002100		L\$LOAD::	EMT E\$LOAD	;GENERATE SPECIAL AUTOLOAD EMT
002100	104035		EMT E\$LOAD	
002102		L\$ETP::	.WORD 0	;POINTER TO ERRTABL
002102	000000		.WORD 0	
002104		L\$ICP::	.WORD L\$INIT	;PTR. TO INIT CODE
002104	020652		.WORD L\$INIT	
002106		L\$CCP::	.WORD L\$CLEAN	;PTR. TO CLEAN-UP CODE
002106	021350		.WORD L\$CLEAN	
002110		L\$ACP::	.WORD L\$AUTO	;PTR. TO AUTO CODE
002110	021346		.WORD L\$AUTO	
002112		L\$PRT::	.WORD L\$PROT	;PTR. TO PROTECT TABLE
002112	020644		.WORD L\$PROT	
002114		L\$TEST::	.WORD 0	;TEST NUMBER
002114	000000		.WORD 0	
002116		L\$DLY::	.WORD 0	;DELAY COUNT
002116	000000		.WORD 0	
002120		L\$HIME::	.WORD 0	;PTR. TO HIGH MEM
002120	000000		.WORD 0	

E 3

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.SBTTL DISPATCH TABLE

; THE DISPATCH TABLE CONTAINS THE STARTING ADDRESS OF EACH TEST.
; IT IS USED BY THE SUPERVISOR TO DISPATCH TO EACH TEST.

002122	000075	.WORD	61
002124		L#DISPATCH:;	
002124	021514	.WORD	T1
002126	021612	.WORD	T2
002130	022000	.WORD	T3
002132	022142	.WORD	T4
002134	022302	.WORD	T5
002136	022444	.WORD	T6
002140	022774	.WORD	T7
002142	023270	.WORD	T8
002144	023442	.WORD	T9
002146	023602	.WORD	T10
002150	023772	.WORD	T11
002152	024152	.WORD	T12
002154	024334	.WORD	T13
002156	024510	.WORD	T14
002160	025034	.WORD	T15
002162	025360	.WORD	T16
002164	025540	.WORD	T17
002166	025732	.WORD	T18
002170	026230	.WORD	T19
002172	026526	.WORD	T20
002174	027044	.WORD	T21
002176	027362	.WORD	T22
002200	027634	.WORD	T23
002202	030102	.WORD	T24
002204	030322	.WORD	T25
002206	030514	.WORD	T26
002210	030624	.WORD	T27
002212	031016	.WORD	T28
002214	031154	.WORD	T29
002216	031322	.WORD	T30
002220	031446	.WORD	T31
002222	031600	.WORD	T32
002224	031736	.WORD	T33
002226	032136	.WORD	T34
002230	032302	.WORD	T35
002232	032562	.WORD	T36
002234	032720	.WORD	T37
002236	033142	.WORD	T38
002240	033324	.WORD	T39
002242	033454	.WORD	T40
002244	033732	.WORD	T41
002246	034032	.WORD	T42
002250	034320	.WORD	T43
002252	034424	.WORD	T44
002254	034636	.WORD	T45
002256	035110	.WORD	T46
002260	035206	.WORD	T47
002262	035324	.WORD	T48

002264	035502	.WORD	T49
002266	035760	.WORD	T50
002270	036232	.WORD	T51
002272	036742	.WORD	T52
002274	037712	.WORD	T53
002276	040140	.WORD	T54
002300	040374	.WORD	T55
002302	040634	.WORD	T56
002304	041166	.WORD	T57
002306	041706	.WORD	T58
002310	044014	.WORD	T59
002312	044332	.WORD	T60
002314	044624	.WORD	T61

9

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1          .SBTTL  DEFAULT HARDWARE P TABLE
2
3          ;**
4          ; THE DEFAULT HARDWARE P-TABLE CONTAINS DEFAULT VALUES OF
5          ; THE TEST DEVICE PARAMETERS.  THE STRUCTURE OF THIS TABLE
6          ; IS IDENTICAL TO THE STRUCTURE OF THE HARDWARE P-TABLES.
7          ;
8
9 002316   000004          .WORD  L10000-L$HW/2
002320
002320
10 002320   176700        L$HW::
11 002322   000254        DFPTBL::
12 002324   000240        .WORD  176700      ;RPCS1 BASE REGISTER ADDRESS
13 002326   000000        .WORD  254       ;VECTOR ADDRESS
14
24
25 002330          .WORD  240       ;BR LEVEL 5 DEVICE
          .WORD  0         ;DRIVE NUMBER

L10000:

```

```

1          .SBTTL  SOFTWARE P-TABLE
2
3
4          ;**
5          ; THE SOFTWARE P-TABLE CONTAINS THE VALUES OF THE PROGRAM
6          ; PARAMETERS THAT CAN BE CHANGED BY THE OPERATOR.
7          ;--
8 002330 000005          .WORD  L10001-L$SW/2
9          002332          L$SW::
          002332          SFPTBL::
10 002332 000001          SWTTST: .WORD  1          ;USED TO SELECT MASSBUS INTERFACE TEST;
          ;DISABLED= 0, ENABLED= 1
11 002334 000001          ERRDMP: .WORD  1          ;USED TO ENABLE THE RP07 ERROR LOG DUMP
12 002336 000000          SELTRK: .WORD  0          ;USED TO SELECT A TRACK ADDRESS IN THE MICRO-
          ;DIAGNOSTIC TEST
13
14 002340 000000          TRAKAD: .WORD  0          ;USED TO GET THE USER TRACK ADDRESS
15 002342 000000          SELRUN: .WORD  0          ;USED TO DETERMINE IF USER SELECTED A MICRO-
          ;DIAGNOSTIC TEST
16
24
25 002344          L10001:

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.SBTTL GLOBAL EQUATES SECTION

; THE GLOBAL EQUATES SECTION CONTAINS PROGRAM EQUATES THAT
; ARE USED IN MORE THAN ONE TEST.
;--

; BIT DEFINITIONS

100000	BIT15== 100000
040000	BIT14== 40000
020000	BIT13== 20000
010000	BIT12== 10000
004000	BIT11== 4000
002000	BIT10== 2000
001000	BIT09== 1000
000400	BIT08== 400
000200	BIT07== 200
000100	BIT06== 100
000040	BIT05== 40
000020	BIT04== 20
000010	BIT03== 10
000004	BIT02== 4
000002	BIT01== 2
000001	BIT00== 1

001000	BIT9== BIT09
000400	BIT8== BIT08
000200	BIT7== BIT07
000100	BIT6== BIT06
000040	BIT5== BIT05
000020	BIT4== BIT04
000010	BIT3== BIT03
000004	BIT2== BIT02
000002	BIT1== BIT01
000001	BIT0== BIT00

; EVENT FLAG DEFINITIONS
; EF32:EF17 RESERVED FOR SUPERVISOR TO PROGRAM COMMUNICATION

000040	EF.START== 32.	; START COMMAND WAS ISSUED
000037	EF.RESTART== 31.	; RESTART COMMAND WAS ISSUED
000036	EF.CONTINUE== 30.	; CONTINUE COMMAND WAS ISSUED
000035	EF.NEW== 29.	; A NEW PASS HAS BEEN STARTED
000034	EF.PWR== 28.	; A POWER-FAIL/POWER-UP OCCURRED

; PRIORITY LEVEL DEFINITIONS

000340	PRI07== 340
000300	PRI06== 300
000240	PRI05== 240
000200	PRI04== 200
000140	PRI03== 140
000100	PRI02== 100

000040	PRI01== 40
000000	PRI00== 0
	;
	;OPERATOR FLAG BITS
	;
000004	EVL== 4
000010	LOT== 10
000020	ADR== 20
000040	IDU== 40
000100	ISR== 100
000200	UAM== 200
000400	BOE== 400
001000	PNT== 1000
002000	PRI== 2000
004000	IXE== 4000
010000	IBE== 10000
020000	IER== 20000
040000	LOE== 40000
100000	HOE== 100000

```

1      .SBTTL  RHXX REGISTERS
2
3      ;CONTROL AND STATUS REGISTER 1 (RPCS1)
4
5      000100  IE      = 100      ;INTERRUPT ENABLE (BIT #6)
6      000200  RDY     = 200      ;READY (BIT #7)
7      000400  A16    = 400      ;HIGH ORDER BUS ADDRESS BIT (BIT #8)
8      001000  A17    =1000     ;HIGH ORDER BUS ADDRESS BIT (BIT #9)
9      002000  PSEL   =2000     ;PORT SELECT (BIT #10)
10     020000  MCPE   =20000    ;MASSBUS PARITY ERROR (BIT #13)
11     040000  TRE    =40000    ;TRANSFER ERROR (BIT #14)
12     100000  SC     =100000   ;SPECIAL CONDITION (BIT #15)
13
14
15     ;WORD COUNT REGISTER (RPWC)
16     ;EACH BIT IS CALLED BY BIT NUMBER
17
18
19     ;BUS ADDRESS REGISTER (RPBA)
20     ;EACH BIT IS CALLED BY BIT NUMBER
21
22
23     ;CONTROL AND STATUS REGISTER 2 (RPCS2)
24
25     000001  US1    = 1        ;UNIT SELECT (BIT #0)
26     000002  US2    = 2        ;UNIT SELECT (BIT #1)
27     000004  US4    = 4        ;UNIT SELECT (BIT #2)
28     000010  BAI    = 10       ;BUS ADDRESS INCREMENT INHIBIT (BIT #3)
29     000020  PAT    = 20       ;MASSBUS PARITY INHIBIT (BIT #4)
30     000040  CLR    = 40       ;CLEAR (BIT #5)
31     000100  IR     = 100      ;INPUT READY (BIT #6)
32     000200  OR     = 200      ;OUTPUT READY (BIT #7)
33     000400  MDPE   = 400      ;MASSBUS PARITY ERROR (BIT #8)
34     001000  MXF    = 1000     ;MISSED TRANSFER ERROR (BIT #9)
35     002000  PGE    = 2000    ;PROGRAM ERROR (BIT #10)
36     004000  NEM    = 4000    ;NON EXISTENT MEMORY (BIT #11)
37     010000  NED    = 10000   ;NON EXISTENT DRIVE (BIT #12)
38     020000  UPE    = 20000   ;UNIBUS PARITY ERROR
39     040000  WCE    = 40000   ;WRITE CHECK ERROR (BIT #14)
40     100000  DLT    = 100000  ;DATA LATE (BIT #15)
41
42
43     ;DATA BUFFER REGISTER (RPDB)
44     ;EACH BIT IS DEFINED BY BIT NUMBER
45
46     .SBTTL  RP07 REGISTERS
47
48     ;CONTROL AND STATUS 1 (#00)
49
50     000001  GO     = 1        ;GO BIT (BIT #0)
51     000002  F1     = 2        ;FUNCTION CODE BIT #1
52     000004  F2     = 4        ;FUNCTION CODE BIT #2
53     000010  F3     = 10       ;FUNCTION CODE BIT #3
54     000020  F4     = 20       ;FUNCTION CODE BIT #4
55     000040  F5     = 40       ;FUNCTION CODE BIT #5
56     004000  DVA    = 4000    ;DEVICE AVAILABLE (BIT #11)
57

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```

58
59
60
61      000001      OM = 1          ;OFFSET MODE (BIT #0)
62      000002      EWN = 2         ;EARLY WARNING (BIT #1)
63      000004      ILEV = 4        ;INTERLEAVING AVAILABLE (BIT #2)
64      000100      VV = 100        ;VOLUME VALID (BIT #6)
65      000200      DRY = 200       ;DATA READY (BIT #7)
66      000400      DPR = 400       ;DRIVE PRESENT (BIT #8)
67      001000      PGM = 1000      ;PROGRAMABLE (BIT #9)
68      002000      LBT = 2000     ;LAST BLOCK TRANSFERRED (BIT #10)
69      004000      WRL = 4000     ;WRITE LOCKED (BIT #11)
70      010000      MOL = 10000    ;MEDIUM ON LINE (BIT #12)
71      020000      PIP = 20000    ;POSITIONER IN PROGRESS (BIT #13)
72      040000      ERR = 40000    ;COMPOSITE ERROR (BIT #14)
73      100000      ATA = 100000   ;ATTENTION ACTIVE (BIT #15)
74
75
76      ;ERROR REGISTER #1 (RPER1 <#02>)
77
78      000001      ILF = 1         ;ILLEGAL FUNCTION (BIT #0)
79      000002      ILR = 2         ;ILLEGAL REGISTER (BIT #1)
80      000004      RMR = 4         ;REGISTER MODIFICATION REFUSED (BIT #2)
81      000010      PAR = 10        ;PARITY ERROR (BIT #3)
82      000020      FER = 20        ;FORMAT ERROR (BIT #4)
83      000040      WCF = 40        ;WRITE CLOCK FAIL (BIT #5)
84      000100      ECH = 100       ;ECC HARD ERROR (BIT #6)
85      000200      HCE = 200       ;HEADER COMPARE ERROR (BIT #7)
86      000400      HCRC = 400      ;HEADER CRC ERROR (BIT #8)
87      001000      AOE = 1000      ;ADDRESS OVERFLOW ERROR (BIT #9)
88      002000      IAE = 2000     ;INVALID ADDRESS ERROR (BIT #10)
89      004000      WLE = 4000     ;WRITE LOCK ERROR (BIT #11)
90      010000      DTE = 10000    ;DRIVE TIMING ERROR (BIT #12)
91      020000      OPI = 20000    ;OPERATION INCOMPLETE (BIT #13)
92      040000      UNS = 40000    ;DRIVE UNSAFE (BIT #14)
93      100000      DCK = 100000   ;DATA CHECK ERROR (BIT #15)
94
95
96      ;DIAGNOSTIC MAINTAINABILTY REGISTER (RPMR1 <#03>)
97
98      100000      DMD = 100000    ;DIAGNOSTIC MODE (BIT #15)
99
100
101      ;ATTENTION SUMMARY PSEUDO REGISTER (RPAS <#04>)
102
103      000001      AT0 = 1         ;DEVICE 0 (BIT #0)
104      000002      AT1 = 2         ;DEVICE 1 (BIT #1)
105      000004      AT2 = 4         ;DEVICE 2 (BIT #2)
106      000010      AT3 = 10        ;DEVICE 3 (BIT #3)
107      000020      AT4 = 20        ;DEVICE 4 (BIT #4)
108      000040      AT5 = 40        ;DEVICE 5 (BIT #5)
109      000100      AT6 = 100       ;DEVICE 6 (BIT #6)
110      000200      AT7 = 200      ;DEVICE 7 (BIT #7)
111
112
113      ;DESIRED SECTOR/TRACK ADDRESS REGISTER (RPDA <#05>)
114      ;EACH BIT IS CALLED BY BIT NUMBER
  
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115
116
117           ;DRIVE TYPE REGISTER (RPDT <#06>)
118
119           000001      DRT0 = 1           ;DRIVE TYPE NUMBER (BIT #0)
120           000002      DRT1 = 2           ;DRIVE TYPE NUMBER (BIT #1)
121           000004      DRT2 = 4           ;DRIVE TYPE NUMBER (BIT #2)
122           000010      DRT3 = 10          ;DRIVE TYPE NUMBER (BIT #3)
123           000020      DRT4 = 20          ;DRIVE TYPE NUMBER (BIT #4)
124           000040      DRT5 = 40          ;DRIVE TYPE NUMBER (BIT #5)
125           000100      DRT6 = 100         ;DRIVE TYPE NUMBER (BIT #6)
126           000200      DRT7 = 200        ;DRIVE TYPE NUMBER (BIT #7)
127           000400      DRT8 = 400        ;DRIVE TYPE NUMBER (BIT #8)
128           004000      DRQ  = 4000       ;DRIVE REQUEST REQUIRED (BIT #11)
129           020000      MOH  = 20000      ;MOVING HEAD TYPE DRIVE (BIT #13)
130           040000      TAP  = 40000     ;TAPE DRIVE (BIT #14)
131           100000      NBA  = 100000    ;NOT BLOCK ADDRESSED (BIT #15)
132
133
134           ;LOOK AHEAD REGISTER (RPLA <#07>)
135
136           000100      SC1  = 100         ;SECTOR COUNT FIELD 1 (BIT #6)
137           000200      SC2  = 200         ;SECTOR COUNT FIELD 2 (BIT #7)
138           000400      SC4  = 400         ;SECTOR COUNT FIELD 4 (BIT #8)
139           001000      SC8  = 1000        ;SECTOR COUNT FIELD 8 (BIT #9)
140           002000      SC16 = 2000       ;SECTOR COUNT FIELD 16 (BIT #10)
141           004000      SC32 = 4000       ;SECTOR COUNT FIELD 32 (BIT #11)
142           010000      SC64 = 10000      ;SECTOR COUNT FIELD 64 (BIT #12)
143
144
145           ;RP07 SERIAL NUMBER REGISTER (RPSN <#10>)
146           ;EACH BIT IS CALLED BY BIT NUMBER
147
148
149           ;RP07 OFFSET REGISTER (RPOF <#11>)
150
151           000200      OFFDIR = 200        ;OFFSET DIRECTION (BIT #7)
152           002000      HCI   = 2000       ;HEADER COMPARE CODE INHIBIT (BIT #10)
153           004000      ECI   = 4000       ;ERROR CORRECTION CODE INHIBIT (BIT #11)
154           010000      FMT   = 10000      ;16 BIT FORMAT (BIT #12)
155           040000      MTD   = 40000      ;MOVE TRACK DESCRIPTOR (BIT #14)
156           100000      CMOD  = 100000     ;COMMAND MODIFIER (BIT #15)
157
158
159           ;RP07 DESIRED CYLINDER ADDRESS (RPDC <#12>)
160           ;EACH BIT IS CALLED BY BIT NUMBER
161
162
163           ;RP07 CURRENT CYLINDER ADDRESS (RPCC <#13>)
164           ;EACH BIT IS CALLED BY BIT NUMBER
165
166
167           ;RP07 ERROR REGISTER 3 (RPER3 <#15>)
168
169           000002      SCF   = 2           ;SYNC CLOCK FAILURE (BIT #1)
170           000004      SBE   = 4           ;SYNC BYTE ERROR (BIT #2)
171           000010      DPE   = 10          ;DATA PARITY ERROR (BIT #3)

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172      000020      SDF      = 20      ;SERDES DATA FAILURE (BIT #4)
173      000040      DCU       = 40      ;DC UNSAFE (BIT #5)
174      000100      IXU       = 100     ;INDEX UNSAFE (BIT #6)
175      000200      DVC       = 200     ;DEVICE CHECK (BIT #7)
176      000400      PHF       = 400     ;8080 PROCESSOR HANDSHAKE FAILURE (BIT #8)
177      001000      LCE       = 1000    ;LOSS OF CYLINDER ERROR (BIT #9)
178      002000      LBC       = 2000    ;LOSS OF BIT CLOCK (BIT #10)
179      020000      DSE       = 20000   ;DEFECT SKIP ERROR (BIT #13)
180      040000      SKI       = 40000   ;SEEK INCOMPLETE (BIT #14)
181      100000      BSE       = 100000  ;BAD SECTOR ERROR (BIT #15)
182
183
184      ;RP07 ERROR REGISTER #2 (RPER2 <#14>)
185
186      000400      WRU       = 400     ;BITS 0 THROUGH 7 = READ ONLY BITS
187      001000      WOR       = 1000    ;WRITE READY UNSAFE (BIT #8)
188      002000      RWU1      = 2000    ;WRITE OVERRUN (BIT #9)
189      004000      RWU2      = 4000    ;READ/WRITE UNSAFE #1 (BIT #10)
190      010000      RWU3      = 10000   ;READ/WRITE UNSAFE #2 (BIT #11)
191      020000      CPU       = 20000   ;READ/WRITE UNSAFE #3 (BIT #12)
192      040000      CPE       = 40000   ;CPU UNSAFE (BIT #13)
193      100000      PGE       = 100000  ;CROM PARITY ERROR (BIT #14)
194
195
196      ;ECC POSITION REGISTER (RPEC1 <#16>)
197      ;EACH BIT IS DEFINED BY BIT NUMBER
198
199
200      ;ECC PATTERN REGISTER (RPEC2 <#17>)
201      ;EACH BIT IS DEFINED BY BIT NUMBER
202
203      .SBTTL  RP07 COMMAND DEFINITIONS
204
205      000005      SEEK      = 5       ;SEEK
206      000007      RECAL     = 7       ;RECALIBRATE
207      000011      DRCLR    = 11      ;DRIVE CLEAR
208      000013      RELEASE  = 13      ;DRIVE RELEASE
209      000015      NOP      = 15      ;NO OPERATION
210      000021      RIP      = 21      ;READ IN PRESET (NO OPERATION)
211      000031      SEARCH   = 31      ;SEARCH
212      000035      DIAG     = 35      ;DIAGNOSTIC MODE
213      000051      WCKD     = 51      ;WRITE CHECK DATA
214      000053      WCKHD    = 53      ;WRITE CHECK HEADER AND DATE
215      000061      WRDTA    = 61      ;WRITE DATA
216      000063      FORTRK   = 63      ;FORMAT HEADER AND SD FOR ENTIRE TRACK
217      000065      WRTD     = 65      ;WRITE TRACK DESCRIPTOR
218      000071      RDDTA    = 71      ;READ DATA
219      000073      RDHDTA   = 73      ;READ HEADER AND DATA
220      000075      RTD      = 75      ;READ TRACK DESCRIPTOR
221

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1          .SBTTL  GLOBAL DATA SECTION
2
3          ;**
4          ; THE GLOBAL DATA SECTION CONTAINS DATA THAT ARE USED
5          ; IN MORE THAN ONE TEST.
6          ;
7
8 002344 000001 PATT1:: 000001
9 002346 177776 PATT2:: 177776
10 002350 177777 PATT3:: 177777
11 002352 000000 PATT4:: 000000
12 002354 125252 PATT5:: 125252
13 002356 052525 PATT6:: 052525
14 002360 000070 PATT7:: 000070
15 002362 030221 PATT8:: 030221
16 002364 000002 PATT9:: 000002
17
18 002366 000000 TABADD:: .WORD 0
19 002370 000037 ENDRK:: .WORD 31.
20 002372 000000 LASTRK:: .WORD 0
21 002374 001165 ENDCYL:: .WORD 629.
22 002376 000000 LASCYL:: .WORD 0
23 002400 000000 BITPOS:: .WORD 0
24 002402 000012 ITCOUN:: .WORD 10.
25 002404 000000 ERRWD1:: .WORD 0
26 002406 000000 ERRWD2:: .WORD 0
27 002410 000000 BYTCNT:: .WORD 0
28 002412 000000 NEGWRD:: .WORD 0
29 002414 000000 DESTRK:: .WORD 0
30 002416 000000 DESCYL:: .WORD 0
31 002420 000000 FUNCTN:: .WORD 0
32 002422 000000 ROUTDO:: .WORD 0
33 002424 000000 SELNUM:: .WORD 0
34
35 002426 000000 CLKSTA:: .WORD 0
36 002430 000000 FASTAT:: .WORD 0
37 002432 000000 CSTORE:: .WORD 0
38 002434 000000 PATCNT:: .WORD 0
39 002436 000000 TEMP:: .WORD 0
40 002440 000000 SNK:: .WORD 0
41 002442 000000 SRC:: .WORD 0
42 002444 000000 SRCTMP:: .WORD 0
43 002446 000000 MASK:: .WORD 0
44 002450 000000 MSK:: .WORD 0
45 002452 000000 RCVED:: .WORD 0
46 002454 000000 EXPTED:: .WORD 0
47 002456 000000 TESTRG:: .WORD 0
48 002460 000000 ILOCK:: .WORD 0
49 002462 000000 INTFLG:: .WORD 0
50 002464 000000 UNABLE:: .WORD 0
51 002466 000000 ERSTAT:: .WORD 0
52 002470 000000 FATOF:: .WORD 0
53
54 002472 000000 UNIT:: .WORD 0
55 002474 176700 RPADR:: .WORD 176700
56 002476 000254 000240 RPVEC:: .WORD 254,5*32.
57 002502 000050 RHEXT:: .WORD 50
    
```

;PATTERN 8 (WORST CASE)

```

;BUFFER POINTER
;LAST TRACK (RP07.)
;PROGRAM CONTROLLED LAST TRACK
;LAST CYLINDER, (RP07.)
;PROGRAM CONTROLLED LAST CYLINDER
;USED TO MASK THE CORRECT RPAS BIT POSITION
;ITERATION COUNTER
;ERROR MESSAGE INDEX #1
;ERROR MESSAGE INDEX #2
;USED TO INDICATE #OF WORDS TRANSFERRED
;NEGATED WORD COUNT FOR DRIVER
;USED TO SELECT A DESIRED TRACK
;USED TO SELECT A DESIRED CYLINDER
;USED TO SPECIFY A SELECTED FUNCTION
;USE THIS PARAMETER ('USER SELECTED' INDICATOR)
;USED TO STORE THE USER MICRODIAGNOSTIC INPUT

;CLOCK STATUS (NO CLOCK= 0,KW11-P= 1 OR KW11-L= -1
;FAILED STATUS (USED INTERNALLY BY PROGRAM)
;SAVE CARRY FROM PREVIOUS XFER
;# OF PATTERNS TO USE
;TEMPORARY STORAGE FOR SCOPE LOOPS
;ADDRESS OF REGISTER UNDER TEST
;ADDRESS OF TESTING DATA PATTERN
;DATA PATTERN TEMPORARY STORAGE
;CONTAINS # OF BITS TO TEST
;CONTAINS BIT UNDER TEST
;CONTAINS RECEIVED BAD DATA
;CONTAINS EXPECTED GOOD DATA
;CONTAINS ADDRESS OF REGISTER UNDER TEST
;USED TO INDICATE RPOB IR/OR POLLING
;USED TO INDICATE THAT AN INTERRUPT HAS OCCURRED
;USED TO CHECK FOR MANUAL INTERVENTION
;REPORTS PASS/FAIL STATUS TO CALLING MODULE
;FUNCTION AT TIME OF FAILURE

;USED TO SELECT A UNIT FOR TEST
;CONTAINS RPCS1 BASE ADDRESS
;CONTAINS VECTOR ADDRESS & BR LEVEL
;CONTAINS RH70 OFFSET TO RPBAE
    
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58 002504 000000          RHTYPE:: .WORD 0          ;CONTAINS RHXX TYPE; RH11= 0, RH70= 1
59 002506 000000          DRVNO:: .WORD 0          ;DRIVE NUMBER
60 002510 000000          DRVSN:: .WORD 0          ;STORAGE FOR EACH S/N DIGIT
61
62 002512 176700          RPCS1:: .WORD 176700       ;BASE ADDRESS USED FOR THE DRIVE
63 002514 176702          RPWC:: .WORD 176702       ;WORD COUNT REGISTER
64 002516 176704          RPBA:: .WORD 176704       ;BYTE ADDRESS REGISTER
65 002520 176706          RPDA:: .WORD 176706       ;DESIRED SECTOR/TRACK ADDRESS
66 002522 176710          RPCS2:: .WORD 176710       ;RP07 STATUS REGISTER
67 002524 176712          RPDS:: .WORD 176712       ;RP07 DRIVE STATUS
68 002526 176714          RPER1:: .WORD 176714       ;RP07 ERROR REGISTER #1
69 002530 176716          RPAS:: .WORD 176716       ;RP07 ATTENTION SUMMARY PSEUDO REGISTER
70 002532 176720          RPLA:: .WORD 176720       ;RP07 LOOK AHEAD REGISTER
71 002534 176722          RPDB:: .WORD 176722       ;RP07 DATA BUFFER
72 002536 176724          RPHR1:: .WORD 176724       ;RP07 MAINTENANCE REGISTER #1
73 002540 176726          RPD1:: .WORD 176726       ;DRIVE TYPE REGISTER
74 002542 176730          RPSN:: .WORD 176730       ;RP07 SERIAL NUMBER
75 002544 176732          RPOF:: .WORD 176732       ;RP07 OFFSET REGISTER
76 002546 176734          RPDC:: .WORD 176734       ;RP07 DESIRED CYLINDER
77 002550 176736          RPCC:: .WORD 176736       ;RP07 CURRENT CYLINDER
78 002552 176740          RPER2:: .WORD 176740       ;RP07 ERROR REGISTER #2
79 002554 176742          RPER3:: .WORD 176742       ;RP07 ERROR REGISTER #3
80 002556 176744          RPEC1:: .WORD 176744       ;RP07 ERROR POSITION
81 002560 176746          RPEC2:: .WORD 176746       ;RP07 ERROR PATTERN
82 002562 176750          RPBAE:: .WORD 176750       ;RH70 REGISTER
83 002564 176752          RPCS3:: .WORD 176752       ;RH70 REGISTER
84
85
86          ;ATTENTION BITS TABLE (ATABIT=8 BYTES)
87          ;THIS TABLE CONTAINS THE CORRESPONDING BIT TO EACH DRIVES
88          ;ATTENTION BIT
89 002566 001          ATABIT:: .BYTE 1          ;DRIVE 0
90 002567 002          .BYTE 2          ;DRIVE 1
91 002570 004          .BYTE 4          ;DRIVE 2
92 002571 010          .BYTE 10         ;DRIVE 3
93 002572 020          .BYTE 20         ;DRIVE 4
94 002573 040          .BYTE 40         ;DRIVE 5
95 002574 100          .BYTE 100        ;DRIVE 6
96 002575 200          .BYTE 200        ;DRIVE 7
97
98          ; STORAGE FOR DEVICE REGISTERS
99          ;
100 002576          REG:: .BLKW 22.          ;SAVE REGISTERS HERE
101
102 002652          PSTACK:: .BLKW 10.        ;SOFTWARE PSEUDO STACK
103 002676          MCUTXT:: .BLKW 13.        ;ASCII TEXT POINTER FILE
104 002730          IOBUFF:: .BLKW <50.*6>        ;BUFFER USED FOR DATA TRANSFERS
105
106          ; MODULE CALLOUT DISPATCH TABLE
107          ;
108 004060 011161          MCUTAB:: J1          ;
109 004062 011166          J2          ;A02 MODULE (BIT1 ERRWD1)
110 004064 011173          J3          ;A03 MODULE (BIT2 ERRWD1)
111 004066 011200          J4          ;A04 MODULE (BIT3 ERRWD1)
112 004070 011205          J5          ;A05 MODULE (BIT4 ERRWD1)
113 004072 011212          J6          ;A06 MODULE (BIT5 ERRWD1)
114 004074 011217          J7          ;A07 MODULE (BIT6 ERRWD1)

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115	004076	011224	J8	;A08 MODULE (BIT 7 ERRWD1)
116	004100	011231	J9	;A09 MODULE (BIT 8 ERRWD1)
117	004102	011236	J10	;A10 MODULE (BIT 9 ERRWD1)
118	004104	011243	J11	;A11 MODULE (BIT 10 ERRWD1)
119	004106	011250	J12	;A12 MODULE (BIT 11 ERRWD1)
120	004110	011255	J13	;A13 MODULE (BIT 12 ERRWD1)
121	004112	011262	J14	;A14 MODULE (BIT 13 ERRWD1)
122	004114	011267	J15	;A15 MODULE (BIT 14 ERRWD1)
123	004116	011274	J16	;A16 MODULE (BIT 15 ERRWD1)
124	004120	011301	J17	;A17 MODULE (BIT 0 ERRWD2)
125	004122	011132	RH	;RH CONTROLLER (BIT 1 ERRWD2)
126	004124	011151	CA	;CABLE (BIT 2 ERRWD2)
127	004126	011121	DS	;MASSBUS DISABLE SWITCH (BIT 3 ERRWD2)
128	004130	011074	AD	;DUAL DRIVE RESPONSE (BIT 4 ERRWD2)
129	004132	011306	J20	;A20 MODULE (BIT 5 ERRWD2)
130	004134	011313	J21	;A21 MODULE (BIT 6 ERRWD2)
131	004136	011320	HDA	;HDA CALLOUT (BIT 7 ERRWD2)
132	004140	011325	TERM	;TERMINATOR CALLOUT (BIT 8 ERRWD2)
133	004142	011341	SENSOR	;PHASE DETECTOR SENSOR (BIT 9 ERRWD2)
134	004144	011361	BLOWER	;BLOWER ASSY. (BIT 10 ERRWD2)
135	004146	011376	PTRANS	;POWER TRANSFORMER (BIT 11 ERRWD2)
136	004150	011421	MTRBRK	;MOTOR / BRAKE ASSY'S (BIT 12 ERRWD2)
137	004152	011443	K1RELA	;RELAY K1 (BIT 13 ERRWD2)
138	004154	011455	OPRPNL	;OPERATOR'S PANEL (BIT 14 ERRWD2)
139	004156	011477	DRVBLT	;DRIVE BELT (BIT 15 ERRWD2)
140				
141	004160	000002	TST03:: 2	;# OF PATTERNS USED IN THIS TEST
142	004162	002522	RPCS2	;REGISTER TO TEST
143	004164	000037	000037	;BIT MASK, BITS TO TEST = 1
144	004166	002344	PATT1	;PATTERN TO USE
145	004170	002346	PATT2	;PATTERN TO USE
146				
147	004172	000002	TST04:: 2	;# OF PATTERNS USED IN THIS TEST
148	004174	002514	RPWC	;REGISTER TO TEST
149	004176	177777	177777	;BIT MASK, BITS TO TEST = 1
150	004200	002344	PATT1	;PATTERN TO USE
151	004202	002346	PATT2	;PATTERN TU USE
152				
153	004204	000002	TST05:: 2	;# OF PATTERNS USED IN THIS TEST
154	004206	002516	RPBA	;REGISTER TO TEST
155	004210	177776	177776	;BIT MASK, BITS TO TEST = 1
156	004212	002364	PATT9	;PATTERN TO USE
157	004214	002346	PATT2	;PATTERN TO USE
158				
159	004216	000003	TST08:: 3	;# OF PATTERNS IN USE IN THIS TEST
160	004220	002534	RPDB	;REGISTER UNDER TEST
161	004222	177777	177777	;BIT MASK, BITS TO TEST = 1
162	004224	002344	PATT1	;PATTERN TO USE
163	004226	002346	PATT2	;PATTERN TO USE
164	004230	002354	PATT5	;PATTERN TO USE
165				
166	004232	000002	TST11:: 2	;# OF PATTERNS TO USE IN THIS TEST
167	004234	002564	RPCS3	;REGISTER TO TEST
168	004236	000117	000117	;BIT MASK, BITS TO TEST = 1
169	004240	002344	PATT1	;PATTERN TO USE
170	004242	002346	PATT2	;PATTERN TO USE
171				

172	004244	000002	TST12::	2	;# OF PATTERNS TO USE IN THIS TEST
173	004246	002562		RPBAE	;REGISTER TO TEST
174	004250	000077		000077	;BIT MASK, BITS TO TEST = 1
175	004252	002344		PATT1	;PATTERN TO USE
176	004254	002346		PAT12	;PATTERN TO USE
177					
178	004256	000003	TST28::	3	;# OF PATTERNS TO USE
179	004260	002520		RPDA	;REGISTER TO TEST
180	004262	177777		177777	;BIT MASK, BITS TO TEST = 1
181	004264	002344		PATT1	;PATTERN TO USE
182	004266	002346		PATT2	;PATTERN TO USE
183	004270	002350		PATT3	;PATTERN TO USE
184					
185	004272	002512	TST33::	RPCS1	;FILE OF REGISTERS
186	004274	002520		RPDA	;TO BE USED IN
187	004276	002544		RPOF	;THIS TEST
188	004300	002546		RPDC	;LAST REGISTER USED - THIS TEST
189					
190	004302	000010	TST34::	8.	;# OF PATTERNS TO USE
191	004304	002536		RPMR1	;REGISTER TO TEST
192	004306	177777		177777	;BITS TO TEST
193	004310	002344		PATT1	;USE THIS PATTERN
194	004312	002346		PATT2	;USE THIS PATTERN
195	004314	002350		PATT3	;USE THIS PATTERN
196	004316	002354		PATT5	;USE THIS PATTERN
197	004320	002356		PATT6	;USE THIS PATTERN
198	004322	002360		PATT7	;USE THIS PATTERN
199	004324	002362		PATT8	;USE THIS PATTERN
200	004326	002364		PATT9	;USE THIS PATTERN
201					
202	004330	002512	TST49::	RPCS1	;FILE OF WRITABLE REGISTERS TO TEST
203	004332	002514		RPWC	
204	004334	002516		RPBA	
205	004336	002520		RPDA	
206	004340	002522		RPCS2	
207	004342	002536		RPMR1	
208	004344	002544		RPOF	
209	004346	002546		RPDC	
210	004350	002562		RPBAE	
211	004352	002564		RPCS3	

1		.SBTTL	MODULE CALLOUT TABLE	
2				
3				
4				;LAST ERROR CODE GUIDE REVISION: 3/15/81 (REV A)
5				;LAST CHANGE TO THIS SOURCE CODE: 4/22/81
6	004354	000000	EC.00: 0	;NOT USED (00 ERROR CODE)
7	004356	000000	0	;NOT USED
8	004360	000000	0	;NOT USED (01 ERROR CODE)
9	004362	000000	0	;NOT USED
10	004364	000000	0	;NOT USED (02 ERROR CODE)
11	004366	000000	0	;NOT USED
12	004370	000000	0	;NOT USED (03 ERROR CODE)
13	004372	000000	0	;NOT USED
14	004374	000000	0	;NOT USED (04 ERROR CODE)
15	004376	000000	0	;NOT USED
16	004400	000000	0	;NOT USED (05 ERROR CODE)
17	004402	000000	0	;NOT USED
18	004404	000000	0	;NOT USED (06 ERROR CODE)
19	004406	000000	0	;NOT USED
20	004410	000000	0	;NOT USED (07 ERROR CODE)
21	004412	000000	0	;NOT USED
22	004414	000000	0	;NOT USED (08 ERROR CODE)
23	004416	000000	0	;NOT USED
24	004420	000000	0	;NOT USED (09 ERROR CODE)
25	004422	000000	0	;NOT USED
26	004424	000000	0	;NOT USED (0A ERROR CODE)
27	004426	000000	0	;NOT USED
28	004430	000000	0	;NOT USED (0B ERROR CODE)
29	004432	000000	0	;NOT USED
30	004434	000000	0	;NOT USED (0C ERROR CODE)
31	004436	000000	0	;NOT USED
32	004440	000000	0	;NOT USED (0D ERROR CODE)
33	004442	000000	0	;NOT USED
34	004444	000000	0	;NOT USED (0E ERROR CODE)
35	004446	000000	0	;NOT USED
36	004450	000000	0	;NOT USED (0F ERROR CODE)
37	004452	000000	0	;NOT USED
38	004454	000100	BIT6	;A7 MODULE (10 ERROR CODE)
39	004456	000000	0	;NO CALLOUT
40	004460	000100	BIT6	;A7 MODULE (11 ERROR CODE)
41	004462	000000	0	;NO CALLOUT
42	004464	000100	BIT6	;A7 MODULE (12 ERROR CODE)
43	004466	000000	0	;NO CALLOUT
44	004470	000100	BIT6	;A7 MODULE (13 ERROR CODE)
45	004472	000000	0	;NO CALLOUT
46	004474	000100	BIT6	;A7 MODULE (14 ERROR CODE)
47	004476	000000	0	;NO CALLOUT
48	004500	000100	BIT6	;A7 MODULE (15 ERROR CODE)
49	004502	000000	0	;NO CALLOUT
50	004504	000100	BIT6	;A7 MODULE (16 ERROR CODE)
51	004506	000000	0	;NOT USED
52	004510	000100	BIT6	;A7 MODULE (17 ERROR CODE)
53	004512	000000	0	;NO CALLOUT
54	004514	000100	BIT6	;A7 MODULE (18 ERROR CODE)
55	004516	000000	0	;NO CALLOUT
56	004520	000100	BIT6	;A7 MODULE (19 ERROR CODE)
57	004522	000000	0	;NO CALLOUT

58	004524	000100	BIT6	;A7 MODULE (1A ERROR CODE)
59	004526	000000	0	;NO CALLOUT
60	004530	000070	BIT3!BIT4!BIT5	;A4,A5,A6 MODULES (1B ERROR CODE)
61	004532	000200	BIT7	;HDA
62	004534	000070	BIT3!BIT4!BIT5	;A4, A5, A6 MODULES (1C ERROR CODE)
63	004536	000200	BIT7	;HDA
64	004540	000070	BIT3!BIT4!BIT5	;A4, A5, A6 MODULES (1D ERROR CODE)
65	004542	000200	BIT7	;HDA
66	004544	000070	BIT3!BIT4!BIT5	;A4, A5, A6 MODULES (1E ERROR CODE)
67	004546	000200	BIT7	;HDA
68	004550	177776	+CBIT0!BIT1!BIT2	;A4 - A16 MODULES (1F ERROR CODE)
69	004552	000040	BIT5	;A20 MODULE
70	004554	000100	BIT6	;A7 MODULE (20 ERROR CODE)
71	004556	000000	0	;NO CALLOUT
72	004560	000100	BIT6	;A7 MODULE (21 ERROR CODE)
73	004562	000000	0	;NO CALLOUT
74	004564	000100	BIT6	;A7 MODULE (22 ERROR CODE)
75	004566	000000	0	;NO CALLOUT
76	004570	000100	BIT6	;A7 MODULE (23 ERROR CODE)
77	004572	000000	0	;NO CALLOUT
78	004574	000100	BIT6	;A7 MODULE (24 ERROR CODE)
79	004576	000000	0	;NO CALLOUT
80	004600	000100	BIT6	;A7 MODULE (25 ERROR CODE)
81	004602	000000	0	;NO CALLOUT
82	004604	000100	BIT6	;A7 MODULE (26 ERROR CODE)
83	004606	000000	0	;NO CALLOUT
84	004610	000522	BIT1!BIT4!BIT6!BIT8	;A2, A5, A7, A9 MODULES (28 ERROR CODE)
85	004612	000000	0	;NO CALLOUT
86	004614	000050	BIT3!BIT5	;A4, A6 MODULE (28 ERROR CODE)
87	004616	000000	0	;NO CALLOUT
88	004620	000030	BIT3!BIT4	;A4, A5 MODULE (29 ERROR CODE)
89	004622	000000	0	;NO CALLOUT
90	004624	000050	BIT3!BIT5	;A4, A6 MODULES (2A ERROR CODE)
91	004626	000000	0	;NO CALLOUT
92	004630	000030	BIT3!BIT4	;A4, A5 MODULE (2B ERROR CODE)
93	004632	000000	0	;NO CALLOUT
94	004634	000050	BIT3!BIT5	;A4, A6 MODULE (2C ERROR CODE)
95	004636	000000	0	;NO CALLOUT
96	004640	000050	BIT3!BIT5	;A4, A6 MODULE (2D ERROR CODE)
97	004642	000000	0	;NO CALLOUT
98	004644	000030	BIT3!BIT4	;A4, A5 MODULE (2E ERROR CODE)
99	004646	000000	0	;NO CALLOUT
100	004650	000030	BIT3!BIT4	;A4, A5 MODULE (2F ERROR CODE)
101	004652	000000	0	;NO CALLOUT
102	004654	001400	BIT8!BIT9	;A9, A10 MODULES (30 ERROR CODE)
103	004656	000000	0	;NO CALLOUT
104	004660	001000	BIT9	;A10 MODULE (31 ERROR CODE)
105	004662	000000	0	;NO CALLOUT
106	004664	001000	BIT9	;A10 MODULE (32 ERROR CODE)
107	004666	000000	0	;NO CALLOUT
108	004670	001400	BIT8!BIT9	;A9,A10 MODULE (33 ERROR CODE)
109	004672	000000	0	;NO CALLOUT
110	004674	001000	BIT9	;A10 MODULE (34 ERROR CODE)
111	004676	000000	0	;NO CALLOUT
112	004700	001000	BIT9	;A10 ERROR CODE (35 ERROR CODE)
113	004702	000000	0	;NO CALLOUT
114	004704	001000	BIT9	;A10 MODULE (36 ERROR CODE)

115	004706	000000	0	;NO CALLOUT
116	004710	001000	BIT9	;A10 MODULE (37 ERROR CODE)
117	004712	000000	0	;NO CALLOUT
118	004714	001000	BIT9	;A10 MODULE (38 ERROR CODE)
119	004716	000000	0	;NO CALLOUT
120	004720	001000	BIT9	;A10 MODULE (39 ERROR CODE)
121	004722	000000	0	;NO CALLOUT
122	004724	001000	BIT9	;A10 MODULE (3A ERROR CODE)
123	004726	000000	0	;NOT USED
124	004730	001000	BIT9	;A10 MODULE (3B ERROR CODE)
125	004732	000000	0	;NOT USED
126	004734	000100	BIT6	;A7 MODULE (3C ERROR CODE)
127	004736	000000	0	;NOT USED
128	004740	000100	BIT6	;A7 MODULE (3D ERROR CODE)
129	004742	000000	0	;NOT USED
130	004744	000100	BIT6	;A7 MODULE (3E ERROR CODE)
131	004746	000000	0	;NOT USED
132	004750	001102	BIT1!BIT6!BIT9	;A2, A7, A10 MODULES (3F ERROR CODE)
133	004752	000000	0	;NOT USED
134	004754	000000	0	;NO CALLOUT (40 ERROR CODE)
135	004756	000000	0	;NO CALLOUT
136	004760	000102	BIT1!BIT6	;A2, A7 MODULES (41 ERROR CODE)
137	004762	002000	BIT10	;BLOWER ASSY
138	004764	000343	BIT0!BIT1!BIT5!BIT6!BIT7;	A1, A2, A6, A7, A8 MODULES (42 ERROR CODE)
139	004766	135200	BIT7!BIT9!BIT11!BIT12!BIT13!BIT15;	HDA, PHASE DETECTOR, TRANSFORMER, MOTOR, K1, BELT
CALLOUT				
140	004770	000040	BITS	;A6 MODULE (43 ERROR CODE)
141	004772	000200	BIT7	;HDA CALLOUT
142	004774	000070	BIT3!BIT4!BIT5	;A4, A5, A6 MODULES (44 ERROR CODE)
143	004776	000200	BIT7	;HDA CALLOUT
144	005000	000070	BIT3!BIT4!BIT5	;A4, A5, A6 (45 ERROR CODE)
145	005002	000200	BIT7	;HDA CALLOUT
146	005004	000070	BIT3!BIT4!BIT5	;A4, A5, A6 MODULES (46 ERROR CODE)
147	005006	000200	BIT7	;HDA
148	005010	000070	BIT3!BIT4!BIT5	;A4, A5, A6 MODULES (47 ERROR CODE)
149	005012	000200	BIT7	;HDA
150	005014	000030	BIT3!BIT4	;A4, A5 MODULES (48 ERROR CODE)
151	005016	000000	0	;NO CALLOUT
152	005020	000030	BIT3!BIT4	;A4, A5 MODULES (49 ERROR CODE)
153	005022	000000	0	;NO CALLOUT
154	005024	000070	BIT3!BIT4!BIT5	;A4, A5, A6 MODULES (4A ERROR CODE)
155	005026	000200	BIT7	;HDA
156	005030	000032	BIT1!BIT3!BIT4	;A2, A4, A5 MODULES (4B ERROR CODE)
157	005032	000000	0	;NO CALLOUT
158	005034	000020	BIT4	;A5 MODULE (4C ERROR CODE)
159	005036	000000	0	;NO CALLOUT
160	005040	000020	BIT4	;A5 MODULE (4D ERROR CODE)
161	005042	000000	0	;NO CALLOUT
162	005044	000053	BIT0!BIT1!BIT3!BIT5	;A1, A2, A4, A6 MODULES (4E ERROR CODE)
163	005046	000000	0	;NO CALLOUT
164	005050	000012	BIT1!BIT3	;A2, A4 MODULES (4F ERROR CODE)
165	005052	000000	0	;NOT USED
166	005054	000070	BIT3!BIT4!BIT5	;A4, A5, A6 MODULES (50 ERROR CODE)
167	005056	000200	BIT7	;HDA
168	005060	000070	BIT3!BIT4!BIT5	;A4, A5, A6 MODULES (51 ERROR CODE)
169	005062	000200	BIT7	;HDA
170	005064	000070	BIT3!BIT4!BIT5	;A4, A5, A6 MODULES (52 ERROR CODE)
171	005066	000200	BIT7	;HDA

172	005070	000050	BIT3!BIT5	;A4, A6 MODULES (53 ERROR CODE)
173	005072	000000	0	;NO CALLOUT
174	005074	000012	BIT1!BIT3	;A2, A4 MODULES (54 ERROR CODE)
175	005076	000000	0	;NOT USED
176	005100	000070	BIT3!BIT4!BIT5	;A4, A5, A6 MODULES (55 ERROR CODE)
177	005102	000200	BIT7	;HDA
178	005104	000012	BIT1!BIT3	;A2, A4 MODULES (56 ERROR CODE)
179	005106	000000	0	;NOT USED
180	005110	000030	BIT3!BIT4	;A4, A5 MODULES (57 ERROR CODE)
181	005112	000000	0	;NO CALLOUT
182	005114	000030	BIT3!BIT4	;A4, A5 MODULES (58 ERROR CODE)
183	005116	000000	0	;NO CALLOUT
184	005120	000030	BIT3!BIT4	;A4, A5 MODULES (59 ERROR CODE)
185	005122	000000	0	;NO CALLOUT
186	005124	000030	BIT3!BIT4	;A4, A5 MODULES (5A ERROR CODE)
187	005126	000000	0	;NO CALLOUT
188	005130	000030	BIT3!BIT4	;A4, A5 MODULES (5B ERROR CODE)
189	005132	000000	0	;NC CALLOUT
190	005134	000030	BIT3!BIT4	;A4, A5 MODULES (5C ERROR CODE)
191	005136	000000	0	;NO CALLOUT
192	005140	000030	BIT3!BIT4	;A4, A5 MODULES (5D ERROR CODE)
193	005142	000000	0	;NO CALLOUT
194	005144	000030	BIT3!BIT4	;A4, A5 MODULES (5E ERROR CODE)
195	005146	000000	0	;NO CALLOUT
196	005150	000030	BIT3!BIT4	;A4, A5 MODULES (5F ERROR CODE)
197	005152	000000	0	;NO CALLOUT
198	005154	000330	BIT3!BIT4!BIT6!BIT7	;A4, A5, A7, A8 MODULES (60 ERROR CODE)
199	005156	040000	BIT14	;OPERATOR'S PANEL
200	005160	000070	BIT3!BIT4!BIT5	;A4, A5, A6 MODULES (61 ERROR CODE)
201	005162	000200	BIT7	;HDA
202	005164	000050	BIT3!BIT5	;A4, A6 MODULES (62 ERROR CODE)
203	005166	000000	0	;NO CALLOUT
204	005170	000020	BIT4	;A5 MODULE (63 ERROR CODE)
205	005172	000000	0	;NOT USED
206	005174	004570	BIT3!BIT4!BIT5!BIT6!BIT8	;BIT11,A4, A5, A6, A7, A9, A12 MODULES (64 ERROR CODE)
207	005176	000200	BIT7	;HDA
208	005200	004550	BIT3!BIT5!BIT6!BIT8!BIT11	;A4, A6, A7, A9, A12 MODULES (65 ERROR CODE)
209	005202	000000	0	;NO CALLOUT
210	005204	000070	BIT3!BIT4!BIT5	;A4, A5, A6 MODULES (66 ERROR CODE)
211	005206	000000	0	;NO CALLOUT
212	005210	000040	BIT5	;A6 MODULES (67 ERROR CODE)
213	005212	000000	0	;NO CALLOUT
214	005214	000050	BIT3!BIT5	;A4, A6 MODULES (68 ERROR CODE)
215	005216	000000	0	;NO CALLOUT
216	005220	000200	BIT7	;A8 MODULE (69 ERROR CODE)
217	005222	000000	0	;NOT USED
218	005224	004200	BIT7!BIT11	;A8, A12 MODULES (6A ERROR CODE)
219	005226	000004	BIT2	;MASSBUS CABLE
220	005230	000000	0	;NOT USED (6B ERROR CODE)
221	005232	000000	0	;NOT USED
222	005234	000160	BIT4!BIT5!BIT6	;A5, A6, A7 MODULES (6C ERROR CODE)
223	005236	000000	0	;NO CALLOUT
224	005240	000160	BIT4!BIT5!BIT6	;A5, A6, A7 MODULE (6D ERROR CODE)
225	005242	000000	0	;NO CALLOUT
226	005244	000060	BIT4!BIT5	;A5, A6 MODULE (6E ERROR CODE)
227	005246	000000	0	;NO CALLOUT
228	005250	000060	BIT4!BIT5	;A5, A6 MODULE (6F ERROR CODE)

229	005252	000000	0	;NO CALLOUT
230	005254	000130	BIT3!BIT4!BIT6	;A4, A5, A7 MODULES (70 ERROR CODE)
231	005256	000000	0	;NO CALLOUT
232	005260	000010	BIT3	;A4 MODULE (71 ERROR CODE)
233	005262	000000	0	;NO CALLOUT
234	005264	000012	BIT1!BIT3	;A2, A4 MODULE (72 ERROR CODE)
235	005266	000000	0	;NO CALLOUT
236	005270	000012	BIT1!BIT3	;A2, A4 MODULE (73 ERROR CODE)
237	005272	000000	0	;NO CALLOUT
238	005274	000020	BIT4	;A5 MODULE (74 ERROR CODE)
239	005276	000000	0	;NO CALLOUT
240	005300	000020	BIT4	;A5 MODULE (75 ERROR CODE)
241	005302	000000	0	;NO CALLOUT
242	005304	000020	BIT4	;A5 MODULE (76 ERROR CODE)
243	005306	000000	0	;NO CALLOUT
244	005310	000020	BIT4	;A5 MODULE (77 ERROR CODE)
245	005312	000000	0	;NO CALLOUT
246	005314	000020	BIT4	;A5 MODULE (78 ERROR CODE)
247	005316	000000	0	;NO CALLOUT
248	005320	000020	BIT4	;A5 MODULE (79 ERROR CODE)
249	005322	000000	0	;NO CALLOUT
250	005324	000020	BIT4	;A5 MODULE (7A ERROR CODE)
251	005326	000000	0	;NO CALLOUT
252	005330	000020	BIT4	;A5 MODULE (7B ERROR CODE)
253	005332	000000	0	;NO CALLOUT
254	005334	000020	BIT4	;A5 MODULE (7C ERROR CODE)
255	005336	000000	0	;NO CALLOUT
256	005340	000020	BIT4	;A5 MODULE (7D ERROR CODE)
257	005342	000000	0	;NO CALLOUT
258	005344	165700	BIT6!BIT7!BIT8!BIT9!BIT11!BIT13!BIT14!BIT15	;A7, A8, A9, A10, A12, A14, A15, A16 (7E ERROR CODE)
259	005346	000201	BIT0!BIT7	;A17, HDA CALLOUT (7E ERROR CODE)
260	005350	016200	BIT7!BIT10!BIT11!BIT12	;A8, A11, A12, A13 (7F ERROR CODE)
261	005352	000000	0	;NO CALLOUT
262	005354	000100	BIT6	;A7 MODULE (80 ERROR CODE)
263	005356	001000	BIT9	;PHASE DETECTOR
264	005360	001600	BIT7!BIT8!BIT9	;A8, A9, A10 MODULE (81 ERROR CODE)
265	005362	000000	0	;NO CALLOUT
266	005364	001400	BIT8!BIT9	;A9, A10 MODULES (82 ERROR CODE)
267	005366	000000	0	;NO CALLOUT
268	005370	001700	BIT6!BIT7!BIT8!BIT9	;A7, A8, A9, A10 MODULES (83 ERROR CODE)
269	005372	000000	0	;NO CALLOUT
270	005374	025600	BIT7!BIT8!BIT9!BIT11!BIT13	;A8, A9, A10, A12, A14 MODULES (84 ERROR CODE)
271	005376	000000	0	;NO CALLOUT
272	005400	001400	BIT8!BIT9	;A9, A10 MODULES (85 ERROR CODE)
273	005402	000000	0	;NO CALLOUT
274	005404	001400	BIT8!BIT9	;A9, A10 MODULES (86 ERROR CODE)
275	005406	000000	0	;NO CALLOUT
276	005410	000600	BIT7!BIT8	;A8, A9 MODULES (87 ERROR CODE)
277	005412	000000	0	;NO CALLOUT
278	005414	000000	0	;NO CALLOUT (88 ERROR CODE)
279	005416	000000	0	;NO CALLOUT
280	005420	000200	BIT7	;A8 MODULE (89 ERROR CODE)
281	005422	000000	0	;NOT USED
282	005424	000240	BIT5!BIT7	;A6, A8 MODULE (8A ERROR CODE)
283	005426	000000	0	;NO CALLOUT
284	005430	000020	BIT4	;A5 MODULE (8B ERROR CODE)
285	005432	000000	0	;NO CALLOUT

286	005434	000020	BIT4	;A5 MODULE (8C ERROR CODE)
287	005436	000000	0	;NO CALLOUT
288	005440	000020	BIT4	;A5 MODULE (8D ERROR CODE)
289	005442	000000	0	;NO CALLOUT
290	005444	165200	BIT7!BIT9!BIT11!BIT13!BIT14!BIT15;A8, A10, A12, A14, A15, A16	MODULE (8E ERROR CODE)
291	005446	000200	BIT7	;HDA
292	005450	001400	BIT8!BIT9	;A9, A10 MODULES (8F ERROR CODE)
293	005452	000000	0	;NO CALLOUT
294	005454	004000	BIT11	;A12 MODULE (90 ERROR CODE)
295	005456	000000	0	;NO CALLOUT
296	005460	004200	BIT7!BIT11	;A8, A12 MODULES (91 ERROR CODE)
297	005462	000000	0	;NO CALLOUT
298	005464	004000	BIT11	;A12 MODULE (92 ERROR CODE)
299	005466	000000	0	;NO CALLOUT
300	005470	004200	BIT7!BIT11	;A8, A12 MODULES (93 ERROR CODE)
301	005472	000000	0	;NO CALLOUT
302	005474	004000	BIT11	;A12 MODULE (94 ERROR CODE)
303	005476	000000	0	;NO CALLOUT
304	005500	004300	BIT6!BIT7!BIT11	;A7, A8, A12 MODULES (95 ERROR CODE)
305	005502	000000	0	;NO CALLOUT
306	005504	004000	BIT11	;A12 MODULE (96 ERROR CODE)
307	005506	000000	0	;NO CALLOUT
308	005510	004000	BIT11	;A12 MODULE (97 ERROR CODE)
309	005512	000000	0	;NO CALLOUT
310	005514	004200	BIT7!BIT11	;A8, A12 MODULES (98 ERROR CODE)
311	005516	000000	0	;NO CALLOUT
312	005520	004200	BIT7!BIT11	;A8, A12 MODULES (99 ERROR CODE)
313	005522	000000	0	;NO CALLOUT
314	005524	004200	BIT7!BIT11	;A8, A12 MODULES (9A ERROR CODE)
315	005526	000000	0	;NO CALLOUT
316	005530	004200	BIT7!BIT11	;A8, A12 MODULES (9B ERROR CODE)
317	005532	000000	0	;NO CALLOUT
318	005534	004200	BIT7!BIT11	;A8, A12 MODULES (9C ERROR CODE)
319	005536	000000	0	;NO CALLOUT
320	005540	004000	BIT11	;A12 MODULE (9D ERROR CODE)
321	005542	000000	0	;NO CALLOUT
322	005544	004000	BIT11	;A12 MODULE (9E ERROR CODE)
323	005546	000000	0	;NO CALLOUT
324	005550	004000	BIT11	;A12 MODULE (9F ERROR CODE)
325	005552	000000	0	;NO CALLOUT
326	005554	004000	BIT11	;A12 MODULE (A0 ERROR CODE)
327	005556	000000	0	;NO CALLOUT
328	005560	004000	BIT11	;A12 MODULE (A1 ERROR CODE)
329	005562	000000	0	;NO CALLOUT
330	005564	004000	BIT11	;A12 MODULE (A2 ERROR CODE)
331	005566	000000	0	;NO CALLOUT
332	005570	004000	BIT11	;A12 MODULE (A3 ERROR CODE)
333	005572	000000	0	;NO CALLOUT
334	005574	004000	BIT11	;A12 MODULE (A4 ERROR CODE)
335	005576	000000	0	;NO CALLOUT
336	005600	004200	BIT7!BIT11	;A8, A12 MODULES (A5 ERROR CODE)
337	005602	000000	0	;NO CALLOUT
338	005604	004200	BIT7!BIT11	;A8, A12 MODULES (A6 ERROR CODE)
339	005606	000000	0	;NO CALLOUT
340	005610	004000	BIT11	;A12 MODULE (A7 ERROR CODE)
341	005612	000000	0	;NO CALLOUT
342	005614	004000	BIT11	;A12 MODULE (A8 ERROR CODE)

343	005616	000000	0	;NO CALLOUT
344	005620	004000	BIT11	;A12 MODULE (A9 ERROR CODE)
345	005622	000000	0	;NO CALLOUT
346	005624	004000	BIT11	;A12 MODULE (AA ERROR CODE)
347	005626	000000	0	;NO CALLOUT
348	005630	004000	BIT11	;A12 MODULE (AB ERROR CODE)
349	005632	000000	0	;NO CALLOUT
350	005634	004000	BIT11	;A12 MODULE (AC ERROR CODE)
351	005636	000000	0	;NO CALLOUT
352	005640	004000	BIT11	;A12 MODULE (AD ERROR CODE)
353	005642	000000	0	;NO CALLOUT
354	005644	004000	BIT11	;A12 MODULE (AE ERROR CODE)
355	005646	000000	0	;NO CALLOUT
356	005650	004000	BIT11	;A12 MODULE (AF ERROR CODE)
357	005652	000000	0	;NO CALLOUT
358	005654	004000	BIT11	;A12 MODULE (B0 ERROR CODE)
359	005656	000000	0	;NO CALLOUT
360	005660	004000	BIT11	;A12 MODULE (B1 ERROR CODE)
361	005662	000000	0	;NO CALLOUT
362	005664	004000	BIT11	;A12 MODULE (B2 ERROR CODE)
363	005666	000000	0	;NO CALLOUT
364	005670	004000	BIT11	;A12 MODULE (B3 ERROR CODE)
365	005672	000000	0	;NO CALLOUT
366	005674	004000	BIT11	;A12 MODULE (B4 ERROR CODE)
367	005676	000000	0	;NO CALLOUT
368	005700	004000	BIT11	;A12 MODULE (B5 ERROR CODE)
369	005702	000000	0	;NO CALLOUT
370	005704	004000	BIT11	;A12 MODULE (B6 ERROR CODE)
371	005706	000000	0	;NO CALLOUT
372	005710	004000	BIT11	;A12 MODULE (B7 ERROR CODE)
373	005712	000000	0	;NO CALLOUT
374	005714	004000	BIT11	;A12 MODULE (B8 ERROR CODE)
375	005716	000000	0	;NO CALLOUT
376	005720	004300	BIT6!BIT7!BIT11	;A7, A8, A12 MODULE (B9 ERROR CODE)
377	005722	000000	0	;NO CALLOUT
378	005724	004200	BIT7!BIT11	;A8, A12 MODULES (BA ERROR CODE)
379	005726	000000	0	;NO CALLOUT
380	005730	000000	0	;NO CALLOUT (BB ERROR CODE)
381	005732	000000	0	;NO CALLOUT
382	005734	000000	0	;NO CALLOUT (BC ERROR CODE)
383	005736	000000	0	;NO CALLOUT
384	005740	000000	0	;NO CALLOUT (BD ERROR CODE)
385	005742	000000	0	;NO CALLOUT
386	005744	004000	BIT11	;A12 MODULE (BE ERROR CODE)
387	005746	000000	0	;NO CALLOUT
388	005750	004000	BIT11	;A12 MODULE (BF ERROR CODE)
389	005752	000000	0	;NO CALLOUT
390	005754	000020	BIT4	;A5 MODULE (C0 ERROR CODE)
391	005756	000000	0	;NO CALLOUT
392	005760	000020	BIT4	;A5 MODULE (C1 ERROR CODE)
393	005762	000000	0	;NO CALLOUT
394	005764	000030	BIT3!BIT4	;A4, A5 MODULES (C2 ERROR CODE)
395	005766	000000	0	;NO CALLOUT
396	005770	000020	BIT4	;A5 MODULE (C3 ERROR CODE)
397	005772	000000	0	;NO CALLOUT
398	005774	000020	BIT4	;A5 MODULE (C4 ERROR CODE)
399	005776	000000	0	;NO CALLOUT

400	006000	000060	BIT4!BIT5	;A5, A6 MODULES (C5 ERROR CODE)
401	006002	000000	0	;NO CALLOUT
402	006004	000020	BIT4	;A5 MODULE (C6 ERROR CODE)
403	006006	000000	0	;NO CALLOUT
404	006010	000000	0	;NOT USED (C7 ERROR CODE)
405	006012	000000	0	;NOT USED
406	006014	000000	0	;NOT USED (C8 ERROR CODE)
407	006016	000000	0	;NOT USED
408	006020	000000	0	;NOT USED (C9 ERROR CODE)
409	006022	000000	0	;NOT USED
410	006024	000000	0	;NOT USED (CA ERROR CODE)
411	006026	000000	0	;NOT USED
412	006030	000000	0	;NOT USED (CB ERROR CODE)
413	006032	000000	0	;NOT USED
414	006034	000000	0	;NOT USED (CC ERROR CODE)
415	006036	000000	0	;NOT USED
416	006040	000000	0	;NOT USED (CD ERROR CODE)
417	006042	000000	0	;NOT USED
418	006044	000000	0	;NOT USED (CE ERROR CODE)
419	006046	000000	0	;NOT USED
420	006050	000000	0	;NOT USED (CF ERROR CODE)
421	006052	000000	0	;NOT USED
422	006054	001400	BIT8!BIT9	;A9, A10 MODULE (D0 ERROR CODE)
423	006056	000000	0	;NO CALLOUT
424	006060	021400	BIT8!BIT9!BIT13	;A9, A10, A14 MODULES (D1 ERROR CODE)
425	006062	000000	0	;NO CALLOUT
426	006064	001000	BIT9	;A10 MODULE (D2 ERROR CODE)
427	006066	000000	0	;NO CALLOUT
428	006070	005400	BIT8!BIT9!BIT11	;A9, A10, A12 MODULES (D3 ERROR CODE)
429	006072	000000	0	;NO CALLOUT
430	006074	021000	BIT9!BIT13	;A10, A14 MODULES (D4 ERROR CODE)
431	006076	000000	0	;NO CALLOUT
432	006100	025400	BIT8!BIT9!BIT11!BIT13	;A9, A10, A12, A14 MODULES (D5 ERROR CODE)
433	006102	000000	0	;NO CALLOUT
434	006104	061000	BIT9!BIT13!BIT14	;A10, A14, A15 MODULES (D6 ERROR CODE)
435	006106	000001	BIT0	;A17 MODULE
436	006110	000000	0	;NOT USED (D7 ERROR CODE)
437	006112	000000	0	;NOT USED
438	006114	001000	BIT9	;A10 MODULE (D8 ERROR CODE)
439	006116	000000	0	;NO CALLOUT
440	006120	000000	0	;NOT USED (D9 ERROR CODE)
441	006122	000000	0	;NOT USED
442	006124	004400	BIT8!BIT11	;A9, A12 MODULE (DA ERROR CODE)
443	006126	000000	0	;NO CALLOUT
444	006130	000000	0	;NOT USED (DB ERROR CODE)
445	006132	000000	0	;NOT USED
446	006134	060000	BIT13!BIT14	;A14, A15 MODULES (DC ERROR CODE)
447	006136	000000	0	;NO CALLOUT
448	006140	061000	BIT9!BIT13!BIT14	;A10, A14, A15 MODULES (DD ERROR CODE)
449	006142	000000	0	;NO CALLOUT
450	006144	020000	BIT13	;A14 MODULE (DE ERROR CODE)
451	006146	000000	0	;NO CALLOUT
452	006150	020000	BIT13	;A14 MODULE (DF ERROR CODE)
453	006152	000000	0	;NO CALLOUT
454	006154	020000	BIT13	;A14 MODULE (EO ERROR CODE)
455	006156	000000	0	;NO CALLOUT
456	006160	020000	BIT13	;A14 MODULE (E1 ERROR CODE)

457	006162	000000	0	;NOT USED
458	006164	020000	BIT13	;A14 MODULE (E2 ERROR CODE)
459	006166	000000	0	;NO CALLOUT
460	006170	020000	BIT13	;A14 MODULE (E3 ERROR CODE)
461	006172	000000	0	;NO CALLOUT
462	006174	020000	BIT13	;A14 MODULE (E4 ERROR CODE)
463	006176	000000	0	;NO CALLOUT
464	006200	000000	0	;NOT USED (E5 ERROR CODE)
465	006202	000000	0	;NOT USED
466	006204	160000	BIT13!BIT14!BIT15	;A14, A15, A16 MODULE (E6 ERROR CODE)
467	006206	000000	0	;OPEN
468	006210	040000	BIT14	;A15 MODULE (E7 ERROR CODE)
469	006212	000000	0	;OPEN
470	006214	141000	BIT9!BIT14!BIT15	;A10, A14, A15 MODULES (E8 ERROR CODE)
471	006216	000000	0	;NO CALLOUT
472	006220	001000	BIT9	;A10 MODULE (E9 ERROR CODE)
473	006222	000000	0	;NO CALLOUT
474	006224	000600	BIT7!BIT8	;A8, A9 MODULES (EA ERROR CODE)
475	006226	000000	0	;NO CALLOUT
476	006230	000000	0	;NO CALLOUT (EB ERROR CODE)
477	006232	000000	0	;NO CALLOUT
478	006234	000000	0	;NO CALLOUT (EC ERROR CODE)
479	006236	000000	0	;NO CALLOUT
480	006240	000100	BIT6	;A7 MODULE (ED ERROR CODE)
481	006242	000000	0	;NO CALLOUT
482	006244	000000	0	;NO CALLOUT (EE ERROR CODE)
483	006246	000000	0	;NO CALLOUT
484	006250	000000	0	;NO CALLOUT (EF ERROR CODE)
485	006252	000000	0	;NO CALLOUT
486	006254	100000	BIT15	;A16 MODULE (F0 ERROR CODE)
487	006256	000000	0	;NO CALLOUT
488	006260	100200	BIT7!BIT15	;A8, A16 MODULE (F1 ERROR CODE)
489	006262	000201	BIT0!BIT7	;A17, HDA CALLOUT
490	006264	100000	BIT15	;A16 MODULE (F2 ERROR CODE)
491	006266	000200	BIT7	;HDA CALLOUT
492	006270	100000	BIT15	;A16 MODULE (F3 ERROR CODE)
493	006272	000200	BIT7	;HDA CALLOUT
494	006274	100000	BIT15	;A16 MODULE (F4 ERROR CODE)
495	006276	000200	BIT7	;HDA CALLOUT
496	006300	100000	BIT15	;A16 MODULE (F5 ERROR CODE)
497	006302	000000	0	;NOT USED
498	006304	141000	BIT9!BIT14!BIT15	;A10, A15, A16 MODULE (F6 ERROR CODE)
499	006306	000201	BIT0!BIT7	;A17, HDA CALLOUT
500	006310	100000	BIT15	;A16 MODULE (F7 ERROR CODE)
501	006312	000201	BIT0!BIT7	;A17, HDA CALLOUT
502	006314	100000	BIT15	;A16 MODULE (F8 ERROR CODE)
503	006316	000000	0	;NO CALLOUT
504	006320	100000	BIT15	;A16 MODULE (F9 ERROR CODE)
505	006322	000000	0	;NO CALLOUT
506	006324	000000	0	;NOT USED (FA ERROR CODE)
507	006326	000000	0	;NOT USED
508	006330	000000	0	;NOT USED (FB ERROR CODE)
509	006332	000000	0	;NOT USED
510	006334	000000	0	;NOT USED (FC ERROR CODE)
511	006336	000000	0	;NOT USED
512	006340	000000	0	;NOT USED (FD ERROR CODE)
513	006342	000000	0	;NOT USED

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514	006344	000000	0	;NOT USED (FE ERROR CODE)
515	006346	000000	0	;NOT USED
516	006350	000000	0	;NOT USED (FF ERROR CODE)
517	006352	000000	0	;NOT USED
518				

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1          .SBTTL  GLOBAL TEXT SECTION
2
3          ;**
4          ; THE GLOBAL TEXT SECTION CONTAINS FORMAT STATEMENTS,
5          ; MESSAGES, AND ASCII INFORMATION THAT ARE USED IN
6          ; MORE THAN ONE TEST.
7          ;**
8
15         ; NAMES OF DEVICES SUPPORTED BY PROGRAM
16         ;
17 006354   L#DVTYP::
006354     .ASCIZ  /RP07/
           .EVEN
18
24
25         ; TEST DESCRIPTION
26         ;
27 006362   L#DESC::
006362     .ASCIZ  /RP07 FRONT END-HOST ISOLATOR/
           .EVEN
28
35
36         ; FORMAT STATEMENTS USED IN PRINT CALLS
37         ;
38
39 006420   045     116     000  CRLF:: .ASCIZ  /#N/
40 006423   045     116     045  DSNMSG:: .ASCIZ  /#N#ADRIIVE #01#A, PG/
41 006447   045     124     000  SNDIGT:: .ASCIZ  /#T/
45 006452   045     101     124  MSGMOL:: .ASCIZ  /#ATEST #D2#A, BYPASSED, DRIVE OFFLINE#N/
46 006522   045     101     124  MSGMLO:: .ASCIZ  /#ATEST #D2#A, BYPASSED, DRIVE WRITF LOCKED#N/
47 006577   045     116     045  MMSG10::.ASCIZ  /#N#ADRIIVE #01#A, WAITING FOR 'MOL' TO SET (DRIVE OFFLINE)/
48 006671   045     116     045  MMSG11::.ASCIZ  /#N#ADRIIVE #01#A, WAITING FOR 'DRY' TO SET (DRV NOT READY)/
49 006763   045     116     045  MMSG12::.ASCIZ  /#N#ATO REFORMAT FE CYLINDER, TRACK #0 UPON PROGRAM COMPLETION./
50 007062   045     116     045  MMSG15::.ASCIZ  /#N#AREFORMATTING FE CYLINDER, TRACK #0. USE THE FORMAT PROGRAM/
51
52 007161   045     101     122  FRMT00::.ASCIZ  /#AREGISTER UNDER TEST: #06/
53 007214   045     116     045  FRMT01::.ASCIZ  /#N#AEXPECTED DATA: #06#A  RECEIVED DATA: #06/
54 007273   045     101     106  FLST00::.ASCIZ  /#AFAULT LIST: /
55 007312   045     124     000  FLST01::.ASCIZ  /#T/
56 007315   045     101     052  FRMT02::.ASCIZ  /#A** THERE IS ALSO A POSSIBILITY OF A HDA FAILURE **#N/
57 007404   045     116     045  FRMT03::.ASCIZ  /#N#ADRIIVE #01#A, /
58 007426   045     101     115  FRMT04::.ASCIZ  /#AMICRO-CODE TEST #: #T#T#T#T#A (HEX)/
59 007474   045     101     040  FRMT05::.ASCIZ  /#A          ERROR CODE: #T#T#T#T#A (HEX)#N/
60 007545   045     101     106  FRMT06::.ASCIZ  /#AFAILING FUNCTION: #T/
61 007574   045     116     045  FRMT07::.ASCIZ  /#N#ASEEKS TOO LONG: #D3/
62
63 007624   045     116     045  FRMT10::.ASCIZ  /#N#ASEEK OVERSHOOTS: #D3/
64 007655   045     116     045  FRMT11::.ASCIZ  /#N#ASOFT SEEK OVERSHOOTS: #D3/
65 007713   045     116     045  FRMT12::.ASCIZ  /#N#AGUARD-BAND DETECTED SKI'S: #D3/
66 007756   045     116     045  FRMT13::.ASCIZ  /#N#AINDEX ERRORS: #D3/
67 010004   045     116     045  FRMT14::.ASCIZ  /#N#APLO UNSAFES: #D3/
68 010031   045     116     045  FRMT15::.ASCIZ  /#N#AFAILED RECAL ATTEMPTS: #D3/
69 010070   045     116     045  FRMT16::.ASCIZ  /#N#A(HEX) ERROR LOG ENTRIES, IF PRESENT, ARE AS FOLLOWS:/
70 010161   045     124     045  FRMT17::.ASCIZ  /#T#T#T#T#A  /
71
72 010202   045     116     045  FRMT20::.ASCIZ  /#N#A8080 REV. LEVEL IS: #D3#N#A2901 REV. LEVEL IS: #D3/
73 010271   045     116     045  FRMT23::.ASCIZ  /#N#AROUTINE NO. (2 CHAR "HEX" INPUT) /
    
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74
75 010337      045      116      045 FRMT40:..ASCIZ /#N#ADRIE  RPCS1  RPWC  RPBA  RPDA  RPCS2  RPDS/
76 010430      045      116      045 FRMT41:..ASCIZ /#N#06#A  #06#A  #06#A  #06#A  #06#A  #06#A  #06#A  #06#A
77
78 010510      045      116      045 FRMT50:..ASCIZ /#N#ARPER1  RPAS  RPLA  RPOB  RPMR1  RPD1  RPSN/
79 010601      045      116      045 FRMT51:..ASCIZ /#N#06#A  #06#A  #06#A  #06#A  #06#A  #06#A  #06#A  #06#A
80
81 010661      045      116      045 FRMT60:..ASCIZ /#N#ARPOF  RPDC  RPCC  RPER2  RPER3  RPEC1  RPEC2/
82 010753      045      116      045 FRMT61:..ASCIZ /#N#06#A  #06#A  #06#A  #06#A  #06#A  #06#A  #06#A  #06#A
83
84 011035      045      101      122 FRMT70:..ASCIZ /#ARPBAE  RPCS3/
85 011055      045      116      045 FRMT71:..ASCIZ /#N#06#A  #06#A/
86
97
```

```

1          .SBTTL GLOBAL ASCII MESSAGE SECTION
2
3 011074    104    125    101 AD:: .ASCIZ /DUAL DRIVE RESPONSE /
4 011121    101    061    062 DS:: .ASCIZ /A12 S01 /           ;MASSBUS DISABLE SWITCH
5 011132    122    110    040 RH:: .ASCIZ /RH CONTROLLER /
6 011151    103    101    102 CA:: .ASCIZ /CABLES /
7 011161    101    060    061 J1:: .ASCIZ /A01 /
8 011166    101    060    062 J2:: .ASCIZ /A02 /
9 011173    101    060    063 J3:: .ASCIZ /A03 /
10 011200   101    060    064 J4:: .ASCIZ /A04 /
11 011205   101    060    065 J5:: .ASCIZ /A05 /
12 011212   101    060    066 J6:: .ASCIZ /A06 /
13 011217   101    060    067 J7:: .ASCIZ /A07 /
14 011224   101    060    070 J8:: .ASCIZ /A08 /
15 011231   101    060    071 J9:: .ASCIZ /A09 /
16 011236   101    061    060 J10:: .ASCIZ /A10 /
17 011243   101    061    061 J11:: .ASCIZ /A11 /
18 011250   101    061    062 J12:: .ASCIZ /A12 /
19 011255   101    061    063 J13:: .ASCIZ /A13 /
20 011262   101    061    064 J14:: .ASCIZ /A14 /
21 011267   101    061    065 J15:: .ASCIZ /A15 /
22 011274   101    061    066 J16:: .ASCIZ /A16 /
23 011301   101    061    067 J17:: .ASCIZ /A17 /
24 011306   101    062    060 J20:: .ASCIZ /A20 /
25 011313   101    062    061 J21:: .ASCIZ /A21 /
26
27 011320    110    104    101 HDA:: .ASCIZ /HDA /
28 011325    124    105    122 TERM:: .ASCIZ /TERMINATOR /
29 011341    063    040    120 SENSOR:: .ASCIZ /3 PHASE SENSOR /
30 011361    102    114    117 BLOWER:: .ASCIZ /BLOWER ASSY /
31 011376    120    117    127 PTRANS:: .ASCIZ /POWER TRANSFORMER /
32 011421    115    117    124 MTRBRK:: .ASCIZ /MOTOR-BRAKE ASSY /
33 011443    122    105    114 K1RELA:: .ASCIZ /RELAY-K1 /
34 011455    117    120    105 OPRPNL:: .ASCIZ /OPERATOR'S PANEL /
35 011477    115    117    124 DRVBLT:: .ASCIZ /MOTOR BELT, MOTOR SPRING /
36
37 011531    122    105    101 READTD:: .ASCIZ /READ TD'S/
38 011543    127    122    124 WTCKHD:: .ASCIZ /WRT CHK HDR & DATA/
39 011566    127    122    111 WTCKD:: .ASCIZ /WRITE CHECK DATA/
40
41 011607    120    114    101 MESG13:: .ASCIZ /PLACE INTERFACE SWITCH A12-S01 IN DOWN POSITION/
42 011667    120    114    101 MESG14:: .ASCIZ /PLACE INTERFACE SWITCH A12-S01 IN UP POSITION/
43
44 011747    103    117    115 EM1:: .ASCIZ /COMPOSITE ERROR SET WHEN NOT EXPECTED/
45 012015    104    122    111 EM2:: .ASCIZ /DRIVE HUNG, DRY NOT SET IN TIME/
46 012055    104    122    111 EM3:: .ASCIZ /DRIVE WRITE LOCKED/
47 012100    104    122    111 EM4:: .ASCIZ /DRIVE OFFLINE/
48 012116    122    120    103 EM5:: .ASCIZ /RPCS2:OR FAILED TO SET IN TIME/
49 012155    122    120    103 EM6:: .ASCIZ /RPCS2:OR FAILED TO CLEAR IN TIME/
50 012217    104    122    111 EM7:: .ASCIZ /DRIVE SHOULD BE WRITE ENABLED AND ON LINE!/
51
52 012272    122    110    040 EM11:: .ASCIZ /RH CONTROLLER DIDN'T RESPOND (NO SSYNC)/
53 012342    102    111    124 EM12:: .ASCIZ /BIT(S) UNDER TEST DIDN'T CHANGE STATE/
54 012410    122    120    103 EM13:: .ASCIZ /RPCS2: CLR DIDN'T FUNCTION PROPERLY/
55 012454    122    105    107 EM14:: .ASCIZ /REG CONTENTS DON'T MATCH EXPECTED DATA/
56 012523    122    105    107 EM15:: .ASCIZ /REG DIDN'T CLEAR WHEN EXPECTED/
57 012562    123    103    040 EM16:: .ASCIZ /SC OR TRE SET WHEN NOT EXPECTED/

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58 012622      122      120      103 EM17:: .ASCIZ  /RPCS2:IR FAILED TO SET IN TIME/
59
60 012661      122      120      103 EM20:: .ASCIZ  /RPCS1:MCPE DIDN'T SET WHEN EXPECTED/
61 012725      122      120      103 EM21:: .ASCIZ  /RPCS1:SC OR TRE DIDN'T SET WHEN EXPECTED/
62 012776      102      111      124 EM22:: .ASCIZ  /BIT(S) UNDER TEST DIDN'T SET WHEN EXPECTED/
63 013051      102      111      124 EM23:: .ASCIZ  /BIT(S) UNDER TEST DIDN'T CLEAR WHEN EXPECTED/
64 013126      122      110      040 EM24:: .ASCIZ  /RH INTERRUPTED AT WRONG PRIORITY/
65 013167      122      110      040 EM25:: .ASCIZ  /RH GENERATED FALSE INTERRUPT/
66 013224      122      110      040 EM26:: .ASCIZ  /RH DIDN'T INTERRUPT WHEN EXPECTED/
67 013266      104      122      111 EM27:: .ASCIZ  /DRIVE NOT PRESENT, TEST INVALID/
68
69 013326      103      117      115 EM30:: .ASCIZ  /COMMAND EXECUTION INCORRECT/
70 013362      104      101      124 EM31:: .ASCIZ  /DATA LINE(S) STUCK LOW/
71 013411      106      101      111 EM32:: .ASCIZ  /FAILED TO SEEK PROPERLY/
72 013441      104      105      124 EM33:: .ASCIZ  /DETECTED ERROR DURING DATA TRANSFER/
73 013505      106      101      111 EM34:: .ASCIZ  /FAILED TO CORRECTLY DETECT A WRITE CHECK ERROR/
74 013564      106      101      111 EM35:: .ASCIZ  /FAILED AN RP07, INTERNAL MICRODIAGNOSTIC TEST/
75 013641      122      110      130 EM36:: .ASCIZ  /RHXX REGISTER SELECTION FAILURE/
76 013701      104      101      124 EM37:: .ASCIZ  /DATA RECEIVED DOESN'T MATCH EXPECTED DATA/
77
78 013753      104      105      124 EM40:: .ASCIZ  /DETECTED ERROR DURING WRITE DATA OPERATION/
79 014026      104      105      124 EM41:: .ASCIZ  /DETECTED ERROR DURING FORMAT OPERATION/
80 014075      104      105      124 EM42:: .ASCIZ  /DETECTED A PERMANENT ERROR/
81 014130      111      116      124 EM43:: .ASCIZ  /INTERNAL RP07 DIAGNOSTIC TIME OUT/

```

.EVEN

.SBTTL GLOBAL ERROR REPORT SECTION

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; **
; THE GLOBAL ERROR REPORT SECTION CONTAINS THE PRINTB AND PRINTX CALLS
; THAT ARE USED IN MORE THAN ONE TEST. IT ALSO INCLUDES THE ASCII MESSAGES
; THAT ARE USED BY THE PRINTB AND PRINTX CALLS..
; --

```

```

96 014172
97 014172      004737      017326      JSR      PC,SAVRPR      ;GET THE REGISTER SNAPSHOT NOW
98 014176      004737      020532      JSR      PC,DECODE     ;DECODE THE BIT MASK FOR THE ERROR!
99 014202      013746      002456      MOV      TESTRG, -(SP)
      014206      012746      007161      MOV      #FRMT00, -(SP)
      014212      012746      000002      MOV      #2, -(SP)
      014216      010600      MOV      SP,R0
      014220      104414      TRAP     C:PNTB
      014222      062706      000006      ADD      #6, SP
100 014226      013746      002452      MOV      RCVED, -(SP)
      014232      013746      002454      MOV      EXPTED, -(SP)
      014236      012746      007214      MOV      #FRMT01, -(SP)
      014242      012746      000003      MOV      #3, -(SP)
      014246      010600      MOV      SP,R0
      014250      104414      TRAP     C:PNTB
      014252      062706      000010      ADD      #10, SP
101 014256      004737      016212      JSR      PC,DMPREG     ;DO THE REGISTER DUMP NOW
102 014262      004737      016556      JSR      PC,FAULTS    ;REPORT THE FAULT LIST
103
104 014266      012746      006420      MOV      #CRLF, -(SP) ;CR-LF
      014272      012746      000001      MOV      #1, -(SP)
      014276      010600      MOV      SP,R0

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	014300	104414		TRAP	C#PNTB	
	014302	062706	000004	ADD	#4, SP	
105	014306			L10002:	TRAP	C#MSG
	014306	104423				
106						
107	014310			ERR1::		
108	014310	004737	017326	JSR	PC, SAVRPR	;GET THE REGISTER SNAPSHOT NOW
109	014314	010446		MOV	R4, -(SP)	;PUT THE ROUTINE NUMBER ON THE STACK
110	014316	004737	015416	JSR	PC, OCTHEX	;AND CONVERT TO HEX
111						
112	014322	012746	002660	MOV	#PSTACK+6, -(SP)	
	014326	012746	002656	MOV	#PSTACK+4, -(SP)	
	014332	012746	002654	MOV	#PSTACK+2, -(SP)	
	014336	012746	002652	MOV	#PSTACK, -(SP)	
	014342	012746	007426	MOV	#FRMT04, -(SP)	
	014346	012746	000005	MOV	#5, -(SP)	
	014352	010600		MOV	SP, R0	
	014354	104414		TRAP	C#PNTB	
	014356	062706	000014	ADD	#14, SP	
113	014362	017746	166164	MOV	#RPER2, -(SP)	;GET THE CONTENTS OF RPER2 ON THE STACK
114	014366	042716	177400	BIC	#177400, (SP)	;AND ELIMINATE THE HIGH ORDER BITS
115	014372	004737	015416	JSR	PC, OCTHEX	;NOW CONVERT TO HEX
116						
117	014376	012746	002660	MOV	#PSTACK+6, -(SP)	
	014402	012746	002656	MOV	#PSTACK+4, -(SP)	
	014406	012746	002654	MOV	#PSTACK+2, -(SP)	
	014412	012746	002652	MOV	#PSTACK, -(SP)	
	014416	012746	007474	MOV	#FRMT05, -(SP)	
	014422	012746	000005	MOV	#5, -(SP)	
	014426	010600		MOV	SP, R0	
	014430	104414		TRAP	C#PNTB	
	014432	062706	000014	ADD	#14, SP	
118	014436	004737	016212	JSR	PC, DMPREG	;DUMP THE REGISTERS NOW
119	014442	004737	016132	JSR	PC, CALMOD	;REPORT THE MODULE LIST
120	014446	004737	020532	JSR	PC, DECODE	;DECODE THE MASK BITS FOR A MODULE CALLOUT
121	014452	004737	016556	JSR	PC, FAULTS	;AND REPORT THE FIND
122						;CR-LF
123	014456	012746	006420	MOV	#CRLF, -(SP)	
	014462	012746	000001	MOV	#1, -(SP)	
	014466	010600		MOV	SP, R0	
	014470	104414		TRAP	C#PNTB	
	014472	062706	000004	ADD	#4, SP	
124	014476			L10003:	TRAP	C#MSG
	014476	104423				
125						
126	014500			ERR2::		
127	014500	004737	020532	JSR	PC, DECODE	;DECODE THE MESSAGE
128	014504	013746	002506	MOV	DRVNO, -(SP)	
	014510	012746	007404	MOV	#FRMT03, -(SP)	
	014514	012746	000002	MOV	#2, -(SP)	
	014520	010600		MOV	SP, R0	
	014522	104414		TRAP	C#PNTB	
	014524	062706	000006	ADD	#6, SP	
129	014530	013746	002470	MOV	FATOF, -(SP)	
	014534	012746	007545	MOV	#FRMT06, -(SP)	
	014540	012746	000002	MOV	#2, -(SP)	
	014544	010600		MOV	SP, R0	

014546	104414		TRAP	C#PNTB	
014550	062706	000006	ADD	#6,SP	
130 014554	013746	002452	MOV	RCVED,-(SP)	
014560	013746	002454	MOV	EXPTD,-(SP)	
014564	012746	007214	MOV	#FRMT01,-(SP)	
014570	012746	000003	MOV	#3,-(SP)	
014574	010600		MOV	SP,RO	
014576	104414		TRAP	C#PNTB	
014600	062706	000010	ADD	#10,SP	
131					
132 014604	012746	006420	MOV	#CRLF,-(SP)	;CR-LF
014610	012746	000001	MOV	#1,-(SP)	
014614	010600		MOV	SP,RO	
014616	104414		TRAP	C#PNTB	
014620	062706	000004	ADD	#4,SP	
133 014624	004737	016556	JSR	PC,FAULTS	;REPORT THE FAULT LIST
134					;CR-LF
135 014630	012746	006420	MOV	#CRLF,-(SP)	
014634	012746	000001	MOV	#1,-(SP)	
014640	010600		MOV	SP,RO	
014642	104414		TRAP	C#PNTB	
014644	062706	000004	ADD	#4,SP	
136 014650			L10004:	TRAP	C#MSG
014650	104423				
137					
138 014652			ERR3::		
139 014652	004737	016212	JSR	PC,DMPREG	;JUST DUMP THE REGISTERS
140					;CR-LF
141 014656	012746	006420	MOV	#CRLF,-(SP)	
014662	012746	000001	MOV	#1,-(SP)	
014666	010600		MOV	SP,RO	
014670	104414		TRAP	C#PNTB	
014672	062706	000004	ADD	#4,SP	
142 014676			L10005:	TRAP	C#MSG
014676	104423				
143					

```

1          .SBTTL GLOBAL SUBROUTINES SECTION
2
3          ;AUTO SIZE FOR RH70 CONTROLLER AND DETERMINE IF IT IS JUMPERED FOR 22 OR
4          ;32 REGISTERS
5          ;CALL
6          ;      JSR      PC,SIZE70      ;CALL ROUTINE
7          ;
8          ;R5 MUST CONTAIN POINTER TO NEW RPCS1 BASE ADDRESS
9
11 014700 005037 002502 SIZE70: CLR      RHEXT      ;CLEAR RPBAE OFFSET
12 014704 005037 002504      CLR      RHXX      ;CLEAR RHXX TYPE REGISTER (RH11)
13 014710 013746 000004      MOV      ERRVEC,-(SP) ;SAVE CONTENTS OF ERROR VECTOR
14 014714 012737 014764 000004      MOV      #2$,ERRVEC ;SETUP 'TRAP' RETURN ADDRESS
15 014722 011500      MOV      (R5),R0 ;GET RPCS1 ADDRESS
16 014724 062700 000050      ADD      #50,R0 ;GET REGISTER OFFSET FOR RH70
17 014730 012702 000012      MOV      #10.,R2 ;GET NUMBER OF REGISTERS TO CHECK
18 014734 005720      TST      (R0)+ ;TRAP IF NOT A VALID RPBAE
19 014736 005720      TST      (R0)+ ;TRAP IF NOT A VALID RPCS3
20 014740 012737 000050 002502      MOV      #50,RHEXT ;LOAD OFFSET FOR RPBAE (22 REGISTER RH)
21 014746 005720 1$: TST      (R0)+ ;TRAP IF NOT A VALID REGISTER
22 014750 005302      DEC      R2 ;DONE WITH ALL 32 REGISTERS ?
23 014752 001375      BNE      1$ ;BR IF NO
24 014754 012737 000074 002502      MOV      #74,RHEXT ;LOAD OFFSET FOR RPBAE (32 REGISTER RH)
25 014762 000403      BR      3$
26 014764 012716 014772 2$: MOV      #3$,R2 ;SETUP RETURN ADDRESS
27 014770 000002      RTI
28
29 014772 011500 3$: MOV      (R5),R0 ;GET RPCS1 REGISTER
30 014774 013702 002502      MOV      RHEXT,R2 ;GET RPBAE REGISTER OFFSET
31 015000 001415      BEQ      4$ ;BR IF NONE
32 015002 060002      ADD      R0,R2 ;GET RPBAE REGISTER
33 015004 052710 001400      BIS      #A17!A16,(R0) ;SET EXTENDED ADDRESS BITS IN RPCS1
34 015010 022712 000003      CMP      #3,(R2) ;ARE THE EXTENDED BITS SET IN RPBAE ?
35 015014 001007      BNE      4$ ;BR IF NO
36 015016 005012      CLR      (R2) ;CLEAR EXTENDED ADDRESS BITS IN RPBAE
37 015020 011046      MOV      (R0),-(SP) ;SAVE RPCS1 REG CONTENTS
38 015022 042726 176377      BIC      #C<A17!A16>,(SP)+ ;ARE THE EXTEND BITS CLEAR IN RPCS1 ?
39 015026 001002      BNE      4$ ;BR IF NO
40 015030 005237 002504      INC      RHXX ;SET RHXX TYPE REGISTER (RH70)
41 015034 012637 000004 4$: MOV      (SP)+,ERRVEC ;RESTORE CONTENTS OF ERROR VECTOR
42 015040 000207      RTS      PC

```

J^E,

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1      .SBTTL  DISK DRIVER AND SUPPORT ROUTINES
2
3      ;*****
4      ;THIS MODULE IS USED ANYTIME A DIAGNOSTIC COMMAND HAS JUST BEEN ISSUED BY
5      ;THE MODULE "DRIVER".  IT POLLS THE CORRECT ATTENTION BIT IN THE PSEUDO
6      ;REGISTER AND USES A 'WATCHDOG TIMER' TO VERIFY THAT THE BIT DOES EVENTUALLY
7      ;SET.  IF IT DOES NOT, AN ERROR MESSAGE IS PRODUCED REPORTING A MICRO-
8      ;DIAGNOSTIC TIMEOUT.
9      ;*****
10
11 015042 010146      RPARDY: MOV      R1,-(SP)      ;SAVE R1
12 015044 010446      MOV      R4,-(SP)      ;SAVE R4
13 015046 012701 000062  MOV      #50,R1      ;GET AN OVERALL ITERATION COUNT
14 015052 033777 002400 165450 1$: BIT      BITPOS,SRPAS ;DONE??
15 015060 001012      BNE      2$          ;IF SET, YES
16 015062 004737 017000      JSR      PC,WAIT    ;USE THE WATCHDOG TIMER
17 015066 005301      DEC      R1          ;ONE LESS CYCLE TO-GO
18 015070 003370      BGT      1$          ;IF NOT ZERO, KEEP WATCHING
19 015072 017704 165440      MOV      SRPMR1,R4   ;GET CONTENTS OF RPMR1
20 015076 104456      TRAP     C$ERHRD
    015100 000621      .WORD   401
    015102 014130      .WORD   EM43
    015104 014310      .WORD   ERR1
21 015106 013777 002400 165414 2$: MOV      BITPOS,SRPAS ;RESET THE ATTENTION BIT TO 0
22 015114 012604      MOV      (SP)+,R4    ;RESTORE R4
23 015116 012601      MOV      (SP)+,R1    ;RESTORE R1
24 015120 000207      RTS      PC          ;TAKE THE RETURN
25
26      ;*****
27      ;THIS MODULE IS CALLED BY THE DRIVER WHEN EVER A NON-DATA COMMAND HAS
28      ;JUST BEEN ISSUED. (EXCEPT A DIAGNOSTIC COMMAND.) IT POLLS FOR RPDS:
29      ;DRY. THE FUNCTION IS NOT TIMED USING A WATCHDOG TIMER, BUT SUPERVISOR
30      ;'BREAKS' ARE SUPPORTED.
31      ;*****
32
33 015122      READY:
    015122 104422      TRAP     C$BRK
34 015124 105777 165374      TSTB    SRPDS      ;READY TRUE?
35 015130 100374      BPL     READY      ;NO, SO WAIT SOME MORE
36 015132 000207      RTS     PC          ;TAKE THE RETURN
37
38      ;*****
39      ;THIS MODULE IS CALLED BY THE DRIVER ANYTIME A DATA COMMAND HAS JUST BEEN
40      ;ISSUED. IT POLLS FOR CONTROLLER READY. THE FUNCTION IS NOT TIMED USING
41      ;A WATCHDOG TIMER, BUT SUPERVISOR 'BREAKS' ARE SUPPORTED.
42      ;*****
43
44 015134      CREADY:
    015134 104422      TRAP     C$BRK
45 015136 105777 165350      TSTB    SRPCS1     ;CONTROLLER READY?
46 015142 100374      BPL     CREADY     ;IF 0, NO...WAIT SOME MORE
47 015144 000207      RTS     PC          ;IT'S 1, RETURN
    
```

```

1
2
3
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11
12 015146 005437 002412 DRIVER: NEG NEGWRD ;NEGATE THE WORD COUNT ONLY ONCE!
13 015152 004737 015122 JSR PC,READY ;POLL FOR DRIVE READY!
14 015156 022737 000035 002420 CMP #DIAG,FUNCTN ;DIAGNOSTIC COMMAND??
15 015164 001414 BEQ 1# ;IF EQUAL, SKIP NEXT CODE
16 015166 013777 002412 165320 MOV NEGWRD,RPWC ;WORD COUNT ---> RP REGISTER
17 015174 013777 002416 165344 MOV DESCYL,RPDC ;GET THE CYLINDER ADDRESS TO THE DEVICE REGISTER
18 015202 013777 002414 165310 MOV DESTRK,RPDA ;TRACK/SEC ---> RP REGISTER
19 015210 013777 002366 165300 MOV TABADD,RPBA ;LOAD THE TRANSFER ADDRESS
20 015216 013777 002420 165266 1#: MOV FUNCTN,RPCSI ;GET THE COMMAND TO EXECUTE
21 015224 023727 002420 000035 CMP FUNCTN,#DIAG ;IS THIS A DATA COMMAND?
22 015232 101004 BHI 2# ;IF > THAN A DIAGNOSTIC COMMAND, YES
23 015234 001406 BEQ 3# ;IF =, IT GETS HANDLED UNIQUELY
24 015236 004737 015122 JSR PC,READY ;POLL FOR DRIVE READY
25 015242 000405 BR 4# ;AND SKIP NEXT POLL OPERATION
26 015244 004737 015134 2#: JSR PC,CREADY ;POLL FOR CONTROLLER READY
27 015250 000402 BR 4# ;NOW RETURN
28 015252 004737 015042 3#: JSR PC,RPARDY ;LOOK FOR ATTENTION NOW
29 015256 000207 4#: RTS PC ;NOW RETURN
30
31
32
33
34
35
36
37
38
39 015260 004737 016662 DIAGST::JSR PC,SEIZE ;GET THE DRIVE'S ATTENTION!
40 015264 012777 177000 165244 MOV #177000,RPMPR1 ;SET UP THE "HANDSHAKE"
41 015272 012737 000035 002420 MOV #DIAG,FUNCTN ;CREATE THE DIAGNOSTIC COMMAND
42 015300 004737 015146 JSR PC,DRIVER ;ISSUE THE COMMAND
43 015304 004737 016662 JSR PC,SEIZE ;RESET COMPOSITE ERROR (SETS WHEN FE IS WRITTEN INTO RMPR1)
44 015310 000207 RTS PC ;AND RETURN TO MAIN

```



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1
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9 015312 012737 040011 002420 DIAGEN: MOV    #TRE!DRCLR,FUNCTN;SET UP FOR A CONTROLLER DRIVE CLEAR COMMAND
10 015320 004737 015146          JSR    PC,DRIVER    ;ISSUE THE COMMAND
11 015324 012777 177400 165204          MOV    #177400,@RPMR1 ;TERMINATE THE SESSION WITH HI BYTE AS "FF"
12 015332 012737 000035 002420          MOV    #DIAG,FUNCTN  ;AND SET UP THE COMMAND
13 015340 004737 015146          JSR    PC,DRIVER    ;ISSUE THE COMMAND NOW!!
14 015344 005077 165166          CLR    @RPMR1      ;RESET THE DIAGNOSTIC MODE BIT
15 015350 000207          RTS    PC          ;RETURN TO MAIN
16
17
18
19
20
21
22
23
24 015352 010477 165160          DIAGLD: MOV    R4,@RPMR1 ;NOW SET THE DIAGNOSTIC NUMBER
25 015356 052777 100000 165152          BIS    #BIT15,@RPMR1 ;AND SET DMD = 1
26 015364 012737 000035 002420          MOV    #DIAG,FUNCTN  ;AND SET UP FOR A DIAGNOSTIC COMMAND
27 015372 004737 015146          JSR    PC,DRIVER    ;ISSUE THE COMMAND NOW!
28 015376 000207          RTS    PC          ;RETURN TO CALLER!
29
30
31
32
33
34
35
36
37
38 015400 017746 165132          DRVCLR: MOV    @RPMR1,-(SP) ;SAVE CONTENTS OF RPMR1
39 015404 004737 016662          JSR    PC,SEIZE    ;NOW RESET THE DRIVE
40 015410 012677 165122          MOV    (SP)+,@RPMR1 ;RESTORE THE MAINTENANCE REGISTER
41 015414 000207          RTS    PC          ;AND RETURN TO CALLER
42
43
44
45
46
47
48
49 015416 010146          OCTHEX: MOV    R1,-(SP) ;SAVE R1
50 015420 010246          MOV    R2,-(SP) ;SAVE R2
51 015422 012700 002652          MOV    #PSTACK,R0 ;SET UP THE BUFFER ADDRESS
52 015426 012702 000004          MOV    #4,R2      ;GET THE ITERATION VALUES
53 015432 012701 000004          1$: MOV    #4,R1    ;AND DUPLICATE FOR TWO LOOPS
54 015436 005010          CLR    (R0)      ;INITIALIZE THE BUFFER
55 015440 006310          2$: ASL    (R0)      ;MOVE THE PREVIOUS BIT(S) OVER
56 015442 000241          CLC          ;CARRY = 0
57 015444 006366 000006          ASL    6(SP)     ;ROTATE A BIT FROM THE TEST VALUE
    
```

```

58 015450 103002          BCC      3$          ;IF ZERO, SKIP NEXT INSTRUCTION
59 015452 052710 000001   BIS      #BIT0,(R0)   ;MARK THE BIT AS BEING SET
60 015456 005301          3$:   DEC      R1          ;ONE LESS ITERATION TO GO
61 015460 003367          BGT      2$          ;BUT NOT DONE UNTIL = 0!
62 015462 005720          TST      (R0)+       ;NEXT BUFFER LOCATION
63 015464 005302          DEC      R2          ;ONE LESS ITERATION TO-GO
64 015466 003361          BGT      1$          ;IF NOT ZERO, KEEP GOING!
65 015470 012702 000004   MOV      #4,R2       ;GET THE NEW ITERATION COUNT
66 015474 012700 002652   MOV      #PSTACK,R0  ;AND GET THE BUFFER ADDRESS AGAIN
67 015500 005710          4$:   TST      (R0)       ;CONTENTS ZERO?
68 015502 003004          BGT      5$          ;IF NOT, SKIP NEXT
69 015504 005020          CLR      (R0)+       ;SET THIS CHARACTER = NULL
70 015506 005302          DEC      R2          ;ONE LESS CHARACTER TO GO
71 015510 003373          BGT      4$          ;IF NOT ZERO, KEEP GOING
72 015512 000412          BR       8$          ;DONE, RETURN!
73 015514 021027 000011   5$:   CMP      (R0),#11  ;ALPHA OR NUMERIC CHARACTER?
74 015520 101003          BHI      6$          ;IF > 11, ALPHA!
75 015522 062720 000060   ADD      #60,(R0)+   ;MAKE NUMERIC ASCII
76 015526 000402          BR       7$          ;AND GO-ON
77 015530 062720 000067   6$:   ADD      #55.,(R0)+ ;MAKE HEX ASCII
78 015534 005302          7$:   DEC      R2          ;ONE LESS ITERATION TO-GO
79 015536 003366          BGT      5$          ;ONE LESS ITERATION, IF NOT ZERO
80 015540 012602          8$:   MOV      (SP)+,R2   ;RESTORE R2
81 015542 012601          MOV      (SP)+,R1   ;AND R1
82 015544 012616          MOV      (SP)+,(SP) ;MOVE STACK OVER INPUT VALUE
83 015546 000207          RTS      PC          ;AND RETURN
84
85
86 ;*****
87 ;DETERMINE IF THERE IS A CLOCK ON SYSTEM. START THE CLOCK. "CLKSTA" WILL
88 ;INDICATE THE CLOCK TYPE.
89 ;      0= NO CLOCK
90 ;      +1= KW11-P
91 ;      -1= KW11-L
92 ;THIS ROUTINE WILL ALSO SETUP "TICKMS" (TIME PER CLOCK TICK IN MILLISECONDS)
93 ;AND "TICKUS" (TIME PER CLOCK TICK IN MICROSECONDS) AS PER LINE FREQUENCY.
94 ;CALL
95 ;      JSR      PC,ST.CLK      ;START THE CLOCK
96 ;      RETURN
97 ;*****
98 015550 005037 002426   ST.CLK: CLR      CLKSTA      ;ASSUME "NO CLOCK"
99 015554 005037 015750   CLR      HERTZ          ;ASSUME "UNKNOWN" HERTZ
100 ;IS THERE A P-CLOCK PRESENT ?
101 015560 012700 000120   MOV      #'P,R0
102 015564 104462          TRAP    C#CLK
103 015566 010005          MOV      R0,R5
104 ;GO TO 1$ IF NO
105 BCC      1$
106 ;SET P-CLOCK P-TABLE & START P-CLOCK
107 015572 010537 015724   MOV      R5,PCLKTB     ;SAVE P-CLOCK TABLE ADDRESS
108 015576 011537 015726   MOV      (R5),PKCS     ;GET 'CSR' ADDRESS
109 015602 011537 015730   MOV      (R5),PKB      ;MAKE PKB ADDRESS BY
110 015606 062737 000002 015730   ADD      #2,PKB        ;ADDING 2
111 015614 012537 015732   MOV      (R5)+,PKC     ;MAKE PKC ADDRESS BY
112 015620 062737 000004 015732   ADD      #4,PKC        ;ADDING 4

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113 015626 005725          TST      (R5)+      ;SKIP OVER 'BR LEVEL'
114 015630 012537 015734    MOV      (R5)+,PKV    ;GET 'VECTOR' ADDRESS
115 015634 012537 015750    MOV      (R5)+,HERTZ  ;GET 'HERTZ' LINE FREQUENCY
116 015640 012737 000001 002426    MOV      #1,CLKSTA   ;SET P-CLOCK FLAG
117 015646 004737 015752    JSR      PC,ST.PCLK  ;START P-CLOCK AS A WATCH DOG TIMER
118 015652 000207          RTS      PC
119 015654          1$:          ;IS THERE A L-CLOCK PRESENT ?
120 015654 012700 000114    MOV      #'L,RO
      015660 104462          TRAP    C#CLK
      015662 010005          MOV      RO,R5
121          ;GO TO 2$ IF NO
122 015664 103016          BCC     2$
123
124          ;SET L-CLOCK P-TABLE, START L-CLOCK
125
126 015666 010537 015740    MOV      R5,LCLKTB   ;SAVE L-CLOCK TABLE ADDRESS
127 015672 012537 015742    MOV      (R5)+,LKS   ;GET 'CSR' ADDRESS
128 015676 005725          TST      (R5)+      ;SKIP OVER 'BR LEVEL'
129 015700 012537 015744    MOV      (R5)+,LKV   ;GET 'VECTOR' ADDRESS
130 015704 012537 015750    MOV      (R5)+,HERTZ  ;GET 'HERTZ' LINE FREQUENCY
131 015710 012737 177777 002426    MOV      #-1,CLKSTA  ;L-CLOCK FLAG
132 015716 004737 016016    JSR      PC,ST.LCLK  ;START L-CLOCK AS A WATCH DOG TIMER
133 015722 000207          2$:      RTS      PC
134
135          ;KW11-P CLOCK TABLE, CSR REG, PKB REG, PKC REG & VEC ADR
136
137 015724 000000          PCLKTB: .WORD 0      ;P-CLK TBL ADR
138
139 015726 172540          PKCS:   .WORD 172540 ;CONTROL & STATUS
140 015730 172542          PKB:   .WORD 172542 ;COUNT SET BFR
141 015732 172544          PKC:   .WORD 172544 ;COUNTER
142 015734 000104 000106    PKV:   .WORD 104,106 ;VECTOR
143
144          ;KW11-L CLOCK TABLE, CSR REG & VEC ADR
145
146 015740 000000          LCLKTB: .WORD 0      ;L-CLK TBL ADR
147
148 015742 177546          LKS:   .WORD 177546 ;CONTROL & STATUS
149 015744 000100 000102    LKV:   .WORD 100,102 ;VECTOR
150
151 015750 000000          HERTZ: .WORD 0      ;60 HZ. OR 50 HZ. LINE FREQUENCY
152
153 015752          ST.PCLK: ;SETUP VECTOR FOR P-CLOCK
154 015752 012746 000300    MOV      #PRI06,-(SP)
      015756 012746 016104    MOV      #KWSRV,-(SP)
      015762 013746 015734    MOV      PKV,-(SP)
      015766 012746 000003    MOV      #3,-(SP)
      015772 104437          TRAP    C#SVEC
      015774 062706 000010    ADD     #10,SP
155 016000 012777 000001 177722    MOV      #1,#PKB    ;COUNT ONE TICK
156 016006 012777 000115 177712    MOV      #115,#PKCS ;"INT.EN.",COUNT DOWN", "MODE 1 (REPEAT)",
157          ;"LINE FREQ", AND "RUN"
158 016014 000207          1$:      RTS      PC      ;RETURN
159
160 016016          ST.LCLK: ;SETUP VECTOR FOR L-CLOCK
161 016016 012746 000300    MOV      #PRI06,-(SP)
      016022 012746 016104    MOV      #KWSRV,-(SP)
    
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016026 013746 015744          MOV     LKV,-(SP)
016032 012746 000003          MOV     #3,-(SP)
016036 104437                   TRAP   C$SVEC
016040 062706 000010          ADD     #10,SP
162 016044 012777 000100 177670 1$:  MOV     #100,BLKS      ;START THE KW11-L
163 016052 000207          RTS     PC              ;RETURN
164
165          ;THIS ROUTINE IS USED TO STOP THE SYSTEM CLOCK
166          ;CALL
167          ;      JSR     PC,STOPCK      ;CALL ROUTINE
168
169 016054 005737 002426  STOPCK: TST     CLKSTA      ;IS THERE A CLOCK AVAILABLE ?
170 016060 001410          BEQ     2$              ;BR IF NO
171 016062 100404          BMI     1$              ;BR IF L-CLOCK
172 016064 042777 000101 177634  BIC     #101,BPKCS      ;STOP THE P-CLOCK
173 016072 000403          BR     2$
174 016074 042777 000100 177640 1$:  BIC     #100,BLKS      ;STOP THE L-CLOCK
175 016102 000207          2$:  RTS     PC
176
177          ;KW11 CLOCK INTERRUPT SERVICE ROUTINE
178
180 016104 012746 000024  KWSRV: MOV     #20,-(SP)      ;ASSUME 20.0 MSEC
181 016110 023727 015750 000062  CMP     HERTZ,#50.      ;IS IT 50 HERTZ LINE FREQUENCY ?
182 016116 001402          BEQ     1$              ;BR IF YES
183 016120 012716 000020  MOV     #16,-(SP)      ;MUST BE 60HZ, 16.667 MSEC
184 016124 162637 016776 1$:  SUB     (SP),WATIME     ;SUBTRACT TIME PER TICK IN MILLISECONDS
185 016130 000002  L10006: RTI
016130
186
187          ;;*****
188          ;THIS MODULE IS USED TO DECODE THE CONTENTS OF RPER2 AND PRODUCE A MODULE
189          ;FAULT LIST BASED ON THE CONTENTS OF RPER2. INPUT IS FROM RPER2 (LOW BYTE)
190          ;OUTPUT IS TO ERRWD1 AND ERRWD2. TABLE LOOKUP IS DONE STARTING AT EC.00.
191          ;;*****
192
193 016132 010146  CALMOD: MOV     R1,-(SP)      ;SAVE R1
194 016134 010246          MOV     R2,-(SP)      ;SAVE R2
195 016136 017702 164410          MOV     @RPER2,R2      ;GET THE CONTENTS OF RPER2
196 016142 012701 004354          MOV     #EC.00,R1      ;GET THE TOP OF THE CALLOUT LIST
197 016146 042702 177400          BIC     #177400,R2      ;STRIP THE HIGH BYTE INFORMATION
198 016152 001005          BNE     1$              ;IF NOT ZERO, IT'S VALID
199 016154 005037 002404          CLR     ERRWD1          ;SET THE CALLOUT LIST TO 0
200 016160 005037 002406          CLR     ERRWD2          ;FOR BOTH (THIS ERROR CODE IS BAD)
201 016164 000407          BR     2$              ;NOW TAKE THE RETURN
202 016166 022121 1$:  CMP     (R1),R1          ;MOVE THROUGH THE LIST
203 016170 005302          DEC     R2              ;ONE LESS ENTRY TO GO
204 016172 003375          BGT     1$              ;DO UNTIL R2 = 0
205 016174 012137 002404          MOV     (R1),ERRWD1     ;LOAD THE MODULE CALLOUT FOR THIS CODE
206 016200 011137 002406          MOV     (R1),ERRWD2     ;FOR BOTH MASKS
207 016204 012602 2$:  MOV     (SP),R2          ;RESTORE R2
208 016206 012601          MOV     (SP),R1          ;RESTORE R1
209 016210 000207          RTS     PC              ;AND RETURN TO CALLER
210
211          ;;*****
212          ;THIS MODULE IS PART OF THE I/O SUPPORT. IT IS USED TO DUMP THE RP-07
213          ;REGISTERS AS PART OF AN ERROR MESSAGE. INPUT TO THIS MODULE IS FROM
214          ;REG - REG+52. OUTPUT IS TO THE USED SPECIFIED PRINTING DEVICE.

```

```

215
216
217 016212
218 016212 012746 010337
    016216 012746 000001
    016222 010600
    016224 104415
    016226 062706 000004
219 016232 013746 002610
    016236 013746 002606
    016242 013746 002604
    016246 013746 002602
    016252 013746 002600
    016256 013746 002576
    016262 013746 002506
    016266 012746 010430
    016272 012746 000010
    016276 010600
    016300 104415
    016302 062706 000022
220
221 016306 012746 010510
    016312 012746 000001
    016316 010600
    016320 104415
    016322 062706 000004
222 016326 013746 002626
    016332 013746 002624
    016336 013746 002622
    016342 013746 002620
    016346 013746 002616
    016352 013746 002614
    016356 013746 002612
    016362 012746 010601
    016366 012746 000010
    016372 010600
    016374 104415
    016376 062706 000022
223
224 016402 012746 010661
    016406 012746 000001
    016412 010600
    016414 104415
    016416 062706 000004
225 016422 013746 002644
    016426 013746 002642
    016432 013746 002640
    016436 013746 002636
    016442 013746 002634
    016446 013746 002632
    016452 013746 002630
    016456 012746 010753
    016462 012746 000010
    016466 010600
    016470 104415
    016472 062706 000022
226 016476 005737 002504
    
```

```

DMPREG:
MOV #FRMT40, (SP)
MOV #1, -(SP)
MOV SP, R0
TRAP C#PNTX
ADD #4, SP
MOV REG+12, -(SP)
MOV REG+10, -(SP)
MOV REG+6, -(SP)
MOV REG+4, -(SP)
MOV REG+2, -(SP)
MOV REG, -(SP)
MOV DRVNO, -(SP)
MOV #FRMT41, -(SP)
MOV #10, -(SP)
MOV SP, R0
TRAP C#PNTX
ADD #22, SP

;PRINT 'DRIVE RPCS1 RPWC RPBA RPDA RPCS2 RPD5'

MOV #FRMT50, -(SP)
MOV #1, -(SP)
MOV SP, R0
TRAP C#PNTX
ADD #4, SP
MOV REG+30, -(SP)
MOV REG+26, -(SP)
MOV REG+24, -(SP)
MOV REG+22, -(SP)
MOV REG+20, -(SP)
MOV REG+16, -(SP)
MOV REG+14, -(SP)
MOV #FRMT51, -(SP)
MOV #10, -(SP)
MOV SP, R0
TRAP C#PNTX
ADD #22, SP

;PRINT 'RPER1 RPAS RPLA RPDB RPMR1 RPD1 RPSN'

MOV #FRMT60, -(SP)
MOV #1, -(SP)
MOV SP, R0
TRAP C#PNTX
ADD #4, SP
MOV REG+46, -(SP)
MOV REG+44, -(SP)
MOV REG+42, -(SP)
MOV REG+40, -(SP)
MOV REG+36, -(SP)
MOV REG+34, -(SP)
MOV REG+32, -(SP)
MOV #FRMT61, -(SP)
MOV #10, -(SP)
MOV SP, R0
TRAP C#PNTX
ADD #22, SP

;PRINT 'RPOF RPDC RPCC RPER2 RPER3 RPEC1 RPEC2'

TST RHTYPE
;IS IT RH70 CONTROLLER ?
    
```

Df,

227	016502	001424		BEQ	14				
228									
229	016504	012746	011035	MOV	#FRMT70,-(SP)				
	016510	012746	000001	MOV	#1,(SP)				
	016514	010600		MOV	SP,R0				
	016516	104415		TRAP	C#PNTX				
	016520	062706	000004	ADD	#4,SP				
230	016524	013746	002650	MOV	REG#52,-(SP)				
	016530	013746	002646	MOV	REG#50,-(SP)				
	016534	012746	011055	MOV	#FRMT71,-(SP)				
	016540	012746	000003	MOV	#3,-(SP)				
	016544	010600		MOV	SP,R0				
	016546	104415		TRAP	C#PNTX				
	016550	062706	000010	ADD	#10,SP				
231	016554	000207		RTS	PC				

14:

;BR IF NO
;PRINT 'RPBAE RPC53'

```

1
2
3
4
5
6
7
8
9 016556
016556 012746 007273
016562 012746 000001
016566 010600
016570 104414
016572 062706 000004
10 016576 010146
11 016600 012701 000015
12 016604
016604 012246
016606 012746 007312
016612 012746 000002
016616 010600
016620 104414
016622 062706 000006
13 016626 005712
14 016630 001402
15 016632 005301
16 016634 003363
17 016636
18 016636 012746 006420
016642 012746 000001
016646 010600
016650 104414
016652 062706 000004
19 016656 012601
20 016660 000207

;*****
;THIS MODULE IS USED TO PRINT THE MODULE FAULT LIST TO THE USER. IT
;IS PART OF THE I/O SUPPORT USED WHEN AN ERROR MESSAGE IS PRODUCED.
;INPUT IS SET UP BY 'DECODE' SO THAT R2 IS THE LIST POINTER. OUTPUT IS
;TO THE USER SPECIFIED PRINTING DEVICE.
;*****

FAULTS:
MOV #FLST00,-(SP)
MOV #1,-(SP)
MOV SP,R0
TRAP C:PNTB
ADD #4,SP
MOV R1,-(SP) ;PUSH R1 ON STACK
MOV #13,R1 ;GET THE ITERATION COUNT

1$:
MOV (R2),-(SP)
MOV #FLST01,-(SP)
MOV #2,-(SP)
MOV SP,R0
TRAP C:PNTB
ADD #6,SP
TST (R2) ;MORE DATA?
BEQ 2$ ;IF ZERO, NO!
DEC R1 ;ONE LESS ITERATION TO-GO
BGT 1$ ;DO UNTIL = 0, OR (R2) = 0
;CR-LF

2$:
MOV #CRLF,-(SP)
MOV #1,-(SP)
MOV SP,R0
TRAP C:PNTB
ADD #4,SP
MOV (SP),R1 ;POP STACK INTO R1
RTS PC ;AND RETURN TO CALLER

```

```

1
2
3 ;*****
4 ; THIS MODULE DOES THE SEIZE OPERATION IN THE EVENT THAT
5 ; A GIVEN DRIVE IS DUAL PORTED.
6 ; CALL IS JSR PC, SEIZE
7 ; THERE ARE NO SIDE EFFECTS
8 ;*****
9 016662 052777 000040 163632 SEIZE: BIS #CLR, @RPCS2 ; START OUT WITH A CLEARED CONTROLLER
10 016670 013777 002506 163624 MOV DRVNO, @RPCS2 ; RELOAD THE DRIVE NUMBER
11 016676 105777 163622 TSTB @RPDS ; IS THIS DRIVE SEIZED BY ANOTHER PORT?
12 016702 100424 BMI 3$ ; NO, JUST TAKE RETURN
13 016704 005077 163614 CLR @RPDS ; ISSUE A DRIVE REQUEST
14 016710 010246 MOV R2, -(SP) ; SAVE R2
15 016712 012702 000012 MOV #10, R2 ; LOAD R2 WITH AN OVERALL ITERATION COUNT
16 016716 105777 163602 1$: TSTB @RPDS ; NOW WAIT FOR THE OTHER PORT TO RELEASE
17 016722 100410 BMI 2$ ; NOT YET IF RPDS:DRY = 0
18 016724 004737 017000 JSR PC, WAIT
19 016730 005302 DEC R2 ; AND REDUCE THE ITERATION COUNT
20 016732 001371 BNE 1$ ; LOOK AGAIN FOR DRIVE PRESENT
21 016734 104455 TRAP C$ERDF
    016736 000001 .WORD 1
    016740 013266 .WORD EM27
    016742 000000 .WORD 0
22 016744 112777 000377 163556 2$: MOVB #377, @RPAS ; CLEAR ANY UNWANTED ATTENTION BITS
23 016752 012602 MOV (SP)+, R2 ; RESTORE R2
24 016754 000207 3$: RTS PC ; AND TAKE RETURN
25
26 ;*****
27 ; THIS MODULE IS USED TO WAIT FOR THE SPECIFIED TIME IN MILLISECONDS
28 ; CALL
29 ; MOV #NUMBER, -(SP) ; NUMBER IN MILLISECONDS TO WAIT
30 ; JSR PC, WAITMS ; CALL WAIT ROUTINE
31 ;
32 ; NOTE: THE SHORTEST WAIT CANNOT BE LESS THAN 16.66MS
33 ;
34 ;*****
35
36 016756 016637 000002 016776 WAITMS: MOV 2(SP), WATIME ; GET WAIT TIME IN MILLISECONDS
37 016764 005737 016776 1$: TST WATIME ; DONE WITH WAIT YET ?
38 016770 003375 BGT 1$ ; BR IF NO
39 016772 012616 MOV (SP)+, (SP) ; ADJUST RETURN ADDRESS ON STACK
40 016774 000207 RTS PC ; NOW RETURN TO MAIN
41
42 016776 000000 WATIME: .WORD 0 ; WAIT TIME GOES HERE
43
44 ;*****
45 ; THIS MODULE IS USED TO STALL IN LOOPS WHICH MUST WAIT FOR THE
46 ; RP07 MICROPROCESSORS. THE WAIT IS A FIXED TIME PERIOD, AND
47 ; CANNOT BE CHANGED DYNAMICALLY. THERE ARE NO SIDE EFFECTS.
48 ;*****
49
50 017000 WAIT:
    017000 012727 000372 MOV #250, (PC)+
    017004 000000 .WORD 0
    017006 013727 002116 MOV L$DLY, (PC)+
    017012 000000 .WORD 0

```



```

017014 005367 177772          DEC      6(PC)
017020 001375                BNE     .-4
017022 005367 177756          DEC     22(PC)
017026 001367                BNE     .-20
51 017030 000207                RTS     PC          ;NOW RETURN TO MAIN
52
53
54 ;*****
55 ;THIS MODULE DOES SOME OF THE ERROR CHECKING WHICH MUST OCCUR AS A
56 ;RESULT OF ANY DATA TRANSFER.  THE MODULE CHECKS SC, TRE, AND MCPE IN
57 ;RPCS1, AND CHECKS ERR IN RPDS.  IF ERRORS ARE DETECTED, "ERSTAT" IS
58 ;SET TO -1, OTHERWISE "ERSTAT" = 0.  THERE ARE NO OTHER SIDE EFFECTS.
59 ;*****
60 017032 005037 002466  ERRCK: CLR      ERSTAT      ;START OUT WITHOUT ERRORS!
61 017036 032777 040000 163460 BIT     #ERR,#RPDS  ;COMPOSITE ERROR?
62 017044 001415                BEQ     1#         ;NOT IF 0!
63 017046 013737 002524 002456 MOV     RPDS,TESTRG ;GET THE FAILING REGISTER
64 017054 017737 163444 002452 MOV     #RPDS,RCVED ;AND THE FAILING DATA
65 017062 013737 002452 002454 MOV     RCVED,EXPTD ;NOW FORM THE EXPECTED DATA
66 017070 042737 040000 002454 BIC     #ERR,EXPTD  ;BY CLEARING THE CORRECT BIT
67 017076 000420                BR      2#         ;NOW, GO-ON
68 017100 032777 160000 163404 1#: BIT     #SC!TRE!MCPE,#RPCS1;DID WE GET ANY ERRORS?
69 017106 001417                BEQ     3#         ;IF ZERO, NO!
70 017110 013737 002512 002456 MOV     RPCS1,TESTRG ;GET THE FAILING REGISTER
71 017116 017737 163370 002452 MOV     #RPCS1,RCVED ;AND THE FAILING DATA
72 017124 013737 002452 002454 MOV     RCVED,EXPTD ;NOW FORM THE EXPECTED DATA
73 017132 042737 160000 002454 BIC     #SC!TRE!MCPE,EXPTD;BY CLEARING THE CORRECT BITS!
74 017140 012737 177777 002466 2#: MOV     #-1,ERSTAT ;SHOW THE ERROR STATUS
75 017146 000207                3#: RTS     PC          ;RETURN TO MAIN
76
77 ;*****
78 ;THIS MODULE DOES THE DATA LOGGING IN THE EVENT OF A DATA BUFFER
79 ;MISCOMPARE.  THE ADDRESS "RPDB" IS LOADED INTO "TESTRG", THE
80 ;CORRECTED CONTENTS OF "RPBA" ARE USED TO POINT TO THE EXPECTED DATA IN "EXPTD",
81 ;AND THE CONTENTS OF "RPDB" ARE LOADED INTO THE RECEIVED DATA "RCVED".
82 ;THERE ARE NO OTHER SIDE EFFECTS.
83 ;*****
84
85 017150 010246  LOCATE: MOV     R2,-(SP)      ;SAVE R2
86 017152 017702 163340        MOV     #RPBA,R2      ;GET THE ADDRESS OF THE EXPECTED DATA
87 017156 162702 000002        SUB     #2,R2         ;AND CORRECT IT
88 017162 005737 002504        TST     RHTYPE       ;WHICH CONTROLLER??
89 017166 001422                BEQ     3#         ;IT'S AN RH11 IF 0!
90 017170 032777 004000 163366 BIT     #BIT11,#RPCS3 ;IS IT AN EVEN WORD TRANSFER?
91 017176 001402                BEQ     1#         ;NO, IT IS NOT, IF 0!
92 017200 162702 000004        SUB     #4,R2         ;CORRECT IT!
93 017204 032777 002000 163352 1#: BIT     #BIT10,#RPCS3 ;IS IT A DOUBLE WORD TRANSFER?
94 017212 001402                BEQ     2#         ;IF ZERO, NO!!
95 017214 162702 000002        SUB     #2,R2         ;CORRECT FOR A DOUBLE WORD TRANSFER
96 017220 032777 010000 163336 2#: BIT     #BIT12,#RPCS3 ;IS IT AN ODD WORD TRANSFER?
97 017226 001402                BEQ     3#         ;IF ZERO, NO!
98 017230 162702 000002        SUB     #2,R2         ;CORRECT FOR ODD WORD
99 017234 011237 002454 3#: MOV     (R2),EXPTD   ;GET THE ACTUAL DATA
100 017240 017737 163270 002452 MOV     #RPDB,RCVED  ;AND FAILING DATA
101 017246 012602                MOV     (SP)+,R2     ;NOW RESTORE R2
102 017250 000207                RTS     PC          ;AND RETURN TO MAIN
103

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104 ;:*****
105 ;THIS MODULE IS USED FOR AN ERROR LOG DUMP. IT IS FED BY R1, WHICH
106 ;INITIALLY IS N - 1 FOR THE ROUTINE TO BE SELECTED. R4 IS USED FOR
107 ;THE DUMP ROUTINE, AND R1, AFTER BEING INCREMENTED IS USED AS THE
108 ;LOW BYTE ARGUMENT IN R4. THIS MODULE IS CALLED BY THE TEST WHICH
109 ;DUMPS THE RP07 ERROR LOG.
110 ;:*****
111
112 017252 040104 NEXLOC: BIC R1,R4 ;TAKE THE PREVIOUS ARGUMENT FROM R4
113 017254 005201 INC R1 ;GET THE NEXT RAM ADDRESS
114 017256 050104 BIS R1,R4 ;NOW LOAD THE ARGUMENT INTO R4
115 017260 004737 015352 JSR PC,DIAGLD ;R4 IS USED TO LOAD THE DIAGNOSTIC ROUTINE
116 017264 000207 RTS PC ;NOW TAKE THE RETURN

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I 6

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1          ;*****
2          ;THIS MODULE CONTROLS SPIRAL READS OR WRITES.  IT INCREMENTS THE DESIRED
3          ;TRACK ADDRESS UNTIL IT IS READY TO OVERFLOW INTO AN ILLEGAL ADDRESS.
4          ;WHEN THIS IS READY TO HAPPEN, THE DESIRED TRACK IS SET TO ZERO, AND THE
5          ;DESIRED CYLINDER ADDRESS IS INCREMENTED.  THE TERMINAL STATE IS REACHED
6          ;WHEN THE DESIRED CYLINDER IS ABOUT TO OVERFLOW, AND THE DESIRED TRACK IS
7          ;ALSO ABOUT TO OVERFLOW.  WHEN THIS HAPPENS, THE DESIRED TRACK ADDRESS
8          ;IS RESET TO 0.  THE CALLING MODULE MUST DETECT WHEN THIS CONDITION
9          ;OCCURS.  VARIABLES: DESCYL, AND DESTRK ARE AFFECTED BY THIS MODULE.
10         ;THIS MODULE IS AFFECTED BY THE VALUE IN "LASTRK", WHICH REPRESENTS
11         ;THE LAST USER TRACK, AND BY LASCYL, WHICH REPRESENTS THE LAST USER
12         ;CYLINDER ADDRESS ON THE DRIVE.  LASCYL DOES NOT INCLUDE ANY DIAGNOSTIC
13         ;FE CYLINDER ADDRESSING.
14         ;*****
15
16 017266 123737 002415 002372 SPIRAL:  CMPB   DESTRK+1,LASTRK ;TRACK COUNT AT MAX?
17 017274 103003                BHIS   1$           ;IF HIGHER OR SAME, YES!
18 017276 105237 002415                INCB   DESTRK+1       ;NEXT TRACK PLEASE...
19 017302 000410                BR     3$           ;AND RETURN
20 017304 023737 002416 002376 1$:    CMP   DESCYL,LASCYL ;LAST CYLINDER ADDRESS?
21 017312 101002                BHI   2$           ;YES, WE ARE ABOUT TO OVERFLOW!!
22 017314 005237 002416                INC   DESCYL       ;NEXT CYLINDER ADDRESS PLEASE....
23 017320 105037 002415                2$:    CLRB  DESTRK+1 ;RESET THE TRACK ADDRESS TO 0
24 017324 000207                3$:    RTS    PC      ;NAD TAKE THE RETURN
25
26         ;*****
27         ;THIS MODULE CREATES AN IMAGE OF THE RP REGISTERS.
28         ;IT IS USED TO SAVE THE REGISTERS FOR AN ERROR DUMP AFTER
29         ;AN ERROR IS DETECTED.  CALL IS JSR PC,SAVRPR
30         ;THE OUTPUT OF THIS MODULE LOADS A BUFFER CALLED "REG"
31         ;*****
32
33 017326 010046                SAVRPR: MOV   RO,-(SP)
34 017330 010146                MOV   R1,-(SP)
35 017332 012700 002512                MOV   @RPCS1,RO ;AND THE TRANSFER ADDRESSES
36 017336 012701 002576                MOV   @REG,R1   ;OF THE SOURCE AND REG BUFFERS
37 017342 013021                1$:    MOV   @R0+,(R1)+ ;NOW LOG THE DATA
38 017344 022700 002562                CMP   @RPBAE,RO ;ARE WE AT THE LIMIT?
39 017350 101374                BHI   1$         ;DO UNTIL ALL RHXX REGISTERS ARE LOGGED
40 017352 005737 002504                TST  RHTYPE
41 017356 001402                BEQ  2$
42 017360 013021                MOV   @R0+,(R1)+ ;GET THE CONTENTS OF RPBAE
43 017362 013021                MOV   @R0+,(R1)+ ;GET THE CONTENTS OF RPCS3
44 017364 012601                2$:    MOV   (SP)+,R1
45 017366 012600                MOV   (SP)+,RO
46 017370 000207                RTS    PC      ;RETURN TO MAIN FOR ERROR REPORT
47
48         ;*****
49         ;THE FOLLOWING THREE MODULES ARE USED TO FORM UP EXPECTED VS RECEIVED DATA
50         ;FOR TWO TYPES OF CASES.  THE FIRST IS WHEN THE PROGRAM TRIES TO SET A BIT
51         ;AND THE BIT FAILS TO SET, AND THE SECOND IS WHEN THE BIT FAILS TO CLEAR.
52         ;THE FORMER CASE IS HANDLED BY "BISEXP" AND THE LATTER BY "BICEXP".
53         ;BOTH "BISEXP" AND "BICEXP" CALL "REGSET" TO PERFORM SOME PRELIMINARY
54         ;DATA SETUP.  BOTH MODULES "BISEXP" AND "BICEXP" AFFECT THE FOLLOWING:
55         ;"TESTRG", "EXPTED", "RCVED".
56         ;*****
57

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58 017372 017602 000000      BISEXP: MOV      @2(SP),R2      ;GET THE POINTER TO THE FAILING REG.
59 017376 004737 017452      JSR      PC,REGSET      ;GO LOAD RESULTS
60 017402 062716 000002      ADD      @2,(SP)        ;MOVE THE POINTER TO GET THE BIT MASK
61 017406 057637 000000 002454  BIS      @2(SP),EXPTED    ;SET EXPECTED BIT WHICH FAILED
62 017414 062716 000002      ADD      @2,(SP)        ;MOVE THE POINTER FOR A RETURN
63 017420 000207      RTS      PC              ;RETURN
64
65 017422 017602 000000      BICEXP: MOV      @2(SP),R2      ;GET THE POINTER TO THE FAILING REG.
66 017426 004737 017452      JSR      PC,REGSET      ;GO LOAD RESULTS
67 017432 062716 000002      ADD      @2,(SP)        ;MOVE THE POINTER TO GET THE MASK
68 017436 047637 000000 002454  BIC      @2(SP),EXPTED    ;CLEAR EXPECTED BIT WHICH FAILED
69 017444 062716 000002      ADD      @2,(SP)        ;MOVE THE POINTER TO TAKE A RETURN
70 017450 000207      RTS      PC              ;NOW TAKE THE RETURN
71
72 017452 011237 002456      REGSET: MOV      (R2),TESTRG    ;GET THE FAILING REGISTER
73 017456 011202      MOV      (R2),R2        ;GET THE FAILING REGISTER
74 017460 011237 002452      MOV      (R2),RCVED      ;NOW GET ITS CONTENTS
75 017464 013737 002452 002454  MOV      RCVED,EXPTED    ;AND FORM EXPECTED DATA
76 017472 000207      RTS      PC              ;RETURN
77
78 ;*****
79 ;THIS MODULE ISSUES A CONTROLLER CLEAR AND CHECKS THE REGISTER POINTED
80 ;TO BY THE STACK WHEN THE MODULE WAS ORIGINALLY CALLED. THE REGISTER
81 ;IS CHECKED AGAINST LOCATION "MSK". THE BITS IN MSK = 0 FOR THOSE BITS
82 ;WHICH SHOULD HAVE CLEARED AFTER A CONTROLLER CLEAR. IF THE BITS UNDER TEST
83 ;DID NOT CLEAR, AN ERROR MESSAGE IS DISPATCHED BY THIS MODULE, REPORTING
84 ;THE FAILING REGISTER, FAILING DATA, AND EXPECTED DATA. THE RETURN
85 ;ADDRESS IS MOVED OVER THE REGISTER UNDER TEST, AND CONTROLL IS AGAIN
86 ;PASSED TO THE CALLING MODULE. THIS MODULE AFFECTS: "TESTRG", "EXPTED",
87 ;"RCVED".
88 ;*****
89
90 017474 005137 002450      RESET:  COM      MSK          ;INVERT THE BIT MASK, BITS TO TEST=1
91 017500 010246      MOV      R2,-(SP)        ;SAVE R2
92 017502 017602 000002      MOV      @2(SP),R2      ;FORM ADDRESS OF REGISTER UNDER TEST
93 017506 011202      MOV      (R2),R2        ;GOT IT NOW!
94 017510 052777 000040 163004  BIS      @CLR,@RPCS2     ;SET RPCS2:CLR=1
95 017516 033712 002450      BIT      MSK,(R2)       ;LOOK FOR BIT(S) UNTER TEST TO CLEAR
96 017522 001415      BEQ      1$             ;IF OK, SKIP ERROR DISPATCH
97 017524 010237 002456      MOV      R2,TESTRG      ;LOAD THE FAILING ADDRESS
98 017530 011237 002454      MOV      (R2),EXPTED    ;AND GET THE FAILING DATA
99 017534 011237 002452      MOV      (R2),RCVED      ;AND SAVE IT
100 017540 043737 002450 002454  BIC      MSK,EXPTED     ;NOW FORM THE EXPECTED DATA
101 017546 104456      TRAP     C$ERHRD
    017550 000005      .WORD   5
    017552 012523      .WORD   EM15
    017554 014172      .WORD   ERRO
102 017556 005137 002450      1$:  COM      MSK          ;BITS TO TEST=0
103 017562 012602      MOV      (SP)+,R2       ;RESTORE R2
104 017564 062716 000002      ADD      @2,(SP)        ;MOVE RETURN ADDRESS OVER DATA FIELD
105 017570 000207      RTS      PC              ;RETURN

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3 ;*****
4 ;THIS MODULE, WITH EXTERNALLY SET-UP LINKAGE, WRITES THE REGISTER-UNDER
5 ;TEST TO A ZERO. IF THE BITS UNDER TEST DO NOT CLEAR AS EXPECTED, AN
6 ;ERROR MESSAGE IS DISPATCHED IN THIS MODULE. CONTROL IS DETERMINED BY:
7 ;"ILOCK"; WHICH DETERMINES IF THE DEVICE MUST BE POLLED, IE "IR" OR "OR"
8 ;= 1 AND "MSK" WHICH CONTAINS THE BITS-UNDER-TEST = 0. WHEN THE
9 ;MODULE IS CALLED, "SNK" SHOULD EQUAL THE ADDRESS OF THE REGISTER UNDER TEST.
10 ;THE OUTPUT OF THIS MODULE IS IN THREE VARIABLES: "TESTRG", "EXPTED", AND
11 ;"RCVED".
12 ;*****
13 017572 005737 002460 LDZERO: TST ILOCK ;POLLED MODE?
14 017576 001402 BEQ 1$ ;NOT IF ZERO
15 017600 004737 017672 JSR PC,IRLOCK ;POLL AND WAIT FOR IR TO SET
16 017604 005077 162630 1$: CLR @SNK ;WRITE 0'S TO THE REGISTER UNDER TEST
17 017610 005737 002460 TST ILOCK ;POLLED MODE?
18 017614 001402 BEQ 2$ ;NOT IF ZERO
19 017616 004737 017706 JSR PC,ORLOCK ;OK, POLL FOR OR TO SET
20 017622 017737 162612 002452 2$: MOV @SNK,RCVED ;GET THE TEST RESULTS
21 017630 043737 002450 002452 BIC MSK,RCVED ;STRIP OUT THE UNWANTED BITS
22 017636 013737 002450 002454 MOV MSK,EXPTED ;GET THE BIT MASK
23 017644 005137 002454 COM EXPTED ;BITS-TO-TEST = 1
24 017650 033737 002454 002452 BIT EXPTED,RCVED ;NOW DO THE DATA COMPARISON
25 017656 001404 BEQ 4$ ;BITS TO TEST = 0, OK!
26 017660 104456 TRAP C$ERHRD
    017662 000006 .WORD 6
    017664 012523 .WORD EM15
    017666 014172 .WORD ERRO
27 017670 000207 4$: RTS PC ;RETURN TO MAIN
28
29 ;*****
30 ;THIS MODULE POLLS "IR" TO EQUAL A ONE AT SOME TIME. THE ACTUAL TESTING
31 ;OF "IR" AGAINST A WATCHDOG TIMER IS NOT DONE HERE, BUT A SUPERVISOR CALL
32 ;IS ISSUED IN CASE "IR" NEVER SETS, AND THE DIAGNOSTIC HANGS. THE DIAGNOSTIC
33 ;WILL RESPOND TO A CONTROL C WHILE IN THIS MODULE.
34 ;*****
35
36 017672 IRLOCK: TRAP C$BRK
37 017672 104422 BIT @IR,@RPCS2 ;POLL IR IN RPCS2
38 017702 001773 000100 162620 BEQ IRLOCK ;AND WAIT FOR IT!
39 017704 000207 RTS PC ;NOW RETURN TO CALLING SUBROUTINE
40
41 ;*****
42 ;THIS MODULE POLLS "OR" AND WAITS FOR IT TO SET. THE ACTUAL TESTING
43 ;OF "OR" AGAINST A WATCHDOG TIMER IS NOT DONE HERE, BUT A SUPERVISOR CALL
44 ;IS ISSUED IN CASE "OR" NEVER SETS, AND THE DIAGNOSTIC HANGS. THE DIAGNOSTIC
45 ;WILL RESPOND TO A CONTROL C WHILE IN THIS MODULE.
46 ;*****
47
48 017706 ORLOCK: TRAP C$BRK
49 017706 104422 BIT @OR,@RPCS2 ;POLL OR IN RPCS2
50 017710 032777 000200 162604 BEQ ORLOCK ;AND WAIT FOR IT!
51 017720 000207 RTS PC ;NOW RETURN TO CALLING SUBROUTINE

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8 017722 004737 016662
9 017726 012777 000021 162556
10 017734 052777 010000 162602
11 017742 000207
12
13
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29 017744 010246
30 017746 005037 002432
31 017752 017602 000002
32 017756 012237 002434
33 017762 013237 002440
34 017766 013737 002440 002456
35 017774 012237 002446
36 020000 011237 002442
37 020004 017737 162432 002444
38 020012 013737 002446 002450
39 020020 005137 002450
40 020024 012602
41 020026 062716 000002
42 020032 000207
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51 020034 013746 002444
52 020040 063716 002432
53 020044 043716 002450
54 020050 011637 002454
55 020054 005737 002460
56 020060 001402
57 020062 004737 017672

;*****
;THIS MODULE, ONCE THE DRIVE HAS BEEN SEIZED, DOES A PRELOAD OF THE DRIVE.
;A PRELOAD IS AN OPERATION WHEREIN THE DRIVE IS SET UP THROUGH USE OF A READ
;IN PRESET COMMAND, AND SETTING FORMAT 16 = 1. THERE ARE NO SIDE EFFECTS.
;*****
PRELOD: JSR PC,SEIZE ;GET THE DRIVE'S ATTENTION
        MOV @RIP,@RPCS1 ;ISSUE A READ IN PRESET COMMAND
        BIS @FMT,@RPOF ;16 BITS/WORD
        RTS PC ;RETURN

;*****
;THIS MODULE DOES THE PARAMETER SETUP FOR "FLOAT", "LOZERO" AND "CONSET".
;IT GETS ITS INPUT FROM A TABLE POINTED TO BY THE STACK WHEN THE
;MODULE IS INITIALLY CALLED. THIS TABLE CONTAINS THE DATA STRUCTURE
;USED BY SOME TESTS. CONTAINED WITHIN THE DATA STRUCTURES ARE
;THE FOLLOWING: 1) THE REGISTER UNDER TEST, 2) THE BITS UNDER TEST, 3)
;THE DATA PATTERNS TO USE, 4) THE NUMBER OF PATTERNS TO USE.
;THE OUTPUT OF THIS MODULE IS IN: "MSK"; WHICH CONTAINS THE COMPLIMENTED
;FORM OF THE BITS UNDER TEST, "PATCNT" WHICH CONTAINS THE NUMBER OF PATTERNS
;TO USE, "MASK" WHICH CONTAINS THE NUMBER OF BITS TO TEST, "SRC"; WHICH
;CONTAINS THE ADDRESS OF THE DATA PATTERN TO USE, "SNK"; WHICH CONTAINS
;THE ADDRESS OF THE REGISTER TO TEST, "SRCTMP"; WHICH IS LOADED FOR A
;POSSIBLE ERROR CONDITION, "CSTORE" WHICH CONTAINS THE CARRY BIT FROM THE
;LAST OPERATION (INITIALLY SET TO 0, INDICATING THE FIRST OPERATION).
;*****
SETUP: MOV R2,-(SP) ;SAVE R2
       CLR CSTORE ;CLEAN CARRY STORE
       MOV @2(SP),R2 ;GET TABLE ADDRESS
       MOV (R2)+,PATCNT ;GET THE # OF PATTERNS TO RUN
       MOV @2(R2)+,SNK ;ADDRESS:REGISTER TO TEST
       MOV SNK,TESTRG ;ADDRESS = REGISTER UNDER TEST
       MOV (R2)+,MASK ;BITS TO TEST
       MOV (R2),SRC ;TEST PATTERN
       MOV @SRC,SRCTMP ;BUFFER TO DIDDLE THE BITS
       MOV MASK,MSK ;GET THE BITS TO STRIP OUT
       COM MSK ;DON'T CARE BITS = 1
       MOV (SP)+,R2 ;RESTORE R2
       ADD @2,(SP) ;MODIFY RETURN OVER DATA FIELD
       RTS PC ;RETURN

;*****
;THIS MODULE GENERATES A BIT WHICH IS FLOATED THROUGH A SELECTED REGISTER
;UNDER TEST. IT IS SETUP THROUGH THE MODULE "SETUP". IF ERRORS ARE DETECTED,
;IT WILL DISPATCH AN APPROPRIATE ERROR MESSAGE. THIS MODULE EFFECTS THE
;FOLLOWING VARIABLES: "MASK", "CSTORE", "SRCTMP", "RCVED", "EXPTED".
;*****
FLOAT: MOV SRCTMP,-(SP) ;PUT PATTERN ON STACK
       ADD CSTORE,(SP) ;ADD CARRY FROM LAST ROTATE
       BIC MSK,(SP) ;CLEAR OUT UNWANTED BITS
       MOV (SP),EXPTED ;GET THE EXPECTED DATA
       TST ILOCK ;SHOULD WE POLL IR/OR??
       BEQ 1$ ;NO, JUST DO THE LOAD FUNCTION
       JSR PC,IRLOCK ;GO-AHEAD AND POLL FOR IR = 1

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58 020066 011677 162346      1$:  MOV      (SP),@SNK      ;WRITE DATA TO REG UNDER TEST
59 020072 005737 002460      TST      ILOCK          ;SHOULD WE POLL FOR OR = 1?
60 020076 001402              BEQ      2$             ;NO, JUST GET RESULTS
61 020100 004737 017706      JSR      PC,ORLOCK      ;OK, POLL FOR OR = 1
62 020104 017746 162330      2$:  MOV      @SNK,-(SP)    ;GET THE RESULTS
63 020110 043716 002450      BIC      MSK,(SP)       ;STRIP UNWANTED DATA
64 020114 011637 002452      MOV      (SP),RCVED     ;AND SAVE FOR POSSIBLE ERROR REPORT
65 020120 022626              CMP      (SP)+,(SP)+    ;LOOK FOR MATCH
66 020122 001411              BEQ      5$             ;IF MATCH, SKIP ERROR DISPATCH
67 020124 062716 000002      ADD      @2,(SP)        ;ERROR, MODIFY RETURN FOR ERROR LOOP
68 020130 005037 002446      CLR      MASK          ;MASK = 0 FOR PREMATURE EXIT
69 020134 104456              TRAP    C$ERHRD
    020136 000007              .WORD  7
    020140 012454              .WORD  EM14
    020142 014172              .WORD  ERRO
70 020144 000207      4$:  RTS      PC           ;RETURN
71 020146 000241      5$:  CLC          ;CARRY = 0
72 020150 006137 002446      ROL      MASK          ;REDUCE THE ITERATION COUNT BY ONE
73 020154 000241              CLC          ;CARRY = 0
74 020156 006137 002444      ROL      SRCTMP        ;ROTATE PATTERN
75 020162 103403              BCS      6$           ;OBSERVE & SAVE CARRY
76 020164 005037 002432      CLR      CSTORE        ;CARRY=0
77 020170 000765              BR       4$           ;RETURN
78 020172 012737 000001 002432 6$:  MOV      @1,CSTORE     ;CARRY = 1
79 020200 000761              BR       4$           ;RETURN
80
81
82 ;*****
83 ;THIS MODULE DOES SOME DATA COMPARISON. IF THE DATA DOES NOT MATCH,
84 ;AN ERROR MESSAGE AND APPROPRIATE DATA ARE REPORTED. VARIABLES AFFECTED ARE:
85 ;"PSTACK", "TESTRG", "RCVED", "EXPTED".
86 ;*****
87 020202 010246      COMPAR: MOV      R2,-(SP)    ;SAVE R2
88 020204 012702 002652      MOV      @PSTACK,R2    ;GET THE SOFTWARE PSTACK ADDRESS
89 020210 017612 000002      MOV      @2(SP),(R2)    ;GET THE ADDRESS OF THE DATA PATTERN TO RUN
90 020214 013242              MOV      @R2+,-(R2)     ;NOW GET THE DATA PATTERN TO USE
91 020216 043712 002450      BIC      MSK,(R2)       ;THROW OUT UNUSED DATA
92 020222 011237 002454      MOV      (R2),EXPTED    ;AND SAVE EXPECTED RESULTS FOR POSSIBLE ERROR
93 020226 005737 002460      TST      ILOCK          ;POLL IR/OR MODE?
94 020232 001402              BEQ      1$           ;NO, JUST GO-ON
95 020234 004737 017672      JSR      PC,IRLOCK      ;WAIT FOR IR TO SET, IT REALLY WILL!
96 020240 012277 162174      1$:  MOV      (R2)+,@SNK    ;WRITE DATA TO THE REGISTER
97 020244 005737 002460      TST      ILOCK          ;POLL IR/OR MODE?
98 020250 001402              BEQ      2$           ;NOT IF ZERO
99 020252 004737 017706      JSR      PC,ORLOCK      ;WAIT FOR OR TO SET, IT REALLY WILL!
100 020256 017712 162156      2$:  MOV      @SNK,(R2)     ;GET THE RESULTS
101 020262 043712 002450      BIC      MSK,(R2)       ;IGNORE UNUSED DATA
102 020266 013737 002440 002456      MOV      SNK,TESTRG     ;SAVE REGISTER UNDER TEST
103 020274 011237 002452      MOV      (R2),RCVED     ;AND THE REGISTER DATA
104 020300 021242              CMP      (R2),-(R2)     ;CHECK RESULTS
105 020302 001406              BEQ      4$           ;OK, SKIP ERROR REPORT
106 020304 104456              TRAP    C$ERHRD
    020306 000004              .WORD  4
    020310 012454              .WORD  EM14
    020312 014172              .WORD  ERRO
107 020314 005037 002402      CLR      ITCOUN        ;SET ITERATIONS TO 0
108 020320 012602      4$:  MOV      (SP)+,R2      ;RESTORE R2

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109 020322 062716 000002          ADD    #2,(SP)      ;MOVE RETURN OVER DATA INPUT
110 020326 000207          RTS     PC          ;NOW RETURN TO MAIN
111
112
113          ;*****
114          ;THIS MODULE IS USED TO CONTINUE A SETUP PROCEDURE BETWEEN SUBTESTS
115          ;WITHIN A DIAGNOSTIC TEST. IT AFFECTS THE FOLLOWING VARIABLES: "PATCNT",
116          ;"CSTORE", "MASK", "SRCTMP", "SRC".
117          ;*****
118 020330 005337 002434          CONSET: DEC    PATCNT      ;ONE LESS PATTERN TO GO
119 020334 100415          BMI     1$          ;UNDERFLOW, WE'RE FINISHED!
120 020336 005037 002432          CLR     CSTORE      ;CLEAR CARRY STORE
121 020342 062737 000002 002442          ADD    #2,SRC      ;GET NEXT PATTERN
122 020350 013737 002450 002446          MOV    MSK,MASK     ;RELOAD # OF BITS TO TEST
123 020356 005137 002446          COM    MASK         ;CORRECT THE INVERSION (BITS TESTED=1)
124 020362 017737 162054 002444          MOV    @SRC,SRCTMP  ;LOAD THE BUFFER FOR BIT MANIPULATION
125 020370 000207          1$:   RTS     PC          ;RETURN

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9 020372 010146          WATDRY: MOV      R1, (SP)          ;SAVE R1
10 020374 012701 000062 1$:      MOV      #50.,R1          ;GET AN ITERATION COUNT
11 020400 013777 002506 162114    MOV      DRVNO,DRPCS2        ;LOAD THE UNIT UNDER TEST
12 020406 032777 010000 162110 2$:      BIT      @MOL,DRPDS        ;MEDIUM ON LINE?
13 020414 001017          BNE      3$                ;IF = 1, YES
14 020416 004737 017000          JSR      PC,WAIT          ;STALL FOR A WHILE
15 020422 005301          DEC      R1                ;ONE LESS ITERATION TO GO
16 020424 003370          BGT      2$                ;DO UNTIL R1 = 0
17 020426 013746 002506          MOV      DRVNO,-(SP)
    020432 012746 006577          MOV      @MSG10,(SP)
    020436 012746 000002          MOV      #2,-(SP)
    020442 010600          MOV      SP,R0
    020444 104417          TRAP    C:PNTF
    020446 062706 000006          ADD     #6,SP
18 020452 000750          BR      1$                ;AND LOOP
19
20 020454 012701 000062          3$:      MOV      #50.,R1          ;GET AN ITERATION COUNT
21 020460 032777 000200 162036 4$:      BIT      @DRY,DRPDS        ;IS DRIVE READY SET?
22 020466 001017          BNE      5$                ;YES, GO-ON
23 020470 004737 017000          JSR      PC,WAIT          ;STALL FOR A WHILE
24 020474 005301          DEC      R1                ;ONE LESS ITERATION TO-GO
25 020476 003370          BGT      4$                ;DO UNTIL R1 = 0
26 020500 013746 002506          MOV      DRVNO,-(SP)
    020504 012746 006671          MOV      @MSG11,-(SP)
    020510 012746 000002          MOV      #2,-(SP)
    020514 010600          MOV      SP,R0
    020516 104417          TRAP    C:PNTF
    020520 062706 000006          ADD     #6,SP
27 020524 000753          BR      3$                ;AND LOOP
28
29 020526 012601          5$:      MOV      (SP),R1          ;RESTORE R1
30 020530 000207          RTS     PC                ;EXIT

```

C7

```

1
2
3
4
5
6
7
8
9
10 020532 012700 002404
11 020536 012702 004060
12 020542 012703 002676
13 020546 012705 000002
14 020552 012704 000015
15 020556 012701 000001
16 020562 030110
17 020564 001402
18 020566 011223
19 020570 005304
20 020572 005722
21 020574 006301
22 020576 001371
23 020600 005305
24 020602 001402
25 020604 005720
26 020606 000763
27 020610 005704
28 020612 001403
29 020614 005023
30 020616 005304
31 020620 003375
32 020622 012702 002676
33 020626 000207
34
35
36
37
38
39 020630
40 020630 005237 002462
41 020634
    020634 000002
42
;*****
;THIS MODULE DECODES TWO VARIABLES: "ERRWD1" AND "ERRWD2".  CONTAINED
;WITHIN THESE TWO VARIABLES ARE BITS WHICH REPRESENT THE VARIOUS MODULES
;WHICH ARE TO BE CALLED OUT FOR DIAGNOSTIC TEST FAILURES.  AFTER THE
;DECODING IS DONE, THE MODULE CREATED AN ASCII DISPATCH TABLE WHICH
;POINTS TO THE VARIOUS ASCII MESSAGES REPRESENTING THE ACTUAL MODULE CALLOUT.
;*****
DECODE:  MOV    @ERRWD1,R0      ;GET THE FIRST ERROR WORD STATUS
        MOV    @MCUTAB,R2     ;GET THE MODULE CALL OUT INDEX FILE
        MOV    @MCUTXT,R3    ;NOW GET THE OUTPUT POINTER FILE
        MOV    @2,R5         ;WE'RE DOING 2 ERROR WORD MASKS!
        MOV    @13,R4        ;AND WE'RE CREATING 13. MESSAGE FILES!
1$:     MOV    @BIT0,R1      ;FORM THE INITIAL BIT MASK
2$:     BIT    R1,(R0)       ;IS THIS BIT "ON"??
        BEQ    3$           ;NO, DON'T DO ANYTHING NOW!
        MOV    (R2),(R3)     ;GET THIS MESSAGE!
        DEC    R4           ;ONE LESS MESSAGE TO GET!
3$:     TST    (R2)         ;NEXT INPUT MESSAGE PLEASE...
        ACL    R1           ;MOV MASK OVER FOR NEXT FIND...
        BNE    2$           ;KEEP GOING IF NOT ZERO
        DEC    R5           ;NEXT ERROR WORD STATUS ?
        BEQ    4$           ;IF ZERO, DONE WITH SEARCH
        TST    (R0)         ;NEXT ERROR WORD PLEASE..
        BR     1$           ;NOW SCAN THIS WORD!
4$:     TST    R4           ;DID WE LOAD 7 MESSAGES?
        BEQ    6$           ;YES, JUST LOAD POINTER AND RETURN
5$:     CLR    (R3)         ;CREATE THE NULL MESSAGE FILE
        DEC    R4           ;DONE?
        BGT    5$           ;NOT IF > 0!
6$:     MOV    @MCUTXT,R2    ;LOAD THE OUTPUT POINTER NOW, WE'RE DONE!
        RTS    PC          ;TAKE THE RETURN
;*****
;THIS IS A SIMPLE INTERRUPT ROUTINE WHICH TALLYS THE NUMBER OF INTERRUPTS
;RECEIVED FOR ANY SELECTED OPERATION.
;*****
INTSRV::
        INC    INTFLG      ;COUNT THIS INTERRUPT
L10007:
        RTI

```

11
39
41
42
43
44
45
46 020636
47
59
60 020636 000167
020640 000000
61
73
74
75 020642
020642 104425

```
.SBTTL REPORT CODING SECTION
; **
; THE REPORT CODING SECTION CONTAINS THE
; "PRINTS" CALLS THAT GENERATE STATISTICAL REPORTS.
; --
L$RPT::
        .WORD  J$JMP
        .WORD  L10010-2-.
        .EVEN
L10010: TRAP  C$RPT
```

1
2
3
4
5
6
7
8 020644
9 020644 000000
10 020646 177777
11 020650 000006
13

.SBTTL PROTECTION TABLE
; **
; THIS TABLE IS USED BY THE RUNTIME SERVICES
; TO PROTECT THE LOAD MEDIA.
; --
L\$PROT::
0 ;P TABLE OFFSET OF CSR
-1 ;NOT A MASSBUS DEVICE
6 ;P-TABLE OFFSET DRIVE *

```

1          .SBTTL  INITIALIZE SECTION
2
3          ;**
4          ; THE INITIALIZE SECTION CONTAINS THE CODING THAT IS PERFORMED
5          ; AT THE BEGINNING OF EACH PASS.
6          ;--
7
8 020652    L$INIT::
9
10 020652   104433          TRAP    C$RESET          ;RESET THE WORLD
11
12 020654   012700   000034  MOV     #EF.PWR,R0          ;POWER UP SEQUENCE ?
13 020660   104447          TRAP    C$REFG
14 020662   103504          BCS     5$
15
16 020664   012700   000036  MOV     #EF.CON,R0          ;GO TO 5$ IF YES
17 020670   104447          TRAP    C$REFG          ;CONTINUE COMMAND ?
18
19 020672   103002          BCC     1$
20
21 020674   104432          TRAP    C$EXIT          ;GO TO 1$ IF NO, ELSE
22 020676   000446          .WORD  L10012-.          ;EXIT INIT
23
24 020700          1$:
25 020700   012700   000035  MOV     #EF.NEW,R0          ;'STA', 'RES' OR 'NEW PASS' ?
26 020704   104447          TRAP    C$REFG
27
28 020706   103015          BCC     2$
29 020710   005037   002422  CLR     ROUTDO             ;GO TO 2$ IF NO, MUST BE NEW 'SUB-PASS'
30
31 020714   012746   006420  MOV     #CRLF,-(SP)         ;ALLOW A NEW USER SELECTED MICRO DIAGNOSTIC SELECTION
32 020720   012746   000001  MOV     #1,-(SP)           ;CR-LF
33 020724   010600          MOV     SP,R0
34 020726   104417          TRAP    C$PNTF
35 020730   062706   000004  ADD     #4,SP
36
37 020734   012737   177777   002472  MOV     #-1,UNIT           ;RESET UNIT COUNT
38 020742   005237   002472   2$: INC     UNIT             ;GET NEXT UNIT NUMBER FOR TESTING
39 020746   012702   000024  MOV     #20,R2             ;RH/RP REGISTER COUNT
40 020752   012703   002512  MOV     #RPCS1,R3          ;DATA SINK
41
42 020756   013700   002472  MOV     UNIT,R0            ;GET UNIT FROM HARDWARE P-TABLE
43 020762   104442          TRAP    C$GPHRD
44 020764   010005          MOV     R0,R5
45
46 020766   103365          BCC     2$
47 020770   011346          MOV     (R3),-(SP)         ;SAVE R3
48 020772   011546          MOV     (R5),-(SP)         ;AND THE BASE ADDRESS
49 020774   166616   000002  SUB     2(SP),(SP)         ;DERIVE NEW ADDRESS
50 021000   061623          3$: ADD     (SP),(R3)+       ;LOG IT IN NEW TABLE
51 021002   005302          DEC     R2                 ;COUNT LOGGING
52 021004   001375          BNE     3$                 ;R2 NOT ZERO, CONTINUE LOGGING
53 021006   004737   014700  JSR     PC,SIZE70          ;SEE IF RH70 IS PRESENT
54 021012   005737   002504  TST     RHTYPE             ;IS IT AN RH70 ?
55 021016   001406          BEQ     4$                 ;BR IF NO
56 021020   013702   002502  MOV     RHEXT,R2           ;GET RPB AE OFFSET
57 021024   061502          ADD     (R5),R2            ;ADD BASE ADDRESS TO OFFSET
58 021026   010223          MOV     R2,(R3)+          ;SAVE NEW RPB AE
59 021030   005722          TST     (R2)+             ;ADD 2

```

```

52 021032 010213      MOV      R2,(R3)      ;SAVE NEW RPCS3
53
54 021034 022626      4:      CMP      (SP)+,(SP)+  ;RESTORE STACK
55 021036 012537 002474  MOV      (R5)+,RPADR  ;SAVE RPCS1 BASE ADDRESS
56 021042 012537 002476  MOV      (R5)+,RPVEC  ;SAVE INTERRUPT VECTOR ADDRESS
57 021046 012537 002500  MOV      (R5)+,RPVEC+2 ;SAVE INTERRUPT PRIORITY
58 021052 011537 002506  MOV      (R5),DRVNO   ;SETUP DRIVE NUMBER FOR UNIT N
59 021056 013737 002370 002372  MOV      ENDTRK,LASTRK ;SET UP THE LAST USABLE TRACK
60 021064 013737 002374 002376  MOV      ENDCYL,LASCYL ;AND THE LAST USABLE CYLINDER
61 021072 000402      BR       6#
62
63 021074 004737 020372      5:      JSR      PC,WATDRY    ;PWR FAIL, WAIT FOR THE DRIVE TO GO READY
64 021100 005037 002404      6:      CLR      ERRWD1      ;NO ERROR STATUS BITS
65 021104 005037 002406      CLR      ERRWD2      ;FOR BOTH MASKS
66 021110 005037 002460      CLR      ILOCK       ;START WITHOUT IR/OR INTERLOCK
67 021114 005037 002462      CLR      INTFLG      ;RESET THE INTERRUPT COUNTER
68 021120 005037 002464      CLR      UNABLE      ;INSURE THAT UNIT IS ENABLED
69 021124 005037 002466      CLR      ERSTAT      ;NO FAIL STATUS
70 021130 005037 002420      CLR      FUNCTN      ;START UP WITH NO FUNCTION CODE
71 021134 012777 000040 161360  MOV      #CLR,ORPCS2  ;MASSBUS INIT TO CLEAR IMPENDING INTERRUPTS
72 021142 013701 002506      MOV      DRVNO,R1    ;GET THE DRIVE NUMBER
73 021146 010177 161350      MOV      R1,ORPCS2   ;SELECT DRIVE
74 021152 005037 002400      CLR      BITPOS      ;CLEAR ATTENTION BIT POSITION WORD
75 021156 116137 002566 002400  MOVB     ATABIT(R1),BITPOS ;GET ATA BIT POSITION FOR THIS DRIVE
76 021164 004737 015550      JSR      PC,ST.CLK   ;START THE CLOCK
77 021170 012746 003720      MOV      #2000,-(SP) ;WAIT 2000. MS
    021174 004737 016756      JSR      PC,WAITMS
78
79
80
81 021200 012701 000004      MOV      #4,R1       ;4 DIGITS
82 021204 013746 002506      MOV      DRVNO,-(SP)
    021210 012746 006423      MOV      #DSNMSG,-(SP)
    021214 012746 000002      MOV      #2,-(SP)
    021220 010600      MOV      SP,R0
    021222 104417      TRAP     C#PNTF
    021224 062706 000006      ADD     #6,SP
83 021230 017746 161306      MOV      BRPSN,-(SP) ;FETCH S/N
84 021234 005002      7:      CLR      R2          ;ZERO OUTPUT
85 021236 006116      ROL     (SP)         ;PUT NEXT DIGIT INTO R2
86 021240 006102      ROL     R2
87 021242 006116      ROL     (SP)
88 021244 006102      ROL     R2
89 021246 006116      ROL     (SP)
90 021250 006102      ROL     R2
91 021252 006116      ROL     (SP)
92 021254 006102      ROL     R2
93 021256 062702 000060      ADD     #'0,R2       ;MAKE RESULT ASCII
94 021262 010237 002510      MOV      R2,DRVSN    ;SAVE R2 FOR PRINT
95 021266 012746 002510      MOV      #DRVSN,-(SP)
    021272 012746 006447      MOV      #SNDIGT,-(SP)
    021276 012746 000002      MOV      #2,-(SP)
    021302 010600      MOV      SP,R0
    021304 104417      TRAP     C#PNTF
    021306 062706 000006      ADD     #6,SP
96 021312 005301      DEC     R1           ;COUNT DOWN DIGIT
97 021314 003347      BGT     7#          ;NEXT DIGIT

```

```

98 021316 005726          TST      (SP)+          ;RESTORE STACK
99                                     ;CR-LF
100 021320 012746 006420   MOV      @CRLF,-(SP)
    021324 012746 000001   MOV      @1,(SP)
    021330 010600          MOV      SP,R0
    021332 104417          TRAP     C$PNTF
    021334 062706 000004   ADD      @4,SP
101
125
126 021340 104432          TRAP     C$EXIT
    021342 000002          .WORD   L10012-.
127
139                          .EVEN
140
141 021344                L10012:
    021344 104411          TRAP     C$INIT

```

```

1          .SBTTL  AUTODROP SECTION
2
3          ;**
4          ; THIS CODE IS EXECUTED IMMEDIATELY AFTER THE INITIALIZE CODE IF
5          ; THE "ADR" FLAG WAS SET.  THE UNIT(S) UNDER TEST ARE CHECKED TO
6          ; SEE IF THEY WILL RESPOND.  THOSE THAT DON'T ARE IMMEDIATELY
7          ; DROPPED FROM TESTING.
8          ;--
9
10 021346  L$AUTO::
11
18 021346  L10013:
   021346 104461      TRAP    C$AUTO

```



```

1          .SBTTL  CLEANUP CODING SECTION
2
3
4          ;**
5          ; THE CLEANUP CODING SECTION CONTAINS THE CODING THAT IS PERFORMED
6          ; AFTER THE HARDWARE TESTS HAVE BEEN PERFORMED.
7          ;--
8 021350   L$CLEAN::
9 021350   005037 002404   CLR  ERRWD1   ;AND ANY LEFT-OVER ERROR STATUS
10 021354  005037 002406   CLR  ERRWD2   ;FOR BOTH MASKS!
11 021360  005037 002466   CLR  ERSTAT   ;SET FOR PASS STATUS
12 021364  005037 002430   CLR  FASTAT   ;ENSURE THAT 'INTERNAL' FAILED STATUS = 0
13 021370  005037 002464   CLR  UNABLE   ;INSURE THAT UNIT IS ENABLED
14 021374  022737 000035 002420  CMP  #DIAG,FUNCTN ;WAS LAST COMMAND A DIAGNOSTIC COMMAND?
15 021402  001002                BNE  1$      ;IF SO, TAKE THE BRANCH
16 021404  004737 015312                JSR  PC,DIAGEN ;AND ENSURE THAT THE UNIT ISN'T IN DIAGNOSTIC MODE
17 021410                1$:
18 021410  012700 000340                MOV  #PRI07,R0 ;SET PRIORITY TO 7
19 021414  104441                TRAP C$SPRI
20 021416  004737 016054                JSR  PC,STOPCK ;STOP CLOCK
21 021422  012777 000040 161072                MOV  #CLR,#RPCS2 ;MASSBUS INIT TO CLEAR IMPENDING INTERRUPTS
22 021430  013777 002506 161064                MOV  DRVNO,#RPCS2 ;GET DRIVE NUMBER
23 021436  005737 002426                TST  CLKSTA   ;RELEASE APPROPRIATE CLOCK VECTOR
24 021442  001410                BEQ  3$      ;NO CLOCK, SKIP
25 021444  100404                BMI  2$      ;L-CLK
26 021446  013700 015734                MOV  PKV,R0   ;P-CLK VECTOR RELEASE
27 021452  104436                TRAP C$CVEC
28 021454  000403                BR   3$
29 021456                2$:
30 021456  013700 015744                MOV  LKV,R0
31 021462  104436                TRAP C$CVEC   ;L-CLK VECTOR RELEASE
32 021464                3$:
33 021464  013700 002476                MOV  RPVEC,R0 ;RP07 VECTOR RELEASE
34 021470  104436                TRAP C$CVEC
35
36
37
38
39
40
41 021472  104432                TRAP C$EXIT
42 021474  000002                .WORD L10014-.
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57 021476   L10014:
58 021476  104412                TRAP C$CLEAN

```

```

1          .SBTTL  DROP UNIT SECTION
2
3
4          ;**
5          ; THE DROP UNIT SECTION CONTAINS THE CODING THAT CAUSES A DEVICE
6          ; TO NO LONGER BE TESTED.
7          ;--
8 021500   L$DU::
9
18
19 021500   000167      .WORD  J$JMP
20 021502   000000      .WORD  L10015-2-.
32
33          .EVEN
34 021504   104453     L10015:
21504      TRAP  C$DU

```

L 7

```

1          .SBTTL  ADD UNIT SECTION
2
3
4          ;**
5          ; THE ADD-UNIT SECTION CONTAINS ANY CODE THE PROGRAMMER WISHES
6          ; TO BE EXECUTED IN CONJUNCTION WITH THE ADDING OF A UNIT BACK
7          ; TO THE TEST CYCLE.
8          ;--
9 021506   L$AU::
10
19
20 021506 000167      .WORD  J$JMP
   021510 000000      .WORD  L10016 2 .
21
33          .EVEN
34
35 021512      L10016:
   021512 104452      TRAP   C$AU

```

M7

2

.SBTTL HARDWARE TESTS

```

1          .SBTTL TEST 1 UNIT UNDER TEST
2
37
39
40          ;# TEST 01 UNIT UNDER TEST
41          ;# : GET CSR ADDRESS AND ACCESS THE CONTROLLER
42          ;# : IF DEVICE DOESN'T RESPOND
43          ;# : : THEN
44          ;# : : OUTPUT ERROR MESSAGE (NO SSYNC, DEVICE NOT PRESENT)
45          ;# : ENDF
46          ;# END TEST 01
47
54
60 021514          T1:: MOV #10.,ITCOUN ;LOAD THE OVERALL ITERATION COUNTER
61 021514 012737 000012 002402
62 021522          1$: MOV #240,-(SP)
   021522 012746 000240          MOV #2$,-(SP)
   021526 012746 021564          MOV #4,-(SP)
   021532 012746 000004          MOV #3,-(SP)
   021536 012746 000003          TRAP C$SVEC
   021542 104437          ADD #10,SP
   021544 062706 000010          TST BRPCS1 ;ACCESS THE CONTROLLER
63 021550 005777 160736
64 021554 012700 000004          MOV #4,R0
   021560 104436          TRAP C$CVEC
65 021562 000407          BR 3$
66 021564 022626          2$: CMP (SP)+,(SP)+ ;RESTORE THE STACK, DEVICE DIDN'T RESPOND
67 021566 104456          TRAP C$ERHRD
   021570 000001          .WORD 1
   021572 012272          .WORD EM11
   021574 000000          .WORD 0
68 021576 005037 002402          CLR ITCOUN ;SET ITERATIONS TO 0
69 021602 005337 002402          3$: DEC ITCOUN ;ONE LESS ITERATION TO GO
70 021606 003745          BGT 1$ ;KEEP GOING UNTIL = 0!
71 021610          L10017: TRAP C$ETST
   021610 104401
  
```

```

1          .SBTTL TEST 2 RP CLEAR TEST
2
3          ;# TEST 02 RPCLEAR TEST
4          ;# : WRITE RPBA = #2
5          ;# : GET CONTENTS OF RPBA AND STORE THEM
6          ;# : IF RPBA = 0
7          ;# : : THEN
8          ;# : : OUTPUT ERROR MESSAGE (RPBA DIDN'T SET)
9          ;# : : ELSE
10         ;# : : SET RPCS2: CLR (BIT 05) = 1
11         ;# : ENDF
12         ;# : COMPARE RPBA WITH STORED VALUE
13         ;# : IF RPBA DID NOT CHANGE
14         ;# : : THEN
15         ;# : : OUTPUT ERROR MESSAGE (DEVICE CLEAR DID NOT FUNCTION)
16         ;# : ENDF
17         ;# END TEST 02
18
19 021612          T2::
20 021612 012737 000012 002402          MOV      #10.,ITCOUN      ;LOAD THE OVERALL ITERATION COUNT
21 021620          1#:
22 021620 104404          TRAP     C#BSEG
23 021622 013777 002346 160666          MOV      PATT2,RPBA      ;LOAD UP RPBA WITH ALL ONES
24 021630 005777 160662          TST      BRPBA          ;SEE IF ANY BIT SET
25 021636 013737 002516 002456          BNE      2#             ;IF ANY BITS SET, TAKE BRANCH
26 021644 017737 160646 002452          MOV      RPBA,TESTRG    ;SAVE THE ADDRESS OF THE REGISTER UNDER TEST
27 021652 013737 002346 002454          MOV      BRPBA,RCVED    ;AND ITS CONTENTS
28 021660 005037 002404          CLR      ERRWD1        ;NOW GET THE EXPECTED RESULTS
29 021664 012737 000002 002406          MOV      #BIT1,ERRWD2   ;NO RP07 MODULE CALLOUT
30 021672 104456          TRAP     C#ERHRD        ;JUST CALLOUT THE CONTROLLER
31 021702 005037 002402          .WORD   2
32 021706          .WORD   EM22
33 021710 104405          .WORD   ERRO
34 021712 017746 160600          CLR      ITCOUN        ;ITERATIONS = 0
35 021716 052777 000040 160576          2#:
36 021724 027726 160566          10000#:
37 021730 001016          TRAP     C#ESEG
38 021732 005037 002454          TRAP     C#BSEG
39 021736 013737 002516 002456          MOV      BRPBA,-(SP)    ;SAVE RPBA FOR COMPARISON
40 021744 017737 160546 002452          BIS      #CLR,BRPCS2    ;ISSUE DEVICE CLEAR
41 021752 104456          MOV      BRPBA,(SP)    ;COMPARE PRESENT RPBA STATE WITH RPBA LAST STATE
42 021754 000003          CMP      BRPBA,(SP)    ;TAKE BRANCH IF A CHANGE OCCURRED
43 021756 012410          BNE      3#             ;FORM THE EXPECTED DATA
44 021760 014172          CLR      EXPTED        ;GET ADDRESS OF FAILING REGISTER
45 021762 005037 002402          MOV      RPBA,TESTRG    ;AND THE CONTENTS OF RPBA
46 021766          TRAP     C#ERHRD
47 021770 005337 002402          .WORD   3
48 021774 003311          .WORD   EM13
49 021776          .WORD   ERRO
50          CLR      ITCOUN        ;ITERATIONS = 0
51          3#:
52          10001#:
53          TRAP     C#ESEG
54          DEC      ITCOUN        ;ONE LESS ITERATION TO-GO
55          BGT      1#           ;IF NOT 0, KEEP GOING!
56          L10020:

```

CX

CZRJMB0 RP07 FE-HOST ISOLATOR MACRO V04.00 1 DEC 83 10:39:09 PAGE 37 1
TEST 2 RP CLEAR TEST

SEQ 0093

021776 104401

TRAP C1E1ST

```

1      .SBTTL TEST 3 RPCS2 READ WRITE TEST
2
3      ;# TEST 03 RPCS2 READ-WRITE TEST
4      ;# : WRITE RPCS2 WITH DATA PATTERNS 1-4, ONE AT A TIME
5      ;# : BITS TO TEST = 0..2
6      ;# : IF RPCS2 DOES NOT MATCH PATTERN
7      ;# : : THEN
8      ;# : : OUTPUT ERROR MESSAGE (BIT UNDER TEST DID-NOT SET)
9      ;# : : ELSE
10     ;# : : SET RPCS2: CLR = 1
11     ;# : ENDF
12     ;# : IF RPCS2 BIT UNDER TEST DID NOT CLEAR
13     ;# : : THEN OUTPUT ERROR MESSAGE (BIT DIDN'T CLEAR WITH DEVICE CLEAR)
14     ;# : ENDF
15     ;# END TEST 03
16
17     022000      T3::
18     022000 012737 000002 002406      MOV      #BIT1,ERRWD2      ;SET UP THE MODULE CALLOUT (JUST-IN-CASE)
19     022006 005037 002404              CLR      ERRWD1          ;NO MODULE CALLOUT FOR THE DRIVE
20     022012 012737 000012 002402      MOV      #10.,ITCOUN      ;LOAD THE OVERALL ITERATION COUNT
21     022020      1#::
22     022020 004737 017744              JSR      PC,SETUP        ;LOAD I/O POINTERS
23     022024 004160              TST03          ;FROM THIS TABLE
24     022026 013737 002444 002436      64#:: MOV      SRCTMP,TEMP      ;SET UP FOR POSSIBLE LOOP
25     022034 104404              TR,P        C#BSEG
26     022036 004737 020034              JSR      PC,FLOAT        ;FLOAT THE PATTERN
27     022042 000403              BR       65#            ;PATTERN FLOATED OK, SKIP ERROR DSPATCH
28     022044 013737 002436 002444      MOV      TEMP,SRCTMP     ;RESTORE THE OLD DATA PATTERN FOR ERROR LOOP
29     022052      65#::
30     022052      10000#::
31     022052 104405              TRAP     C#ESEG
32     022054 005737 002446              TST      MASK            ;IF MASK = 0, WE'RE DONE
33     022060 001362              BNE     64#
34     022062 004737 020330              JSR      PC,CONSET       ;GET NEXT PATTERN
35     022066 005737 002434              TST      PATCNT         ;IF PATTERN COUNT UNDERFLOWED, DONE!
36     022072 002355              BGE     64#            ;NOT DONE YET, GO-ON
37     022074 104404              TRAP     C#BSEG
38     022076 004737 020202              JSR      PC,COMPAR       ;WRITE THE NEXT PATTERN
39     022102 002352              PATT4          ;WHICH IS PATTERN #4
40     022104      10001#::
41     022104 104405              TRAP     C#ESEG
42     022106 104404              TRAP     C#BSEG
43     022110 104404              TRAP     C#BSEG
44     022112 004737 020202              JSR      PC,COMPAR       ;DO ANOTHER DATA COMPARISON
45     022116 002350              PATT3          ;USING PATTERN #3
46     022120      10003#::
47     022120 104405              TRAP     C#ESEG
48     022122 004737 017474              JSR      PC,RESET       ;RESET THE DEVICE
49     022126 002522              RPCS2          ;CLEAR RPCS2 BY SETTING MASSBUS CLEAR
50     022130      10002#::
51     022130 104405              TRAP     C#ESEG
52     22 022132 005337 002402              DEC      ITCOUNT        ;ONE LESS ITERATION TO-GO
53     23 022136 003330              BGT     1#            ;KEEP GOING IF NOT ZERO
54     24 022140      L10021::
55     022140 104401              TRAP     C#ETST

```


E 2

```

1      .SBTTL TEST 4 RPWC READ WRITE TEST
2
3      ;# TEST 04 RPWC READ-WRITE TEST
4      ;# : WRITE RPWC WITH DATA PATTERNS 1..4
5      ;# : BITS TO TEST = 1..15
6      ;# : IF RPWC BIT UNDER TEST DOESN'T MATCH EXPECTED
7      ;# : : THEN
8      ;# : : OUTPUT ERROR MESSAGE (BIT UNDER TEST DID NOT SET)
9      ;# : : ELSE
10     ;# : : WRITE RPWC = 0
11     ;# : : ENDF
12     ;# : IF RPWC BIT(S) UNDER TEST DID NOT CLEAR
13     ;# : : THEN
14     ;# : : OUTPUT ERROR MESSAGE (BIT(S) DIDN'T CLEAR WHEN EXPECTED)
15     ;# : : ENDF
16     ;# END TEST 04
17
18 022142 T4::
19 022142 005037 002404 CLR ERRWD1 ;MODULE CALLOUT
20 022146 012737 000002 002406 MOV #BIT1,ERRWD2 ;FOR THIS TEST
21 022154 012737 000012 002402 MOV #10.,ITCOUN ;LOAD THE OVERALL ITERATION COUNT
22 022162 1# :
    022162 004737 017744 JSR PC,SETUP ;LOAD I/O POINTERS
    022166 004172 TST04 ;FROM THIS TABLE
    022170 013737 002444 002436 64# : MOV SRCTMP,TEMP ;SET UP FOR POSSIBLE LOOP
    022176 104404 TRAP C#BSEG
    022200 004737 020034 JSR PC,FLOAT ;FLOAT THE PATTERN
    022204 000403 BR 65# ;PATTERN FLOATED OK, SKIP ERROR DSPATCH
    022206 013737 002436 002444 MOV TEMP,SRCTMP ;RESTORE THE OLD DATA PATTERN FOR ERROR LOOP
    022214 65# :
    022214 10000# :
    022214 104405 TRAP C#ESEG
    022216 005737 002446 TST MASK ;IF MASK = 0, WE'RE DONE
    022222 001362 BNE 64#
    022224 004737 020330 JSR PC,CONSET ;GET NEXT PATTERN
    022230 005737 002434 TST PATCNT ;IF PATTERN COUNT UNDERFLOWED, DONE!
    022234 002355 BGE 64# ;NOT DONE YET, GO-ON
    022236 104404 TRAP C#BSEG
    022240 004737 020202 JSR PC,COMPAR ;WRITE THE NEXT PATTERN
    022244 002352 PATT4 ;WHICH IS PATTERN #4
    022246 10001# :
    022246 104405 TRAP C#ESEG
    022250 104404 TRAP C#BSEG
    022252 104404 TRAP C#BSEG
    022254 004737 020202 JSR PC,COMPAR ;DO ANOTHER DATA COMPARISON
    022260 002350 PATT3 ;USING PATTERN #3
    022262 10003# :
    022262 104405 TRAP C#ESEG
    022264 004737 017572 JSR PC,LDZERO ;WRITE RPWC TO 0 TO CLEAR IT!
    022270 10002# :
    022270 104405 TRAP C#ESEG
23 022272 005337 002402 DEC ITCOUN ;ONE LESS ITERATION TO-GO
24 022276 003331 BGT 1# ;IF NOT ZERO, KEEP GOING
25 022300 L10022 :
    022300 104401 TRAP C#ETST
    
```

```

1      .SBTTL TEST 5 RPBA READ WRITE TEST
2
3      ;# TEST 05 RPBA READ-WRITE TEST
4      ;# : WRITE RPBA WITH DATA PATTERNS 1..4, ONE AT A TIME
5      ;# : BITS TO TEST = 0..15
6      ;# : IF RPBA BIT(S) UNDER TEST DON'T MATCH EXPECTED DATA
7      ;# : : THEN
8      ;# : : OUTPUT ERROR MESSAGE (BIT(S) UNDER TEST DON'T MATCH TEST DATA)
9      ;# : : ELSE
10     ;# : : WRITE RPCS2: CLR = 1
11     ;# : ENDF
12     ;# : IF RPBA BIT(S) UNDER TEST DIDN'T CLEAR
13     ;# : : THEN
14     ;# : : OUTPUT ERROR MESSAGE (BIT(S) UNDER TEST DIDN'T CLEAR)
15     ;# : ENDF
16     ;# END TEST 05
17 022302 TS::
18 022302 005037 002404 CLR ERRWD1 ;MODULE CALLOUT
19 022306 012737 000002 002406 MOV #BIT1,ERRWD2 ;FOR THIS TEST
20 022314 012737 000012 002402 MOV #10.,ITCOUN ;LOAD THE ITERATION COUNTER
21 022322 1$: JSR PC,SETUP ;LOAD I/O POINTERS
022322 004737 017744 TST05 ;FROM THIS TABLE
022326 004204 64$: MOV SRCTMP,TEMP ;SET UP FOR POSSIBLE LOOP
022330 013737 002444 002436 TRAP C#BSEG
022336 104404 JSR PC,FLOAT ;FLOAT THE PATTERN
022340 004737 020034 BR 65$ ;PATTERN FLOATED OK, SKIP ERROR DSPATCH
022344 000403 MOV TEMP,SRCTMP ;RESTORE THE OLD DATA PATTERN FOR ERROR LOOP
022346 013737 002436 002444 65$:
022354 10000$: TRAP C#ESEG
022354 104405 TST MASK ;IF MASK = 0, WE'RE DONE
022356 005737 002446 BNE 64$
022362 001362 JSR PC,CONSET ;GET NEXT PATTERN
022364 004737 020330 TST PATCNT ;IF PATTERN COUNT UNDERFLOWED, DONE!
022370 005737 002434 BGE 64$ ;NOT DONE YET, GO-ON
022374 002355 TRAP C#BSEG
022376 104404 JSR PC,COMPAR ;WRITE THE NEXT PATTERN
022400 004737 020202 JSR PATT4 ;WHICH IS PATTERN #4
022404 002352 10001$: TRAP C#ESEG
022406 104405 TRAP C#BSEG
022410 104404 TRAP C#BSEG
022412 104404 JSR PC,COMPAR ;DO ANOTHER DATA COMPARISON
022414 004737 020202 JSR PATT3 ;USING PATTERN #3
022420 002350 10003$: TRAP C#ESEG
022422 104405 JSR PC,RESET ;RESET THE DEVICE
022424 004737 017474 RPBA ;CLEAR RPBA BY SETTING MASSBUS CLEAR
022430 002516 10002$: TRAP C#ESEG
022432 104405 DEC ITCOUN ;ONE LESS TO GO
022432 104405 BGT 1$ ;IF => 0, KEEP GOING!
22 022434 005337 002402 L10023: TRAP C#ETST
23 022440 003330
24 022442 104401

```

```

1      .SBTTL TEST 6 SC & TRE TEST 1 (RH11)
2
3      ;# TEST 06 SPECIAL CONDITION AND TRANSFER ERROR TEST (RH11 TEST ONLY!)
4      ;# : SET RPCS2: CLR = 1
5      ;# : IF RPCS1: SC OR RPCS1: TRE = 1
6      ;# : : THEN
7      ;# : : OUTPUT ERROR MESSAGE (BIT STUCK AT 1, AND SHOULDN'T BE)
8      ;# : : ELSE
9      ;# : : SET RPCS2: MXF (BIT 09) = 1
10     ;# : : IF RPCS2: MXF <> 1
11     ;# : : : THEN
12     ;# : : : OUTPUT ERROR MESSAGE (BIT FAILED TO SET WHEN EXPECTED)
13     ;# : : : ELSE
14     ;# : : : IF RPCS1: TRE <> 1
15     ;# : : : : THEN
16     ;# : : : : OUTPUT ERROR MESSAGE (BIT FAILED TO SET WHEN EXPECTED)
17     ;# : : : : ENDF
18     ;# : : : IF RPCS1: SC <> 1
19     ;# : : : : THEN
20     ;# : : : : OUTPUT ERROR MESSAGE (BIT FAILED TO SET WHEN EXPECTED)
21     ;# : : : : ENDF
22     ;# : : : SET RPCS2: CLR = 1
23     ;# : : : IF RPCS1: TRE OR SC = 1
24     ;# : : : : THEN
25     ;# : : : : OUTPUT ERROR MESSAGE (BITS FAILED TO CLEAR)
26     ;# : : : : ENDF
27     ;# : : ENDF
28     ;# : ENDF
29     ;# END TEST 06
30

```

```

31 022444      T6::
32 022444 005737 002504      TST      RHTYPE      ;WHICH CONTROLLER??
33 022450 001402              BEQ        1#          ;IF 0, IT'S AN RH11
34 022452 104432              TRAP      C#EXIT
35 022454 000316              .WORD    L10024..
36 022456 005037 002404      1#::    CLR      ERRWD1      ;MODULE CALLOUT FOR THIS TEST
37 022462 012737 000002 002406  MOV     #BIT1,ERRWD2 ;ONLY THE CONTR'LLER
38 022470 012737 000012 002402  MOV     #10.,ITCOUN ;LOAD THE ITERATION COUNTER
39 022476 104404              2#::    TRAP      C#BSEG
40 022500 104404              TRAP      C#BSEG
41 022502 052777 000040 160012  BIS     #CLR, #RPCS2 ;INITIALIZE THE DEVICE
42 022510 013777 002506 160004  MOV     DRVNO,#RPCS2 ;AND LOAD THE DRIVE NUMBER
43 022516 032777 140000 157766  BIT     #SC!TRE,#RPCS1 ;SPECIAL CONDITION OR TRANSFER ERROR?
44 022524 001412              BEQ      3#
45 022526 004737 017422              JSR     PC,BICEXP    ;LOAD FAILING DATA
46 022532 002512              RPCS1   ;FAILING REGISTER
47 022534 140000              SC!TRE ;BIT UNDER TEST
48 022536 104456              TRAP    C#ERMRD
49 022540 000010              .WORD   8
50 022542 012562              .WORD   EM16
51 022544 014172              .WORD   ERRO
52 022546 005037 002402      3#::    CLR      ITCOUN      ;ITERATIONS = 0
53 022552
54 022552 104405      10001#:: TRAP    C#ESEG
55 022554 104404              TRAP    C#BSEG

```

```

51 022556 052777 001000 157736      BIS      @MXF,@RPCS2      ;SET MISSED TRANSFER = 1
52 022564 032777 001000 157730      BIT      @MXF,@RPCS2      ;DID IT SET?
53 022572 001012                BNE      4$              ;YES IT DID, SKIP ERROR DISPATCH
54 022574 004737 017372      JSR      PC,BISEXP        ;LOAD FAILING DATA
55 022600 002522                RPCS2          ;FAILING REGISTER
56 022602 001000                MXF              ;BIT UNDER TEST
57 022604 104456                TRAP      C$ERHRD
    022606 000011                .WORD     9
    022610 012776                .WORD     EM22
    022612 014172                .WORD     ERRO
58 022614 005037 002402      CLR      ITCOUN          ;ITERATIONS = 0
59 022620                4$:
    022620                10002$:
    022620 104405                TRAP      C$ESEG
60 022622 032777 040000 157662      BIT      @TRE,@RPCS1      ;DID WE DETECT A TRANSFER ERROR??
61 022630 001012                BNE      5$              ;YES, GO-ON
62 022632 004737 017372      JSR      PC,BISEXP        ;LOAD FAILING DATA
63 022636 002512                RPCS1          ;FAILING REGISTER
64 022640 040000                TRE              ;BIT UNDER TEST
65 022642 104456                TRAP      C$ERHRD
    022644 000012                .WORD     10
    022646 012776                .WORD     EM22
    022650 014172                .WORD     ERRO
66 022652 005037 002402      CLR      ITCOUN          ;ITERATIONS = 0
67 022656 032777 100000 157626 5$:      BIT      @SC,@RPCS1      ;DID WE GET SPECIAL CONDITION?
68 022664 001012                BNE      6$              ;YES, SKIP ERROR DISPATCH
69 022666 004737 017372      JSR      PC,BISEXP        ;LOAD FAILING DATA
70 022672 002512                RPCS1          ;FAILING REGISTER
71 022674 100000                SC              ;BIT UNDER TEST
72 022676 104456                TRAP      C$ERHRD
    022700 000013                .WORD     11
    022702 012776                .WORD     EM22
    022704 014172                .WORD     ERRO
73 022706 005037 002402      CLR      ITCOUN          ;ITERATIONS = 0
74 022712 052777 000040 157602 6$:      BIS      @CLR,@RPCS2      ;CLEAR OUT THE CONTROLLER
75 022720 013777 002506 157574      MOV      DRVNO,@RPCS2     ;RELOAD THE DRIVE NUMBER
76 022726 032777 140000 157556      BIT      @SC!TRE,@RPCS1  ;DID SC AND TRE CLEAR OUT?
77 022734 001412                BEQ      7$              ;YES, TEST OK!
78 022736 004737 017422      JSR      PC,BICEXP        ;LOAD FAILING DATA
79 022742 002512                RPCS1          ;FAILING REGISTER
80 022744 140000                SC!TRE          ;BIT UNDER TEST
81 022746 104456                TRAP      C$ERHRD
    022750 000014                .WORD     12
    022752 013051                .WORD     EM23
    022754 014172                .WORD     ERRO
82 022756 005037 002402      CLR      ITCOUN          ;ITERATIONS = 0
83 022762                7$:
    022762                10000$:
    022762 104405                TRAP      C$ESEG
84 022764 005337 002402      DEC      ITCOUN          ;ONE LESS ITERATION TO GO
85 022770 003242                BGT      2$              ;KEEP GOING IF => 0!
86 022772                L10024:
    022772 104401                TRAP      C$ETST

```



```

47 023114          2$:
   023114          10001$:
   023114 104405
48 023116 005077 157412
49 023122 032777 000200 157372
50 023130 001032
51 023132 012727 000020
   023136 000000
   023140 013727 002116
   023144 000000
   023146 005367 177772
   023152 001375
   023154 005367 177756
   023160 001367
52 023162 032777 000200 157332
53 023170 001012
54 023172 004737 017372
55 023176 002522
56 023200 000200
57 023202 104456
   023204 000016
   023206 012116
   023210 014172
58 023212 005037 002402
59 023216 005777 157312
60 023222 032777 000200 157272
61 023230 001412
62 023232 004737 017422
63 023236 002522
64 023240 000200
65 023242 104456
   023244 000017
   023246 012155
   023250 014172
66 023252 005037 002402
67 023256
   023256
   023256 104405
68 023260 005337 002402
69 023264 003253
70 023266
   023266 104401

TRAP C#ESEG
CLR  BRPDB ;WRITE RPDB ONCE WITH DATA
BIT  #OR, BRPCS2 ;NOW LOOK FOR OUTPUT READY
BNE  3$ ;GOT IT, GO ON
MOV  #20,(PC)+
.WORD 0
MOV  L#DLY,(PC)+
.WORD 0
DEC  -6(PC)
BNE  -4
DEC  -22(PC)
BNE  -20
BIT  #OR, BRPCS2 ;LOOK FOR OR TO BE SET NOW
BNE  3$ ;IT SET IN TIME
JSR  PC,BISEXP ;LOAD FAILING DATA
RPCS2 ;FAILING REGISTER
OR   ;BIT UNDER TEST
TRAP C#ERHRD
.WORD 14
.WORD EMS
.WORD ERRO
CLR  ITCOUN ;ITERATIONS = 0
TST  BRPDB ;READ THE BUFFER NOW
BIT  #OR, BRPCS2 ;OR SHOULD NOW = 0
BEQ  4$ ;IT CLEARED, TEST OK
JSR  PC,BICEXP ;LOAD FAILING DATA
RPCS2 ;FAILING REGISTER
OR   ;BIT UNDER TEST
TRAP C#ERHRD
.WORD 15
.WORD EMS
.WORD ERRO
CLR  ITCOUN ;ITERATIONS = 0

4$:
10000$:
TRAP C#ESEG
DEC  ITCOUN ;ONE LESS ITERATION TO-GO
BGT  1$ ;KEEP GOING UNTIL <= 0

L10025:
TRAP C#ETST

```

```

1      .SBTTL TEST 8 RPDB READ WRITE TEST #1
2
3      ;* TEST 08 RPDB READ WRITE TEST #1
4      ;* : WRITE RPDB WITH DATA PATTERNS 1,2,5, ONE AT A TIME
5      ;* : BITS TO TEST=0..15
6      ;* : IF RPCS2: IR<>1
7      ;* : : THEN
8      ;* : : POLL BIT UNTIL IT SETS
9      ;* : : ELSE
10     ;* : : WRITE DATA TO RPDB
11     ;* : ENDF
12     ;* : IF RPCS2: OR<>1
13     ;* : : THEN
14     ;* : : POLL BIT UNTIL IT SETS
15     ;* : : ELSE
16     ;* : : READ RPDB
17     ;* : ENDF
18     ;* : IF RPDB RECEIVED DATA DOESN'T MATCH EXPECTED DATA
19     ;* : : THEN
20     ;* : : OUTPUT ERROR MESSAGE (BITS RECEIVED DON'T MATCH EXPECTED DATA)
21     ;* : : ENDF
22     ;* : IF RPCS2: IR<>1
23     ;* : : THEN
24     ;* : : POLL RPCS2: IR UNTIL IT SETS
25     ;* : : ENDF
26     ;* : WRITE RPDB WITH 0'S
27     ;* : IF RPCS2: OR<>1
28     ;* : : THEN
29     ;* : : POLL RPCS2: OR UNTIL IT SETS
30     ;* : : ENDF
31     ;* : IF RPDB<>0
32     ;* : : THEN
33     ;* : : OUTPUT ERROR MESSAGE (BITS FAILED TO CLEAR)
34     ;* : : ENDF
35     ;* END TEST 08

```

```

37 023270          T8::
38 023270 012737 177777 002460      MOV    #-1,ILOCK      ;MARK THE RPDB POLL MODE
39 023276 005037 002404              CLR    ERRWD1         ;CREATE THE MODULE CALLOUT
40 023302 012737 000002 002406      MOV    #BIT1,ERRWD2   ;FOR THIS TEST
41 023310 012737 000012 002402      MOV    #10.,ITCOUN   ;LOAD THE ITERATION COUNTER
42 023316          1$:
   023316 004737 017744              JSR    PC,SETUP       ;LOAD I/O POINTERS
   023322 004216              TST08                ;FROM THIS TABLE
   023324 013737 002444 002436 64$:  MOV    SRCTMP,TEMP     ;SET UP FOR POSSIBLE LOOP
   023332 104404              TRAP   C#BSEG
   023334 004737 020034              JSR    PC,FLOAT       ;FLOAT THE PATTERN
   023340 000403              BR     65$            ;PATTERN FLOATED OK, SKIP ERROR DSPATCH
   023342 013737 002436 002444      MOV    TEMP,SRCTMP   ;RESTORE THE OLD DATA PATTERN FOR ERROR LOOP
   023350          65$:
   023350          10000$:
   023350 104405              TRAP   C#ESEG
   023352 005737 002446              TST    MASK           ;IF MASK = 0, WE'RE DONE
   023356 001362              BNE    64$
   023360 004737 020330              JSR    PC,CONSET     ;GET NEXT PATTERN
   023364 005737 002434              TST    PATCNT        ;IF PATTERN COUNT UNDERFLOWED, DONE!
   023370 002355              BGE    64$           ;NOT DONE YET, GO-ON

```

023372	104404		TRAP	C#BSEG	
023374	004737	020202	JSR	PC,COMPAR	;WRITE THE NEXT PATTERN
023400	002352		PATT4		;WHICH IS PATTERN #4
023402			10001#:		
023402	104405		TRAP	C#ESEG	
023404	104404		TRAP	C#BSEG	
023406	104404		TRAP	C#BSEG	
023410	004737	020202	JSR	PC,COMPAR	;DO ANOTHER DATA COMPARISON
023414	002350		PATT3		;USING PATTERN #3
023416			10003#:		
023416	104405		TRAP	C#ESEG	
023420	004737	017572	JSR	PC,LDZERO	;WRITE RPDB TO 0 TO CLEAR IT!
023424			10002#:		
023424	104405		TRAP	C#ESEG	
43 023426	005337	002402	DEC	ITCOUN	;ONE LESS ITERATION TO-GO
44 023432	003331		BGT	1#	;KEEP GOING UNTIL <= 0!
45 023434	005037	002460	CLR	ILOCK	;CLEAR THE POLLED MODE OF OPERATION
46 023440			L10026:		
023440	104401		TRAP	C#ETST	


```

1      .SBTTL TEST 09 RPDB READ WRITE TEST #2
2
3      ;* TEST 09 RPDB READ WRITE TEST #2
4      ;* : FOR 2 ITERATIONS DO
5      ;* : : IF RPCS2: IR <> 1
6      ;* : : : THEN
7      ;* : : : POLL BIT UNTIL IT SETS
8      ;* : : : ELSE
9      ;* : : : WRITE RPDB WITH PATTERN #5
10     ;* : : : ENDF
11     ;* : : : END DO
12     ;* : : FOR 2 ITERATIONS DO
13     ;* : : : IF RPCS2: OR <> 1
14     ;* : : : : THEN
15     ;* : : : : POLL BIT UNTIL IT SETS
16     ;* : : : : ELSE
17     ;* : : : : READ RPDB
18     ;* : : : : ENDF
19     ;* : : : : IF RPDB <> PATTERN #5
20     ;* : : : : : THEN
21     ;* : : : : : OUTPUT ERROR MESSAGE (BITS RECEIVED DON'T MATCH EXPECTED DATA)
22     ;* : : : : : ENDF
23     ;* : : : : : END DO
24     ;* : : : : : END TEST 09
25
26 023442 T9:: MOV #PATT5,EXPTED ;GET THE TESTING DATA PATTERN
27 023442 012737 002354 002454 CLR ERRWD1 ;CREATE THE MODULE CALLOUT
28 023450 005037 002404 MOV #BIT1,ERRWD2 ;FOR THIS TEST
29 023454 012737 000002 002406 MOV #10.,ITCOUN ;LOAD THE ITERATION COUNT
30 023462 012737 000012 002402
31 023470 1# : TRAP C#BSEG
32 023472 012703 000001 MOV #1,R3 ;SET UP TO DO TWO WRITE OPERATIONS
33 023476 004737 017672 JSR PC,IRLOCK ;WAIT FOR IR TO SET!
34 023502 013777 002454 157024 MOV EXPTED,@RPDB ;NOW LOAD RPDB ONCE
35 023510 005303 DEC R3 ;ONE LESS ITERATION TO GO
36 023512 002371 BGE 2# ;IF NOT MINUS, LOAD RPDB AGAIN!
37 023514 012703 000001 MOV #1,R3 ;NOW SET-UP TO DO TWO READ OPERATIONS
38 023520 004737 017706 JSR PC,ORLOCK ;WAIT FOR OR TO SET
39 023524 023777 002454 157002 CMP EXPTED,@RPDB ;DOES THE DATA MATCH?
40 023532 001414 BEQ 4# ;IF EQUAL, YES IT'S OK
41 023534 013737 002534 002456 MOV RPDB,TESTRG ;GET THE FAILING REGISTER
42 023542 017737 156766 002452 MOV @RPDB,RCVED ;NOW GET THE FAILING DATA
43 023550 104456 TRAP C#ERHRD
44 023552 000020 .WORD 16
45 023554 012454 .WORD EM14
46 023556 014172 .WORD ERRO
47 023560 005037 002402 CLR ITCOUN ;RESET FURTHER ITERATONS
48 023564 005303 4# : DEC R3 ;ONE LESS ITERATION TO-DO
49 023566 002354 BGE 3# ;IF NOT MINUS, DO-AGAIN
50 023570 104405 10000# : TRAP C#ESEG
51 023572 005337 002402 DEC ITCOUN ;ONE LESS ITERATION TO GO
52 023576 003334 BGT 1# ;KEEP GOING UNTIL <= 0
53 023600 L10027: TRAP C#ETST
54 023600 104401

```

```

1      .SBTTL TEST 10 RPDB READ WRITE TEST #3
2
3      ;* TEST 10 RPDB READ WRITE TEST #3
4      ;* : FOR 8 ITERATIONS DO
5      ;* : : IF RRPCS2: IR <> 1
6      ;* : : THEN
7      ;* : : : POLL BIT UNTIL IT SETS
8      ;* : : : ELSE
9      ;* : : : WRITE RPDB WITH A DATA PATTERN (SEQUENTIALLY USING PATTERNS 1 THRU 8)
10     ;* : : : ENDF
11     ;* : : : END DO
12     ;* : : : FOR 8 ITERATIONS DO
13     ;* : : : : IF RPCS2: OR <> 1
14     ;* : : : : THEN
15     ;* : : : : : POLL BIT UNTIL IT SETS
16     ;* : : : : : FLSE
17     ;* : : : : : READ RPDB
18     ;* : : : : : ENDF
19     ;* : : : : : IF RPDB DOESN'T MATCH EXPECTED DATA
20     ;* : : : : : THEN
21     ;* : : : : : : OUTPUT ERROR MESSAGE (BITS RECEIVED DON'T MATCH EXPECTED DATA)
22     ;* : : : : : : ENDF
23     ;* : : : : : : END DO
24     ;* : : : : : : END TEST 10
25

```

```

26 023602      110:: MOV      RPDB,TESTRG      ;GET THE ADDRESS OF THE REGISTER UNDER TEST
27 023602 013737 002534 002456 CLR      ERRWD1          ;MODULE CALLOUT, THIS TEST
28 023610 005037 002404          MOV      #BIT1,ERRWD2    ;ONLY THE CONTROLLER
29 023614 012737 000002 002406 MOV      #10.,ITCOUN     ;LOAD THE ITERATION COUNT
30 023622 012737 000012 002402
31 023630      1#: TRAP      C#BSEG
32 023630 104404          MOV      #1,R4          ;OVERALL LOOP COUNTER
33 023632 012704 000001          MOV      #PATT1,R2      ;INPUT POINTER
34 023642      2#: TRAP      C#BSEG
35 023642 104404          MOV      R2,-(SP)        ;SAVE THE INPUT START ADDRESS
36 023644 010246          MOV      #8.,R3         ;SET UP TO WRITE 8 TIMES
37 023646 012703 000010          JSR      PC,IRLOCK      ;POLL IR AND WAIT FOR IT
38 023652 004737 017672          MOV      (R2)+,@RPDB    ;LOAD THE BUFFER
39 023656 012277 156652          DEC      R3            ;REDUCE THE # OF ITERATIONS
40 023662 005303          BNE     3#            ;AND CONTINUE
41 023664 001372          MOV      (SP)+,R2      ;RESTORE THE ORIGINAL POINTER
42 023666 012602          MOV      #8.,R3         ;AND THE ITERATION COUNTERS
43 023670 012703 000010          JSR      PC,ORLOCK      ;POLL OR AND WAIT FOR IT
44 023674 004737 017706          CMP     (R2)+,@RPDB    ;DOES THE DATA MATCH
45 023700 022277 156630          BEQ     5#            ;IF IT DOES, SKIP ERROR DISPATCH
46 023704 001414          MOV      @RPDB,RCVED    ;GET THE BAD DATA
47 023706 017737 156622 002452 MOV      -2(R2),EXPTED  ;AND THE EXPECTED DATA
48 023714 016237 177776 002454 TRAP     C#ERHRD
49 023722 104456          .WORD   17
50 023724 000021          .WORD   EM14
51 023726 012454          .WORD   ERRO
52 023730 014172          CLR     ITCOUN         ;RESET FURTHER ITERATIONS
49 023732 005037 002402          DEC     R3            ;ONE LESS ITERATION TO GO
50 023736 005303          BNE     4#            ;NOT FINISHED, CHECK NEXT PATTERN
51 023740 001355
52 023742      10001#:

```

B9

```

023742 104405          TRAP  C#ESEG
53 023744 005704      TST   R4          ;DONE?
54 023746 001404      BEQ   6#          ;IF 0, YES
55 023750 012702 002346  MOV   @PATT2,R2   ;GET NEXT PATTERN
56 023754 005004      CLR   R4          ;AND INDICATE 2ND HALF OF TEST
57 023756 000731      BR    2#          ;NOW DO IT!
58 023760
   023760
   023760 104405          TRAP  C#ESEG
59 023762 005337 002402  DEC   ITCOUN      ;ONE LESS ITERATION TO GO
60 023766 003320      BGT   1#          ;KEEP GOING UNTIL <= 0
61 023770
   023770 104401          TRAP  C#ETST

```

6#:
10000#:

L10030:

```

1      .SBTTL TEST 11 MOPE, SC & TRE TEST (RH70 TEST)
2
3      ;# TEST 11 MOPE, SC & TRE TEST (RH70 TEST)
4      ;# SET RPCS2: CLR = 1
5      ;# LOAD THE UNIT-UNDER-TEST # INTO RPCS2
6      ;# SET RPCS2: PAT = 1
7      ;# IF RPCS2: IR <> 1
8      ;# : THEN
9      ;# : WAIT UNTIL RPCS2: : IR = 1
10     ;# : ELSE
11     ;# : WRITE RPDB ONCE, WITH PATTERN #3
12     ;# : ENDF
13     ;# : IF RPCS2: MOPE <> 1
14     ;# : THEN
15     ;# : OUTPUT ERROR MESSAGE (MOPE DIDN'T SET WHEN EXPECTED)
16     ;# : ELSE
17     ;# : IF (RPCS1: SC & RPCS1: TRE <> 1)
18     ;# : THEN
19     ;# : OUTPUT ERROR MESSAGE (FAILED TO DETECT RPCS1: SC OR TRE)
20     ;# : ENDF
21     ;# : ENDF
22     ;# END TEST 11
23
24 023772 T11::
25 023772 005737 002504 TST RHTYPE ;WHICH CONTROLLER TYPE?
26 023776 003002 BGT 1# ;IF > 0, RH70...
27 024000 104432 TRAP C#EXIT
    024002 000146 .WORD L10031-.
28 024004 005037 002404 1# CLR ERRWD1 ;CREATE THE MODULE CALLOUT
29 024010 012737 000002 002406 MOV #BIT1,ERRWD2 ;FOR THIS TEST
30 024016 012737 000012 002402 MOV #10.,ITCOUN ;LOAD THE ITERATION COUNT
31 024024 2#
    024024 104404 TRAP C#BSEG
32 024026 052777 000040 156466 BIS #CLR,#RPCS2 ;START OUT WITHOUT ERRORS!
33 024034 013777 002506 156460 MOV DRVNO,#RPCS2 ;LOAD THE DRIVE NUMBER
34 024042 052777 000020 156452 BIS #PAT,#RPCS2 ;NOW INVERT PARITY
35 024050 004737 017672 JSR PC,IRLOCK ;WAIT FOR IR TO SET!
36 024054 013777 002350 156452 MOV PATT3,#RPDB ;WRITE THIS DATA
37 024062 032777 000400 156432 BIT #MOPE,#RPCS2 ;DID WE FORCE A MASSBUS PARITY ERROR?
38 024070 001005 BNE 3# ;IF SET, YES!!
39 024072 004737 017372 JSR PC,BISEXP ;FORM THE REPORT DATA
40 024076 002522 RPCS2 ;THIS REGISTER
41 024100 000400 MOPE ;THIS BIT FAILED TO SET
42 024102 000410 BR 4# ;NOW TAKE THE CALL!
43 024104 032777 140000 156400 3# BIT #SC!TRE,#RPCS1 ;DID WE GET TRANSFER ERROR AND SPECIAL CONDITION?
44 024112 001012 BNE 5# ;YES, TEST PASSES!
45 024114 004737 017372 JSR PC,BISEXP ;GET THE FAILING DATA
46 024120 002512 RPCS1 ;THIS REGISTER
47 024122 140000 SC!TRE ;THESE BITS FAILED TO SET!
48 024124 4#
    024124 104456 TRAP C#ERMRD
    024126 000022 .WORD 18
    024130 013441 .WORD EM33
    024132 014172 .WORD ERRO
49 024134 005037 002402 CLR ITCOUN ;NO FURTHER ITERATIONS
50 024140 5#
    024140 10000#
  
```

D9

024140 104405
51 024142 005337 002402
52 024146 003326
53 024150
024150 104401

TRAP C#ESEG
DEC ITCOUN
BGT 2#
L10031:
TRAP C#ETST

;ONE LESS ITERATION TO GO
;KEEP GOING IF NOT <= 0!

```

1          .SBTTL TEST 12 RPCS3 READ/WRITE TEST
2
3          ;# TEST 09 (RH70 TEST ONLY) RPCS3 READ WRITE TEST
4          ;# : WRITE RPCS3 WITH DATA PATTERNS 1..4, ONE AT A TIME
5          ;# : BITS TO TEST = 0..3, 6
6          ;# : IF RPCS3 BIT(S) UNDER TEST DIDN'T SET
7          ;# : : THEN
8          ;# : : OUTPUT ERROR MESSAGE (BIT(S) DIDN'T SET)
9          ;# : : ELSE
10         ;# : : SET RPCS2: CLR = 1
11         ;# : : ENDF
12         ;# : IF RPCS3 BIT(S) UNDER TEST DIDN'T CLEAR
13         ;# : : THEN
14         ;# : : OUTPUT ERROR MESSAGE (BIT(S) UNDER TEST DIDN'T CLEAR)
15         ;# : : ENDF
16         ;# : END TEST 12
17
18 024152   T12::
19 024152   005737 002504   TST      RHTYPE      ;IF RHTYPE=+1 CONTROLLER IS AN RH70
20 024156   003002          BGT      1#
21 024160   104432          TRAP    C#EXIT
22 024162   000150          .WORD  L10032-.
23 024164   005037 002404   1# : CLR      ERRWD1    ;MODULE CALLOUT
24 024170   012737 000002 002406   MOV     #BIT1,ERRWD2 ;FOR THIS TEST
25 024176   012737 000012 002402   MOV     #10.,ITCOUN ;SET UP THE ITERATION COUNTER
26 024204   012700 000340   2# :          ;SET PRIORITY TO 7
27 024210   104441          MOV     #PRI07,R0
28 024212   004737 017744   TRAP   C#SPRI
29 024216   004232          JSR    PC,SETUP    ;LOAD I/O POINTERS
30 024220   013737 002444 002436   64# : TST11
31 024226   104404          MOV     SRCTMP,TEMP ;FROM THIS TABLE
32 024230   004737 020034          TRAP   C#BSEG      ;SET UP FOR POSSIBLE LOOP
33 024234   000403          JSR    PC,FLOAT    ;FLOAT THE PATTERN
34 024236   013737 002436 002444   BR     65#         ;PATTERN FLOATED OK, SKIP ERROR DSPATCH
35 024244          65# :          ;RESTORE THE OLD DATA PATTERN FOR ERROR LOOP
36 024244          10000# :
37 024244   104405          TRAP   C#ESEG
38 024246   005737 002446          TST    MASK
39 024252   001362          BNE    64#         ;IF MASK = 0, WE'RE DONE
40 024254   004737 020330          JSR    PC,CONSET   ;GET NEXT PATTERN
41 024260   005737 002434          TST    PATCNT
42 024264   002355          BGE    64#         ;IF PATTERN COUNT UNDERFLOWED, DONE!
43 024266   104404          TRAP   C#BSEG
44 024270   004737 020202          JSR    PC,COMPAR   ;WRITE THE NEXT PATTERN
45 024274   002352          PATT4  ;WHICH IS PATTERN #4
46 024276          10001# :
47 024276   104405          TRAP   C#ESEG
48 024300   104404          TRAP   C#BSEG
49 024302   104404          TRAP   C#BSEG
50 024304   004737 020202          JSR    PC,COMPAR   ;DO ANOTHER DATA COMPARISON
51 024310   002350          PATT3  ;USING PATTERN #3
52 024312          10003# :
53 024312   104405          TRAP   C#ESEG
54 024314   004737 017474          JSR    PC,RESET    ;RESET THE DEVICE
55 024320   002564          RPCS3  ;CLEAR RPCS3 BY SETTING MASSBUS CLEAR
56 024322          10002# :

```

024322 104405
28 024324 005337 002402
29 024330 003325
30 024332
024332 104401

L10032:

TRAP C#ESEG
DEC ITCOUN
BGT 2#
TRAP C#ETST

;ONE LESS ITERATION TO GO
;KEEP GOING IF NOT <= 0!

```

1          .SBTTL TEST 13 RPBAE READ/WRITE TEST
2
3          ;# TEST 13 (RH70 TEST ONLY) RPBAE READ-WRITE TEST
4          ;# : WRITE RPBAE WITH DATA PATTERNS 1..4, ONE AT A TIME
5          ;# : BITS TO TEST = 0..5
6          ;# : IF RPBAE BIT(S) UNDER TEST DIDN'T MATCH EXPECTED DATA
7          ;# : : THEN
8          ;# : : OUTPUT ERROR MESSAGE (BIT(S) DIDN'T SET)
9          ;# : : ELSE
10         ;# : : SET RPCS2: CLR = 1
11         ;# : : ENDF
12         ;# : IF RPBAE BIT(S) UNDER TEST DIDN'T CLEAR
13         ;# : : THEN
14         ;# : : OUTPUT ERROR MESSAGE (BIT(S) UNDER TEST DIDN'T CLEAR)
15         ;# : : ENDF
16         ;# END TEST 13
17
18 024334   T13::
19 024334   005737   002504   TST      RHTYPE      ;TEST CONTROLLER TYPE
20 024340   003002           BGT 1$      ;IF > 0, IT IS AN RH70
21 024342   104432           TRAP     C$EXIT
22 024344   000142           .WORD   L10033-
23 024346   005037   002404   1$: CLR     ERRWD1    ;MODULE CALLOUT
24 024352   012737   000002   002406   MOV     #BIT1,ERRWD2 ;FOR THIS TEST
25 024360   012737   000012   002402   MOV     #10.,ITCOUN ;LOAD THE ITERATION COUNTER
26 024366           004737   017744           JSR     PC,SETUP    ;LOAD I/O POINTERS
27 024372           004244           TST12           ;FROM THIS TABLE
28 024374   013737   002444   002436   64$: MOV     SRCTMP,TEMP ;SET UP FOR POSSIBLE LOOP
29 024402   104404           TRAP     C$BSEG
30 024404   004737   020034           JSR     PC,FLOAT    ;FLOAT THE PATTERN
31 024410   000403           BR      65$        ;PATTERN FLOATED OK, SKIP ERROR DSPATCH
32 024412   013737   002436   002444   MOV     TEMP,SRCTMP ;RESTORE THE OLD DATA PATTERN FOR ERROR LOOP
33 024420           004737   017744           JSR     PC,SETUP
34 024420           004244           TST12
35 024420   104405           TRAP     C$ESEG
36 024422   005737   002446   TST     MASK        ;IF MASK = 0, WE'RE DONE
37 024426   001362           BNE     64$
38 024430   004737   020330           JSR     PC,CONSET   ;GET NEXT PATTERN
39 024434   005737   002434   TST     PATCNT      ;IF PATTERN COUNT UNDERFLOWED, DONE!
40 024440   002355           BGE     64$        ;NOT DONE YET, GO-ON
41 024442   104404           TRAP     C$BSEG
42 024444   004737   020202           JSR     PC,COMPAR   ;WRITE THE NEXT PATTERN
43 024450   002352           JSR     PC,COMPAR   ;WHICH IS PATTERN #4
44 024452           10001$: TRAP     C$ESEG
45 024452   104405           TRAP     C$ESEG
46 024454   104404           TRAP     C$BSEG
47 024456   104404           TRAP     C$BSEG
48 024460   004737   020202           JSR     PC,COMPAR   ;DO ANOTHER DATA COMPARISON
49 024464   002350           JSR     PC,COMPAR   ;USING PATTERN #3
50 024466           10003$: TRAP     C$ESEG
51 024466   104405           TRAP     C$ESEG
52 024470   004737   017474           JSR     PC,RESET    ;RESET THE DEVICE
53 024474   002562           RPBAE           ;CLEAR RPBAE BY SETTING MASSBUS CLEAR
54 024476           10002$: TRAP     C$ESEG
55 024476   104405           TRAP     C$ESEG
56 024500   005337   002402   DEC     ITCOUN      ;ONE LESS ITERATION

```


H9

CZRJMB0 RP07 FE/HOST ISOLATOR MACRO V04.00 1-DEC 83 10:39:09 PAGE 48-1
TEST 13 RPBAE READ/WRITE TEST

SEQ 0111

27 024504 003330
28 024506
024506 104401

L10033: BGT 2#
TRAP C#ETST

;IF NOT <= 0, KEEP GOING

```

1          .SBTTL TEST 14 RPBAE DUPLICATED A16 TEST
2
3          ;# TEST 14 (RH70 TEST ONLY) RPBAE DUPLICATED A16 TEST
4          ;# : WRITE RPCS1: A16 (BIT 08) = 1
5          ;# : IF RPCS1: A16 <> 1
6          ;# : : THEN
7          ;# : : OUTPUT ERROR MESSAGE (BIT DIDN'T SET AS EXPECTED)
8          ;# : : ELSE
9          ;# : : IF RPCS1: A17 = 1
10         ;# : : : THEN
11         ;# : : : OUTPUT ERROR MESSAGE (BIT SET WHEN NOT EXPECTED)
12         ;# : : : ENDF
13         ;# : : IF RPBAE: BIT 0 <> 1
14         ;# : : : THEN OUTPUT ERROR MESSAGE (BIT STUCK AT 0)
15         ;# : : : ELSE
16         ;# : : : SET RPCS2: CLR = 1
17         ;# : : : ENDF
18         ;# : ENDF
19         ;# : IF ((RPCS1: A16) AND (RPBAE: BIT 0)) <> 0
20         ;# : : THEN OUTPUT ERROR MESSAGE (BIT(S) STUCK AT 1)
21         ;# : ENDF
22         ;# END TEST 14
23
24 024510          T14::
25 024510 012737 000002 002406      MOV    #BIT1,ERRWD2 ;MODULE CALLOUT, THIS TEST
26 024516 005037 002404              CLR    ERRWD1       ;NO RP07 BOARDS
27 024522 012737 000012 002402      MOV    #10.,ITCOUN ;LOAD THE ITERATION COUNTER
28 024530          1# :
29 024530 104404              TRAP   C#BSEG
30 024532 012777 000400 155752      MOV    #A16,RPSC1  ;SET RPCS1:A16=1
31 024540 032777 000400 155744      BIT    #A16,RPSC1  ;TEST RPCS1:A16
32 024546 001012              BNE    2#          ;IF =2, GO ON
33 024550 004737 017372              JSR    PC,BISEXP   ;LOAD FAILING DATA
34 024554 002512              RPCS1 ;FAILING REGISTER
35 024556 000400              A16   ;BIT UNDER TEST
36 024560 104456              TRAP   C#ERHRD
37 024562 000022              .WORD 18
38 024564 012776              .WORD EM22
39 024566 014172              .WORD ERRO
40 024570 005037 002402              CLR    ITCOUN     ;NO FURTHER ITERATIONS
41 024574 032777 001000 155710 2# : BIT #A17,RPSC1 ;DID A17 ALSO SET?
42 024602 001412              BEQ    3#          ;IF ZERO, IT'S OK!
43 024604 004737 017422              JSR    PC,BICEXP   ;LOAD THE OFFENDING BIT
44 024610 002512              RPCS1 ;FOR THIS REGISTER
45 024612 001000              A17   ;THIS BIT!
46 024614 104456              TRAP   C#ERHRD
47 024616 000023              .WORD 19
48 024620 012454              .WORD EM14
49 024622 014172              .WORD ERRO
50 024624 005037 002402              CLR    ITCOUN     ;ITERATIONS = 0
51 024630          3# :
52 024630 10000# :
53 024632 104405              TRAP   C#ESEG
54 024634 104404              TRAP   C#BSEG
55 024636 005737 002504              TST    RHTYPE     ;TEST CONTROLLER TYPE
56 024638 003002              BGT    4#          ;IF > 0, IT IS AN RH70
57 024640 104432              TRAP   C#EXIT

```

```

024644 000036 .WORD 10001$ .
50 024646 032777 000001 155706 4$: BIT @BIT0,@RPBAE ;TEST RPBA4:BIT0.(PARALLELS RPCS1=A16)
51 024654 001012 BNE 5$ ;IF SET, GO ON
52 024656 004737 017372 JSR PC,BISEXP ;LOAD FAILING DATA
53 024662 002562 RPBAE ;FAILING REGISTER
54 024664 000001 BITO ;BIT UNDER TEST
55 024666 104456 TRAP C$ERHRD
024670 000024 .WORD 20
024672 012776 .WORD EM22
024674 014172 .WORD ERRO
56 024676 005037 002402 CLR ITCOUN ;ITERATION COUNT = 0
57 024702 5$:
58 024702 10001$:
024702 104405 TRAP C$ESEG
59 024704 104404 TRAP C$BSEG
60 024706 052777 000040 155606 BIS @CLR,@RPCS2 ;CLEAR OUT THE DEVICE
61 024714 032777 000400 155570 BIT @A16,@RPCS1 ;TEST RPCS1:A16
62 024722 001412 BEQ 6$ ;IF ZERO, GO ON
63 024724 004737 017422 JSR PC,BICEXP ;LOAD FAILING DATA
64 024730 002512 RPCS1 ;FAILING REGISTER
65 024732 000400 A16 ;BIT UNDER TEST
66 024734 104456 TRAP C$ERHRD
024736 000025 .WORD 21
024740 013051 .WORD EM23
024742 014172 .WORD ERRO
67 024744 005037 002402 CLR ITCOUN ;NO FURTHER ITERATIONS
68 024750 6$:
69 024750 10002$:
024750 104405 TRAP C$ESEG
70 024752 104404 TRAP C$BSEG
71 024754 005737 002504 TST RHTYPE ;TEST CONTROLLER TYPE
72 024760 003002 BGT 7$ ;IF > 0, IT IS AN RH70
73 024762 104432 TRAP C$EXIT
024764 000036 .WORD 10003$-.
74 024766 032777 000001 155566 7$: BIT @BIT0,@RPBAE ;TEST RPBAE:BIT0
75 024774 001412 BEQ 8$ ;IF 0, GO ON
76 024776 004737 017422 JSR PC,BICEXP ;LOAD FAILING DATA
77 025002 002562 RPBAE ;FAILING REGISTER
78 025004 000001 BITO ;BIT UNDER TEST
79 025006 104456 TRAP C$ERHRD
025010 000026 .WORD 22
025012 013051 .WORD EM23
025014 014172 .WORD ERRO
80 025016 005037 002402 CLR ITCOUN ;RESET THE ITERATION COUNTER
81 025022 8$:
82 025022 10003$:
025022 104405 TRAP C$ESEG
83 025024 005337 002402 DEC ITCOUN ;ONE LESS ITERATION TO GO
84 025030 003237 BGT 1$ ;DO UNTIL <= 0
85 025032 L10034: TRAP C$ETST
025032 104401

```

```

1      .SBTTL TEST 15 RPBAE DUPLICATED A17 TEST
2
3      ;# TEST 15 (RH70 TEST ONLY) RPBAE DUPLICATED A17 TEST
4      ;# : WRITE RPCS1: A17 (BIT 09) = 1
5      ;# : IF RPCS1: A17 <> 1
6      ;# : : THEN
7      ;# : : OUTPUT ERROR MESSAGE (BIT FAILED TO SET)
8      ;# : : ELSE
9      ;# : : IF RPCS1: A16 = 1
10     ;# : : : THEN
11     ;# : : : OUTPUT ERROR MESSAGE (BIT SET WHEN NOT EXPECTED)
12     ;# : : : ENDF
13     ;# : : IF RPBAE: BI101 DIDN'T SET
14     ;# : : : THEN
15     ;# : : : OUTPUT ERROR MESSAGE (BIT FAILED TO SET)
16     ;# : : : ELSE
17     ;# : : : SET RPCS2: CLR = 1
18     ;# : : : ENDF
19     ;# : : IF ((RPCS1: A17) AND (RPBAE: BIT01)) <> 0
20     ;# : : : THEN
21     ;# : : : OUTPUT ERROR MESSAGE (BIT(S) DIDN'T CLEAR)
22     ;# : : : ENDF
23     ;# : ENDF
24     ;# END TEST 15
25

```

```

26 025034      T15::      CLR      ERRWD1      ;MODULE CALLOUT FOR THIS TEST
27 025034 005037 002404      MOV      #BIT1,ERRWD2 ;CONTROLLER ONLY
28 025040 012737 000002 002406      MOV      #10.,ITCOUN ;LOAD THE ITERATION COUNT
29 025046 012737 000012 002402
30 025054      1# :      TRAP      C#BSEG
31 025056 012777 001000 155426      MOV      #A17,RPSC1 ;SET RPCS1:A17=1
32 025064 032777 001000 155420      BIT      #A17,RPSC1 ;TEST RPCS1:A17
33 025072 001012      BNE      2# ;IF =2, OK
34 025074 004737 017372      JSR      PC,BISEXP ;LOAD FAILING DATA
35 025100 002512      RPCS1 ;FAILING REGISTER
36 025102 001000      A17 ;BIT UNDER TEST
37 025104 104456      TRAP      C#ERHRD
38 025114 005037 002402      .WORD    23
39 025120 032777 000400 155364 2# :      .WORD    EM22
40 025126 001412      .WORD    ERRO
41 025130 004737 017422      CLR      ITCOUN ;NO ITERATIONS
42 025134 002512      BIT      #A16,RPSC1 ;DID A16 ALSO SET?
43 025136 000400      BEQ      3# ;IF ZERO, NO-IT'S OK!
44 025140 104456      JSR      PC,BICEXP ;LOAD THE FAILING DATA
45 025150 005037 002402      RPCS1 ;THIS REGISTER
46 025154      A16 ;THIS BIT FAILED TO REMAIN CLEAR!
47 025154      TRAP      C#ERHRD
48 025156 104405      .WORD    24
49 025160 005737 002504      .WORD    EM14
      .WORD    ERRO
      CLR      ITCOUN ;ITERATIONS = 0
      3# :
      10000# :
      TRAP      C#ESEG
      TRAP      C#BSEG
      TST      RHTYPE ;TEST CONTROLLER TYPE

```

L9

50	025164	003002			BGT	4#		;IF > 0, = RH70
51	025166	104432			TRAP	C#EXIT		
	025170	000036			.WORD	10001#-		
52	025172	032777	000002	155362	4#:	BIT	#BIT1,#RPBAE	;TEST RPBAE:BIT1
53	025200	001012			BNE	5#		;IF =1, OK
54	025202	004737	017372		JSR	PC,BISEXP		;LOAD FAILING DATA
55	025206	002562			RPBAE			;FAILING REGISTER
56	025210	000002			BIT1			;BIT UNDER TEST
57	025212	104456			TRAP	C#ERHRD		
	025214	000031			.WORD	25		
	025216	012776			.WORD	EM22		
	025220	014172			.WORD	ERRO		
58	025222	005037	002402		CLR	ITCOUN		;ITERATIONS = 0
59	025226				5#:			
60	025226				10001#:			
	025226	104405			TRAP	C#ESEG		
61	025230	104404			TRAP	C#BSEG		
62	025232	052777	000040	155262	BIS	#CLR,#RPCS2		;SET RPCS2:CLR=1
63	025240	032777	001000	155244	BIT	#A17,#RPCS1		;TEST RPCS1:A17
64	025246	001412			BEQ	6#		;IF 0, OK
65	025250	004737	017422		JSR	PC,BICEXP		;LOAD FAILING DATA
66	025254	002512			RPCS1			;FAILING REGISTER
67	025256	001000			A17			;BIT UNDER TEST
68	025260	104456			TRAP	C#ERHRD		
	025262	000032			.WORD	26		
	025264	013051			.WORD	EM23		
	025266	014172			.WORD	ERRO		
69	025270	005037	002402		CLR	ITCOUN		;ITERATIONS = 0
70	025274				6#:			
71	025274				10002#:			
	025274	104405			TRAP	C#ESEG		
72	025276	104404			TRAP	C#BSEG		
73	025300	005737	002504		TST	RHTYPE		;TEST CONTROLLER TYPE
74	025304	003002			BGT	7#		;IF =+1, IS RH70
75	025306	104432			TRAP	C#EXIT		
	025310	000036			.WORD	10003#-		
76	025312	032777	000002	155242	7#:	BIT	#BIT1,#RPBAE	;TEST RPBAE:BIT1
77	025320	001412			BEQ	8#		;IF =0, OK
78	025322	004737	017422		JSR	PC,BICEXP		;LOAD FAILING DATA
79	025326	002562			RPBAE			;FAILING REGISTER
80	025330	001000			A17			;BIT UNDER TEST
81	025332	104456			TRAP	C#ERHRD		
	025334	000033			.WORD	27		
	025336	013051			.WORD	EM23		
	025340	014172			.WORD	ERRO		
82	025342	005037	002402		CLR	ITCOUN		;ITERATIONS = 0
83	025346				8#:			
84	025346				10003#:			
	025346	104405			TRAP	C#ESEG		
85	025350	005337	002402		DEC	ITCOUN		;ONE LESS ITERATION
86	025354	003237			BGT	1#		;IF NOT <= 0, KEEP GOING
87	025356				L10035:			
	025356	104401			TRAP	C#ETST		

```

1      .SBTTL TEST 16 INTERRUPT ENABLE - BIT TEST
2
3      ;* TEST 16 INTERRUPT ENABLE BIT SET-CLEAR TEST
4      ;* : SET PROCESSOR PRIORITY - 7 (LOCK OUT ALL INTERRUPTS)
5      ;* : SET RPCS1: IE (BIT 06) = 1
6      ;* : IF RPCS1: IE <> 1
7      ;* : : THEN
8      ;* : : OUTPUT ERROR MESSAGE (BIT DIDN'T SET)
9      ;* : : ELSE
10     ;* : : SET RPCS2: CLR = 1
11     ;* : ENDF
12     ;* : IF RPCS1: IE <> 0
13     ;* : : THEN
14     ;* : : OUTPUT ERROR MESSAGE (BIT DIDN'T CLEAR)
15     ;* : ENDF
16     ;* END TEST 16
17
18     025360      T16:
19     025360      005037 002404      CLR      ERRWD1      ;MODULE CALLOUT
20     025364      012737 000002 002406      MOV      #BIT1,ERRWD2 ;FOR THIS TEST
21     025372      012737 000012 002402      MOV      #10,,ITCOUN ;LOAD THE ITERATION COUNT
22     025400      1# :
23     025400      012700 000340      MOV      #PRI07,R0   ;SET PRIORITY TO 7
24     025404      104441      TRAP     C#SPRI
25     025406      104404      TRAP     C#BSEG
26     025410      052777 000100 155074      BIS      #IE,#RPCS1  ;WRITE RPCS1:INTERRUPT ENABLE=1
27     025416      032777 000100 155066      BIT      #IE,#RPCS1  ;TEST RPCS1:IE
28     025424      001012      BNE      2#          ;IF 2, GO ON
29     025426      004737 017372      JSR      PC,BISEXP   ;LOAD FAILING DATA
30     025432      002512      RPCS1    ;FAILING REGISTER
31     025434      000100      IE      ;BIT UNDER TEST
32     025436      104456      TRAP     C#ERHRD
33     025440      000034      .WORD   28
34     025442      012776      .WORD   EM22
35     025444      014172      .WORD   ERRO
36     025446      005037 002402      CLR      ITCOUN      ;ITERATIONS = 0
37     025452      2# :
38     025452      104405      10000# :
39     025454      104404      TRAP     C#ESEG
40     025456      052777 000040 155036      TRAP     C#BSEG
41     025464      032777 000100 155020      BIS      #CLR,#RPCS2 ;SET RPCS2:CLR=1
42     025472      001412      BIT      #IE,#RPCS1  ;TEST RPCS1:IE
43     025474      004737 017422      BEQ      3#          ;IF 0, TEST PASSES
44     025500      002512      JSR      PC,BICEXP   ;LOAD FAILING DATA
45     025502      000100      RPCS1    ;FAILING REGISTER
46     025504      104456      IE      ;BIT UNDER TEST
47     025506      000035      TRAP     C#ERHRD
48     025510      013051      .WORD   29
49     025512      014172      .WORD   EM23
50     025514      005037 002402      .WORD   ERRO
51     025520      CLR      ITCOUN      ;RESET FURTHER ITERATIONS
52     025520      3# :
53     025520      10001# :
54     025522      104405      TRAP     C#ESEG
55     025526      005337 002402      DEC      ITCOUN      ;ONE LESS ITERATION TO-GO
56     025530      003324      BGT      1#          ;IF NOT <= 0, WE'RE NOT DONE
57     025530      012700 000000      MOV      #0,R0

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N9

025534	104441		TRAP	C\$SPRI
49 025536		L10036:		
025536	104401		TRAP	C\$ETST

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1          .SBTTL TEST 17 RH70 DUPLICATE INTERRUPT ENABLE TEST
2
3          ;# TEST 17 (RH70 TEST ONLY) RPCS3 DUPLICATE INTERRUPT ENABLE TEST
4          ;# : SET PROCESSOR PRIORITY = 7
5          ;# : SET RPCS1: IE (BIT 06) = 1
6          ;# : IF RPCS3: IE (BIT 06) <> 1
7          ;# : : THEN
8          ;# : : OUTPUT ERROR MESSAGE
9          ;# : : ELSE SET RPCS2: CLR = 1
10         ;# : ENDF
11         ;# : IF ((RPCS1: IE) AND (RPCS3: IE)) <> 0
12         ;# : : THEN
13         ;# : : OUTPUT ERROR MESSAGE (BIT(S) DIDN'T CLEAR)
14         ;# : ENDF
15         ;# END TEST 17
16
17 025540 T17::
18 025540 005737 002504 TST RMTYPE ;CAN WE DO THIS TEST
19 025544 003002 BGT 1# ;IF RH TYPE =.1, CONTROLLER IS RH70
20 025546 104432 TRAP C#EXIT
    025550 000160 .WORD L10037-.
21 025552 005037 002404 1# : CLR ERRWD1 ;MODULE CALLOUT
22 025556 012737 000002 002406 MOV #BIT1,ERRWD2 ;FOR THIS TEST
23 025564 012737 000012 002402 MOV #10.,ITCOUN ;LOAD THE ITERATION COUNT
24 025572 025572 104404 2# : TRAP C#BSEG
25 ;SET PRIORITY TO 7
26 025574 012700 000340 MOV #PRI07,R0
    025600 104441 TRAP C#SPRI
27 025602 012777 000100 154702 MOV #IE,#RPCS1 ;SET RPCS1:IE=1
28 025610 032777 000100 154746 BIT #IE,#RPCS3 ;TEST RPCS3:IE
29 025616 001012 BNE 3# ;IF SET, GO ON
30 025620 004737 017372 JSR PC,BISEXP ;LOAD FAILING DATA
31 025624 002564 RPCS3 ;FAILING REGISTER
32 025626 000100 IE ;BIT UNDER TEST
33 025630 104456 TRAP C#ERHRD
    025632 000036 .WORD 30
    025634 012776 .WORD EM22
    025636 014172 .WORD ERRO
34 025640 005037 002402 CLR ITCOUN ;NO ITERATIONS NECESSARY
35 025644 3# :
36 025644 10000# : TRAP C#ESEG
    025644 104404 TRAP C#BSEG
37 025646 104404
38 025650 052777 000040 154644 BIS #CLR,#RPCS2 ;CLEAR OUT THE DEVICE
39 025656 032777 000100 154700 BIT #IE,#RPCS3 ;TEST RPCS3:IE
40 025664 001412 BEQ 4# ;IF CLEAR, TEST PASSES
41 025666 004737 017422 JSR PC,BICEXP ;LOAD FAILING DATA
42 025672 002564 RPCS3 ;FAILING REGISTER
43 025674 000100 IE ;BIT UNDER TEST
44 025676 104456 TRAP C#ERHRD
    025700 000037 .WORD 31
    025702 013051 .WORD EM23
    025704 014172 .WORD ERRO
45 025706 005037 002402 CLR ITCOUN ;NO ITERATIONS
46 025712 4# :
47 025712 10001# :
    
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	025712	104405	
48	025714	005337	002402
49	025720	003324	
50	025722	012700	000000
	025726	104441	
51	025730		
	025730	104401	

	TRAP	C#ESEG
	DEC	ITCOUN
	BGT	2#
	MOV	#0,RO
	TRAP	C#SPRI
L10037:	TRAP	C#ETST

ONE LESS ITERATION TO GO
>0 ?? DO AGAIN!!

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1      .SBTTI  TEST 18 IPCKO TEST
2
3      ;#      TEST 18 (RM70 TEST ONLY) MOPE TEST 1
4      ;#      : SET RPCS3: IPCKO (BIT 0) = 1
5      ;#      : IF RPCS3: IPCKO <> 1
6      ;#      : : THEN
7      ;#      : : OUTPUT ERROR MESSAGE (BIT DIDN'T SET)
8      ;#      : : ELSE
9      ;#      : : IF RPCS2: IR <> 1
10     ;#      : : : THEN
11     ;#      : : : WAIT
12     ;#      : : : ENDF
13     ;#      : : WRITE DATA TO RPDB
14     ;#      : ENDF
15     ;#      : IF ((RPCS1: TRE) AND (RPCS1: SC) AND (RPCS2: MCPE)) <> 1
16     ;#      : : THEN
17     ;#      : : OUTPUT ERROR MESSAGE (SHOULD HAVE DETECTED A PARITY ERROR)
18     ;#      : : ELSE
19     ;#      : : SET RPCS2: CLR = 1
20     ;#      : : IF ((RPCS2: MCPE) OR (RPCS1: SC) OR (RPCS1: TRE)) = 1
21     ;#      : : : THEN
22     ;#      : : : OUTPUT ERROR MESSAGE (ERROR STATUS DIDN'T CLEAR)
23     ;#      : : : ENDF
24     ;#      : ENDF
25     ;#      : ENDF
26     ;#      END TEST 18
27
28     025732      T18::
29     025732      005737 002504      TST      RHTYPE      ;IS THE CONTROLLER AN RM70?
        025736      003002      BGT      64#      ;IF > 0, YES.
        025740      104432      TRAP     C#EXIT
        025742      000264      .WORD   L10040-.
        025744      005037 002404      64# : CLR      ERRWD1      ;SET THE MODULE CALLOUT
        025750      012737 000002 002406      MOV      #BIT1,ERRWD2 ;FOR THIS TEST
        025756      012737 000012 002402      MOV      #10.,ITCOUN ;LOAD THE ITERATION COUNT
        025764
        025764      104404      66# : TRAP     C#BSEG
        025766      052777 000001 154570      BIS      #BIT0,#RPCS3 ;SET THE BIT0-UNDER-TEST
        025774      032777 000001 154562      BIT      #BIT0,#RPCS3 ;DID BIT0 SET IN RPCS3?
        026002      001012      BNE      65#      ;YES, SKIP ERROR DISPATCH
        026004      004737 017372      JSR      PC,BISEXP ;LOAD FAILING DATA
        026010      002564      RPCS3    ;FAILING REGISTER
        026012      000001      BIT0     ;BIT UNDER TEST
        026014      104456      TRAP     C#ERHRD
        026016      000040      .WORD   32
        026020      012776      .WORD   EM22
        026022      014172      .WORD   ERRO
        026024      005037 002402      CLR      ITCOUN      ;RESET FURTHER ITERATIONS
        026030
        026030      10000# : 65# : TRAP     C#ESEG
        026032      104404      TRAP     C#BSEG
        026034      004737 017672      JSR      PC,IRLOCK ;POLL INPUT READY IN RPCS2
        026040      005077 154470      CLR      #RPDB      ;WRITE RPDB WITH 0'S
        026044      004737 017706      JSR      PC,ORLOCK ;NOW WAIT FOR OUTPUT READY IN RPCS2
        026050      005777 154460      TST      #RPDB      ;NOW DO A ONE WORD READ OF RPDB
        026054      004737 017000      JSR      PC,WAIT    ;WAIT FOR THE RP07 MICROPROCESSOR
    
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026060	032777	140000	154424		BIT	#SC!TRE,#RPCS1	;LOOK FOR SC AND TRE
026066	001012				BNE	67#	;THEY BOTH SET, GO-ON
026070	004737	017372			JSR	PC,BISEXP	;LOAD FAILING DATA
026074	002512				RPCS1		;FAILING REGISTER
026076	140000				SC!TRE		;BIT UNDER TEST
026100	104456				TRAP	C!ERHRD	
026102	000041				.WORD	33	
026104	012776				.WORD	EM22	
026106	014172				.WORD	ERRO	
026110	005037	002402			CLR	ITCOUN	;RESET FURTHER ITERATIONS
026114	032777	000400	154400	67#:	BIT	#MDPE,#RPCS2	;DID WE DETECT PARITY ERROR?
026122	001012				BNE	68#	;YES, GO-ON
026124	004737	017372			JSR	PC,BISEXP	;LOAD FAILING DATA
026130	002522				RPCS2		;FAILING REGISTER
026132	000400				MDPE		;BIT UNDER TEST
026134	104456				TRAP	C!ERHRD	
026136	000042				.WORD	34	
026140	012776				.WORD	EM22	
026142	014172				.WORD	ERRO	
026144	005037	002402			CLR	ITCOUN	;RESET FURTHER ITERATIONS
026150	052777	000040	154344	68#: 10001#:	BIS	#CLR,#RPCS2	;CLEAR OUT THE DEVICE!
026156	104405				TRAP	C!ESEG	
026160	104404				TRAP	C!BSEG	
026162	032777	000001	154374		BIT	#BITO,#RPCS3	;NOW CHECK TO SEE THAT #BITO DID CLEAR
026170	001412				BEQ	69#	;= 0, TEST OK!!
026172	004737	017422			JSR	PC,BICEXP	;LOAD FAILING DATA
026176	002564				RPCS3		;FAILING REGISTER
026200	000001				BITO		;BIT UNDER TEST
026202	104456				TRAP	C!ERHRD	
026204	000043				.WORD	35	
026206	013051				.WORD	EM23	
026210	000000				.WORD	0	
026212	005037	002402			CLR	ITCOUN	;RESET FURTHER ITERATIONS
026216				69#: 10002#:			
026216	104405				TRAP	C!ESEG	
026220	005337	002402			DEC	ITCOUN	;ONE LESS ITERATION TO-GO
026224	003257				BGT	66#	;TAKE BRANCH IF NOT DONE
30 026226				L10040:			
026226	104401				TRAP	C!ETST	

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1      .SBTTL TEST 19 IPCK1 TEST
2
3      ;# TEST 19 (RH70 TEST ONLY) MOPE TEST 2
4      ;# : SET RPCS3: BIT 01 (IPCK1) = 1
5      ;# : IF RPCS3: IPCK1 <> 1
6      ;# : : THEN
7      ;# : : OUTPUT ERRCR MESSAGE (BIT DIDN'T SET)
8      ;# : : ELSE
9      ;# : : IF RPCS2: IR <> 1
10     ;# : : : THEN
11     ;# : : : WAIT FOR RPCS2: IR TO SET
12     ;# : : : ENDF
13     ;# : : WRITE RPDB ONCE
14     ;# : ENDF
15     ;# : IF ((RPCS1: TRE) AND (RPCS1: SC) AND (RPCS2: MOPE)) <> 1
16     ;# : : : THEN
17     ;# : : : OUTPUT ERROR MESSAGE (UNDETECTED PARITY ERROR)
18     ;# : : : ELSE
19     ;# : : : SET RPCS2: CLR = 1
20     ;# : : : IF ((RPCS1: TRE) OR (RPCS1: SC) OR (RPCS2: MOPE)) = 1
21     ;# : : : : THEN
22     ;# : : : : OUTPUT ERROR MESSAGE (ERROR STATUS FAILED TO CLEAR)
23     ;# : : : : ENDF
24     ;# : : ENDF
25     ;# END TEST 19

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26
27 026230 T19::
28 026230 005737 002504 TST RHTYPE ;IS THE CONTROLLER AN RH70?
026234 003002 BGT 64# ;IF > 0, YES,
026236 104432 TRAP C#EXIT
026240 000264 .WORD L10041-.
026242 005037 002404 64#: CLR ERRWD1 ;SET THE MODULE CALLOUT
026246 012737 000002 002406 MOV #BIT1,ERRWD2 ;FOR THIS TEST
026254 012737 000012 002402 MOV #10.,ITCOUN ;LOAD THE ITERATION COUNT
026262
026262 104404 66#: TRAP C#BSEG
026264 052777 000002 154272 BIS #BIT1,RPSC3 ;SET THE BIT1-UNDER-TEST
026272 032777 000002 154264 BIT #BIT1,RPSC3 ;DID BIT1 SET IN RPSC3?
026300 001012 BNE 65# ;YES, SKIP ERROR DISPATCH
026302 004737 017372 JSR PC,BISEXP ;LOAD FAILING DATA
026306 002564 RPSC3 ;FAILING REGISTER
026310 000001 BIT0 ;BIT UNDER TEST
026312 104456 TRAP C#ERHRD
026314 000044 .WORD 36
026316 012776 .WORD EM22
026320 014172 .WORD ERRO
026322 005037 002402 CLR ITCOUN ;RESET FURTHER ITERATIONS
026326
026326 10000#: TRAP C#ESEG
026330 104404 TRAP C#BSEG
026332 004737 017672 JSR PC,IRLOCK ;POLL INPUT READY IN RPSC2
026336 005077 154172 CLR BRPDB ;WRITE RPDB WITH 0'S
026342 004737 017706 JSR PC,ORLOCK ;NOW WAIT FOR OUTPUT READY IN RPSC2
026346 005777 154162 TST BRPDB ;NOW DO A ONE WORD READ OF RPDB
026352 004737 017000 JSR PC,WAIT ;WAIT FOR THE RP07 MICROPROCESSOR
026356 032777 140000 154126 BIT #SC:TRE,RPSC1 ;LOOK FOR SC AND TRE

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026364	001012			BNE	67#		;THEY BOTH SET, GO-ON
026366	004737	017372		JSR	PC,BISEXP		;LOAD FAILING DATA
026372	002512			RPCS1			;FAILING REGISTER
026374	140000			SC!TRE			;BIT UNDER TEST
026376	104456			TRAP	C#ERHRD		
026400	000045			.WORD	37		
026402	012776			.WORD	EM22		
026404	014172			.WORD	ERRO		
026406	005037	002402		CLR	ITCOUN		;RESET FURTHER ITERATIONS
026412	032777	000400	154102	BIT	#MOPE,@RPCS2		;DID WE DETECT PARITY ERROR?
026420	001012			BNE	68#		;YES, GO-ON
026422	004737	017372		JSR	PC,BISEXP		;LOAD FAILING DATA
026426	002522			RPCS2			;FAILING REGISTER
026430	000400			MOPE			;BIT UNDER TEST
026432	104456			TRAP	C#ERHRD		
026434	000046			.WORD	38		
026436	012776			.WORD	EM22		
026440	014172			.WORD	ERRO		
026442	005037	002402		CLR	ITCOUN		;RESET FURTHER ITERATIONS
026446	052777	000040	154046	BIS	#CLR,@RPCS2		;CLEAR OUT THE DEVICE!
026454							
026454	104405						
026456	104404			TRAP	C#ESEG		
026460	032777	000002	154076	TRAP	C#BSEG		
026466	001412			BIT	#BIT1,@RPCS3		;NOW CHECK TO SEE THAT #BIT1 DID CLEAR
026470	004737	017422		BEQ	69#		;= 0, TEST OK!!
026474	002564			JSR	PC,BICEXP		;LOAD FAILING DATA
026476	000001			RPCS3			;FAILING REGISTER
026500	104456			BIT0			;BIT UNDER TEST
026502	000047			TRAP	C#ERHRD		
026504	013051			.WORD	39		
026506	000000			.WORD	EM23		
026510	005037	002402		.WORD	0		
026514				CLR	ITCOUN		;RESET FURTHER ITERATIONS
026514							
026514	104405						
026516	005337	002402		TRAP	C#ESEG		;ONE LESS ITERATION TO-GO
026522	003257			DEC	ITCOUN		;TAKE BRANCH IF NOT DONE
29 026524				BGT	66#		
026524	104401						
				L10041:			
				TRAP	C#ETST		

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1      .SBTTL TEST 20 IPCK2 TEST
2
3      ;# TEST 20 (RH70 TEST ONLY) MDPE TEST 3
4      ;# : SET RPCS3: IPCK2 (BIT2) = 1
5      ;# : IF RPCS3: IPCK2 <> 1
6      ;# : : THEN
7      ;# : : OUTPUT ERROR MESSAGE (BIT DIDN'T SET)
8      ;# : : ELSE
9      ;# : : IF RPCS2: IR <> 1
10     ;# : : : THEN
11     ;# : : : WAIT FOR RPCS2: IR TO SET
12     ;# : : : ENDF
13     ;# : WRITE DATA TO RPD8
14     ;# : ENDF
15     ;# : IF ((RPCS1: TRE) AND RPCS1: SC) AND (RPCS2: MCPE)) <> 1
16     ;# : : THEN
17     ;# : : OUTPUT ERROR MESSAGE (UNDETECTED PARITY ERROR)
18     ;# : : ELSE
19     ;# : : SET RPCS2: CLR = 1
20     ;# : : IF ((RPCS1: SC) OR (RPCS1: TRE) OR (RPCS2: MCPE)) = 1
21     ;# : : : THEN
22     ;# : : : OUTPUT ERROR MESSAGE (ERROR STATUS FAILED TO CLEAR)
23     ;# : : : ENDF
24     ;# : ENDF
25     ;# END TEST 20
26
27     T20::
28     026526 005737 002504 TST RHTYPE ;IS THE CONTROLLER AN RH70?
29     026532 003002 BGT 64# ;IF > 0, YES,
30     026534 104432 TRAP C#EXIT
31     026536 000304 .WORD L10042-.
32     026540 005037 002404 64# CLR ERRWD1 ;SET THE MODULE CALLOUT
33     026544 012737 000002 002406 MOV #BIT1,ERRWD2 ;FOR THIS TEST
34     026552 012737 000012 002402 MOV #10.,ITCOUN ;LOAD THE ITERATION COUNT
35     026560
36     026560 104404 TRAP C#BSEG
37     026562 052777 000004 153774 BIS #BIT2,@RPCS3 ;SET THE BIT2-UNDER-TEST
38     026570 032777 000004 153766 BIT #BIT2,@RPCS3 ;DID BIT2 SET IN RPCS3?
39     026576 001012 BNE 65# ;YES, SKIP ERROR DISPATCH
40     026600 004737 017372 JSR PC,BISEXP ;LOAD FAILING DATA
41     026604 002564 RPCS3 ;FAILING REGISTER
42     026606 000001 BIT0 ;BIT UNDER TEST
43     026610 104456 TRAP C#ERHRD
44     026612 000050 .WORD 40
45     026614 012776 .WORD EM22
46     026616 014172 .WORD ERRO
47     026620 005037 002402 CLR ITCOUN ;RESET FURTHER ITERATIONS
48     026624
49     026624 10000# 65# 10000#
50     026624 104405 TRAP C#ESEG
51     026626 104404 TRAP C#BSEG
52     026630 004737 017672 JSR PC,IRLOCK ;POLL INPUT READY IN RPCS2
53     026634 005077 153674 CLR @RPD8 ;WRITE RPD8 WITH 0'S
54     026640 004737 017672 JSR PC,IRLOCK ;WAIT FOR IR TO SET AGAIN
55     026644 005077 153664 CLR @RPD8 ;WRITE RPD8 = 0, AGAIN
56     026650 004737 017706 JSR PC,ORLOCK ;NOW WAIT FOR OUTPUT READY IN RPCS2
57     026654 005777 153654 TST @RPD8 ;NOW DO A ONE WORD READ OF RPD8
    
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026660	004737	017706			JSR	PC,ORLOCK	;WAIT FOR OUTPUT READY TO SET IN RPCS2 AGAIN!
026664	005777	153644			TST	BRPDB	;DO A SECOND READ OF RPDB
026670	004737	017000			JSR	PC,WAIT	;WAIT FOR THE RP07 MICROPROCESSOR
026674	032777	140000	153610		BIT	#SC!TRE, BRPCS1	;LOOK FOR SC AND TRE
026702	001012				BNE	67#	;THEY BOTH SET, GO-ON
026704	004737	017372			JSR	PC,BISEXP	;LOAD FAILING DATA
026710	002512				RPCS1		;FAILING REGISTER
026712	140000				SC!TRE		;BIT UNDER TEST
026714	104456				TRAP	C#ERHRD	
026716	000051				.WORD	41	
026720	012776				.WORD	EM22	
026722	014172				.WORD	ERRO	
026724	005037	002402			CLR	ITCOUN	;RESET FURTHER ITERATIONS
026730	032777	000400	153564	67#:	BIT	#MOPE, BRPCS2	;DID WE DETECT PARITY ERROR?
026736	001012				BNE	68#	;YES, GO-ON
026740	004737	017372			JSR	PC,BISEXP	;LOAD FAILING DATA
026744	002522				RPCS2		;FAILING REGISTER
026746	000400				MOPE		;BIT UNDER TEST
026750	104456				TRAP	C#ERHRD	
026752	000052				.WORD	42	
026754	012776				.WORD	EM22	
026756	014172				.WORD	ERRO	
026760	005037	002402			CLR	ITCOUN	;RESET FURTHER ITERATIONS
026764	052777	000040	153530	68#:	BIS	#CLR, BRPCS2	;CLEAR OUT THE DEVICE!
026772				10001#:			
026772	104405				TRAP	C#ESEG	
026774	104404				TRAP	C#BSEG	
026776	032777	000004	153560		BIT	#BIT2, BRPCS3	;NOW CHECK TO SEE THAT #BIT2 DID CLEAR
027004	001412				BEQ	69#	;= 0, TEST OK!!
027006	004737	017422			JSR	PC,BICEXP	;LOAD FAILING DATA
027012	002564				RPCS3		;FAILING REGISTER
027014	000001				BIT0		;BIT UNDER TEST
027016	104456				TRAP	C#ERHRD	
027020	000053				.WORD	43	
027022	013051				.WORD	EM23	
027024	000000				.WORD	0	
027026	005037	002402			CLR	ITCOUN	;RESET FURTHER ITERATIONS
027032				69#:			
027032				10002#:			
027032	104405				TRAP	C#ESEG	
027034	005337	002402			DEC	ITCOUN	;ONE LESS ITERATION TO-GO
027040	003247				BGT	66#	;TAKE BRANCH IF NOT DONE
29 027042				L10042:			
027042	104401				TRAP	C#ETST	

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.SBTTL TEST 21 IPCK3 TEST

;# TEST 21 (RH70 TEST ONLY) MOPE TEST 4
;# : SET RPCS3: IPCK3 (BIT 03) = 1
;# : IF RPCS3: IPCK3 <> 1
;# : : THEN
;# : : OUTPUT ERROR MESSAGE (BIT FAILED TO SET)
;# : : ELSE
;# : : IF RPCS2: IR <> 1
;# : : : THEN
;# : : : WAIT FOR RPCS2: IR TO SET
;# : : : ENDF
;# : : ELSE
;# : : WRITE DATA TO RPDB
;# : : WAIT FOR RPCS2: IR TO SET AGAIN (USING A TIMER)
;# : : WRITE RPDB WITH DATA AGAIN
;# : ENDF
;# : IF ((RPCS1: SC) AND (RPCS1: TRE) AND (RPCS2: MCPE)) <> 1
;# : : THEN
;# : : OUTPUT ERROR MESSAGE (UNDETECTED PARITY ERROR)
;# : : ELSE
;# : : SET RPCS2: CLR = 1
;# : : ENDF
;# : IF ((RPCS1: SC) OR (RPCS1: TRE) OR (RPCS2: MCPE)) = 1
;# : : THEN
;# : : OUTPUT ERROR MESSAGE (ERROR STATUS FAILED TO CLEAR)
;# : : ENDF
;# END TEST 21

```

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027044
027044 005737 002504
027050 003002
027052 104432
027054 000304
027056 005037 002404
027062 012737 000002 002406
027070 012737 000012 002402
027076
027076 104404
027100 052777 000010 153456
027106 032777 000010 153450
027114 001012
027116 004737 017372
027122 002564
027124 000001
027126 104456
027130 000054
027132 012776
027134 014172
027136 005037 002402
027142
027142
027142 104405
027144 104404
027146 004737 017672
027152 005077 153356
027156 004737 017672

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T21::
TST RHTYPE ;IS THE CONTROLLER AN RH70?
BGT 64# ;IF > 0, YES.
TRAP C#EXIT
.WORD L10043-.
64#: CLR ERRWD1 ;SET THE MODULE CALLOUT
MOV #BIT1,ERRWD2 ;FOR THIS TEST
MOV #10.,ITCOUN ;LOAD THE ITERATION COUNT

66#: TRAP C#BSEG
BIS #BIT3, RPCS3 ;SET THE BIT3-UNDER-TEST
BIT #BIT3, RPCS3 ;DID BIT3 SET IN RPCS3?
BNE 65# ;YES, SKIP ERROR DISPATCH
JSR PC, BISEXP ;LOAD FAILING DATA
RPCS3 ;FAILING REGISTER
BITO ;BIT UNDER TEST
TRAP C#ERHRD
.WORD 44
.WORD EM22
.WORD ERRO
CLR ITCOUN ;RESET FURTHER ITERATIONS

65#:
10000#: TRAP C#ESEG
TRAP C#BSEG
JSR PC, IRLOCK ;POLL INPUT READY IN RPCS2
CLR #RPDB ;WRITE RPDB WITH 0'S
JSR PC, IRLOCK ;WAIT FOR IR TO SET AGAIN

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027162	005077	153346		CLR	BRPDB	;WRITE RPDB = 0, AGAIN
027166	004737	017706		JSR	PC,ORLOCK	;NOW WAIT FOR OUTPUT READY IN RPCS2
027172	005777	153336		TST	BRPDB	;NOW DO A ONE WORD READ OF RPDB
027176	004737	017706		JSR	PC,ORLOCK	;WAIT FOR OUTPUT READY TO SET IN RPCS2 AGAIN!
027202	005777	153326		TST	BRPDB	;DO A SECOND READ OF RPDB
027206	004737	017000		JSR	PC,WAIT	;WAIT FOR THE RP07 MICROPROCESSOR
027212	032777	140000	153272	BIT	#SC!TRE, BRPCS1	;LOOK FOR SC AND TRE
027220	001012			BNE	67#	;THEY BOTH SET, GO-ON
027222	004737	017372		JSR	PC,BISEXP	;LOAD FAILING DATA
027226	002512			RPCS1		;FAILING REGISTER
027230	140000			SC!TRE		;BIT UNDER TEST
027232	104456			TRAP	C#ERHRD	
027234	000055			.WORD	45	
027236	012776			.WORD	EM22	
027240	014172			.WORD	ERRO	
027242	005037	002402		CLR	ITCOUN	;RESET FURTHER ITERATIONS
027246	032777	000400	153246	BIT	#MDPE, BRPCS2	;DID WE DETECT PARITY ERROR?
027254	001012			BNE	68#	;YES, GO-ON
027256	004737	017372		JSR	PC,BISEXP	;LOAD FAILING DATA
027262	002522			RPCS2		;FAILING REGISTER
027264	000400			MDPE		;BIT UNDER TEST
027266	104456			TRAP	C#ERHRD	
027270	000056			.WORD	46	
027272	012776			.WORD	EM22	
027274	014172			.WORD	ERRO	
027276	005037	002402		CLR	ITCOUN	;RESET FURTHER ITERATIONS
027302	052777	000040	153212	BIS	#CLR, BRPCS2	;CLEAR OUT THE DEVICE!
027310						
027310	104405			TRAP	C#ESEG	
027312	104404			TRAP	C#BSEG	
027314	032777	000010	153242	BIT	#BIT3, BRPCS3	;NOW CHECK TO SEE THAT #BIT3 DID CLEAR
027322	001412			BEQ	69#	;= 0, TEST OK!!
027324	004737	017422		JSR	PC,BICEXP	;LOAD FAILING DATA
027330	002564			RPCS3		;FAILING REGISTER
027332	000001			BIT0		;BIT UNDER TEST
027334	104456			TRAP	C#ERHRD	
027336	000057			.WORD	47	
027340	013051			.WORD	EM23	
027342	000000			.WORD	0	
027344	005037	002402		CLR	ITCOUN	;RESET FURTHER ITERATIONS
027350						
027350						
027350	104405			TRAP	C#ESEG	
027352	005337	002402		DEC	ITCOUN	;ONE LESS ITERATION TO-GO
027356	003247			BGT	66#	;TAKE BRANCH IF NOT DONE
32 027360						
027360	104401			TRAP	C#ETST	

```

1          .SBTTL TEST 22 INTERRUPT TEST #1
2
3          ;# TEST 22 INTERRUPT TEST 1
4          ;# : WRITE RPCS1: RDY (BIT 07) = 1
5          ;# : IF RPCS1: RDY <> 1
6          ;# : : THEN
7          ;# : : OUTPUT ERROR MESSAGE (RPCS1: RDY STUCK AT 0)
8          ;# : ENDF
9          ;# : SET PROCESSOR PRIORITY = 7 DOWNT0 THE DEVICE PRIORITY, ONE LEVEL AT A TIME
10         ;# : SET RPCS1: RDY AND RPCS1: IE = 1
11         ;# : IF INTERRUPT IS RECEIVED
12         ;# : : THEN
13         ;# : : OUTPUT ERROR MESSAGE (RHXX INTERRUPTED TO WRONG PRIORITY)
14         ;# : ENDF
15         ;# END TEST 22
16
17 027362 T22:: CLR ERRWD1 ;CREATE THE MODULE CALLOUT
18 027362 005037 002404 MOV #BIT1,ERRWD2 ;FOR THIS TEST
19 027366 012737 000002 002406 MOV #10.,ITCOUN ;LOAD THE ITERATION COUNT
20 027374 012737 000012 002402
21 027402 1#: TRAP C#BSEG
22 027404 005037 002462 CLR INTFLG ;RESET THE INTERRUPT STATUS FLAG
23 027410 052777 000200 153074 BIS #RDY,#RPCS1 ;SET RDY = 1 IN RPCS1
24 027416 032777 000200 153066 BIT #RDY,#RPCS1 ;IS IT = 1 ?
25 027424 001012 BNE 2# ;YES, SKIP ERROR DISPATCH
26 027426 004737 017372 JSR PC,BISEXP ;LOAD UP THE ERROR POINTERS
27 027432 002512 RPCS1 ;THIS REGISTER
28 027434 000200 RDY ;THIS BIT
29 027436 104456 TRAP C#ERHRD
30 027446 005037 002402 .WORD 48
31 027452 2#: .WORD EM22
32 027454 012746 000340 .WORD ERRO
33 027456 012746 020630 CLR ITCOUN ;RESET THE ITERATION COUNTER
34 027460 013746 002476 10000#: TRAP C#ESEG
35 027464 012746 000003 MOV #PRI07,-(SP)
36 027470 012746 000003 MOV #INTSRV,-(SP)
37 027474 104437 MOV RPVEC,-(SP)
38 027476 062706 000010 MOV #3,-(SP)
39 027502 012702 000340 TRAP C#SVEC
40 027506 104404 ADD #10,SP
41 027510 010200 MOV #PRI07,R2 ;SET THE PRIORITY TO 7
42 027512 104441 3#: TRAP C#BSEG
43 027514 052777 000300 152770 MOV R2,R0
44 027522 012727 000020 TRAP C#SPRI
45 027526 000000 BIS #RDY!IE,#RPCS1 ;FORCE AN INTERRUPT, BUT DON'T HONOR IT!
46 027530 013727 002116 MOV #20,(PC)+
47 027534 000000 .WORD 0
48 027536 005367 177772 MOV L#DLY,(PC)+
49 027542 001375 .WORD 0
50 027544 005367 177756 DEC -6(PC)
51 027550 001367 BNE .-4
52 DEC -22(PC)
53 BNE .-20

```

38	027552	005737	002462		TST	INTFLG			
39	027556	001406			BEQ	4\$;IF INTFLG > 0, WRONG PRIORITY!!
40	027560	104456			TRAP	C\$ERHRD			;IT'S OK IF ZERO!
	027562	000061			.WORD	49			
	027564	013126			.WORD	EM24			
	027566	000000			.WORD	0			
41	027570	005037	002402		CLR	ITCOUN			;NO ITERATIONS NECESSARY
42	027574			4\$:					
	027574			10001\$:					
	027574	104405			TRAP	C\$ESEG			
43	027576	162702	000040		SUB	#40,R2			;REDUCE THE PRIORITY LEVEL
44	027602	020237	002500		CMP	R2,RPVEC+2			;AT THE DEVICE PRIORITY YET?
45	027606	103337			BHIS	3\$;NOT IF HIGHER OR SAME...
46	027610	052777	000040	152704	BIS	#CLR,#RPCS2			;NOW DISARM INTERRUPTS
47	027616	005337	002402		DEC	ITCOUN			;ONE LESS
48	027622	003267			BGT	1\$;DO UNTIL <= 0
49	027624	013700	002476		MOV	RPVEC,R0			
	027630	104436			TRAP	C\$CVEC			
50	027632			L10044:					
	027632	104401			TRAP	C\$ETST			

```

1      .SBTTL TEST 23 INTERRUPT TEST #2
2
3      ;* TEST 23 INTERRUPT TEST 2
4      ;* : WRITE RPCS2: CLR = 1
5      ;* : SET PROCESSOR PRIORITY = 0
6      ;* : IF ((RPCS1: SC) OR (RPDS: ATA)) = 1
7      ;* : : THEN
8      ;* : : OUTPUT ERROR MESSAGE (PERSISTENT ATA OR SC CANNOT PERFORM INTERRUPT TEST)
9      ;* : : EXIT TEST 19
10     ;* : : ENDF
11     ;* : WRITE RPCS1: IE = 1
12     ;* : IF RHXX INTERRUPTS
13     ;* : : THEN
14     ;* : : OUTPUT ERROR MESSAGE (RECEIVED FALSE INTERRUPT)
15     ;* : : ENDF
16     ;* END TEST 23
17
18 027634      T23::
19 027634      012737 016000 002404      MOV      #BIT10:BIT11:BIT12,ERRWD1;J11-J13 CALLOUT
20 027642      012737 000406 002406      MOV      #BIT1:BIT2:BIT8,ERRWD2;CONTROLLER, CABLE, TERMINATOR
21 027650      012737 000012 002402      MOV      #10.,ITCOUN      ;LOAD THE ITERATION COUNT
22 027656
23 027656      104404      1$:      TRAP      C#BSEG
24 027660      005037 002462      CLR      INTFLG      ;RESET THE INTERRUPTS RECEIVED FLAG
25 027664      052777 000040 152630      BIS      #CLR,@RPCS2      ;CLEAR OUT THE CONTROLLER
26 027672      013777 002506 152622      MOV      DRVNO,@RPCS2      ;LOAD THE DRIVE NUMBER
27 027700      032777 160000 152604      BIT      #SC!TRE!MCPE,@RPCS1;DO WE HAVE A SPECIAL CONDITION, MCPE, OR TRANSFER ERROR?
28 027706      001412      BEQ      2$      ;IF ZERO, NO!!
29 027710      004737 017422      JSR      PC,BICEXP      ;LOAD THE ERROR POINTERS
30 027714      002512      RPCS1      ;THIS REGISTER FAILED,
31 027716      160000      SC!TRE!MCPE      ;THIS DATA SHOULD BE CLEAR
32 027720      104456      TRAP      C#ERHRD
33 027722      000062      .WORD    50
34 027724      012562      .WORD    EM16
35 027726      014172      .WORD    ERRO
36 027730      104432      TRAP      C#EXIT
37 027732      000146      .WORD    L10045-.
38 027734
39 027734      2$:
40 027734      10000$:
41 027734      104405      TRAP      C#ESEG
42 027736      012746 000340      MOV      #PRI07,-(SP)
43 027742      012746 020630      MOV      #INTSRV,-(SP)
44 027746      013746 002476      MOV      RPVEC,-(SP)
45 027752      012746 000003      MOV      #3,-(SP)
46 027756      104437      TRAP      C#SVEC
47 027760      062706 000010      ADD      #10,SP
48 027764      104404      TRAP      C#BSEG
49 027766      012700 000000      MOV      #0,RO
50 027772      104441      TRAP      C#SPRI
51 027774      012777 000100 152510      MOV      #IE,@RPCS1      ;ARM THE DEVICE, BUT DON'T EXPECT AN INTERRUPT
52 030002      012727 000020      MOV      #20,(PC)+
53 030006      000000      .WORD    0
54 030010      013727 002116      MOV      L#DLY,(PC)+
55 030014      000000      .WORD    0
56 030016      005367 177772      DEC      -6(PC)
57 030022      001375      BNE      .-4
58 030024      005367 177756      DEC      -22(PC)
    
```

030030	001367			BNE	. 20	
39 030032	005737	002462		TST	INTFLG	; THIS SHOULD = 0, FOR NO INTERRUPTS
40 030036	001406			BEG	38	; IS ZERO, TEST OK!
41 030040	104456			TRAP	C8ERHRD	
030042	000063			.WORD	51	
030044	013167			.WORD	EM25	
030046	014172			.WORD	ERRO	
42 030050	005037	002402		CLR	ITCOUN	; RESET FURTHER ITERATIONS
43 030054			38:			
030054			100018:			
030054	104405			TRAP	C8ESEG	
44 030056	052777	000040	152436	BIS	@CLR, @RPCS2	; DISARM INTERRUPTS
45 030064	005337	002402		DEC	ITCOUN	; ONE LESS ITERATION
46 030070	003272			BGT	18	; IF > 0, DO AGAIN
47 030072	013700	002476		MOV	RPVEC, R0	
030076	104436			TRAP	C8CVEC	
48 030100			L10045:			
030100	104401			TRAP	C8ETST	

```

1          .SBTTL TEST 24 INTERRUPT TEST #3
2
3          ;# TEST 24 INTERRUPT TEST 3
4          ;# : SET RPCS2: CLR = 1
5          ;# : SET ((RPCS1: IE) AND (RPCS1: RDY)) = 1
6          ;# : CLEAR PROCESSOR STATUS
7          ;# : IF INTERRUPT DOESN'T OCCUR
8          ;# : THEN
9          ;# : : OUTPUT ERROR MESSAGE (DEVICE FAILED TO INTERRUPT)
10         ;# : ENDF
11         ;# END TEST 24
12
13 030102  T24::
14 030102 012737 000012 002402 MOV #10,,ITCOUN ;LOAD THE ITERATION COUNTER
15 030110 012746 000340 MOV #PRI07,-(SP)
    030114 012746 020630 MOV #INTSRV,-(SP)
    030120 013746 002476 MOV RPVEC,-(SP)
    030124 012746 000003 MOV #3,-(SP)
    030130 104437 TRAP C#SVEC
    030132 062706 000010 ADD #10,SP
16 030136 1# :
    030136 104404 TRAP C#BSEG
17 030140 005037 002462 CLR INTFLG ;RESET THE INTERRUPTS RECEIVED MARKER
18 030144 052777 000040 152350 BIS #CLR,#RPCS2 ;FLUSH OUT THE CONTROLLER
19 030152 013777 002506 152342 MOV DRVNO,#RPCS2 ;LOAD THE DRIVE NUMBER TO AVOID A TRANSFER ERROR!
20 030160 005737 002500 TST RPVEC+2 ;GET THE DEVICE PRIORITY
21 030164 001002 BNE 2# ;IT'S > ZERO, SET UP TO LOWER THE PROCESSOR STATUS
22 030166 005046 CLR -(SP) ;IT'S AT PRIORITY 0!
23 030170 000404 BR 3# ;GO NOW!
24 030172 013746 002500 2# : MOV RPVEC+2,-(SP) ;GET THE PRIORITY
25 030176 162716 000040 SUB #40,(SP) ;AND LOWER IT
26 030202 3# :
    030202 012600 MOV (SP)+,R0
    030204 104441 TRAP C#SPRI
27 030206 052777 000300 152276 BIS #RDY!IE,#RPCS1 ;FORCE AN INTERRUPT!!
28 030214 012727 000020 MOV #20,(PC)+
    030220 000000 .WORD 0
    030222 013727 002116 MOV L#DLY,(PC)+
    030226 000000 .WORD 0
    030230 005367 177772 DEC -6(PC)
    030234 001375 BNE .-4
    030236 005367 177756 DEC -22(PC)
    030242 001367 BNE .-20
29 030244 005737 002462 TST INTFLG ;IF WE RECEIVED AN INTERRUPT, THIS > 0
30 030250 003006 BGT 4# ;GOT IT, TEST OK!
31 030252 104456 TRAP C#ERHRD
    030254 000064 .WORD 52
    030256 013224 .WORD EM26
    030260 000000 .WORD 0
32 030262 005037 002402 CLR ITCOUN ;NO ITERATIONS NECESSARY
33 030266 4# :
    030266 10000# :
34 030270 104405 000040 152224 TRAP C#ESEG
35 030276 005337 002402 BIS #CLR,#RPCS2 ;NOW REMOVE ALL INTERRUPT STATUS
36 030302 003315 DEC ITCOUN ;ONE LESS ITERATION TO GO
37 030304 013700 002476 BGT 1# ;IF > 0, DO AGAIN
    MOV RPVEC,R0

```

38	030310	104436		TRAP	C#CVEC	
39	030312	012700	000340	MOV	#PRI07,RO	SET PRIORITY TO 7
	030316	104441		TRAP	C#SPRI	
40	030320		L10046:			
	030320	104401		TRAP	C#ETST	

```

1      .SBTTL TEST 25 BASIC DRIVE TEST
2
3      ;# TEST 25 (RP07 REMOTE REGISTER TESTS)-BASIC DRIVE SELECT TEST
4      ;# : CHECK MASSBUS INTERFACE SWITCH TEST LOCATION 'SWTST'
5      ;# : IF 'SWTST' = 0
6      ;# : : THEN EXIT TEST
7      ;# : : ENDF
8      ;# : PRINT MESSAGE ASKING USER TO DISCONNECT THE DRIVE-UNDER-TEST
9      ;# : FROM THE MASSBUS BY USING THE DISABLE SWITCH
10     ;# : THIS TEST CANNOT BE RUN REMOTELY.
11     ;# : SET RPCS2: CLR = 1
12     ;# : LOAD THE DRIVE-UNDER-TEST DEVICE NUMBER INTO RPCS2
13     ;# : IF REGISTER 06 (RPDT) <> 0
14     ;# : : THEN
15     ;# : : OUTPUT ERROR MESSAGE (DUAL RESPONSE FOUND)
16     ;# : : OUTPUT FAULT LIST = ANOTHER DRIVE RESPONDING,
17     ;# : : RHXX, CABLES, DRIVE SELECT, XMITTERS-RECEIVERS FOR DRIVE.
18     ;# : : J11 / J13, TERMINATOR
19     ;# : ENDF
20     ;# END TEST 25
21
22 030322 T25::
23 030322 005737 002332 TST SWTST ;SHOULD WE DO MASSBUS INTERFACE SWITCH TEST ?
24 030326 001002 BNE 1# ;BR IF = 1, YES
28 030330 104432 TRAP C#EXIT
29 030332 000160 .WORD L10047-.
30 030334 104450 1#: TRAP C#MANI
31 030336 103402 BCS 2#
32 030340 104432 TRAP C#EXIT
33 030342 000150 .WORD L10047-.
34 030344 104443 2#: ;TYPE 'PLACE INTERFACE SWITCH A12-S01 IN DOWN POSITION (L)
35 030346 000404 TRAP C#GMAN
36 030350 002464 BR 10000#
37 030352 000120 .WORD UNABLE
38 030354 011607 .WORD T#CODE
39 030356 000001 .WORD MSG13
40 030360 10000#: .WORD 1
41 030360 005737 002464 TST UNABLE ;DID OPERATOR RESPOND YES?
42 030364 003002 BGT 3# ;IF > 0, YES
43 030366 104432 TRAP C#EXIT
44 030370 000122 .WORD L10047-.
45 030372 104404 3#: TRAP C#BSEG
46 030374 013777 002506 152120 MOV DRVNO, RPCS2 ;LOAD THE DRIVE NUMBER
47 030402 005777 152132 TST BRPDT ;LOOK AT THE DRIVE TYPE REGISTER
48 030406 001422 BEQ 4# ;SHOULD BE ALL 0'S
49 030410 013737 002540 002456 MOV RPDT, TESTRG ;FAILING REGISTER
50 030416 017737 152116 002452 MOV BRPDT, RCVED ;FAILING DATA
51 030424 005037 002454 CLR EXPTED ;EXPECTED DATA
52 030430 012737 016000 002404 MOV #BIT10!BIT11!BIT12, ERRWD1 ;MARK J11, J12 & J13 FOR CALLOUT
53 030436 012737 030424 002406 MOV #BIT1!BIT2!BIT4!BIT8, ERRWD2 ;MARK RH, CABLE, TERMINATOR, ANOTHER DRIVE
54 030444 104456 TRAP C#ERHRD
55 030446 000065 .WORD 53
56 030450 012523 .WORD EM15
57 030452 014172 .WORD ERRO

```



```

47 030454          4$:
   030454          10001$:
   030454 104405          TRAP    C$ESEG
48 030456          5$:
?  49 030456 104443          TRAP    C$GMAN
   030460 000404          BR      10002$
   030462 002464          .WORD  UNABLE
   030464 000120          .WORD  T$CODE
   030466 011667          .WORD  MSG14
   030470 100000          .WORD  100000
   030472          10002$:
50 030472 005737 002464          TST    UNABLE
51 030476 002403          BLT    6$
52 030500 004737 017000          JSR    PC, WAIT
53 030504 000764          BR      5$
54
55 030506 005037 002464          6$: CLR    UNABLE
56 030512          L10047:
   030512 104401          TRAP    C$ETST
;TYPE 'PLACE INTERFACE SWITCH A12-S01 IN UP POSITION (L)
;DID OPERATOR RESPOND YES ?
;IF < 0, YES
;SPIN FOR A STALL LOOP
;NOW ASK THE QUESTION AGAIN!
;INITIALIZE THIS

```

```

1          .SBTTL TEST 26 DEMAND AND TRANSFER TEST
2
3          ;# TEST 26 DEMAND AND TRANSFER TEST
4          ;# : LOAD THE DRIVE-UNDER-TEST'S NUMBER INTO RPCS2
5          ;# : READ RPDT REGISTER
6          ;# : IGNORE DATA AND ERRORS
7          ;# : IF REGISTER DOESN'T RESPOND
8          ;# : : THEN
9          ;# : : OUTPUT ERROR MESSAGE (DEMAND AND TRANSFER LOGIC NOT WORKING)
10         ;# : : OUTPUT FAULT LIST: RHXX, CABLES, J11 / J13, REMOTE POSSIBILITY OF
11         ;# : : JOB, CTOD, REGISTER SELECT LINES, DISABLE SWITCH, TERMINATOR.
12         ;# : ENDF
13         ;# END TEST 26
14
15 030514          T26::
16 030514 012737 000012 002402      MOV      #10.,ITCOUN      ;LOAD THE ITERATION COUNT
17 030522          1$:
18 030522 104404          TRAP     C#BSEG
19 030524 013777 002506 151770      MOV      DRVNO,BRPCS2    ;LOAD THE DRIVE NUMBER
20 030532 017737 152002 002452      MOV      BRPDT,RCVED     ;LOOK AT RPDT
21 030544 001022          TST      RCVED           ;IF IT IS > 0, DRIVE IS THERE
22 030546 012737 020042 002454      BNE      2$             ;> 0, OK
23 030554 013737 002540 002456      MOV      #20042,EXPTED   ;CREATE THE CORRECT DRIVE TYPE CONTENTS
24 030562 012737 012200 002404      MOV      RPDT,TESTRG     ;GET THE FAILING REGISTER
25 030570 012737 000416 002406      MOV      #BIT7!BIT10!BIT12,ERRWD1;SET MODULE CALLOUT MASK
26 030576 104456          MOV      #BIT1!BIT2!BIT3!BIT8,ERRWD2;FOR BOTH WORDS
27 030600 000066          TRAP     C#ERHRD
28 030602 012776          .WORD   54
29 030604 014172          .WORD   EM22
30 030606 005037 002402          .WORD   ERRO
31 030612          CLR      ITCOUN      ;RESET THE ITERATION COUNT
32 030612          2$:
33 030612 104405          10000$:
34 030614 005337 002402          TRAP     C#ESEG
35 030620 003340          DEC      ITCOUN        ;ONE LESS ITERATION
36 030622          BGT      1$             ;IF >0, DO AGAIN
37 030622 104401          L10050:
38 030622          TRAP     C#ETST

```

```

1          .SBTTL TEST 27 UNIQUE UNIT UNDER TEST
2
3          ;% TEST 27 UNIQUE UNIT UNDER TEST
4          ;% : WRITE #46 TO RPCS1 FOR THE DRIVE UNDER TEST
5          ;% : WRITE DATA PATTERN #4 TO RPCS1 FOR ALL OTHER DRIVES ON THE BUS
6          ;% : IF RPCS1 FOR THE DRIVE UNDER TEST <> #46
7          ;% : : THEN
8          ;% : : OUTPUT ERROR MESSAGE (DRIVE SELECT LOGIC FAILURE)
9          ;% : : OUTPUT FAULT LIST: RHXX, CABLE, J11/J13, TERMINATOR
10         ;% : ENDF
11         ;% END TEST 27
12
13 030624 T27::
14 030624 012737 000012 002402 MOV #10.,ITCOUN ;LOAD THE ITERATION COUNT
15 030632 104404 1#: TRAP C#BSEG
16 030634 013777 002506 151660 MOV DRVNO,@RPCS2 ;LOAD THE DRIVE UNDER TEST
17 030642 012777 000046 151642 MOV #46,@RPCS1 ;SET SOME COMMAND FUNCTION BITS
18 030650 005002 CLR R2 ;SET UP TO DO ALL DRIVES
19 030652 020237 002506 2#: CMP R2,DRVNO ;DRIVE UNDER TEST?
20 030656 001405 BEQ 3# ;IF SO, WE ALREADY WROTE IT.
21 030660 010277 151636 MOV R2,@RPCS2 ;LOAD THIS DRIVE #
22 030664 013777 002352 151620 MOV PATT4,@RPCS1 ;AND WRITE A PATTERN
23 030672 005202 3#: INC R2 ;NEXT DRIVE
24 030674 020227 000010 CMP R2,#10 ;DONE
25 030700 103764 BLO 2# ;IF <10, NO
26 030702 013777 002506 151612 MOV DRVNO,@RPCS2 ;RELOAD ORIGINAL DRIVE UNDER TEST
27 030710 012737 000046 002454 MOV #46,EXPTED ;CREATE DATA FILE
28 030716 017737 151570 002452 MOV @RPCS1,RCVED ;GET RESULTS
29 030724 012702 000046 MOV #46,R2 ;AND STRIP UNUSED DATA
30 030730 005102 COM R2 ;FOR A POSSIBLE ERROR REPORT
31 030732 040237 002452 BIC R2,RCVED ;DATA SHOULD MATCH NOW
32 030736 023737 002454 002452 CMP EXPTED,RCVED ;DO THE COMPARISON
33 030744 001417 BEQ 4# ;IF EQUAL, IT'S OK
34 030746 013737 002512 002456 MOV RPCS1,TESTRG ;LOG FAILING REGISTER
35 030754 012737 012000 002404 MOV #BIT10!BIT12,ERRWD1 ;FORM MODULE CALL-OUT
36 030762 012737 000406 002406 MOV #BIT1!BIT2!BIT8,ERRWD2 ;BOTH WORDS
37 030770 104456 TRAP C#ERHRD
   030772 000076 .WORD 62
   030774 012454 .WORD EM14
   030776 014172 .WORD ERRO
38 031000 005037 002402 CLR ITCOUN ;ITERATIONS = 0
39 031004 10000#:
   031004 104405 TRAP C#ESEG
40 031006 005337 002402 DEC ITCOUN ;ONE LESS ITERATION
41 031012 003307 BGT 1# ;DO UNTIL <= 0
42 031014 L10051: TRAP C#ETST
   031014 104401

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1          .SBTTL TEST 28  RPDT REGISTER TEST
2
3          ;#   TEST 28 TEST DRIVE TYPE REGISTER
4          ;#   :   SET RPCS2: CLR = 1
5          ;#   :   LOAD DRIVE-UNDER-TEST'S NUMBER INTO RPCS2
6          ;#   :   READ RPDT
7          ;#   :   IF RPDT DOESN'T = ONE OF THE FOLLOWING:  20042, 24042
8          ;#   :   :   THEN
9          ;#   :   :   OUTPUT ERROR MESSAGE (RP07 NOT FOUND, RPDT = (RPDT CONTENTS))
10          ;#   :   :   OUTPUT FAULT LIST:  RHXX, CABLES, J11/J13, J12, CTOD, RS, MASSBUS,
11          ;#   :   :   JOB, TERMINATOR.
12          ;#   :   ENDF
13          ;#   END TEST 28
14
15 031016          T28::
16 031016 012737 000012 002402          MOV      #10.,ITCOUN      ;LOAD THE ITERATION COUNT
17 031024          1#:
18 031024 104404          TRAP     C#BSEG
19 031026 052777 000040 151466          BIS      #CLR,#RPCS2      ;START OUT WITH AN INITIALIZED CONTROLLER
20 031034 053777 002506 151460          BIS      DRVNO,#RPCS2     ;LOAD THE DRIVE #
21 031042 017737 151472 002452          MOV      #RPDT,RCVED      ;GET RPDT AND STORE IT
22 031050 012737 020042 002454          MOV      #20042,EXPTED    ;CREATE EXPECTED DATA
23 031056 032737 004000 002452          BIT      #DRQ, RCVED      ;DUAL PORTED?
24 031064 001403          BEQ      2#               ;NO, IF NOT SET!
25 031066 052737 004000 002454          BIS      #DRQ, EXPTED     ;SET DUAL-PORT
26 031074 023737 002452 002454          2#:  CMP      RCVED, EXPTED ;DOES DATA MATCH?
27 031102 001417          BEQ      3#               ;YES, TEST OK!
28 031104 013737 002540 002456          MOV      RPDT, TESTRG     ;AND LOAD FAILING REGISTER
29 031112 012737 016200 002404          MOV      #BIT7!BIT10!BIT11!BIT12, ERRWD1;CREATE MODULE CALLOUT LIST
30 031120 012737 000406 002406          MOV      #BIT1!BIT2!BIT8, ERRWD2;FOR BOTH MASK WORDS
31 031126 104456          TRAP     C#ERRWD
32 031130 000067          .WORD    55
33 031132 012454          .WORD    EM14
34 031134 014172          .WORD    ERRO
35 031136 005037 002402          CLR      ITCOUN          ;RESET FURTHER ITERATIONS
36 031142          3#:
37 031142 104405          10000#:
38 031144 005337 002402          TRAP     C#ESEG
39 031150 003325          DEC      ITCOUN          ;ONE LESS ITERATION
40 031152          BGT      1#               ;IF >0, DO AGAIN
41 031152 104401          L10052: TRAP     C#ETST

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1          .SBTTL TEST 29  RPDA READ WRITE TEST
2
3          ;#      TEST 29 RPDA READ WRITE TEST
4          ;#      :   WRITE RPDA WITH DATA PATTERNS 1-4, ONE AT A TIME
5          ;#      :   IF RPDA DATA DOESN'T MATCH EXPECTED
6          ;#      :   :   THEN
7          ;#      :   :   OUTPUT ERROR MESSAGE (RPDA BIT(S) UNDER TEST DON'T MATCH EXPECTED)
8          ;#      :   :   OUTPUT FAULT LIST:  RHXX, CABLES, STUCK DATA BITS, J11/J13,
9          ;#      :   :   CTOD STUCK AT 0, J12, J8, TERMINATOR
10         ;#      :   ENDF
11         ;#      :   WRITE RPDA WITH DATA PATTERN #4
12         ;#      :   IF RPDA DOESN'T = 0
13         ;#      :   :   THEN
14         ;#      :   :   OUTPUT ERROR MESSAGE (RPDA BITS STUCK AT 1)
15         ;#      :   :   OUTPUT FAULT LIST:  RHXX, CABLES, STUCK DATA BITS, J11/J13,
16         ;#      :   :   J12, REMOTE POSSIBILITY OF J8, TERMINATOR
17         ;#      :   ENDF
18         ;#      END TEST 29
19
20 031154   T29::
21 031154   012737   000012   002402   MOV      #10.,ITCOUN      ;LOAD THE ITERATION COUNT
22 031162   012737   016200   002404   MOV      #BIT7:BIT10:BIT11:BIT12,ERRWD1;CREATE THE MODULE CALLOUT
23 031170   012737   000406   002406   MOV      #BIT1:BIT2:BIT8,ERRWD2;FOR BOTH MODULES
24 031176   004737   016662           1#::    JSR      PC,SEIZE        ;LOAD THE DRIVE UNDER TEST
25 031202   004737   017744           JSR      PC,SETUP        ;LOAD I/O POINTERS
    031206   004256           TST28          ;FROM THIS TABLE
    031210   013737   002444   002436   64#::   MOV      SRCTMP,TEMP     ;SET UP FOR POSSIBLE LOOP
    031216   104404           TRAP      C#BSEG
    031220   004737   020034           JSR      PC,FLOAT       ;FLOAT THE PATTERN
    031224   000403           BR        65#          ;PATTERN FLOATED OK, SKIP ERROR DSPATCH
    031226   013737   002436   002444   65#::   MOV      TEMP,SRCTMP    ;RESTORE THE OLD DATA PATTERN FOR ERROR LOOP
    031234           10000#::
    031234   104405           TRAP      C#ESEG
    031236   005737   002446           TST      MASK           ;IF MASK = 0, WE'RE DONE
    031242   001362           BNE      64#
    031244   004737   020330           JSR      PC,CONSET      ;GET NEXT PATTERN
    031250   005737   002434           TST      PATCNT        ;IF PATTERN COUNT UNDERFLOWED, DONE!
    031254   002355           BGE      64#          ;NOT DONE YET, GO-ON
    031256   104404           TRAP      C#BSEG
    031260   004737   020202           JSR      PC,COMPAR      ;WRITE THE NEXT PATTERN
    031264   002352           PATT4          ;WHICH IS PATTERN #4
    031266           10001#::
    031266   104405           TRAP      C#ESEG
    031270   104404           TRAP      C#BSEG
    031272   104404           TRAP      C#BSEG
    031274   004737   020202           JSR      PC,COMPAR      ;DO ANOTHER DATA COMPARISON
    031300   002350           PATT3          ;USING PATTERN #3
    031302           10003#::
    031302   104405           TRAP      C#ESEG
    031304   004737   017572           JSR      PC,LDZERO     ;WRITE RPDA TO 0 TO CLEAR IT!
    031310           10002#::
    031310   104405           TRAP      C#ESEG
26 031312   005337   002402           DEC      ITCOUN        ;ONE LESS ITERATON
27 031316   003327           BGT      1#          ;DO UNTIL <= 0!
28 031320           L10053::
    031320   104401           TRAP      C#ETST

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1          .SBTTL TEST 30 PARITY BIT TRANSITION TEST
2
3          ;# TEST 30 PARITY BIT TRANSITION TEST
4          ;# : WRITE RPDA USING DATA PATTERN 4
5          ;# : IF ((TRE) OR (MCPE)) = 1
6          ;# : : THEN
7          ;# : : OUTPUT ERROR MESSAGE (DETECTED FALSE PARITY ERROR)
8          ;# : : OUTPUT FAULT LIST: RHXX, CABLES, J11/J13, J12, J08, TERMINATOR
9          ;# : ENDF
10         ;# : WRITE RPDA USING DATA PATTERN #1, ONCE.
11         ;# : IF ((TRE) OR (MCPE)) = 1
12         ;# : : THEN
13         ;# : : OUTPUT ERROR MESSAGE (DETECTED FALSE PARITY ERROR)
14         ;# : : OUTPUT FAULT LIST: RHXX, CABLES, J11/J13, J12, J08, TERMINATOR
15         ;# : ENDF
16         ;# END TEST 30
17
18 031322   T30::
19 031322   012737 000012 002402   MOV      #10.,ITCOUN      ;LOAD THE ITERATION COUNT
20 031330   1# :
    031330   104404   TRAP     C#BSEG
21 031332   012703 002352   MOV      #PATT4,R3      ;GET THE ZEROS PATTERN
22 031336   012702 000002   MOV      #2,R2          ;DO THE OPERATION TWICE
23 031342   004737 016662   JSR      PC,SEIZE       ;FLUSH ERRORS AND GET THE DRIVE
24 031346   014377 151146   2# : MOV      -(R3), @RPDA ;LOAD THE PATTERN
25 031352   004737 017000   JSR      PC,WAIT        ;WAIT FOR ANY ERRORS TO SET
26 031356   032777 060000 151126   BIT      @TRE!MCPE,@RPCS1;ERRORS?
27 031364   001420   BEQ      3#             ;NOT IF =0, TEST OK!
28 031366   004737 017422   JSR      PC,BICEXP      ;FORM DATA REPORT
29 031372   002512   RPCS1    ;FORM DATA REPORT
30 031374   060000   TRE!MCPE ;THESE BITS FAILED TO BE CLEAR
31 031376   012737 016200 002404   MOV      #BIT7!BIT10!BIT11!BIT12,ERRWD1;FORM MODULE CALLOUT MASK
32 031404   012737 000406 002406   MOV      #BIT1!BIT2!BIT8,ERRWD2;BOTH WORDS
33 031412   104456   TRAP     C#ERHRD
    031414   000070   .WORD   56
    031416   013051   .WORD   EM23
    031420   014172   .WORD   ERRO
34 031422   005037 002402   CLR      ITCOUN        ;RESET THE ITERATON COUNT
35 031426   005743   3# : TST      -(R3)        ;MOVE POINTER BACK
36 031430   005302   DEC      R2            ;DO SECOND TIME
37 031432   003345   BGT      2#            ;IF R2=0, DONE
38 031434   10000# :
    031434   104405   TRAP     C#ESEG
39 031436   005337 002402   DEC      ITCOUN        ;ONE LESS ITERATION
40 031442   003332   BGT      1#            ;IF <= 0, DONE!!
41 031444   L10054 :
    031444   104401   TRAP     C#ETST

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1          .SBTTL TEST 31  FLOATING DATA PARITY TEST
2
3          ;#      TEST 31 FLOATING ONES AND ZEROS PARITY TEST
4          ;#      :   WRITE RPDA USING DATA PATTERNS 1 TO 9, ONE AT A TIME
5          ;#      :   IF RPER1:  PAR = 1 AFTER ANY WRITE OR ANY READ TO RPDA
6          ;#      :   :   THEN
7          ;#      :   :   OUTPUT ERROR MESSAGE (DETECTED FALSE PARITY ERROR)
8          ;#      :   :   OUTPUT FAULT LIST:  RHXX (PARITY NETWORK), DRIVE (PARITY NETWORK), J12, J08.
9          ;#      :   ENDIF
10         ;#      END TEST 31
11
12 031446          T31::      MOV      #10.,ITCOUN      ;LOAD THE ITERATION COUNT
13 031446 012737 000012 002402
14 031454          1$:      TRAP     C#BSEG
15 031456 012702 000011      MOV      #9.,R2          ;DO FOR 9 PATTERNS
16 031462 012703 002344      MOV      #PATT1,R3      ;GET FIRST PATTERN
17 031466 004737 016662      JSR     PC,SEIZE        ;FLUSH ERRORS AND GET THE DRIVE
18 031472 012377 151022      MOV      (R3)+,@RPDA    ;WRITE PATTERN TO RPDA
19 031476 032777 000010 151022 2$:      BIT      @PAR,@RPER1    ;PARITY ERROR?
20 031504 001006          BNE     3$              ;IF =1, YES - IT'S NOT OK
21 031506 005777 151006      TST     @RPDA          ;READ THE REGISTER JUST WRITTEN
22 031512 032777 000010 151006 3$:      BIT      @PAR,@RPER1    ;DID READ CAUSE ERRORS?
23 031520 001420          BEQ     4$              ;IF PAR = 0, NO!
24 031522 004737 017422      JSR     PC,BICEXP      ;FORM DATA REPORT
25 031526 002526          RPER1     ;FAILING REGISTER
26 031530 000010          PAR      ;THIS BIT FAILED TO CLEAR
27 031532 012737 004200 002404  MOV      #BIT7!BIT11,ERRWD1 ;FORM MODULE CALL OUT MASK
28 031540 012737 000002 002406  MOV      #BIT1,ERRWD2    ;BOTH WORDS
29 031546 104456          TRAP     C#ERHRD
30 031550 000071          .WORD   57
31 031552 013051          .WORD   EM23
32 031554 014172          .WORD   ERRO
33 031556 005037 002402      CLR     ITCOUN        ;RESET FURTHER ITERATIONS
34 031562 005302          4$:      DEC     R2          ;REDUCE ITERATIONS
35 031564 003342          BGT     2$              ;>0, DO AGAIN...
36 031566          10000$:      TRAP     C#ESEG
37 031566 104405          DEC     ITCOUN        ;ONE LESS ITERATION
38 031570 005337 002402      BGT     1$              ;IF <= 0, DONE
39 031574 003327          L10055:      TRAP     C#ETST
40 031576 104401
    
```

```

1      .SBTTL TEST 32 REGISTER SELECT TEST #1
2
3      ;# TEST 32 REGISTER SELECT TEST 1
4      ;# : USE DATA PATTERN #7
5      ;# : WRITE REGISTERS: RPCS1, RPDA, RPDC, RPOF, ONE AT A TIME.
6      ;# : READ EACH REGISTER AFTER WRITING IT
7      ;# : IF REGISTER UNDER TEST DOESN'T MATCH TEST DATA
8      ;# : : THEN
9      ;# : : OUTPUT ERROR MESSAGE (BIT(S) FAILED TO SET)
10     ;# : : OUTPUT FAULT LIST: RHXX, CABLES, J11/J13, J12, JOB, TERMINATOR
11     ;# : ENDIF
12     ;# END TEST 32
13
14 031600 T32::
15 031600 013737 002360 002450      MOV      PATT7,MSK      ;CREAT BIT MASK
16 031606 005137 002450              COM      MSK          ;UNUSED BITS = 1
17 031612 012737 016200 002404      MOV      #BIT7!BIT10!BIT11!BIT12,ERRWD1;CREATE THE MODULE CALLOUT
18 031620 012737 000406 002406      MOV      #BIT1!BIT2!BIT8,ERRWD2;FOR BOTH MASKS
19 031626 004737 016662              JSR      PC,SEIZE      ;FLUSH ERRORS AND GET THE DRIVE
20 031632 012737 000012 002402      MOV      #10.,ITCOUN ;LOAD THE ITERATION COUNT
21 031640
22 031640 104404
23 031642 013701 002512
24 031646 010137 002440
25 031652 004737 020202
26 031656 002360
27 031660 020137 002520
28 031664 103003
29 031666 062701 000006
30 031672 000765
31 031674 020137 002544
32 031700 103003
33 031702 062701 000024
34 031706 000757
35 031710 020137 002546
36 031714 001403
37 031716 062701 000002
38 031722 000751
39 031724
40 031724 104405
41 031726 005337 002402
42 031732 003342
43 031734
44 031734 104401

```

```

T32::
MOV      PATT7,MSK      ;CREAT BIT MASK
COM      MSK          ;UNUSED BITS = 1
MOV      #BIT7!BIT10!BIT11!BIT12,ERRWD1;CREATE THE MODULE CALLOUT
MOV      #BIT1!BIT2!BIT8,ERRWD2;FOR BOTH MASKS
JSR      PC,SEIZE      ;FLUSH ERRORS AND GET THE DRIVE
MOV      #10.,ITCOUN ;LOAD THE ITERATION COUNT

1#:
TRAP     C#BSEG
MOV      RPCS1,R1      ;GET THE FIRST ADDRESS
2#:
MOV      R1,SNK        ;LOAD TEST REGISTER POINTER
JSR      PC,COMPAR     ;DO THE COMPARISON
PATT7    ;USING THIS DATA
CMP      R1,RPDA      ;SEE CURRENT REGISTER
BHIS     3#           ;WE ALREADY DID RPCS1 & RPDA!
ADD      #6,R1        ;DO RPDA NEXT
BR       2#           ;GO!
3#:
CMP      R1,RPOF      ;DID WE DO RPOF?
BHIS     4#           ;YES, SKIP NEXT
ADD      #24,R1       ;DO # RPOF NOW
BR       2#           ;GO!
4#:
CMP      R1,RPDC      ;DONE?
BEQ      5#           ;IF EQUAL, YES
ADD      #2, R1       ;DO RPDC NOW!
BR       2#           ;GO
5#:
10000#:
TRAP     C#ESEG
DEC      ITCOUN       ;ONE LESS ITERATION
BGT      1#           ;IF <= 0, DONE!!

L10056:
TRAP     C#ETST

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```

1      .SBTTL TEST 33 REGISTER SELECT TEST #2
2
3      ;* TEST 33 REGISTER SELECT TEST 2
4      ;* : USE DATA PATTERN #7
5      ;* : WRITE REGISTERS: RPCS1, RPDA, RPDC, RPOF, ONE AT A TIME.
6      ;* : WRITE ALL OTHER REGISTERS WITH 0'S
7      ;* : IF WRITING ALL OTHER REGISTERS WITH 0'S CHANGED THE REGISTER UNDER TEST
8      ;* : THEN
9      ;* : : OUTPUT ERROR MESSAGE (REGISTER SELECT LINES CROSSED)
10     ;* : : OUTPUT FAULT LIST: RH11, CABLE, J11/J13, J12, J08, TERMINATOR
11     ;* : ENDF
12     ;* END TEST 33
13
14 031736 T33::
15 031736 012737 016200 002404 MOV #BIT7!BIT10!BIT11!BIT12,ERRWD1;CREATE THE MODULE CALLOUT
16 031744 012737 000406 002406 MOV #BIT1!BIT2!BIT8,ERRWD2;FOR BOTH MASKS
17 031752 013702 002360 MOV PATT7,R2 ;GET THE TEST PATTERN
18 031756 004737 016662 JSR PC,SEIZE ;GET THE DRIVE, FIRST FLUSH ERRORS!
19 031762 012737 000012 002402 MOV #10.,ITCOUN ;LOAD THE ITERATION COUNT
20 031770 1# :
    031770 104404 TRAP C#BSEG
21 031772 012701 004272 MOV #TST33,R1 ;GET FILE OF REGISTERS
22 031776 013137 002440 2# : MOV #R1)+,SNK ;GET THE TEST REGISTER
23 032002 010277 150432 MOV R2,#SNK ;WRITE THE TEST PATTERN TO THE REGISTER
24 032006 023737 002440 002546 CMP SNK,RPDC ;DONE WRITING REGISTERS YET?
25 032014 103770 BLO 2# ;NOT DONE YET, DO MORE
26 032016 012703 000024 MOV #20.,R3 ;GET THE ITERATION COUNT
27 032022 012701 004272 MOV #TST33,R1 ;GET FILE OF REGISTERS AGAIN
28 032026 013704 002512 MOV RPCS1,R4 ;GET START OF REGISTER FILE
29 032032 020471 000000 3# : CMP R4,#R1) ;SHOULD WE CLEAR THIS REGISTER?
30 032036 001411 BEQ 5# ;IF THEY MATCH, NO
31 032040 005024 CLR (R4)+ ;WRITE THIS REGISTER TO A 0
32 032042 020437 002524 CMP R4,RPDS ;DID WE JUST WRITE RPCS2?
33 032046 001002 BNE 4# ;IF <>, NO..
34 032050 004737 016662 JSR PC,SEIZE ;GET THE DRIVE AGAIN!
35 032054 005303 4# : DEC R3 ;REDUCE THE ITERATION COUNT
36 032056 003365 BGT 3# ;DO UNTIL EQUAL TO 0
37 032060 000402 BR 6# ;TAKE THIS BRANCH WHEN DONE..
38 032062 022421 5# : CMP (R4)+,(R1)+ ;POP THE POINTERS
39 032064 000773 BR 4# ;GO ON
40 032066 012701 004272 6# : MOV #TST33,R1 ;GET FILE REGISTERS AGAIN
41 032072 010237 002450 MOV R2,MSK ;GET THE TESTING PATTERN
42 032076 005137 002450 COM MSK ;DON'T CARE BITS EQUAL 1
43 032102 013137 002440 7# : MOV #R1)+,SNK ;GET THE RESULTS
44 032106 004737 020202 JSR PC,COMPAR ;CHECK THE DATA FOR CORRECTNESS
45 032112 002360 PATT7 ;USING THIS DATA PATTERN
46 032114 023737 002440 002546 8# : CMP SNK,RPDC ;DONE YET??
47 032122 103767 BLO 7# ;NOT YET, IF LOWER
48 032124 104405 10000# : TRAP C#ESEG
49 032126 005337 002402 DEC ITCOUN ;ONE LESS ITERATION
50 032132 003316 BGT 1# ;IF <= 0, DONE!!
51 032134 L10057: TRAP C#ETST
    032134 104401
    
```

BIT

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1          .SBTTL TEST 34 RPMR1 DATA TEST
2
3          ;# TEST 34 RPMR1 DATA TEST
4          ;# : USE DATA PATTERNS 1 TO 9, ONE AT A TIME
5          ;# : BITS TO TEST = 0 TO 15
6          ;# : IF RPMR1 DOESN'T MATCH TEST DATA
7          ;# : : THEN
8          ;# : : OUTPUT ERROR MESSAGE (BIT(S) UNDER TEST FAILED TO SET)
9          ;# : : OUTPUT FAULT LIST: JOB
10         ;# : : ELSE
11         ;# : : WRITE RPMR1 = 0
12         ;# : : IF RPMR1 <> 0
13         ;# : : : THEN
14         ;# : : : OUTPUT ERROR MESSAGE (BIT(S) UNDER TEST FAILED TO CLEAR)
15         ;# : : : OUTPUT FAULT LIST: JOB
16         ;# : : : ENDF
17         ;# : ENDF
18         ;# END TEST 34
19
20 032136   T34::
21 032136   012737 000200 002404   MOV    #BIT7,ERRWD1 ;CREATE THE MODULE CALLOUT
22 032144   005037 002406           CLR    ERRWD2       ;FOR BOTH MASKS
23 032150   004737 016662           JSR    PC,SEIZE     ;FLUSH ERRORS AND GET THE DRIVE
24 032154   012737 000012 002402   MOV    #10.,ITCOUN ;LOAD THE ITERATION COUNT
25 032162           004737 017744           JSR    PC,SETUP     ;LOAD I/O POINTERS
    032166   004302           TST34              ;FROM THIS TABLE
    032170   013737 002444 002436 64$:  MOV    SRCTMP,TEMP  ;SET UP FOR POSSIBLE LOOP
    032176   104404           TRAP   C#BSEG
    032200   004737 020034           JSR    PC,FLOAT     ;FLOAT THE PATTERN
    032204   000403           BR     65$
    032206   013737 002436 002444   MOV    TEMP,SRCTMP ;RESTORE THE OLD DATA PATTERN FOR ERROR LOOP
    032214           65$:
    032214           10000$:
    032214   104405           TRAP   C#ESEG
    032216   005737 002446           TST    MASK         ;IF MASK = 0, WE'RE DONE
    032222   001362           BNE   64$
    032224   004737 020330           JSR    PC,CONSET    ;GET NEXT PATTERN
    032230   005737 002434           TST    PATCNT       ;IF PATTERN COUNT UNDERFLOWED, DONE!
    032234   002355           BGE   64$           ;NOT DONE YET, GO-ON
    032236   104404           TRAP   C#BSEG
    032240   004737 020202           JSR    PC,COMPAR    ;WRITE THE NEXT PATTERN
    032244   002352           PATT4              ;WHICH IS PATTERN #4
    032246           10001$:
    032246   104405           TRAP   C#ESEG
    032250   104404           TRAP   C#BSEG
    032252   104404           TRAP   C#BSEG
    032254   004737 020202           JSR    PC,COMPAR    ;DO ANOTHER DATA COMPARISON
    032260   002350           PATT3              ;USING PATTERN #3
    032262           10003$:
    032262   104405           TRAP   C#ESEG
    032264   004737 017572           JSR    PC,LDZERO    ;WRITE RPMR1 TO 0 TO CLEAR IT!
    032270           10002$:
    032270   104405           TRAP   C#ESEG
26 032272   005337 002402           DEC    ITCOUN       ;ONE LESS ITERATION
27 032276   003331           BGT   1$           ;IF <= 0, DONE
28 032300           L10060:
    
```

C12

CZRJMB0 RPO7 FE/MOST ISOLATOR MACRO V04.00 1 DEC 83 10:39:09 PAGE 69 1
TEST 34 RPR1 DATA TEST

SEQ 0145

032300 104401

TRAP C#E15T

```

1          .SBTTL TEST 35 MASSBUS INTIALIZE DRIVE CLEAR TEST
2
3          ;# TEST 35 MASSBUS INITIALIZE/DRIVE CLEAR RPMR1: DMD BIT TEST
4          ;# : SET RPMR1: DMD = 1
5          ;# : SET RPCS2: CLR = 1
6          ;# : IF RPMR1: DMD = 0
7          ;# : THEN
8          ;# : MARK THE EVENT
9          ;# : ENDF
10         ;# : SET RPMR1: DMD = 1 AGAIN
11         ;# : ISSUE DRIVE CLEAR COMMAND
12         ;# : IF RPMR1: DMD = 0
13         ;# : THEN
14         ;# : MARK THIS EVENT
15         ;# : ENDF
16         ;# : IF RPMR1: DMD DIDN'T CLEAR WITH EITHER EVENT
17         ;# : THEN
18         ;# : OUTPUT ERROR MESSAGE (RPMR1: DMD NOT CLEARED BY RPCS2: CLR OR DRIVE CLEAR)
19         ;# : OUTPUT FAULT LIST: J12, JOB.
20         ;# : ENDF
21         ;# : IF RPMR1: DMD IS CLEARED BY DRIVE CLEAR COMMAND, BUT NOT RPCS2: CLR
22         ;# : THEN
23         ;# : OUTPUT ERROR MESSAGE (RPMR1: CLEARED BY DRIVE CLEAR BUT NOT RPCS2: CLR)
24         ;# : OUTPUT FAULT LIST: J12, CABLE, RHXX.
25         ;# : ENDF
26         ;# : IF RPMR1: DMD CLEARED BY RPCS2: CLR BUT NOT DRIVE CLEAR COMMAND
27         ;# : THEN
28         ;# : OUTPUT ERROR MESSAGE (RPMR1: CLEARED BY RPCS2: CLR BUT NOT DRIVE CLEAR COMMA
29         ;# : OUTPUT FAULT LIST: J11, J12.
30         ;# : ENDF
31         ;# END TEST 35
32
33 032302 T35::
34 032302 005037 002466 CLR ERSTAT ;ERROR STATUS=0 FOR START-UP
35 032306 012737 000012 002402 MOV #10.,ITCOUN ;LOAD THE ITERATION COUNT
36 032314 1# :
37 032314 104404 TRAP C#BSEG
38 032316 013777 002506 150176 MOV DRVNO, BRPCS2 ;LOAD THE DRIVE-UNDER-TEST
39 032324 052777 100000 150204 BIS #DMD, BRPMD1 ;SET RPMR1-DMD=1
40 032332 052777 000040 150162 BIS #CLR, BRPCS2 ;TRY TO CLEAR IT USING A CONTROLLER CLR
41 032340 013777 002506 150154 MOV DRVNO, BRPCS2 ;RELOAD THE DRIVE NUMBER
42 032346 032777 100000 150162 BIT #DMD, BRPMD1 ;DID IT CLEAR?
43 032354 001403 BEQ 2# ;YES, SKIP NEXT
44 032356 152737 000377 002466 BISB #377, ERSTAT ;MARK THIS FAILED STATE
45 032364 013777 002506 150130 2# : MOV DRVNO, BRPCS2 ;LOAD THE DRIVE #
46 032372 052777 100000 150136 BIS #DMD, BRPMD1 ;SET RPMR1-DMD=1
47 032400 012777 000011 150104 MOV #DRCLR, BRPCS1 ;ISSURE A DRIVE CLEAR COMMAND
48 032414 001403 BIT #DMD, BRPMD1 ;DID DMD CLEAR?
49 032416 152737 000377 002467 BEQ 3# ;IF 0, YES
50 032424 005737 002466 BISB #377, ERSTAT+1 ;MARK THE FAILED STATE
51 032430 001445 3# : TST ERSTAT ;TEST PASS?
52 032432 012737 004000 002404 BEQ 7# ;IF 0 YES
53 032440 022737 000377 002466 MOV #BIT11, ERRWD1 ;LOAD PART OF THE MODULE CALL OUT
54 032446 001415 CMP #377, ERSTAT ;NOW DETERMINE WHAT FAILED
55 032450 005037 002406 CLR ERRWD2 ;DRIVE CLEAR COMMAND WORKED, RH CLR FAILED
56 032454 105737 002466 TSTB ERSTAT ;FORM FURTHER MODULE CALL-OUT
;FURTHER CHECK RESULTS

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57 032460 001404          BEQ      4#          ;RMCLR WORKED, DRIVE CLEAR FAILED
58 032462 052737 000200 002404  BIS     @BIT7,ERRWD1 ;NOTHING WORKED, DRIVE CLEAR OR RMCLR
59 032470 000407          BR       6#          ;REPORT THE ERROR
60 032472 052737 012000 002404 4#:    BIS     @BIT10!BIT12,ERRWD1 ;CREATE MODULE CALL-OUT
61 032500 000403          BR       6#          ;REPORT IT
62 032502 012737 000006 002406 5#:    MOV     @BIT1!BIT2,ERRWD2 ;CREATE MODULE CALL OUT
63 032510 013737 002536 002456 6#:    MOV     RPRM1,TESTRG ;FORM REPORT DATA
64 032516 005037 002454          CLR     EXPTED      ;EXPECTED DATA
65 032522 012737 100000 002452  MOV     @DMD,RCVED   ;RECEIVED DATA
66 032530 104456          TRAP    C#ERHRD
    032532 000075          .WORD  61
    032534 013051          .WORD  EM23
    032536 014172          .WORD  ERRO
67 032540 005037 002402          CLR     ITCOUN      ;NO ITERATIONS
68 032544          7#:
    032544          10000#:
69 032546 104405          TRAP    C#ESEG
70 032552 005037 002466          CLR     ERSTAT      ;ERSTAT=0
71 032556 005337 002402          DEC     ITCOUN      ;ONE LESS ITERATION
72 032560 003256          BGT     1#          ;IF <= 0, DONE!
    032560 104401          L10061: TRAP    C#ETST

```

```

1          .SBTTL TEST 36 PARITY INITIALIZE TEST
2
3          ;# TEST 36 PARITY INITIALIZE TEST
4          ;# : SET RPCS2: CLR = 1
5          ;# : IF (RPER1: PAR) = 1
6          ;# : : THEN
7          ;# : : OUTPUT ERROR MESSAGE (DETECTED FALSE PARITY ERROR)
8          ;# : : OUTPUT FAULT LIST: J12, J09, J10. (CURRENT STATE OF 2901 = ?? )
9          ;# : ENDF
10         ;# : IF (RPER1: ILF) = 1
11         ;# : : THEN
12         ;# : : OUTPUT ERROR MESSAGE (DETECTED FALSE ILLEGAL FUNCTION ERROR)
13         ;# : : OUTPUT FAULT LIST: J12, J09, J10. (2901 ??)
14         ;# : ENDF
15         ;# END TEST 36
16
17 032562   T36::
18 032562   012737 000012 002402   MOV      #10.,ITCOUN      ;LOAD THE ITERATION COUNT
19 032570   104404   TRAP     C#BSEG          ;
20 032572   004737 016662   JSR      PC,SEIZE        ;GET CONTROL OF THE DRIVE
21 032576   013737 002526 002456   MOV      RPER1,TESTRG    ;FORM REPORT DATA
22 032604   005037 002454   CLR      EXPTED          ;EXPTED=0
23 032610   005037 002452   CLR      RCVED           ;RECEIVED=?
24 032614   032777 000010 147704   BIT      #PAR,#RPER1     ;IS PARITY ERROR=1?
25 032622   001403   BEQ      2#              ;IF 0, NO
26 032624   052737 000010 002452   BIS      #PAR,RCVED      ;MARK THE ERROR
27 032632   032777 000001 147712 2# :   BIT      #ILF,#RPER2    ;IS ILLEGAL FUNCTION SET?
28 032640   001403   BEQ      3#              ;IF 0, NO
29 032642   052737 000001 002452   BIS      #ILF,RCVED     ;MARK IT!
30 032650   005737 002452 3# :   TST     RCVED           ;ERRORS??
31 032654   001414   BEQ      4#              ;IF 0, TEST PASSES
32 032656   012737 012000 002404   MOV      #BIT10!BIT12,ERRWD1 ;FORM MODULE CALLOUT LIST
33 032664   012737 000006 002406   MOV      #BIT1!BIT2,ERRWD2 ;BOTH WORDS
34 032672   104456   TRAP     C#ERHRD        ;
35 032674   000077   .WORD    63
36 032676   013051   .WORD    EM23
37 032700   014172   .WORD    ERRO
38 032702   005037 002402   CLR      ITCOUN          ;NO ITERATIONS
39 032706   104405   TRAP     C#ESEG          ;
40 032710   005337 002402   DEC      ITCOUN          ;ONE LESS ITERATION
41 032714   003325   BGT     1#              ;IF <= 0, DONE
42 032716   104401   L10062: TRAP     C#ETST

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1          .SBTTL TEST 37 PARITY ERROR DETECTION TEST
2
3          ;# TEST 37 PARITY ERROR DETECTION TEST
4          ;# : SET RPCS2: PAT = 1
5          ;# : ISSUE A KNOWN ILLEGAL FUNCTION
6          ;# : IF (RPER1: ILF = 1 AND RPER1: PAR = 0)
7          ;# : : THEN
8          ;# : : OUTPUT ERROR MESSAGE (PARITY ERROR NOT DETECTED)
9          ;# : : OUTPUT FAULT LIST: J12.
10         ;# : ENDF
11         ;# : IF ((RPER1: ILF AND RPER1: PAR) = 1 OR = 0)
12         ;# : : THEN
13         ;# : : OUTPUT ERROR MESSAGE (UNKNOWN FUNCTIONAL SEQUENCE)
14         ;# : : OUTPUT FAULT LIST: J09, J10, J12, (2901 GONE ??)
15         ;# : ENDF
16         ;# END TEST 37
17
18 032720          T37::
19 032720 012737 000012 002402      MOV      #10.,ITCOUN      ;LOAD THE ITERATION COUNT
20 032726          1$:
21 032726 104404          TRAP     C#BSEG
22 032730 004737 016662          JSR      PC,SEIZE      ;GET THE DRIVE UNDER TEST
23 032734 052777 000020 147560      BIS      #PAT,#RPCS2    ;INVERT PARITY, FORCE ERRORS!!
24 032742 012777 000046 147542      MOV      #46,#RPCS1    ;LOAD AN ILLEGAL FUNCTION CODE (WITHOUT SETTING GO)
25 032750 012737 000010 002452      MOV      #PAR,RCVED    ;FORM EXPECTED DATA
26 032756 013737 002452 002454      MOV      RCVED,EXPTED  ;IN CASE OF AN ERROR
27 032764 005037 002466          CLR      ERSTAT        ;RESET STATUS MARK
28 032770 004737 017000          JSR      PC,WAIT       ;STALL FOR SOME SETTLE TIME
29 032774 032777 000001 147524      BIT      #ILF,#RPER1   ;DID ILLEGAL FUNCTION SET?
30 033002 001406          BEQ     2$             ;IF NOT, GO ON
31 033004 052737 000001 002452      BIS      #ILF,RCVED    ;LOG THIS ERROR IN THE RECEIVED BUFFER
32 033012 112737 000377 002466      MOV     #377,ERSTAT    ;MARK THIS FAILURE
33 033020 032777 000010 147500      BIT     #PAR,#RPER1    ;DID PARITY ERROR SET?
34 033026 001006          BNE     3$             ;IF SO, GO ON
35 033030 042737 000010 002452      BIC     #PAR,RCVED     ;LOG FAILING RESULT
36 033036 112737 000377 002466      MOV     #377,ERSTAT    ;MARK THIS FAILURE
37 033044 005737 002466          3$: TST      ERSTAT      ;ERRORS?
38 033050 001425          BEQ     5$             ;IF 0, NO
39 033052 013737 002526 002456      MOV     RPER1,TESTRG   ;GET FAILING REGISTER
40 033060 012737 004000 002404      MOV     #BIT11,ERRWD1  ;AND FORM MODULE CALL-OUT
41 033066 005037 002406          CLR     ERRWD2         ;BOTH WORDS
42 033072 023727 002466 000377      CMP     ERSTAT,#377    ;ILLEGAL FUNCTION ONLY SET?
43 033100 001403          BEQ     4$             ;IF MATCH, THAT WAS ONLY ERROR
44 033102 052737 001400 002404      BIS     #BIT8!BIT9,ERRWD1 ;FORM REST OF CALL OUT
45 033110          4$: TRAP     C#ERHRD
46 033112 104456          .WORD  64
47 033114 000100          .WORD  EM14
48 033116 012454          .WORD  ERRO
49 033120 005037 002402          CLR     ITCOUN        ;NO ITERATIONS NECESSARY
50 033124          5$: 10000$:
51 033124 104405          TRAP     C#ESEG
52 033126 005037 002466          CLR     ERSTAT        ;ERSTAT=0
53 033132 005337 002402          DEC     ITCOUN        ;ONE LESS ITERATION
54 033136 003273          BGT     1$            ;IF <= 0, WE'RE DONE!!
55 033140          L10063:

```

H12

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TEST 37 PARITY ERROR DETECTION TEST

SEQ 0150

033140 104401

TRAP C#ETST


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1          .SBTTL TEST 38 CORRECT PARITY TEST
2
3          ;# TEST 38 CORRECT PARITY TEST
4          ;# : LOAD DATA PATTERNS 1 TO 4 INTO RPDA, ONE AT A TIME
5          ;# : READ RPDA AFTER EACH WRITE FUNCTION
6          ;# : IF ((RPCS1: MCPE) OR (RPCS1: TRE) OR (RPER1: PAR)) = 1
7          ;# : THEN
8          ;# : : OUTPUT ERROR MESSAGE (PARITY LOGIC MALFUNCTION)
9          ;# : : OUTPUT FAULT LIST: J11, J12, J13, RHXX, CABLE, TERMINATOR
10         ;# : ENDF
11         ;# END TEST 38
12
13 033142   T38::
14 033142   012737 000012 002402   MOV      #10.,ITCOUN      ;LOAD THE ITERATION COUNT
15 033150   1#:
16 033150   104404   TRAP     C#BSEG
17 033152   004737 016662   JSR      PC,SEIZE        ;GET THE DRIVE UNDER TEST
18 033156   012702 002344   MOV      #PATT1,R2      ;GET THE PATTERN ADDRESS
19 033162   012701 000004   MOV      #4,R1          ;AND THE OVERALL ITERATION COUNT
20 033166   012277 147326   2#: MOV      (R2)+,@RPDA   ;WRITE THE DATA
21 033172   005777 147322   TST      @RPDA          ;READ THE REGISTER
22 033176   032777 060000 147306   BIT      @MCPE!TRE,@RPCS1 ;ERROR?
23 033204   001011   BNE      3#             ;IF <>0, YES!
24 033206   004737 017000   JSR      PC,WAIT        ;STALL FOR SOME SETTLE TIME
25 033212   032777 000010 147306   BIT      @PAR,@RPER1    ;PARITY ERROR?
26 033220   001010   BNE      4#             ;IF <>0, YES
27 033222   005301   DEC      R1             ;ONE LESS ITERATION
28 033224   003360   BGT      2#             ;IF >0, NOT FINISHED
29 033226   000431   BR       6#             ;GET OUT NOW!
30 033230   004737 017422   3#: JSR      PC,BICEXP    ;FORM UP THE FAILING DATA
31 033234   002512   RPCS1    ;THIS REGISTER
32 033236   060000   MCPE!TRE ;THESE BITS FAILED TO CLEAR
33 033240   000410   BR       5#             ;REPORT THE ERROR
34 033242   013737 002526 002456 4#: MOV      RPER1,TESTRG   ;GET ADDRESS OF FAILING DATA
35 033250   017737 147252 002452   MOV      @RPER1,RCVED   ;GOT FAILED RESULTS
36 033256   005037 002454   CLR      EXPTED         ;FORM EXPECTED DATA
37 033262   012737 016000 002404 5#: MOV      @BIT10!BIT11!BIT12,ERRWD1 ;FORM MODULE CALL-OUT
38 033270   012737 000406 002406   MOV      @BIT1!BIT2!BIT8,ERRWD2 ;BOTH WORDS
39 033276   104456   TRAP     C#ERHRD
40 033300   000101   .WORD    65
41 033302   013051   .WORD    EM23
42 033304   014172   .WORD    ERRO
43 033306   005037 002402   CLR      ITCOUN        ;NO FURTHER ITERATIONS
44 033312   10000# 6#:
45 033312   104405   10000#  ;
46 033314   005337 002402   TRAP     C#ESEG
47 033320   003313   DEC      ITCOUN        ;ONE LESS ITERATION
48 033322   L10064: BGT      1#             ;IF <= 0, DONE!!
49 033322   104401   TRAP     C#ETST

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1          .SBTTL TEST 39 CLEAR COMPOSITE ERROR TEST
2
3          ;# TEST 39 CLEAR COMPOSITE ERROR TEST
4          ;# : SET RPCS2: CLR = 1
5          ;# : IF RPDS: ERR = 1
6          ;# : : THEN
7          ;# : : IF ((RPER1 = 0) AND (RPER2 = 0) AND (RPER3 = 0))
8          ;# : : : THEN
9          ;# : : : OUTPUT ERROR MESSAGE (DETECTED A PERMANENT ERROR)
10         ;# : : : ELSE
11         ;# : : : OUTPUT ERROR MESSAGE (DETECTED COMPOSITE ERROR)
12         ;# : : : ENDF
13         ;# : : OUTPUT FAULT LIST: J12
14         ;# : ENDF
15         ;# END TEST 39
16
17 033324          T39::
18 033324 012737 000012 002402      MOV      #10.,ITCOUN      ;LOAD THE ITERATION COUNT
19 033332          1#:
20 033332 104404          TRAP     C#BSEG
21 033334 004737 016662      JSR      PC,SEIZE      ;GET THE DRIVE UNDER TEST
22 033340 032777 040000 147156    BIT      #ERR,#RPDS    ;DID WE RECEIVE A COMPOSITE ERROR?
23 033346 001435          BEQ      4#            ;IF 0, TEST OK
24 033350 004737 017422      JSR      PC,BICEXP     ;FORM UP ERROR REPORT
25 033354 002524          RPDS     ;THIS REGISTER
26 033356 040000          ERR      ;THIS BIT FAILED TO CLEAR
27 033360 005037 002406      CLR      ERRWD2       ;CREATE MODULE CALL OUT
28 033364 012737 004000 002404    MOV      #BIT11,ERRWD1 ;BOTH WORDS
29 033372 005777 147130      TST     #RPER1       ;DID WE HAVE A DETECTABLE HARDWARE BUG?
30 033376 001013          BNE     2#            ;IF NOT 0, YES
31 033400 005777 147146      TST     #RPER2       ;DID WE HAVE A DETECTABLE HARDWARE BUG??
32 033404 001010          BNE     2#            ;IF NOT 0, YES
33 033406 005777 147142      TST     #RPER3       ;DID WE HAVE A DETECTABLE HARDWARE BUG?
34 033412 001005          BNE     2#            ;IF NOT 0, YES
35 033414 104456          TRAP     C#ERHRD
36 033416 000102          .WORD   66
37 033420 014075          .WORD   EM42
38 033422 014172          .WORD   ERRO
39 033424 000404          BR      3#            ;SKIP NEXT MESSAGE
40 033426          2#:
41 033426 104456          TRAP     C#ERHRD
42 033430 000103          .WORD   67
43 033432 011747          .WORD   EM1
44 033434 014172          .WORD   ERRO
45 033436 005037 002402      3#: CLR      ITCOUN      ;NO FURTHER ITERATIONS NECESSARY
46 033442          4#:
47 033442          10000#:
48 033442 104405          TRAP     C#ESEG
49 033444 005337 002402      DEC     ITCOUN       ;ONE LESS ITERATION TO-GO
50 033450 003330          BGT     1#            ;IF >0, DO AGAIN
51 033452          L10065:
52 033452 104401          TRAP     C#ETST

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```

1          .SBTTL TEST 40 COMPOSITE ERROR SET - RESET TEST
2
3          ;# TEST 40 FORCE A COMPOSITE ERROR, THEN CLEAR IT
4          ;# : SET RPCS2: PAT = 1
5          ;# : WRITE DATA PATTERN #1 TO RPDA
6          ;# : READ RPDA AFTER PERFORMING THE WRITE OPERATION
7          ;# : IF ((RPDS: ERR) OR (RPER1: PAR)) = 0
8          ;# : : THEN
9          ;# : : OUTPUT ERROR MESSAGE (COMPOSITE ERROR DIDN T SET WHEN EXPECTED)
10         ;# : : OUTPUT FAULT LIST: J09, J10, J12
11         ;# : : ELSE
12         ;# : : SET RPCS2: CLR = 1
13         ;# : : IF ((RPDS: ERR) OR (RPER1: PAR)) = 1
14         ;# : : : THEN
15         ;# : : : OUTPUT ERROR MESSAGE (ERROR STATUS FAILED TO CLEAR)
16         ;# : : : OUTPUT FAULT LIST: J12
17         ;# : : : ENDF
18         ;# : ENDF
19         ;# END TEST 40
20
21 033454          T40::
22 033454 012737 000012 002402          MOV      #10.,ITCOUN      ;LOAD THE ITERATION COUNT
23 033462          1#:
24 033462 104404          TRAP     C#BSEG
25 033464 004737 016662          JSR      PC,SEIZE      ;GET THE DRIVE UNDER TEST
26 033470 052777 000020 147024          BIS      #PAT,#RPCS2  ;INVERT PARITY - FORCE ERRORS!
27 033476 013777 002344 147014          MOV      PATT1,#RPDA  ;WRITE A PATTERN
28 033504 005777 147010          TST      #RPDA        ;READ THE REGISTER JUST WRITTEN
29 033510 004737 017000          JSR      PC,WAIT      ;STALL FOR THE RP07 MICROPROCESSOR
30 033514 032777 000010 147004          BIT      #PAR,#RPER1 ;DID WE DETECT A PARITY ERROR?
31 033522 001005          BNE      2#           ;IF = 1, YES
32 033524 004737 017372          JSR      PC,BISEXP   ;FORM THE FAILING DATA
33 033530 002526          RPER1    ;THIS REGISTER FAILED
34 033532 000010          PAR      ;THIS BIT FAILED TO SET
35 033534 000410          BR       3#           ;AND REPORT IT
36 033536 032777 040000 146760 2#:          BIT      #ERR,#RPDS  ;DID WE GET COMPOSITE ERROR?
37 033544 001017          BNE      4#           ;IF = 1, YES
38 033546 004737 017372          JSR      PC,BISEXP   ;FORM THE ERROR DATA
39 033552 002524          RPDS     ;FORM THE ERROR REPORT
40 033554 040000          ERR      ;FORM THE EXPECTED DATA
41 033556 012737 005400 002404 3#:          MOV      #BIT8!BIT9!BIT11,ERRWD1 ;FORM MODULE CALL-OUT LIST
42 033564 005037 002406          CLR      ERRWD2      ;BOTH WORDS
43 033570 104456          TRAP     C#ERHRD
44 033572 000104          .WORD   68
45 033574 012776          .WORD   EM22
46 033576 014172          .WORD   ERRO
47 033600 005037 002402          CLR      ITCOUN     ;NO FURTHER ITERATONS NECESSARY
48 033604 052777 000040 146710 4#:          BIS      #CLR,#RPCS2 ;RESET THE DEVICE
49 033612 013777 002506 146702          MOV      DRVNO,#RPCS2 ;RELOAD THE DRIVE - UNDER - TEST
50 033620 032777 000010 146700          BIT      #PAR,#RPER1 ;ERROR STATUS GONE?
51 033626 001411          BEQ      5#           ;IF = 0, YES
52 033630 013737 002526 002456          MOV      RPER1,TESTRG ;FORM THE ERROR REPORT DATA
53 033636 017737 146664 002452          MOV      #RPER1,RCVED ;PAR SET AND SHOULD HAVE CLEARED
54 033644 005037 002454          CLR      EXPTED     ;SHOW 0 BITS EXPECTED DATA
55 033650 000410          BR       6#           ;AND REPORT THE ERROR
56 033652 032777 040000 146644 5#:          BIT      #ERR,#RPDS  ;DID COMPOSITE ERROR CLEAR?
    
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54 033660 001417          BEQ      7$          ;IF 0, YES
55 033662 004737 017422   JSR      PC,BICEXP    ;CREATE THIS INFORMATION
56 033666 002524          RPDS          ;AND MAKE IT AVAILABLE FOR
57 033670 040000          ERR           ;AN ERROR MESSAGE
58
59 033672 012737 004000 002404 6$:  MOV     #BIT11,ERRWD1 ;CREATE MODULE CALL OUT
60 033700 005037 002406          CLR     ERRWD2      ;FOR BOTH WORDS
61 033704 104456          TRAP    C$ERMPD
    033706 000105          .WORD   69
    033710 011747          .WORD   EM1
    033712 014172          .WORD   ERRO
62 033714 005037 002402          CLR     ITCOUN      ;RESET THE ITERATION COUNTER
63 033720          7$:
    033720          10000$:
    033720 104405          TRAP    C$ESEG
64 033722 005337 002402          DEC     ITCOUN      ;ONE LESS ITERATION TO GO
65 033726 003255          BGT     1$          ;DO UNTIL <= 0
66 033730          L10066:
    033730 104401          TRAP    C$ETST

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```

1          .SBTTL TEST 41 ATA CLEAR TEST
2
3          ;# TEST 41 CLEAR ATA TEST
4          ;# : SET RPCS2: CLR = 1
5          ;# : IF RPDS: ATA = 1
6          ;# : : THE
7          ;# : : OUTPUT ERROR MESSAGE (DETECTED FALSE ATA)
8          ;# : : OUTPUT FAULT LIST: J12
9          ;# : ENDF
10         ;# END TEST 41
11
12 033732  T41::
13 033732 012737 000012 002402  MOV      #10.,ITCOUN      ;LOAD THE ITERATION COUNT
14 033740 033740 104404 1# :
15 033742 004737 016662  JSR      C#BSEG
16 033746 004737 017000  JSR      PC,SEIZE      ;GET THE DRIVE UNDER TEST
17 033752 032777 100000 146544  JSR      PC,WAIT      ;WAIT FOR THE RP07 MICROPROCESSOR
18 033760 001417  BEQ      #ATA,#RPDS   ;DOES THE ATTENTION SUMMARY BIT = 1
19 033762 004737 017422  JSR      2#           ;IF IT DOES, IT'S WRONG.
20 033766 002524  RPDS      PC,BICEXP   ;FORM THE FAILING DATA
21 033770 140000  ATA!ERR   ;THIS REGISTER FAILED
22 033772 012737 004000 002404  MOV      #BIT11,ERRWD1 ;THESE BITS FAILED TO CLEAR
23 034000 005037 002406  CLR      ERRWD2      ;FORM MODULE CALL - OUT
24 034004 104456  TRAP     C#ERHRD    ;BOTH WORDS
    034006 000106  .WORD   70
    034010 012454  .WORD   EM14
    034012 014172  .WORD   ERRO
25 034014 005037 002402  CLR      ITCOUN      ;RESET THE ITERATON COUNTER
26 034020 034020 10000# :
    034020 104405  TRAP     C#ESEG
27 034022 005337 002402  DEC      ITCOUN      ;ONE LESS ITERATION
28 034026 003344  BGT      1#          ;DO UNTIL <= 0
29 034030 034030  L10067 :
    034030 104401  TRAP     C#ETST

```

```

1          .SBTTL TEST 42 ATA SET - RESET TEST
2
3          :# TEST 42 SET AND CLEAR ATA BIT
4          :# : SET RPCS2: PAT = 1
5          :# : WRITE RPDA WITH DATA PATTERN #1, ONCE
6          :# : IF ((RPDS: ATA) AND (RPDS: ERR)) <> 1
7          :# : : THEN
8          :# : : OUTPUT ERROR MESSAGE (ATA DIDN'T SET WHEN EXPECTED)
9          :# : : OUTPUT FAULT LIST: J09, J10
10         :# : : ELSE
11         :# : : ISSUE DRIVE CLEAR COMMAND
12         :# : : ENDF
13         :# : IF ((RPDS: ATA) AND (RPDS: ERR)) <> 0
14         :# : : THEN
15         :# : : OUTPUT ERROR MESSAGE (ATA DIDN'T CLEAR WHEN EXPECTED)
16         :# : : OUTPUT FAULT LIST: J12
17         :# : : ENDF
18         :# : SET RPCS2: PAT = 1
19         :# : WRITE RPDA WITH DATA PATTERN #1, ONCE
20         :# : SET RPCS2: CLR = 1
21         :# : IF ((RPDS: ATA) OR (RPDS: ERR)) <> 0)
22         :# : : THEN
23         :# : : OUTPUT ERROR MESSAGE (RPCS2: CLR DIDN'T CLEAR ATA AS EXPECTED)
24         :# : : OUTPUT FAULT LIST: J12
25         :# : : ENDF
26         :# END TEST 42
27
28 034032          T42::
29 034032 012737 000012 002402      MOV      #10.,ITCOUN      ;LOAD THE ITERATION COUNTER
30 034040          1$:
31 034042 104404          TRAP     C#BSEG
32 034046 004737 016662          JSR     PC,SEIZE        ;GET THE DRIVE UNDER TEST
33 034054 013777 002344 146446    BIS     #PAT,&RPCS2     ;INVERT PARITY
34 034062 005037 002406          MOV     PATT1,&RPDA    ;MOVE DATA TO RPDA
35 034066 004737 017000          CLR     ERRWD2        ;FORM SOME MODULE CALL - OUT
36 034072 032777 140000 146424    JSR     PC,WAIT       ;WAIT FOR THE RP07 MICROPROCESSOR TO FINISH
37 034100 001035          BIT     #ATA!ERR,&RPDS ;DID WE DETECT ATTENTION AND ERROR?
38 034102 012737 001400 002404    BNE     2$            ;IF = 1, YES
39 034110 004737 017372          MOV     #BIT8!BIT9,ERRWD1 ;FORM BALANCE OF MODULE CALL OUT
40 034114 002524          JSR     PC,BISEXP     ;SHOW DATA TO ERROR - REPORT
41 034116 140000          RPDS    ATA!ERR      ;THIS REGISTER
42 034120 012737 001400 002404    MOV     #BIT8!BIT9,ERRWD1 ;THESE BITS FAILED TO SET
43 034126 000452          BR      4$            ;LOG THE MODULE CALLOUT
44 034130 032777 010000 146366    BIT     #MOL,&RPDS    ;REPORT IT!
45 034136 001016          BNE     2$            ;IS THE DRIVE ON-LINE
46 034140 004737 017326          JSR     PC,SAVRPR    ;YES, IT IS ONLINE!
47 034144 013746 002114          JSR     PC,SAVRPR    ;GET THE REGISTER SNAPSHOT
48 034150 012746 006452          MOV     L#TEST,-(SP)
49 034154 012746 000002          MOV     #MSGMOL,-(SP)
50 034160 010600          MOV     #2,-(SP)
51 034162 104417          MOV     SP,RO
52 034164 062706 000006          TRAP    C#PNTF
53 034170 104432          ADD     #6,SP
54 034172 000124          TRAP    C#EXIT
55 034174 013777 002506 146320 2$: .WORD    L10070-
56 034202 012777 000011 146302    MOV     DRVNO,&RPCS2  ;LOAD THE DRIVE #, CLEAR OUT PARITY INVERT
57                                MOV     #DRCLR,&RPCS1  ;ISSUE A DRIVE CLEAR COMMAND
    
```

B.2

55	034210	032777	140000	146306		BIT	#ATA:FRR, BRPDS	;CHECK ATTENTION AND ERROR
56	034216	001016				BNE	48	;THEY'RE SET, ERROR!
57	034220	052777	000020	146274	38:	BIS	#PAT, BRPCS2	;INVERT PARITY
58	034226	013777	002344	146264		MOV	PATT1, BRPDA	;WRITE DATA AGAIN
59	034234	004737	017000			JSR	PC, WAIT	;WAIT FOR THE MICRO PROCESSORS
60	034240	004737	016662			JSR	PC, SEIZE	;GET THE DRIVE NOW!
61	034244	032777	140000	146252		BIT	#ATA:ERR, BRPDS	;CHECK ATTENTION AND ERROR
62	034252	001415				BEQ	58	;IF 0, TEST PASSES
63	034254	004737	017422		48:	JSR	PC, BICEXP	;FORM EXPECTED DATA
64	034260	002524				RPDS		;THIS REGISTER
65	034262	140000				ATA:ERR		;THESE BITS FAILED TO CLEAR
66	034264	012737	004000	002404		MOV	#BIT11, ERRWD1	;LOAD THIS MODULE CALLOUT
67	034272	104456				TRAP	C:ERMRD	
	034274	000107				.WORD	71	
	034276	012454				.WORD	EM14	
	034300	014172				.WORD	ERRO	
68	034302	005037	002402			CLR	ITCOUN	;NO FURTHER ITERATIONS
69	034306				58:			
	034306				100008:			
	034306	104405				TRAP	C:SEEG	
70	034310	005337	002402			DEC	ITCOUN	;ONE LESS TO-GO
71	034314	003251				BGT	18	;IF <= 0, WE'RE DONE!
72	034316				L16070:			
	034316	104401				TRAP	C:ETST	

C.3

```

1          .SBTTL TEST 43 RPAS CLEAR TEST
2
3          ;# TEST 43 CLEAR RPAS REGISTER TEST
4          ;# : SET RPCS2: CLR = 1
5          ;# : IF RPAS <> 0
6          ;# : : THEN
7          ;# : : OUTPUT ERROR MESSAGE (RPAS DIDN T CLEAR WHEN EXPECTED)
8          ;# : : OUTPUT CONTENTS OF RPAS
9          ;# : : OUTPUT FAULT LIST: J11 / J13, J12, ANOTHER DRIVE
10         ;# : ENDF
11         ;# END TEST 43
12
13 034320 T43::
14 034320 012737 000012 002402 MOV #10.,ITCOUN ;LOAD THE ITERATION COUNTER
15 034326 104404 18:
16 034330 004737 016662 TRAP C#BSEG
17 034334 005777 146170 JSR PC,SEIZE ;GET THE DRIVE UNDER TEST
18 034340 001424 BEQ #RPAS ;RPAS = 0?
19 034342 005037 002454 CLR #21 ;IF 0, TEST OK!
20 034346 013737 002530 002456 CLR EXPTED ;FORM ERROR DATA
21 034354 017737 146150 002452 MOV RPAS,TESTRG ;FOR AN ERROR DISPATCH
22 034362 012737 016000 002404 MOV #RPAS,RCVED ;GET RECEIVED DATA
23 034370 012737 000020 002406 MOV #BIT10:BIT11:BIT12,ERRWD1 ;FORM MODULE CALL OUT
24 034376 104456 MOV #BIT4,ERRWD2 ;BOTH WORDS
25 034400 000110 TRAP C#ERMRD
26 034402 012523 .WORD 72
27 034404 014172 .WORD EM15
28 034406 005037 002402 .WORD ERRO
29 034412 104405 CLR ITCOUN ;RESET THE ITERATION COUNTER
30 034414 005337 002402 24:
31 034420 005342 100004: TRAP C#ESEG
32 034422 104401 DEC ITCOUN ;ONE LESS TO-GO
33 BGT #1 ;IF >0, WE'RE NOT DONE
34 L10071: TRAP C#ETST
  
```



```

1          .SBITL TEST 44 RPAS CORRECT POSITION TEST
2
3          ;# TEST 44 RPAS CORRECT POSITION DECODE TEST
4          ;# : SET RPCS2: CLR = 1
5          ;# : SET RPCS2: PAT = 1
6          ;# : WRITE RPDA WITH DATA PATTERN #1, ONCE
7          ;# : IF RPAS: ATA BIT IS NOT CORRECT POSITION FOR DRIVE UNDER TEST
8          ;# : : THEN
9          ;# : : OUTPUT ERROR MESSAGE (RPAS DECODE LOGIC FAILURE)
10         ;# : : OUTPUT FAULT LIST: J11 / J13
11         ;# : : ELSE
12         ;# : : WRITE RPAS WITH EXPECTED RESULTS
13         ;# : : ENDF
14         ;# : SET RPCS2: PAT = 0
15         ;# : IF RPAS: ATA BIT UNDER TEST <> 0
16         ;# : : THEN
17         ;# : : OUTPUT ERROR MESSAGE (RPAS DECODE LOGIC FAILURE)
18         ;# : : OUTPUT FAULT LIST: J11 / J13, J12
19         ;# : : ENDF
20         ;# END TEST 44
21
22 034424          T44::
23 034424 012737 000012 002402          MOV      #10.,ITCOUN      ;LOAD THE ITERATION COUNT
24 034432          1#::
25 034432 104404          TRAP     C#BSEG
26 034434 004737 016662          JSR     PC,SEIZE      ;GET THE DRIVE UNDER TEST
27 034440 052777 000020 146054          BIS     #PAT,#RPCS2  ;INVERT PARITY (FORCE ERRORS)
28 034446 013777 002344 146044          MOV     PATT1,#RPDA  ;WRITE A PATTERN TO RPDA
29 034454 004737 017000          JSR     PC,WAIT      ;WAIT FOR THE RP07 MICROPROCESSOR TO FINISH
30 034460 013737 002400 002454          MOV     BITPOS,EXPTD ;GET THE EXPECTED DATA
31 034466 023777 002454 146034          CMP     EXPTD,#RPAS ;DID CORRECT ATN BIT SET?
32 034474 001417          BEQ     2#          ;IF EQUAL OK!
33 034476 013737 002530 002456          MOV     RPAS,TESTRG ;FORM REGISTER DATA
34 034504 017737 146020 002452          MOV     #RPAS,RCVED ;AND RECEIVED ERROR DATA
35 034512 012737 012000 002404          MOV     #BIT10!BIT12,ERRWD1 ;NOW GET MODULE CALL - OUT
36 034524 104456          CLR     ERRWD2      ;BOTH WORDS
37 034526 000111          TRAP     C#ERHRD
38 034530 012454          .WORD   73
39 034532 014172          .WORD   EM14
40 034534 042777 000020 145760 2#::          BIC     #PAT,#RPCS2 ;INVERT PARITY AGAIN
41 034542 013777 002454 145760          MOV     EXPTD,#RPAS ;TRY TO CLEAR RPAS
42 034550 005037 002454          CLR     EXPTD      ;SHOW EXPECTED RESULTS
43 034554 005777 145750          TST     #RPAS      ;DID RPAS CLEAR?
44 034560 001421          BEQ     3#          ;IF SO, SKIP ERROR DISPATCH
45 034562 013737 002530 002456          MOV     RPAS,TESTRG ;FORM REGISTER DATA
46 034570 017737 145734 002452          MOV     #RPAS,RCVED ;FORM RECEIVED DATA
47 034576 012737 016000 002404          MOV     #BIT10!BIT11!BIT12,ERRWD1 ;CREATE MODULE LIST
48 034604 005037 002406          CLR     ERRWD2      ;BOTH WORDS
49 034610 104456          TRAP     C#ERHRD
50 034612 000112          .WORD   74
51 034614 013051          .WORD   EM23
52 034616 014172          .WORD   ERRO
53 034620 005037 002402          CLR     ITCOUN     ;NO LOOPS NECESSARY
54 034624          3#::
55 034624 104405          10000#::
56 034624          TRAP     C#ESEG
  
```

E13

CZRJMB0 RP07 FE HOST ISOLATOR MACRO V04.00 1 DEC 83 10:39:09 PAGE 79 1
TEST 44 RPAS CORRECT POSITION TEST

SEQ 0160

49 034626 005337 002402
50 034632 003277
51 034634
034634 104401

DEC ITCOUN
BGT 18
L10072:
TRAP C#ETST

;ONE LESS TO GO
;IF >0, WE'RE NOT DONE

```

1          .SBTTL TEST 45 UNIQUE POSITION DECODE TEST
2
3          ;# TEST 45 RPAS UNIQUE POSITION DECODE TEST
4          ;# : SET RPCS2: CLR = 1
5          ;# : SET RPCS2: PAT = 1
6          ;# : WRITE RPDA WITH DATA PATTERN #1, ONCE
7          ;# : IF RPAS: ATA FOR THE DRIVE UNDER TEST <> 1
8          ;# : : THEN
9          ;# : : OUTPUT ERROR MESSAGE (RPAS DECODE LOGIC FAILURE)
10         ;# : : OUTPUT FAULT LIST: J11/J13
11         ;# : ENDF
12         ;# : IF RPDS: ATA <> 1
13         ;# : : THEN
14         ;# : : OUTPUT ERROR MESSAGE (RPDS: ATA DIDN'T SET)
15         ;# : ENDF
16         ;# : WRITE RPAS WITH THE COMPLIMENT OF THE EXPECTED DATA
17         ;# : IF RPAS: ATA FOR THE DRIVE UNDER TEST = 0
18         ;# : : THEN
19         ;# : : OUTPUT ERROR MESSAGE (RPAS DECODE LOGIC FAILURE)
20         ;# : : OUTPUT FAULT LIST: J11 / J13
21         ;# : ENDF
22         ;# END TEST 45
23
24 034636          T45::
25 034636 012737 000012 002402      MOV      #10.,ITCOUN      ;LOAD THE ITERATION COUNT
26 034644          1# :
27 034644 104404          TRAP     C#BSEG
28 034646 004737 016662          JSR     PC,SEIZE        ;GET THE DRIVE UNDER TEST
29 034652 052777 000020 145642      BIS     #PAT,#RPCS2    ;INVERT PARITY (FORCE ERRORS)
30 034660 013777 002344 145632      MOV     PATT1,#RPDA    ;WRITE RPDA WITH PATTERN1
31 034666 013737 002400 002454      MOV     BITPOS,EXPTED ;GET THE CORRECT ATTENTION BIT POSITION
32 034674 004737 017000          JSR     PC,WAIT        ;WAIT FOR THE RP07 MICROPROCESSOR
33 034700 023777 002454 145622      CMP     EXPTED,#RPAS  ;MATCH?
34 034706 001421          BEQ     2#            ;IF EQUAL, OK!
35 034710 013737 002530 002456      MOV     RPAS,TESTRG   ;FORM FAILURE DATA
36 034716 017737 145606 002452      MOV     #RPAS,RCVED   ;AND LOG IT
37 034724 012737 012000 002404      MOV     #BIT10!BIT12,ERRWD1 ;CREATE MODULE CALL - OUT
38 034732 005037 002406          CLR     ERRWD2        ;BOTH WORDS
39 034736 104456          TRAP     C#ERHRD
40 034740 000113          .WORD   75
41 034742 012454          .WORD   EM14
42 034744 014172          .WORD   ERRO
43 034746 005037 002402          CLR     ITCOUN        ;NO LOOPS NECESSARY
44 034752 032777 100000 145544 2# : BIT     #ATA,#RPDS    ;DID ATA SET?
45 034760 001012          BNE     3#            ;IF NOT ZERO, YES!
46 034762 004737 017372          JSR     FC,BISEXP     ;LOAD THE FAILING INFORMATION
47 034766 002524          RPDS          ;THIS REGISTER FAILED
48 034770 100000          ATA          ;THIS BIT FAILED TO SET
49 034772 104456          TRAP     C#ERHRD
50 034774 000114          .WORD   76
51 034776 012776          .WORD   EM22
52 035000 014172          .WORD   ERRO
53 035002 005037 002402          CLR     ITCOUN        ;NO LOOP NECESSARY
54 035006 005137 002454 3# : COM     EXPTED      ;COMPLIMENT THE EXPECTED DATA
55 035012 013777 002454 145510      MOV     EXPTED,#RPAS  ;AND WRITE TO RPDA (SHOULD DO NOTHING)
56 035020 005137 002454          COM     EXPTED        ;RE-INVERT EXPECTED DATA
57 035024 023777 002454 145476      CMP     EXPTED,#RPAS  ;AND SEE IF ATN CLEAR

```

```

51 035032 001421          BEQ      4$          ;IF MATCH, IT DID NOT TEST OK!
52 035034 013737 002530 002456  MOV     RPAS,TESTRG ;FORM FAILING REGISTER
53 035042 017737 145462 002452  MOV     @RPAS,RCVED ;AND FAILING DATA
54 035050 012737 012000 002404  MOV     @BIT10!BIT12,ERRWD1 ;CREATE MODULE CALLOUT
55 035056 005037 002406          CLR     ERRWD2      ;BOTH WORDS
56 035062 104456          TRAP    C$ERHRD
    035064 000115          .WORD   77
    035066 012454          .WORD   EM14
    035070 014172          .WORD   ERRO
57 035072 005037 002402          CLR     ITCOUN      ;RESET THE ITERATION COUNTER
58 035076          4$:
    035076          10000$:
    035076 104405          TRAP    C$ESEG
59 035100 005337 002402          DEC     ITCOUN      ;ONE LESS ITERATION
60 035104 003257          BGT     1$          ;IF > 0, DO AGAIN!!
61 035106          L10073:
    035106 104401          TRAP    C$ETST
  
```

```

1          .SBTTL TEST 46 MASSBUS ATTENTION CLEAR TEST
2
3          ;# TEST 46 CLEAR MASSBUS ATTENTION TEST
4          ;# : SET RPCS2: CLR = 1
5          ;# : IF ((RPCS1: SC) OR (ON RH20-"ATTN") = 1
6          ;# : : THEN
7          ;# : : OUTPUT ERROR MESSAGE (DETECTED FALSE SPECIAL CONDITION)
8          ;# : : OUTPUT FAULT LIST: CABLE, RHXX, J11/J13, ANOTHER DRIVE, TERMINATOR
9          ;# : ENDF
10         ;# END TEST 46
11
12 035110          T46::
13 035110 012737 000012 002402      MOV      #10.,ITCOUN      ;LOAD THE ITERATION COUNT
14 035116          1$:
15 035116 104404          TRAP     C#BSEG
16 035120 004737 016662          JSR     PC,SEIZE      ;GET THE DRIVE AFTER PURGING ERRORS!
17 035124 032777 100000 145360    BIT     #SC,#RPCS1    ;TEST RPCS1 = SPECIAL CONDITION
18 035132 001420          BEQ     2$            ;IF 0, TEST OK!
19 035134 004737 017422          JSR     PC,BICEXP     ;FORM UP FAILING DATA
20 035140 002512          RPCS1   ;THIS REGISTER
21 035142 100000          SC        ;THIS BIT FAILED TO CLEAR
22 035144 012737 012000 002404    MOV     #BIT10!BIT12,ERRWD1 ;FORM UP MODULE CALLOUT
23 035152 012737 000426 002406    MOV     #BIT1!BIT2!BIT4!BIT8,ERRWD2;BOTH WORDS
24 035160 104456          TRAP     C#ERMRD
25 035162 000116          .WORD   78
26 035164 012562          .WORD   EM16
27 035166 014172          .WORD   ERRO
28 035170 005037 002402          CLR     ITCOUN      ;NO ITERATIONS NECESSARY
29 035174          2$:
30 035174 10000$:          10000$:
31 035174 104405          TRAP     C#ESEG
32 035176 005337 002402          DEC     ITCOUN      ;ONE LESS ITERATION TO GO
33 035202 003345          BGT     1$
34 035204          L10074:
35 035204 104401          TRAP     C#ETST
    
```

```

1          .SBTTL TEST 47 MASSBUS ATTENTION SET/CLEAR TEST
2
3          ;# TEST 47 MASSBUS ATTN SET & CLEAR TEST
4          ;# : SET RPCS2: CLR = 1
5          ;# : SET RPCS2: PAT = 1
6          ;# : WRITE RPDA WITH DATA PATTERN #1, ONCE
7          ;# : IF ((RPCS1: SC) OR (IN RH20-"ATTN")) <> 1
8          ;# : THEN
9          ;# : : OUTPUT ERROR MESSAGE (FAILED TO DETECT SPECIAL CONDITION WHEN EXPECTED)
10         ;# : : OUTPUT FAULT LIST: RHXX, CABLES, J11 / J13, TERMINATOR
11         ;# : ENDF
12         ;# END TEST 47
13
14 035206          T47::
15 035206 012737 000012 002402      MOV      #10.,ITCOUN      ;LOAD THE ITERATION COUNT
16 035214          1#:
17 035214 104404          TRAP     C#BSEG
18 035216 004737 016662          JSR      PC,SEIZE      ;FLUSH ERRORS THEN GET THE DRIVE
19 035222 052777 000020 145272      BIS      #PAT,#RPCS2   ;INVERT PARITY (FORCE ERRORS)
20 035230 013777 002344 145262      MOV      PATT1,#RPDA   ;WRITE RPDA, ONCE
21 035236 004737 017000          JSR      PC,WAIT      ;WAIT FOR THE RP07 MICROPROCESSOR
22 035242 032777 100000 145242      BIT      #SC,#RPCS1   ;DID SPECIAL CONDITION SET?
23 035250 001020          BNE      2#          ;IF = 2, YES
24 035252 004737 017372          JSR      PC,BISEXP    ;FORM ERROR DATA
25 035256 002512          RPCS1          ;FOR AN ERROR DISPATCH
26 035260 100000          SC              ;THIS BIT FAILED TO SET
27 035262 012737 012000 002404      MOV      #BIT10!BIT12,ERRWD1 ;FORM MODULE LIST
28 035270 012737 000406 002406      MOV      #BIT1!BIT2!BIT8,ERRWD2 ;BOTH WORDS
29 035276 104456          TRAP     C#ERHRD
30 035300 000117          .WORD   79
31 035302 012725          .WORD   EM21
32 035304 014172          .WORD   ERRO
33 035306 005037 002402          CLR      ITCOUN      ;RESET THE ITERATION COUNTER
34 035312          2#:
35 035312 10000#          10000#:
36 035312 104405          TRAP     C#ESEG
37 035314 005337 002402          DEC      ITCOUN      ;ONEW LESS ITERATION
38 035320 003335          BGT      1#          ;IF <= 0, DONE
39 035322          L10075:
40 035322 104401          TRAP     C#ETST

```

```

1          .SBTTL TEST 48 READ IN PRESET COMMAND TEST
2
3          ;# TEST 48 READ-IN PRESET BASIC COMMAND TEST
4          ;# : SET RPCS2: CLR = 1
5          ;# : ISSUE READ-IN PRESET COMMAND
6          ;# : IF RPDS: ERR = 1
7          ;# : : THEN
8          ;# : : OUTPUT ERROR MESSAGE (DETECTED FALSE COMPOSITE ERROR)
9          ;# : : OUTPUT FAULT LIST: J12
10         ;# : ENDF
11         ;# END TEST 48
12
13 035324 T48::
14 035324 012737 000012 002402 MOV #10.,ITCOUN ;LOAD THE ITERATION COUNT
15 035332 032777 010000 145164 BIT #MOL,#RPDS ;DRIVE ON LINE?
16 035340 001016 BNE 1# ;IF 1, YES
17 035342 004737 017326 JSR PC,SAVRPR ;GET THE REGISTER SNAPSHOT
18 035346 013746 002114 MOV L#TEST,-(SP)
    035352 012746 006452 MOV #MSGMOL,-(SP)
    035356 012746 000002 MOV #2,-(SP)
    035362 010600 MOV SP,R0
    035364 104417 TRAP C#PNTF
    035366 062706 000006 ADD #6,SP
22 035372 104432 TRAP C#EXIT
    035374 000104 .WORD L10076-.
23 035376 1#:
    035376 104404 TRAP C#BSEG
24 035400 004737 016662 JSR PC,SEIZE ;GET THE DRIVE UNDER TEST
25 035404 012777 000021 145100 MOV #RIP,#RPCS1 ;ISSUE THE READ-IN-PRESET
26 035412 004737 017000 JSR PC,WAIT ;WAIT FOR THE RP07 MICROPROCESSOR
27 035416 032777 040000 145100 BIT #ERR,#RPDS ;DID IT CAUSE AN ERROR?
28 035424 001417 BEQ 2# ;IF 0, NO!
29 035426 004737 017422 JSR PC,BICEXP ;LOAD FAILURE DATA
30 035432 002524 RPDS ;THIS REGISTER
31 035434 040000 ERR ;THIS BIT FAILED TO STAY CLEAR
32 035436 012737 004000 002404 MOV #BIT11,ERRWD1 ;FORM MODULE CALLOUT
33 035444 005037 002406 CLR ERRWD2 ;FOR BOTH WORDS
34 035450 104456 TRAP C#ERHRD
    035452 000120 .WORD 80
    035454 013051 .WORD EM23
    035456 014172 .WORD ERRO
35 035460 005037 002402 CLR ITCOUN ;NO ITERATIONS NECESSARY
36 035464 2#:
    035464 104405 10000#: TRAP C#ESEG
37 035466 005337 002402 DEC ITCOUN ;ONE LESS TO-GO
38 035472 003341 BGT 1# ;UNTIL <= 0!!
39 035474 004737 017722 JSR PC,PRELOD ;RESET THE DRIVE TO 16 BIT MODE
40 035500 L10076: TRAP C#ETST
    035500 104401

```

```

1          .SBTTL TEST 49 RHXX UNIQUE REGISTER TEST
2
3          :#      : SET RPCS2: CLR = 1
4          :#      : LOAD DRIVE NUMBER INTO RPCS2
5          :#      : REPEAT
6          :#      : : WRITE A UNIQUE PATTERN INTO A SELECTED REGISTER
7          :#      : : REGISTERS TO TEST = RPCS1, RPWC, RPBA, RPDA, RPMR1, RPOF, RPDC
8          :#      : : OPTIONAL REGISTERS FOR AN RH70 = RPBAE, RPCS3
9          :#      : : UNTIL ALL REGISTERS HAVE BEEN WRITTEN
10         :#      : ENDREPEAT
11         :#      : IF REGISTER UNDER TEST DOESN'T MATCH EXPECTED DATA
12         :#      : : THEN
13         :#      : : OUTPUT ERROR MESSAGE (REGISTER SELECTION FAILURE)
14         :#      : : OUTPUT FAULT LIST: RHXX, CABLES, J11, J12, J13, TERMINATOR
15         :#      : ENDIF
16         :#      END TEST 49
17
18 035502   T49::
19 035502   012737 000012 002402   MOV      #10,ITCOUN ;LOAD THE ITERATION COUNT
20 035510   004737 016662           JSR      PC,SEIZE   ;LOAD THE DRIVE UNDER TEST
21 035514   012737 000002 002436 1#:   MOV      #2,TEMP    ;LOAD THE FIRST DATA PATTERN
22 035522   012702 002652           MOV      #PSTACK,R2 ;CREATE THE CHECK BUFFER ADDRESS
23 035526   012701 004330           MOV      #TST49,R1  ;GET THE FILE OF REGISTERS
24 035532   012703 000004           MOV      #4,R3      ;GET THE FIRST SEGMENT COUNT
25 035536   013146           2#:   MOV      @R1+,-(SP) ;GET THE INITIAL STATE OF THE REGISTER
26 035540   017612 000000           MOV      @R1+,-(SP) ;SAVE IT IN THE IMAGE FILE
27 035544   053736 002436           BIS      TEMP,@R1+  ;WRITE THE UNIQUE TEST BIT
28 035550   053722 002436           BIS      TEMP,(R2)+ ;AND SET THE CORRECT MASK IN THE IMAGE FILE
29 035554   005237 002436           INC      TEMP       ;NEXT UNIQUE PATTERN
30 035560   005303           DEC      R3         ;REDUCE THE ITERATION COUNT
31 035562   003365           BGT     2#         ;IF > 0, KEEP GOING!
32 035564   012737 000010 002436   MOV      #10,TEMP   ;NEXT PATTERN
33 035572   012703 000004           MOV      #4,R3      ;AND THE NEXT SEGMENT COUNT
34 035576   005737 002504           TST     RHTYPE     ;WHICH CONTROLLER?
35 035602   001402           BEQ     4#         ;IF 0, RH11
36 035604   062703 000002           ADD     #2,R3      ;ADD 2 TO THE SEGMENT COUNT TO INCLUDE RPBAE & RPCS3
37 035610   013146           4#:   MOV      @R1+,-(SP) ;SAVE THE INITIAL STATE OF THE REGISTER
38 035612   017612 000000           MOV      @R1+,-(SP) ;NOW GET THE INITIAL CONTENTS OF THE REGISTER
39 035616   053736 002436           BIS      TEMP,@R1+  ;NOW WRITE THE TEST PATTERN
40 035622   053722 002436           BIS      TEMP,(R2)+ ;AND UPDATE THE IMAGE FILE
41 035626   005237 002436           INC     TEMP       ;NEXT PATTERN
42 035632   005303           DEC     R3         ;ONE LESS ITERATION TO GO
43 035634   003365           BGT     4#         ;IF > 0, NOT DONE YET!!
44 035636   012701 004330           MOV     #TST49,R1  ;GET THE REGISTER FILE AGAIN
45 035642   012702 002652           MOV     #PSTACK,R2 ;AND THE OUTPUT FILE AGAIN
46 035646   012703 000010           MOV     #8,R3      ;GET THE OVERALL ITERATION COUNT
47 035652   005737 002504           TST     RHTYPE     ;WHICH CONTROLLER??
48 035656   001402           BEQ     5#         ;IF 0, IT'S AN RH11!!
49 035660   062703 000002           ADD     #2,R3      ;INCLUDE THE TWO EXTRA REGISTERS: RPBAE & RPCS3
50 035664   013146           5#:   MOV     @R1+,-(SP) ;GET THE ADDRESS OF THE REGISTER UNDER TEST
51 035666   023622           CMP     @R1+,-(R2)+ ;DOES THE DATA MATCH?
52 035670   001425           BEQ     6#         ;YES, GO-ON!
53 035672   017637 177776 002452   MOV     @-2(SP),RCVED ;GET THE FAILING DATA
54 035700   016637 177776 002456   MOV     -2(SP),TESTRG ;AND THE FAILING REGISTER ADDRESS
55 035706   016237 177776 002454   MOV     -2(R2),EXPTED ;NOW GET THE EXPECTED DATA
56 035714   012737 016000 002404   MOV     #BIT10!BIT11!BIT12,ERRWD1
57 035722   012737 000406 002406   MOV     #BIT1!BIT2!BIT8,ERRWD2;CREATE THE MODULE CALLOUT

```


58	035730	104456		TRAP	C\$ERHRD	
	035732	000121		.WORD	81	
	035734	013641		.WORD	EM36	
	035736	014172		.WORD	ERRO	
59	035740	005037	002402	CLR	ITCOUN	;RESET THE ITERATION COUNTER
60	035744	005303		6\$: DEC	R3	;ONE LESS REGISTER TO TEST
61	035746	003346		BGT	5\$;IF > 0, KEEP GOING!
62	035750	005337	002402	DEC	ITCOUN	;ONE LESS ITERATION
63	035754	003257		BGT	1\$;IF <= 0, DONE!!
64	035756			L10077:		
	035756	104401		TRAP	C\$ETST	

TEST 50 RPLA STATIC TEST

TOR

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1          .SBTTL TEST 50 RPLA STATIC TEST
2
3          ;* TEST 50 RPLA STATIC TEST
4          ;* : SET UP FOR A SECTOR MATCH IN RPLA
5          ;* : SET UP A WATCHDOG TIMER
6          ;* : REPEAT
7          ;* : : IF DESIRED SECTOR DOESN'T MATCH CONTENTS OF RPLA
8          ;* : : : THEN
9          ;* : : : DECREMENT THE WATCHDOG TIMER
10         ;* : : : IF WATCHDOG TIMER = 0
11         ;* : : : : THEN
12         ;* : : : : OUTPUT ERROR MESSAGE (CAN'T FIND DESIRED SECTOR IN TIME)
13         ;* : : : : OUTPUT FAULT LIST: J8, J11, J12, J13, RHXX, CONTROLLER, CABLES, TERMINA
14         ;* : : : : ELSE
15         ;* : : : : RE READ RPLA LOOKING FOR A SECTOR MATCH
16         ;* : : : : ENDF
17         ;* : : : : ELSE
18         ;* : : : : GET NEXT LEGAL SECTOR ADDRESS
19         ;* : : : : REFRESH THE WATCHDOG TIMER
20         ;* : : : ENDF
21         ;* : : UNTIL ALL LEGAL SECTOR ADDRESSES HAVE BEEN USED
22         ;* : ENDF
23         ;* END TEST 50
24
25 035760          T50::
26 035760 012737 000012 002402 MOV #10.,ITCOUN ;LOAD THE OVERALL ITERATION COUNTER
27 035766 005001          1#: CLR R1 ;R1 IS USED FOR THE SECTOR ADDRESS
28 035770 012703 000003 MOV #3,R3 ;OVERALL ITERATION COUNTER
29 035774 013737 002532 002456 MOV RPLA,TESTRG ;THIS REGISTER MIGHT FAIL
30 036002 012737 016200 002404 MOV #BIT7!BIT10!BIT11!BIT12,ERRWD1
31 036010 012737 000406 002406 MOV #BIT1!BIT2!BIT8,ERRWD2
32 036016 004737 016662 JSR PC,SEIZE ;GET THE DRIVE NOW!
33 036022 012737 177777 002436 2#: MOV #-1,TEMP ;USED FOR A WATCHDOG TIMER
34 036030 027701 144476 3#: CMP @RPLA,R1 ;NOW LOOK FOR SECTOR 0
35 036034 001421 BEQ 6# ;MATCH, GO-ON
36 036036 005337 002436 DEC TEMP ;1.2 LESS MICROSECONDS TO GO
37 036042 001372 BNE 3# ;KEEP GOING IF NOT ZERO
38 036044 005303 DEC R3 ;ONE LESS ITERATION TO GO
39 036046 003365 BGT 2# ;IF NOT ZERO, KEEP GOING
40 036050 017737 144456 002452 4#: MOV @RPLA,RCVED ;GET THE RECEIVED DATA
41 036056 010137 002454 5#: MOV R1,EXPTD ;GET THE EXPECTED DATA
42 036062 104456 TRAP C$ERHRD
   036064 000122 .WORD 82
   036066 012454 .WORD EM14
   036070 014172 .WORD ERRO
43 036072 005037 002402 CLR ITCOUN ;RESET THE ITERATION COUNTER
44 036076 000454 BR 14# ;TAKE EARLY RETURN
45 036100 012703 002652 6#: MOV @PSTACK,R3 ;GET THE 2 OUT OF 3 BUFFER
46 036104 062701 000100 ADD #100,R1 ;SET UP FOR THE NEXT SECTOR ADDRESS
47 036110 020127 006200 CMP R1,#6200 ;DONE? (SECTOR 50)
48 036114 001442 BEQ 13# ;IF MATCH, YES
49 036116 012702 000002 MOV #2,R2 ;WE MUST HAVE TWO MATCHES
50 036122 012704 000003 MOV #3,R4 ;USE THIS FOR AN OVERALL ITERATION COUNT
51 036126 012737 177777 002436 7#: MOV #-1,TEMP ;USE THIS AS A WATCHDOG TIMER
52 036134 005337 002436 8#: DEC TEMP ;1.2 MICRO SECONDS LESS WINDOW
53 036140 001404 BEQ 9# ;IF ZERO, FIND OUT WHICH ITERATION
54 036142 027701 144364 CMP @RPLA,R1 ;MATCH?

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55 036146 001372          BNE      8$          ;IF NOT, KEEP TRYING
56 036150 001403          BEQ      10$         ;IF SO, TRY AGAIN
57 036152 005304          9$:      DEC      R4          ;ONE LESS ITERATION TO GO
58 036154 003364          BGT      7$          ;IF NOT ZERO, KEEP TRYING
59 036156 001734          BEQ      4$          ;IF ZERO, WE HAVE AN ERROR
60 036160 017723 144346   10$:     MOV      @RPLA,(R3)+    ;GET THE FIRST OF THREE READINGS
61 036164 017723 144342   MOV      @RPLA,(R3)+    ;GET THE SECOND OF THREE READINGS
62 036170 017723 144336   MOV      @RPLA,(R3)+    ;GET THE FINAL READING
63 036174 024301          11$:     CMP      -(R3),R1      ;DO WE MATCH?
64 036176 001003          BNE      12$         ;IF NOT, CHECK IT FOR ERRORS
65 036200 005302          DEC      R2          ;OK ONCE, TRY AGAIN
66 036202 003374          BGT      11$         ;TAKE BRANCH IF NOT 0
67 036204 000406          BR       13$         ;TEST OK, SO-FAR
68 036206 020327 002650   12$:     CMP      R3,@PSTACK 2 ;DID WE RUN OUT OF BUFFER?
69 036212 101370          BHI      11$         ;NOT YET
70 036214 011337 002454   MOV      (R3),EXPTED    ;GET THE EXPECTED DATA FOR THE REPORT
71 036220 000716          BR       5$          ;NOW REPORT THE ERROR
72 036222 005337 002402   13$:     DEC      ITCOUN    ;ONE LESS ITERATION.....
73 036226 003257          BGT      1$          ;IF <= 0, DONE!!
74 036230          14$:
    036230          L10100:
    036230 104401          TRAP    C$ETST

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13.4

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1 .SBTTL TEST 51 RPRM1 RPER2 WRAP AROUND TEST
2
3
4 ;# TEST 51 RPRM1 RPER2 WRAP AROUND TEST
5 ;# : USING PATTERNS 1-4, ONE AT A TIME.
6 ;# : WRITE RPRM1, HIGH BYTE WITH 'FE' (HEX) AND LOW BYTE WITH TEST PATTERN
7 ;# : ISSUE A DIAGNOSTIC COMMAND
8 ;# : WAIT FOR THE COMMAND COMPLETION
9 ;# : IF RPER2, LOW BYTE ONLY, DOESN'T MATCH THE TEST PATTERN
10 ;# : : THEN
11 ;# : : OUTPUT ERROR MESSAGE (REGISTER CONTENTS DON'T MATCH EXPECT DATA)
12 ;# : : OUTPUT FAULT LIST: J7, J8
13 ;# : ENDF
14 ;# : WRITE RPRM1, HIGH BYTE WITH 'FF' (HEX)
15 ;# : ISSUE A DIAGNOSTIC COMMAND
16 ;# END TEST 51
17 036232
18 036232 012737 000002 002402 T51:: MOV #2,,ITCOUN ;LOAD THE ITERATION COUNT
19 036240 012737 000035 002420 MOV #DIAG,FUNCTN ;LOAD THE DIAGNOSTIC COMMAND FUNCTION
20 036246 012737 000500 002404 MOV #BIT6!BIT7,ERRWD1 ;LOAD THE CALLOUT LIST
21 036254 005037 002406 CLR ERRWD2 ;NO MODULE FOR THIS MASK
22 036260 004737 016662 JSR PC,SEIZE ;LOAD THE DRIVE NUMBER
23 036264 013737 002552 002456 MOV RPER2,TESTRG ;THIS REGISTER MAY FAIL
24 036272 012701 177000 11: MOV #177000,R1 ;SET UP FOR A 0'S WRITE WRAP TO RPER2
25 036276 104404 TRAP C1BSEG
26 036300 010177 144232 MOV R1,BRPMR1 ;LOAD THE MAINTENANCE REGISTER NOW
27 036304 004737 015146 JSR PC,DRIVER ;ISSUE THE DIAGNOSTIC COMMAND
28 036310 017746 144236 MOV BRPER2,-(SP) ;GET THE RESULTS
29 036314 042716 177400 BIC #177400,(SP) ;AND REMOVE THE UNWANTED BITS
30 036320 120126 CMPB R1,(SP) ;MATCH?
31 036322 001415 BEQ 21 ;TAKE BRANCH IF SO...
32 036324 005037 002454 CLR EXPTED ;RESET THE EXPECTED DATA
33 036330 110137 002454 MOVB R1,EXPTED ;LOAD THE EXPECTED STATUS
34 036334 016637 177776 002452 MOV -2(SP),RCVED ;AND THE FAILING STATUS
35 036342 104456 TRAP C1ERMRD
36 036344 000123 .WORD 83
37 036346 012454 .WORD EM14
38 036350 014172 .WORD ERRO
39 036352 005037 002402 CLR ITCOUN ;NO ITERATIONS NECESSARY
40 036356 004737 015400 21: JSR PC,DRVCLR ;RESET ANY ERRORS AND
41 036362 004737 015312 JSR PC,DIAGEN ;SHUT THE DIAGNOSTIC MODE OFF.
42 036366 104405 100001: TRAP C1ESEG
43 036370 104404 TRAP C1BSEG
44 036372 012701 177377 MOV #177377,R1 ;WRITE AN ALL ONES PATTERN TO RPER2
45 036376 010177 144134 MOV R1,BRPMR1 ;WRITE THE MAINTENANCE REGISTER NOW
46 036402 004737 015146 JSR PC,DRIVER ;ISSUE THE DIAGNOSTIC COMMAND
47 036406 017746 144140 MOV BRPER2,-(SP) ;GET THE RESULTS
48 036412 042716 177400 BIC #177400,(SP) ;STRIP THE HIGH BITS OUT
49 036416 120126 CMPB R1,(SP) ;MATCH?
50 036420 001415 BEQ 31 ;IF SO, TAKE BRANCH
51 036422 005037 002454 CLR EXPTED ;SET UP FOR AN ERROR MESSAGE
52 036426 110137 002454 MOVB R1,EXPTED ;SET THE EXPECTED DATA
53 036432 016637 177776 002452 MOV -2(SP),RCVED ;SET THE RECEIVED DATA
54 036440 104456 TRAP C1ERMRD
55 036442 000124 .WORD 84
    
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036444 012454          .WORD  EM14
036446 014172          .WORD  ERRO
53 036450 005037 002402 CLR    ITCOUN          ;NO FURTHER ITERATIONS NECESSARY
54 036454 004737 015400 34: JSR    PC,DRVCLR     ;RESET ANY ERRORS AND
55 036460 004737 015312 JSR    PC,DIAGEN      ;SHUT THE DIAGNOSTIC MODE OFF.
56 036464 104405 100014: TRAP  C#ESEG
57 036466 012701 000001 MOV    #BIT0,R1        ;LOAD THE NEXT PATTERN NOW
58 036472 052701 177000 44: BIS    #177000,R1     ;AND SET THE DIAGNOSTIC START MASK
59 036476 104404 TRAP  C#BSEG
60 036500 010177 144032 MOV    R1,BRPMR1      ;LOAD THE WRAP TEST NOW
61 036504 004737 015146 JSR    PC,DRIVER      ;ISSUE THE COMMAND NOW!
62 036510 017746 144036 MOV    BRPER2,-(SP)   ;GET THE RESULTS
63 036514 042716 177400 BIC    #177400,(SP)  ;STRIP UNWANTED DATA
64 036520 120126 CMPB   R1,(SP)+       ;MATCH??
65 036522 001415 BEQ    54              ;IF SO, SKIP ERROR MESSAGE
66 036524 005037 002454 CLR    EXPTED         ;RESET THE EXPECTED DATA
67 036530 110137 002454 MOVB   R1,EXPTED     ;GET THE EXPECTED DATA
68 036534 016637 177776 002452 MOV    -2(SP),RCVED  ;AND THE FAILED RESULTS
69 036542 104456 TRAP  C#ERMRD
70 036544 000125 .WORD  85
71 036546 012454 .WORD  EM14
72 036550 014172 .WORD  ERRO
73 036552 005037 002402 CLR    ITCOUN          ;NO ITERATIONS NECESSARY
74 036556 004737 015400 54: JSR    PC,DRVCLR     ;RESET ANY ERRORS AND
75 036562 004737 015312 JSR    PC,DIAGEN      ;SHUT THE DIAGNOSTIC MODE OFF.
76 036566 104405 100024: TRAP  C#ESEG
77 036570 042701 177200 BIC    #177200,R1    ;DONE?
78 036574 001402 BEQ    64              ;IF ZERO, YES!!!
79 036576 006301 ASL    R1              ;NEXT BIT POSTIION, NOW!
80 036600 000734 BR     44              ;KEEP GOING!
81 036602 012701 000376 64: MOV    #376,R1        ;LAST PATTERN
82 036606 052701 177000 74: BIS    #177000,R1    ;LOAD THE DIAGNOSTIC START AGAIN
83 036612 104404 TRAP  C#BSEG
84 036614 010177 143716 MOV    R1,BRPMR1      ;LOAD THE WRAP DATA NOW
85 036620 004737 015146 JSR    PC,DRIVER      ;EXECUTE THE DIAGNOSTIC COMMAND NOW
86 036624 017746 143722 MOV    BRPER2,-(SP)   ;GET THE RESULTS
87 036630 042716 177400 BIC    #177400,(SP)  ;STRIP UNWANTED DATA
88 036634 120126 CMPB   R1,(SP)+       ;MATCH??
89 036636 001415 BEQ    84              ;IF SO, SKIP ERROR REPORT
90 036640 005037 002454 CLR    EXPTED         ;RESET THE EXPECTED DATA
91 036644 110137 002454 MOVB   R1,EXPTED     ;LOG THE GOOD DATA
92 036650 016637 177776 002452 MOV    -2(SP),RCVED  ;LOG THE BAD DATA
93 036656 104456 TRAP  C#ERMRD
94 036660 000126 .WORD  86
95 036662 012454 .WORD  EM14
96 036664 014172 .WORD  ERRO
97 036666 005037 002402 CLR    ITCOUN          ;RESET THE ITERATIONS COUNTER
98 036672 004737 015400 84: JSR    PC,DRVCLR     ;RESET ANY ERRORS AND
99 036676 004737 015312 JSR    PC,DIAGEN      ;SHUT THE DIAGNOSTIC MODE OFF.
100 036702 104405 100034: TRAP  C#ESEG
101 036704 042701 177400 BIC    #177400,R1    ;REMOVE THE MASK
102 036710 000261 SEC

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99 036712 006101          ROL    R1          ;SHIFT LEFT (ONE TIME!!)
100 036714 042701 177400  BIC    0177400,R1    ;CLEAR THE UNUSED BITS FOR THE FINAL TEST
101 036720 022701 000377  CMP    0377,R1      ;DONE??
102 036724 001330          BNE    7$          ;IF NOT, KEEP GOING
103 036726 005337 002402  DEC    ITCOUN      ;ONE LESS ITERATION TO-GO
104 036732 003402          BLE    9$          ;IF <= 0, DONE
105 036734 000137 036<12  JMP    1$          ;DO UNTIL = 0
106 036740
    036740
    036740 104401
9$:
L10101:
    TRAP  C$ETST

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1          .SBTTL TEST 52 ERROR LOG DUMP
2
3          ;# TEST 52 ERROR LOG DUMP
4          ;# : THIS TEST DOES NO DATA CHECKING
5          ;# : LOAD #17(HEX) INTO RPMR1, HIGH BYTE
6          ;# : LOAD LOW BYTE OF RPMR1 WITH RAM LOCATION TO BE DUMPED:
7          ;# : 71-72(HEX) FOR REVISION LEVEL
8          ;# : 32-37(HEX) FOR THE ERROR LOG
9          ;# : 88(HEX) FOR FAILED RECAL ATTEMPTS
10         ;# : 38-4A(HEX) FOR LAST 20. UNIQUE ERROR LOG ENTRIES
11         ;# : REPEAT
12         ;# : : LOAD A DIAGNOSTIC COMMAND
13         ;# : : WHEN COMMAND EXECUTION COMPLETES GET CONTENTS OF RPER2
14         ;# : : CONVERT TO HEX OR DECIMAL (AS REQUIRED)
15         ;# : : PRINT OUTPUT TO USER
16         ;# : : UNTIL ALL CONTENTS HAVE BEEN DUMPED
17         ;# : : ENDREPEAT
18         ;# : END TEST 52
19
20         T52::
21         036742 005737 002334          TST      ERRDMP          ;DUMP THE ERROR LOG?
22         036746 003002                  BGT      1#             ;IF >0, YES
26         036750 104432                  TRAP    C#EXIT
27         036752 000736                  .WORD   L10102-
28         036754 004737 016662          1#:     JSR      PC,SEIZE          ;LOAD THE DRIVE NUMBER
29         036760 012702 002652          MOV     #PSTACK,R2       ;GET THE OUTPUT BUFFER
30         036764 012737 000035 002420  MOV     #DIAG,FUNCTN     ;SET UP FOR A DIAGNOSTIC COMMAND
31         036772 012701 000161          MOV     #161,R1          ;THIS IS THE FIRST LOW BYTE PARAMETER (71 HEX)
32         036776 012704 000027          MOV     #27,R4           ;THIS IS THE DUMP ROUTINE NUMBER (17 HEX)
33         037004 004737 015260          SWAB   R4                ;PUT THIS AS THE COMMAND NUMBER
34         037010 050104                  JSR     PC,DIAGST        ;START THE DIAGNOSTIC MONITOR
35         037012 004737 015400          2#:     BIS     R1,R4          ;LOAD THE RAM ADDRESS
36         037016 004737 015352          JSR     PC,DRVCLR        ;NO ERRORS INITIALLY
37         037022 017712 143524          JSR     PC,DIAGLD        ;ISSUE THE COMMAND
38         037026 042722 177400          MOV     BRPER2,(R2)      ;GET THE RESULTS (8080/2901 REV'S)
39         037032 040104                  BIC     #177400,(R2)    ;STRIP OUT UNWANTED DATA
40         037034 020127 000162          BIC     R1,R4           ;REMOVE THE LOW BYTE ARGUMENT
41         037040 001402                  CMP     R1,#162         ;DONE BOTH LOCATIONS? (72 HEX)
42         037042 005201                  BEQ     3#              ;IF MATCH, YES
43         037044 000761                  INC     R1              ;SET THE 2901 REV LEVEL REQUEST
44         037046                  BR      2#              ;AND GO TO THE RAM AND GET IT
45         037046 013746 002654          3#:     MOV     PSTACK+2,-(SP)    ;PRINT 8080 AND 2901 REVISION LEVELS
46         037052 013746 002652          MOV     PSTACK,-(SP)
47         037056 012746 010202          MOV     #FRMT20,-(SP)
48         037062 012746 000003          MOV     #3,-(SP)
49         037066 010600                  MOV     SP,R0
50         037070 104417                  TRAP   C#PNTF
51         037072 062706 000010          ADD     #10,SP
52         037076 012701 000061          MOV     #61,R1          ;SET UP FOR THE NEXT RAM DUMP (31 HEX)
53         037102 004737 015400          JSR     PC,DRVCLR        ;NO ERRORS NOW!
54         037106 004737 017252          JSR     PC,NEXLOC        ;NOW GET THE DATA
55         037112 017746 143434          MOV     BRPER2,-(SP)     ;GET THE RAM OUTPUT
56         037116 042726 177400          BIC     #177400,(SP)    ;STRIP UNUSED DATA
57         037122 016646 177776          MOV     -2(SP),-(SP)    ;PRINT NUMBER OF SEEKS TOO LONG
58         037126 012746 007574          MOV     #FRMT07,-(SP)

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	037132	012746	000002	MOV	#2, (SP)	
	037136	010600		MOV	SP, R0	
	037140	104417		TRAP	C#PNTF	
	037142	062706	000006	ADD	#6, SP	
53	037146	004737	015400	JSR	PC, DRVCLR	;NO RESIDUAL ERRORS
54	037152	004737	017252	JSR	PC, NEXLOC	;GET THE NEXT RAM CONTENTS
55	037156	017746	143370	MOV	BRPER2, -(SP)	;GET THE RESULTS
56	037162	042726	177400	BIC	#177400, (SP)	;STRIP UNWANTED DATA
57						;PRINT NUMBER OF SEEK OVERSHOOTS
58	037166	016646	177776	MOV	-2(SP), -(SP)	
	037172	012746	007624	MOV	#FRMT10, -(SP)	
	037176	012746	000002	MOV	#2, -(SP)	
	037202	010600		MOV	SP, R0	
	037204	104417		TRAP	C#PNTF	
	037206	062706	000006	ADD	#6, SP	
59	037212	004737	015400	JSR	PC, DRVCLR	;NO ERRORS
60	037216	004737	017252	JSR	PC, NEXLOC	;NEXT CONTENTS, PLEASE..
61	037222	017746	143324	MOV	BRPER2, -(SP)	;GET THE RESULTS
62	037226	042726	177400	BIC	#177400, (SP)	;STRIP UNUSED DATA
63						;PRINT NUMBER OF SOFT SEEK OVERSHOOTS
64	037232	016646	177776	MOV	-2(SP), -(SP)	
	037236	012746	007655	MOV	#FRMT11, -(SP)	
	037242	012746	000002	MOV	#2, -(SP)	
	037246	010600		MOV	SP, R0	
	037250	104417		TRAP	C#PNTF	
	037252	062706	000006	ADD	#6, SP	
65	037256	004737	015400	JSR	PC, DRVCLR	;NO FURTHER ERRORS
66	037262	004737	017252	JSR	PC, NEXLOC	;GET THE NEXT CONTENTS PLEASE..
67	037266	017746	143260	MOV	BRPER2, -(SP)	;GET THE RESULTS
68	037272	042726	177400	BIC	#177400, (SP)	;STRIP THE UNUSED DATA
69						;PRINT GUARD-BAND DETECTED SKI'S
70	037276	016646	177776	MOV	-2(SP), -(SP)	
	037302	012746	007713	MOV	#FRMT12, -(SP)	
	037306	012746	000002	MOV	#2, -(SP)	
	037312	010600		MOV	SP, R0	
	037314	104417		TRAP	C#PNTF	
	037316	062706	000006	ADD	#6, SP	
71	037322	004737	015400	JSR	PC, DRVCLR	;NO FURTHER ERRORS
72	037326	004737	017252	JSR	PC, NEXLOC	;NEXT RAM LOCATION...
73	037332	017746	143214	MOV	BRPER2, -(SP)	;GET THE RESULTS
74	037336	042726	177400	BIC	#177400, (SP)	;STRIP THE UNUSED DATA
75						;PRINT NUMBER OF INDEX ERRORS
76	037342	016646	177776	MOV	-2(SP), -(SP)	
	037346	012746	007756	MOV	#FRMT13, -(SP)	
	037352	012746	000002	MOV	#2, -(SP)	
	037356	010600		MOV	SP, R0	
	037360	104417		TRAP	C#PNTF	
	037362	062706	000006	ADD	#6, SP	
77	037366	004737	015400	JSR	PC, DRVCLR	;NO FURTHER ERRORS
78	037372	004737	017252	JSR	PC, NEXLOC	;NEXT RAM LOCATION
79	037376	017746	143150	MOV	BRPER2, -(SP)	;GET THE RESULTS
80	037402	042726	177400	BIC	#177400, (SP)	;STRIP THE "WHO CARES" BITS
81						;PRINT NUMBER OF PLO UNSAFES
82	037406	016646	177776	MOV	-2(SP), -(SP)	
	037412	012746	010004	MOV	#FRMT14, -(SP)	
	037416	012746	000002	MOV	#2, -(SP)	
	037422	010600		MOV	SP, R0	

037424	104417		TRAP	C:PNTF	
037426	062706	000006	ADD	#6,SP	
83 037432	012701	000210	MOV	#210,R1	;GET THE SET-UP FOR THE #OF RECAL ATTEMPTS(88 HEX)
84 037436	004737	015400	JSR	PC,DRVCLR	;NO FURTHER ERRORS
85 037442	004737	017252	JSR	PC,NEXLOC	;GET THE DATA NOW
86 037446	017746	143100	MOV	BRPER2,-(SP)	;GET THE RESULTS
87 037452	042726	177400	BIC	#177400,(SP)	;STRIP THE UNWANTED DATA
88					;PRINT THE NUMBER OF RECAL ATTEMPTS
89 037456	016646	177776	MOV	-2(SP),-(SP)	
037462	012746	010031	MOV	#FRMT15,-(SP)	
037466	012746	000002	MOV	#2,-(SP)	
037472	010600		MOV	SP,R0	
037474	104417		TRAP	C:PNTF	
037476	062706	000006	ADD	#6,SP	
90					;PRINT ERROR LOG ENTRIES, IF ANY
91 037502	012746	010070	MOV	#FRMT16,-(SP)	
037506	012746	000001	MOV	#1,-(SP)	
037512	010600		MOV	SP,R0	
037514	104417		TRAP	C:PNTF	
037516	062706	000004	ADD	#4,SP	
92 037522	012702	000004	MOV	#4,R2	;GET A 4 ITERATION COUNT
93 037526	012701	000067	MOV	#67,R1	;GET THE FIRST RAM LOCATION-1 FOR THE LAST 20 ERRORS
94 037532	012703	000005	MOV	#5,R3	;5 ENTRIES / ROW
95					;CR-LF
96 037536	012746	006420	MOV	#CRLF,-(SP)	
037542	012746	000001	MOV	#1,-(SP)	
037546	010600		MOV	SP,R0	
037550	104417		TRAP	C:PNTF	
037552	062706	000004	ADD	#4,SP	
97 037556	004737	015400	JSR	PC,DRVCLR	;NO FURTHER ERRORS
98 037562	004737	017252	JSR	PC,NEXLOC	;GET THE RAM DATA
99 037566	017746	142760	MOV	BRPER2,-(SP)	;GET THE RESULTS
100 037572	042716	177400	BIC	#177400,(SP)	;STRIP THE UNUSED RESULTS
101 037576	005726		TST	(SP)	;LOOK FOR NULL DATA
102 037600	001427		BEQ	6#	;TAKE BRANCH IF 0
103 037602	005746		TST	-(SP)	;RESTORE THE STACK FOR OCTHEX
104 037604	004737	015416	JSR	PC,OCTHEX	;CONVERT TO HEX
105					;DUMP THE RAM CONTENTS
106 037610	012746	002660	MOV	#PSTACK+6,-(SP)	
037614	012746	002656	MOV	#PSTACK+4,-(SP)	
037620	012746	002654	MOV	#PSTACK+2,-(SP)	
037624	012746	002652	MOV	#PSTACK,-(SP)	
037630	012746	010161	MOV	#FRMT17,-(SP)	
037634	012746	000005	MOV	#5,-(SP)	
037640	010600		MOV	SP,R0	
037642	104417		TRAP	C:PNTF	
037644	062706	000014	ADD	#14,SP	
107 037650	005303		DEC	R3	;ONE LESS ROW TO GO
108 037652	003341		BGT	5#	;KEEP GOING
109 037654	005302		DEC	R2	;ONE LESS COLUMN TO GO
110 037656	003325		BGT	4#	;KEEP GOING
111 037660					;CR-LF
112 037660	012746	006420	MOV	#CRLF,-(SP)	
037664	012746	000001	MOV	#1,-(SP)	
037670	010600		MOV	SP,R0	
037672	104417		TRAP	C:PNTF	
037674	062706	000004	ADD	#4,SP	

113 037700 004737 015400
114 037704 004737 015312
115 037710
037710 104401

JSR PC,DRVCLR ;RESET RPER2 TO 0
JSR PC,DIAGEN ;SHUT OFF THE DIAGNOSTIC MONITOR
L10102:
TRAP C&ETST

```

1      .SBTTL TEST 53 COMPOSITE MICROCODE TEST
2
3      ;# TEST 53 COMPOSITE MICROCODE TEST
4      ;# : THIS TEST RUNS TWO SEQUENCES OF MICRODIAGNOSTICS THROUGH THE
5      ;# : RP07. THE FIRST SEQUENCE IS COMPRISED OF ROUTINES 24 - 38
6      ;# : THE SECOND SEQUENCE IS COMPRISED OF ROUTINES 18 - 23. IF THE
7      ;# : LOOP ON ERROR OPTION IS SELECTED, THE ROUTINE WHICH WAS RUNNING
8      ;# : AT THE TIME OF THE ERROR WILL BE 'FROZEN' SO THAT THE ERROR MAY
9      ;# : BE ANALYZED FURTHER TO IDENTIFY THE FAILURE MECHANISM.
10     ;# : TEST ALGORITHM IS AS FOLLOWS:
11     ;# : TURN ON THE DIAGNOSTIC MONITOR
12     ;# : LOAD RPRM1 WITH A DIAGNOSTIC NUMBER (AND HEAD NUMBER IF NECESSARY)
13     ;# : REPEAT
14     ;# : : ISSUE A DIAGNOSTIC COMMAND
15     ;# : : IF RPER2 (LOW BYTE) <> 0
16     ;# : : : THEN
17     ;# : : : REPORT THE ERROR (IN HEX), AND THE MODULE CALLOUT
18     ;# : : : ENDFIF
19     ;# : : UNTIL ALL ROUTINES HAVE BEEN RUN
20     ;# : ENDFEPEAT
21     ;# : TURN OFF THE DIAGNOSTIC MONITOR
22     ;# END TEST 53
23
24 037712 TS3::
25 037712 012704 000044 MOV #44,R4 ;SET UP THE FIRST ROUTINE NUMBER
26 037716 004737 016662 JSR PC,SEIZE ;LOAD THE DRIVE NUMBER
27 037722 004737 015260 JSR PC,DIAGST ;AND THEN THE "HANDSHAKE"
28 037726 005002 CLR R2 ;R2 USED FOR THE TRACK ADDRESS
29 037730 000304 1#: SWAB R4 ;R4 HIGH BYTE USED FOR THE ROUTINE #
30 037732 2#:
31 037732 104404 TRAP C#BSEG
32 037734 004737 015352 JSR PC,DIAGLD ;NOW EXECUTE THE ROUTINE NUMBER
33 037740 017746 142606 MOV #RPER2,-(SP) ;GET THE RESULTS OF THE TEST
34 037744 042726 177400 BIC #177400,(SP)+ ;STRIP JUNK
35 037752 104456 BEQ 3# ;IF 0, YES!!
36 037754 000620 TRAP C#ERHRD
37 037756 013564 .WORD 400
38 037760 014310 .WORD EM35
39 040002 012737 040011 002420 MOV #TRE!DRCLR,FUNCTN ;LOAD THE DRIVE CLEAR AND CONTROLLER CLEAR COMMAND
40 040004 000304 JSR PC,DRIVER ;NOW EXECUTE THE DRIVE CLEAR COMMAND
41 040006 005204 100000 142534 BIS #0MD,#RPMR1 ;SET THE DIAGNOSTIC MODE BIT AGAIN
42 040010 120427 000037 3#:
43 040014 103745 100000# TRAP C#ESEG
44 040016 120427 000043 SWAB R4 ;RESTORE R4
45 040022 101035 INC R4 ;GET NEXT ROUTINE #
46 040024 000304 CMPB R4,#37 ;IS THIS A READ/WRITE ROUTINE?
47 040026 005737 002336 BLO 1# ;VALID ROUTINE, KEEP GOING
48 040032 001411 CMPB R4,#43 ;READ-WRITE ROUTINE?
49 040034 010446 BHI 5# ;IF HIGHER, NO
50 040036 042716 000377 SWAB R4 ;ROUTINE # IN HIGH BYTE
51 040042 022627 021400 TST SELTRK ;USER SPECIFIED TRACK ADDRESS??
;IF ZERO, NO-DO THEM ALL!!
MOV R4,-(SP) ;GET R4 ON THE STACK FOR SOME CHECKING
BIC #377,(SP) ;STRIP THE TRACK ADDRESS
CMP (SP)+,#21400 ;WAS THIS THE LAST ROUTINE?

```

52	040046	001431		BEQ	6#					
53	040050	053704	002340	BIS	TRAKAD,R4					;IF =, YES IT WAS!!
54	040054	000726		BR	2#					;SET THE USER SPECIFIED TRACK ADDRESS
55	040056	162704	000400	4#:	SUB	#400,R4				;AND GO-ON
56	040062	040204			BIC	R2,R4				;GET THE LAST ROUTINE # (WE MAY NOT BE DONE)
57	040064	005202			INC	R2				;RESET THE TRACK ADDRESS
58	040066	050204			BIS	R2,R4				;NEXT TRACK ADDRESS, PLEASE
59	040070	020227	000037		CMP	R2,#31.				;LOAD THE NEW TRACK ADDRESS
60	040074	101716			BLOS	2#				;WAS IT LEGAL?
61	040076	105004			CLRB	R4				;YES IT WAS, GO-ON
62	040100	005002			CLR	R2				;RESET TO TRACK 0
63	040102	062704	000400		ADD	#400,R4				;AND RESET THE TRACK TO 0
64	040106	020427	021400		CMP	R4,#21400				;GET NEXT ROUTINE #
65	040112	103707			BLO	2#				;IS THIS ROUTINE #43 (HIGH BYTE INFO)?
66	040114	000406			BR	6#				;IF LESS, NO
67	040116	120427	000073	5#:	CMPB	R4,#73				;DONE, TURN OFF THE MONITOR
68	040122	101702			BLOS	1#				;END ROUTINE?
69	040124	012704	000030		MOV	#30,R4				;NOT YET, IF LOWER
70	040130	000677			BR	1#				;LOAD THE NEXT SEQUENCE OF ROUTINES
71	040132	004737	015312	6#:	JSR	PC.DIAGEN				;AND KEEP GOING
72	040136			L10103:						;ALL DONE, SHUT-OFF THE DIAGNOSTIC MONITOR
	040136	104401			TRAP	C#ETST				

```

1      .SBTTL TEST 54 READ-IN-PRESET FUNCTIONAL TEST
2
3      ;# TEST 54 READ-IN-PRESET FUNCTIONAL TEST
4      ;# : WRITE RPDA WITH DATA PATTERN #3
5      ;# : WRITE RPDC WITH DATA PATTERN #3
6      ;# : SET RPOF: FMT = 1
7      ;# : ISSUE A READ-IN-PRESET COMMAND
8      ;# : : IF ((RPDA) OR (RPDC) OR (RPOF: FMT) <> 0
9      ;# : : THEN
10     ;# : : OUTPUT ERROR MESSAGE (RIP COMMAND FAILED TO EXECUTE PROPERLY)
11     ;# : : OUTPUT FAULT LIST: J12
12     ;# : ENDF
13     ;# END TEST 54
14
15     040140 T54::
16     040140 012737 000012 002402 MOV #10.,ITCOUN ;LOAD THE ITERATION COUNT
17     040146 032777 010000 142350 BIT #MOL,SRPDS ;DRIVE ON-LINE?
18     040154 001016 BNE 1# ;IF = 1, YES
19     040156 004737 017326 JSR PC,SAVRPR ;GET THE REGISTER IMAGE
20     040162 013746 002114 MOV L#TEST,-(SP)
    040166 012746 006452 MOV #MSGMOL,-(SP)
    040172 012746 000002 MOV #2,-(SP)
    040176 010600 MOV SP,R0
    040200 104417 TRAP C#PNTF
    040202 062706 000006 ADD #6,SP
24     040206 104432 TRAP C#EXIT
    040210 000162 .WORD L10104-.
25     040212 1#:
    040212 104404 TRAP C#BSEG
26     040214 004737 016662 JSR PC,SEIZE ;GET THE DRIVE UNDER TEST
27     040220 013777 002350 142272 MOV PATT3,SRPDA ;WRITE PRDA = -1
28     040226 013777 002350 142312 MOV PATT3,SRPDC ;WRITE RPDC = -1
29     040234 052777 010000 142302 BIS #FMT,SRPOF ;FMT 16 = 1
30     040242 012777 000021 142242 MOV #RIP,SRPCS1 ;ISSUE THE READ-IN-PRESET COMMAND
31     040250 005777 142244 TST SRPDA ;DID RPDA CLEAR?
32     040254 001405 BEQ 2# ;IF 0, YES!
33     040256 004737 017422 JSR PC,BICEXP ;FORM THE FAILING DATA
34     040262 002520 RPDA ;THIS REGISTER
35     040264 177777 177777 ;THESE BITS FAILED TO CLEAR
36     040266 000420 BR 4# ;GO-ON
37     040270 005777 142252 2#: TST SRPDC ;DID RPDC CLEAR?
38     040274 001405 BEQ 3# ;IF = 0, YES!
39     040276 004737 017422 JSR PC,BICEXP ;FORM THE FAILING DATA
40     040302 002546 RPDC ;THIS REGISTER
41     040304 177777 177777 ;THESE BITS FAILED TO CLEAR
42     040306 000410 BR 4# ;NOW REPORT THE ERROR
43     040310 032777 010000 142226 3#: BIT #FMT,SRPOF ;DID FMT16 CLEAR
44     040316 001417 BEQ 5# ;IF 0, YES
45     040320 004737 017422 JSR PC,BICEXP ;FORM THE FAILING DATA FOR THIS FAILURE
46     040324 002544 RPOF ;THIS REGISTER
47     040326 010000 FMT ;THIS BIT FAILED TO CLEAR
48     040330 012737 004000 002404 4#: MOV #BIT11,ERRWD1 ;FORM MODULE CALL-OUT
49     040336 005037 002406 CLR ERRWD2 ;BOTH WORDS
50     040342 104456 TRAP C#ERHRD
    040344 000127 .WORD 87
    040346 013326 .WORD EM30
    040350 014172 .WORD ERRO
    
```

51	040352	005037	002402		CLR	ITCOUN		;NO ITERATIONS NOW!!
52	040356			5\$:				
	040356			10000\$:				
	040356	104405			TRAP	C\$ESEG		
53	040360	005337	002402		DEC	ITCOUN		;ONE LESS ITERATION
54	040364	003312			BGT	1\$;IF <= 0, DONE!!
55	040366	004737	017722		JSR	PC,PRELOD		;PUT DRIVE BACK IN 16 BIT MODE
56	040372			L10104:				
	040372	104401			TRAP	C\$ETST		

```

1      .SBTTL TEST 55 COMMAND REJECT TEST
2
3      ;# TEST 55 COMMAND REJECT TEST
4      ;# : SET RPCS2: PAT = 1
5      ;# : WRITE RPDA WITH DATA PATTERN #3, ONCE
6      ;# : WRITE RPAS WITH DATA PATTERN #3, ONCE
7      ;# : ISSUE A READ-IN-PRESET COMMAND
8      ;# : IF ((RPDS: ATA <> 1) OR (RPDA <> DATA PATTERN #3))
9      ;# : : THEN
10     ;# : : OUTPUT ERROR MESSAGE (COMMAND EXECUTED WITH ERRORS PRESENT)
11     ;# : : OUTPUT FAULT LIST: J12
12     ;# : ENDIF
13     ;# END TEST 55
14
15     040374 T55::
16     040374 012737 000012 002402 MOV #10.,ITCOUN ;LOAD THE ITERATION COUNT
17     040402 032777 010000 142114 BIT #MOL,&RPDS ;DRIVE ON-LINE?
18     040410 001016 BNE 1# ;IF = 1, YES
19     040412 004737 017326 JSR PC,SAVRPR ;GET THE REGISTER SNAPSHOT
20     040416 013746 002114 MOV L#TEST,-(SP)
      040422 012746 006452 MOV #MSGMOL,-(SP)
      040426 012746 000002 MOV #2,-(SP)
      040432 010600 MOV SP,R0
      040434 104417 TRAP C#PNTF
      040436 062706 000006 ADD #6,SP
24     040442 104432 TRAP C#EXIT
      040444 000166 .WORD L10105-.
25     040446 1#:
      040446 104404 TRAP C#BSEG
26     040450 004737 016662 JSR PC,SEIZE ;GET THE DRIVE UNDER TEST
27     040454 052777 000020 142040 BIS #PAT,&RPCS2 ;INVERT PARITY (FORCE ERRORS)
28     040462 013777 002350 142030 MOV PATT3,&RPDA ;WRITE RPDA = - 1
29     040470 013777 002350 142032 MOV PATT3,&RPAS ;WRITE RPAS = - 1
30     040476 004737 017000 JSR PC,WAIT ;NOW WAIT FOR THE 8080 TO DETECT THE PARITY ERROR
31     040502 012777 000021 142002 MOV #RIP,&RPCS1 ;ISSUE A READ-IN-PRESET
32     040510 023777 002350 142002 CMP PATT3,&RPDA ;MATCH??
33     040516 001412 BEQ 2# ;IF OK, (MATCH) GO-ON
34     040520 013737 002350 002454 MOV PATT3,EXPTED ;FORM THE EXPECTED DATA
35     040526 013737 002520 002456 MOV RPDA,TESTRG ;GET THE FAILING REGISTER
36     040534 017737 141760 002452 MOV &RPDA,RCVED ;NOW THE FAILING RESULTS
37     040542 000412 BR 3# ;NOW REPORT IT!
38     040544 004737 017000 2#: JSR PC,WAIT ;STALL FOR RP07 MICROPROCESSOR DELAY
39     040550 032777 100000 141746 BIT #ATA,&RPDS ;DID ATA CLEAR
40     040556 001017 BNE 4# ;IF SET, NO - IT'S OK
41     040560 004737 017372 JSR PC,BISEXP ;FORM ERROR DATA
42     040564 002524 RPDS ;THIS REGISTER
43     040566 100000 ATA ;THIS BIT FAILED TO SET
44     040570 012737 004000 002404 3#: MOV #BIT11,ERRWD1 ;FORM MODULE CALL.-OUT
45     040576 005037 002406 CLR ERRWD2 ;BOTH WORDS
46     040602 104456 TRAP C#ERRD
      040604 000130 .WORD 88
      040606 013326 .WORD EM30
      040610 014172 .WORD ERRO
47     040612 005037 002402 CLR ITCOUN ;NO ITERATIONS NEEDED
48     040616 4#:
      040616 10000#: TRAP C#ESEG
      040616 104405

```

49 040620 005337 002402
50 040624 003310
51 040626 004737 017722
52 040632
040632 104401

L10105:

DEC ITCOUN
BGT 1\$
JSR PC,PRELOD
TRAP C\$ETST

;ONE LESS ITERATION TO-GO
;IF <= 0, DONE
;16/BIT MODE


```

1      .SBTTL TEST 56: DATA TEST #1
2
3
4      ;# TEST DATA TEST #1 FIRST DATA TEST OF THE MASSBUS DATA LINES
5      ;# : SET UP A (TOGGLE) BIT MAP FOR ALL EXPECTED BITS (BITS 0 TO 15)
6      ;# : SET UP FOR A RETRY OF 20128 ITERATIONS (629 * 32)
7      ;# : SET RPDC = 0
8      ;# : SET RPDA = 255(.)
9      ;# : REPEAT
10     ;# : : SET RPOF: CMOD = 1
11     ;# : : ISSUE A READ TRACK DESCRIPTOR COMMAND
12     ;# : : IF (RPCS1: TRE) OR (RPDS: ERR) = 1
13     ;# : : : THEN
14     ;# : : : SET RPCS2: CLR = 1
15     ;# : : : INCREMENT THE RETRY COUNTER
16     ;# : : : RELOAD THE DRIVE NUMBER
17     ;# : : : IF RPDA < LAST TRACK ADDRESS (32 RP07)
18     ;# : : : : THEN INCREMENT RPDA (HIGH BYTE ONLY)
19     ;# : : : : ELSE CLEAR RPDA (HIGH BYTE)
20     ;# : : : : INCREMENT RPDC
21     ;# : : : : ENDF
22     ;# : : : ELSE
23     ;# : : : STORE TO WORD #1 AND WORD #2
24     ;# : : : MARK OFF BITS WHICH JUST TOGGLED FROM OFF TO ON, IN BIT MAP
25     ;# : : : INCREMENT RPDA (HIGH BYTE ONLY)
26     ;# : : : IF RPDA (HIGH BYTE) > LAST TRACK ADDRESS (32-RP07)
27     ;# : : : : THEN
28     ;# : : : : SET RPDA (HIGH BYTE) = 0
29     ;# : : : : INCREMENT RPDC
30     ;# : : : : ELSE
31     ;# : : : : INCREMENT RPDA (HIGH BYTE ONLY)
32     ;# : : : : ENDF
33     ;# : : : ENDF
34     ;# : : : UNTIL (BIT MAP-ALL BITS UNDER TEST HAVE TOGGLED) OR (RETRY MAX EXCEEDED)
35     ;# : : ENDF
36     ;# : : IF BIT MAP DIDN'T COMPLETELY TOGGLE, AND RETRY COUNT > MAXIMUM (20128)
37     ;# : : : THEN
38     ;# : : : : OUTPUT ERROR MESSAGE (DATA LINES STUCK OR OPEN)
39     ;# : : : : OUTPUT FAULT LIST: J11 / J13, CABLES, RMXX, J10, TERMINATOR
40     ;# : : : : ENDF
41     ;# : : ENDF
42     ;# : ENDF

```

```

42 040634          T56::
43 040634 004737 016662          JSR    PC,SEIZE          ;GET THE DRIVE UNDER TEST
44 040640 032777 010000 141656 BIT    #MOL,#RPDS      ;IS THE DRIVE REALLY ON-LINE?
45 040646 001016          BNE    1#              ;IF SET, IT IS ON-LINE
46 040650 004737 017326          JSR    PC,SAVRPR       ;GET THE REGISTER SNAPSHOT
47 040654 013746 002114          MOV    L#TEST,-(SP)
      040660 012746 006452          MOV    #MSGMOL,-(SP)
      040664 012746 000002          MOV    #2,-(SP)
      040670 010600          MOV    SP,R0
      040672 104417          TRAP  C#PNTF
      040674 062706 000006          ADD    #6,SP
51 040700 104432          TRAP  C#EXIT
      040702 000262          .WORD L10106-
52 040704 012737 000012 002402 1# : MOV    #10,,ITCOUN      ;LOAD THE ITERATION COUNT
53 040712 012737 177777 002454 2# : MOV    #-1,EXPTED     ;SET UP FOR THE EXPECTED RESULTS
54 040720

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	040720	104404			TRAP	C#BSEG		
55	040722	005037	002432		CLR	CSTORE	;CLEAR THE BITS RECEIVED COUNTER	
56	040726	005037	002452		CLR	RCVED	;CLEAR THE RECEIVER OF THE DATA	
57	040732	005037	002416		CLR	DESCYL	;START AT CYLINDER 0	
58	040736	012737	000377	002414	MOV	#377,DESTK	;AND TRACK 0	
59	040744	012701	000006		MOV	#6,R1	;GET AN ITERATION COUNT	
60	040750	012702	002652		MOV	#PSTACK,R2	;GET THE BUFFER ADDRESS	
61	040754	005022		3#:	CLR	(R2).	;INITIALIZE THE BUFFER	
62	040756	005301			DEC	R1	;ONE LESS ITERATION TO-GO	
63	040760	003375			BGT	3#	;IF NOT ZERO, KEEP GOING	
64	040762	052777	100000	141554	4#:	BIS	#CMOD,#RPOF	;SET COMMAND MODIFIER
65	040770	012737	000075	002420	MOV	#RTD,FUNCTN	;SET COMMAND = READ TRACK DESCRIPTOR	
66	040776	012737	002652	002366	MOV	#PSTACK,TABADD	;LOAD BUFFER LINK	
67	041004	012737	000006	002412	MOV	#6,NEGWRD	;SET WORD COUNT	
68	041012	004737	015146		JSR	PC,DRIVER	;DO THE OPERATION NOW!	
69	041016	005237	002432		INC	CSTORE	;SHOW THIS ITERATION IN THE COUNTER	
70	041022	032777	040000	141474	BIT	#ERR,#RPDS	;DID WE GET AN ERROR?	
71	041030	001004			BNE	5#	;IF SET, YES	
72	041032	032777	040000	141452	BIT	#TRE,#RPCS1	;DID WE GET A TRANSFER ERROR?	
73	041040	001403			BEQ	6#	;NO, THE TRANSFER WAS OK!	
74	041042	004737	016662		5#:	JSR	PC,SEIZE	;GET RID OF ERRORS NOW
75	041046	000414			BR	8#		
76	041050	012701	000006		6#:	MOV	#6,R1	;GET THE ITERATION COUNT
77	041054	012702	002652		MOV	#PSTACK,R2	;AND THE BUFFER ADDRESS	
78	041060	052237	002452		7#:	BIS	(R2),#RCVED	;LOG THE BIT(S) TRANSITION(S)
79	041064	005301			DEC	R1	;REDUCE THE ITERATION COUNT	
80	041066	003374			BGT	7#	;IF > 0, KEEP GOING!	
81	041070	023737	002452	002454	CMP	RCVED,EXPTED	;ALL BITS TOGGLE?	
82	041076	001426			BEQ	10#	;IF SAME, YES	
83	041100	023727	002432	047200	8#:	CSTORE,#<628.*32.>	;DONE ALL CYLINDERS?	
84	041106	103003			BHIS	9#	;YES, THERE IS AN ERROR	
85	041110	004737	017266		JSR	PC,SPIRAL	;UPDATE THE DRIVER	
86	041114	000722			BR	4#	;AND GO-ON!	
87	041116	013737	002534	002456	9#:	MOV	RPDB,TESTRG	;LOAD FAILING "REGISTER"
88	041124	012737	013000	002404	MOV	#BIT9!BIT10!BIT12,ERRWD1	;CREATE MODULE CALL-OUT	
89	041132	012737	000406	002406	MOV	#BIT1!BIT2!BIT8,ERRWD2	;BOTH WORDS	
90	041140	104456			TRAP	C#ERHRD		
	041142	001440			.WORD	800		
	041144	013362			.WORD	EM31		
	041146	014172			.WORD	ERRO		
91	041150	005037	002402		CLR	ITCOUN	;NO FURTHER ITERATIONS NECESSARY	
92	041154				10#:			
	041154				10000#:			
93	041156	005337	002402		TRAP	C#ESEG		
94	041162	003256			DEC	ITCOUN	;ONE LESS ITERATION TO GO	
95	041164				BGT	2#	;DO UNTIL = 0	
	041164	104401			L10106:	TRAP	C#ETST	

```

1      .SBTTL TEST 57: DATA TEST #2
2
3      ;# TEST DATA TEST #2 TEST INVALID ADDRESS ERROR, RECALIBRATE & SEEK COMMANDS
4      ;# : SET RPDC = FE CYLINDER ADDRESS
5      ;# : SET RPDA = 0
6      ;# : SET RPOF: CMD
7      ;# : CLEAR RMPM1: DMD
8      ;# : ISSUE SEEK COMMAND
9      ;# : IF RPER1: IAE <> 1
10     ;# : THEN
11     ;# : : OUTPUT ERROR MESSAGE (FAILED TO DETECT AN INVALID ADDRESS ERROR)
12     ;# : : OUTPUT FAULT LIST: JO9, J10, JO8, JO7, J12, RHXX, CABLES, TERMINATOR
13     ;# : : ELSE
14     ;# : : SET RPCS2: CLR = 1
15     ;# : : ISSUE RECALIBRATE COMMAND
16     ;# : : IF ((RPCS1: TRE) OR (RPDS: ERR)) = 1
17     ;# : : : THEN
18     ;# : : : OUTPUT ERROR MESSAGE (DETECTED ERRORS AFTER ISSUING A RECALIBRATE COMMAND)
19     ;# : : : OUTPUT FAULT LIST: JO9, J10, J12, CABLES, RHXX, TERMINATOR
20     ;# : : : ENDF
21     ;# : : SET RPOF: CMD = 1
22     ;# : : SET RMPM1: DMD = 1
23     ;# : : SET RPDC = FE CYLINDER
24     ;# : : ISSUE A SEEK COMMAND
25     ;# : : IF RPDC <> RPCC AND ((RPDS: ERR <> 1) OR (RPCS1: TRE <> 1))
26     ;# : : : THEN
27     ;# : : : OUTPUT ERROR MESSAGE (DIDN'T ACCESS FE CYLINDER PROPERLY, DIDN'T DETECT AN
ERROR)
28     ;# : : : OUTPUT FAULT LIST: JO9, J10, RHXX, CABLES, J12, TERMINATOR
29     ;# : : : ELSE
30     ;# : : : IF RPDC <> RPCC AND ((RPDS: ERR = 1) OR (RPCS1: TRE = 1))
31     ;# : : : : THEN
32     ;# : : : : OUTPUT ERROR MESSAGE (DIDN'T ACCESS FE CYLINDER PROPERLY, DID DETECT ERR
ORS)
33     ;# : : : : OUTPUT FAULT LIST: JO9, J10, JO8, JO7, RHXX, CABLES, J12
34     ;# : : : : ENDF
35     ;# : : ENDF
36     ;# : ENDF
37     ;# END TEST
38

```

39	041166			
40	041166	013737	002376	002416
41	041174	005237	002416	
42	041200	005037	002414	
43	041204	004737	016662	
44	041210	032777	010000	141306
45	041216	001016		
46	041220	004737	017326	
47	041224	013746	002114	
	041230	012746	006452	
	041234	012746	000002	
	041240	010600		
	041242	104417		
	041244	062706	000006	
51	041250	104432		
	041252	000432		
52	041254			
	041254	104404		
53	041256	052777	100000	141260

```

TS7::
MOV LASCYL,DESCYL ;FORM THE CE CYLINDER ADDRESS
INC DESCYL ;IT IS ONE MORE THAN THE END CYLINDER
CLR DESTRK ;START AT TRACK #0
JSR PC,SEIZE ;GET THE DRIVE UNDER TEST
BIT #MOL,#RPDS ;IS THE DRIVE ON LINE??
BNE 1# ;IF 1, IT IS
JSR PC,SAVRPR ;GET THE REGISTER SNAPSHOT
MOV L#TEST,-(SP)
MOV #MSGMOL,-(SP)
MOV #2,-(SP)
MOV SP,R0
TRAP C#PNTF
ADD #6,SP
TRAP C#EXIT
.WORD L10107-.

1#:
TRAP C#BSEG
BIS #CMOD,#RPOF ;SET COMMAND MODIFIER

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```

54 041264 042777 100000 141244 BIC #DMD,#RPMR1 ;AND FAIL TO SET DIAGNOSTIC MODE (FORCE ERRORS!!)
55 041272 012737 002652 002366 MOV #PSTACK,TABADD ;DO THE LINK TRANSFER ADDRESS
56 041300 012737 000006 002412 MOV #6,NEGWRD ;AND SET UP A WORD COUNT
57 041306 012737 000005 002420 MOV #SEEK,FUNCTN ;LOAD A SEEK COMMAND
58 041314 004737 015146 JSR PC,DRIVER ;NOW ISSUE THE COMMAND
59 041320 004737 017000 JSR PC,WAIT ;WAIT FOR THINGS TO SETTLE DOWN
60 041324 022777 002000 141174 CMP #IAE,#RPER1 ;DID WE GET AN INVALID ADDRESS ERROR? (ONLY??)
61 041332 001423 BEQ 2# ;IF = YES WE DID!
62 041334 012737 002000 002454 MOV #IAE,EXPTED ;FORM THE EXPECTED DATA
63 041342 017737 141160 002452 MOV #RPER1,RCVED ;FORM THE RECEIVED DATA
64 041350 013737 002526 002456 MOV #RPER1,TESTRG ;THIS REGISTER FAILED THE TEST
65 041356 012737 005700 002404 MOV #BIT6!BIT7!BIT8!BIT9!BIT11,ERRWD1;LIST THE MODULE CALLOUT
66 041364 012737 000406 002406 MOV #BIT1!BIT2!BIT8,ERRWD2;FOR BOTH MASKS
67 041372 104456 TRAP C#ERHRD
   041374 001441 .WORD 801
   041376 012454 .WORD EM14
   041400 014172 .WORD ERRO
68 041402 2#:
   041402 10000#:
   041402 104405 TRAP C#ESEG
69 041404 104404 TRAP C#BSEG
70 041406 004737 016662 JSR PC,SEIZE ;PURGE ERRORS, AND RELOAD THE DRIVE NUMBER
71 041412 012737 000007 002420 MOV #RECAL,FUNCTN ;NOW SET A RECALIBRATE COMMAND IN THE QUEUE
72 041420 004737 015146 JSR PC,DRIVER ;EXECUTE THE COMMAND NOW!
73 041424 004737 017000 JSR PC,WAIT ;WAIT FOR SOME SETTLE TIME
74 041430 032777 040000 141054 BIT #TRE,#RPCS1 ;TRANSFER ERROR??
75 041436 001405 BEQ 3# ;NOPE, NOT IF ZERO
76 041440 004737 017422 JSR PC,BICEXP ;LOAD THIS FAILURE STATUS
77 041444 002512 RPCS1 ;THIS REGISTER
78 041446 040000 TRE ;THIS BIT SET AND SHOULDN'T HAVE
79 041450 000410 BR 4# ;NOW REPORT THE FIND
80 041452 032777 040000 141044 3#: BIT #ERR,#RPDS ;DID WE GET AN ERROR SUMMATION BIT??
81 041460 001420 BEQ 5# ;NOT IF ZERO
82 041462 004737 017422 JSR PC,BICEXP ;FORM THIS ERROR!!
83 041466 002524 RPDS ;THIS REGISTER FAILED
84 041470 040000 ERR ;THIS BIT SET AND SHOULDN'T HAVE
85 041472 012737 005400 002404 4#: MOV #BIT8!BIT9!BIT11,ERRWD1;FORM THE MODULE CALLOUT
86 041500 012737 000406 002406 MOV #BIT1!BIT2!BIT8,ERRWD2;FOR BOTH MASKS
87 041506 104456 TRAP C#ERHRD
   041510 001442 .WORD 802
   041512 013051 .WORD EM23
   041514 014172 .WORD ERRO
88 041516 004737 016662 JSR PC,SEIZE ;RESET THE ERROR CONDITION
89 041522 5#:
   041522 10001#:
   041522 104405 TRAP C#ESEG
90 041524 104404 TRAP C#BSEG
91 041526 052777 100000 141002 BIS #DMD,#RPMR1 ;AND NOW SET DIAGNOSTIC MODE
92 041534 012737 000005 002420 MOV #SEEK,FUNCTN ;LOAD A SEEK COMMAND
93 041542 004737 015146 JSR PC,DRIVER ;DO THE SEEK NOW!
94 041546 004737 017000 JSR PC,WAIT ;SETTLE TIME.....
95 041552 027777 140770 140770 CMP #RPDC,#RPCC ;DID WE GET ON-CYLINDER??
96 041560 001446 BEQ 7# ;YES, TEST PASSES
97 041562 017737 140760 002454 MOV #RPDC,EXPTED ;LOAD THE ERROR STATUS
98 041570 017737 140754 002452 MOV #RPCC,RCVED ;EXPECTED VS RECEIVED
99 041576 013737 002550 002456 MOV #RPCC,TESTRG ;AND THE "FAILED" REGISTER
100 041604 032777 040000 140712 BIT #ERR,#RPDS ;LOOK FOR ERROR BITS

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101 041612 001017          BNE      6$          ;WE DIDN'T GET ON CYLINDER, BUT WE DETECTED AN ERROR
102 041614 032777 040000 140670 BIT      @TRE,@RPCS1 ;DID WE DETECT A TRANSFER ERROR?
103 041622 001013          BNE      6$          ;IF = 1, YES
104 041624 012737 005400 002404 MOV      @BIT8!BIT9!BIT11,ERRWD1;LOAD THE MODULE CALLOUT
105 041632 012737 000406 002406 MOV      @BIT1!BIT2!BIT8,ERRWD2;FOR BOTH MASKS
106 041640 104456          TRAP     C$ERHRD
      041642 001443          .WORD   803
      041644 012725          .WORD   EM21
      041646 014172          .WORD   ERRO
107 041650 000412          BR       7$          ;NOW CHECK FOR LOOP...
108 041652 012737 005700 002404 6$: MOV      @BIT6!BIT7!BIT8!BIT9!BIT11,ERRWD1;LOAD ALL THESE BITS FOR MODULE CALLOUT
109 041660 012737 000006 002406 MOV      @BIT1!BIT2,ERRWD2;THESE BITS ALSO!!
110 041666 104456          TRAP     C$ERHRD
      041670 001444          .WORD   804
      041672 012454          .WORD   EM14
      041674 014172          .WORD   ERRO
111 041676 004737 016662          7$: JSR      PC,SEIZE      ;END WITHOUT ERRORS
112 041702          10002$: TRAP     C$ESEG
113 041704          L10107: TRAP     C$ETST
      041704 104401

```

```

1      .SBTTL TEST 58: DATA TEST #3
2
3      ;# TEST DATA TEST #3 READ TD'S, FORMAT, FORMAT VERIFY A SELECTED TRACK ON FE CYLINDER
4      ;# THEN PERFORM DATA TESTING ON THAT TRACK
5      ;# : VAR DO-REPEAT: BOOLEAN
6      ;# : VAR RETRY-COUNTER: INTEGER
7      ;# : SET RPDC = FE CYLINDER ADDRESS
8      ;# : SET DO-REPEAT = TRUE
9      ;# : SET RPDA = 255(.)
10     ;# : ISSUE A SEEK COMMAND
11     ;# : IF ((RPER2: ERR) OR (RPCS1: TRE)) = 1
12     ;# : : THEN
13     ;# : : OUTPUT ERROR MESSAGE (DIDN'T EXECUTE SEEK PROPERLY)
14     ;# : : OUTPUT FAULT LIST: J09, J10, J08, J07, CABLES, RHXX, TERMINATOR
15     ;# : : ENDF
16     ;# : REPEAT
17     ;# : : SET RPOF: : CMD = 1
18     ;# : : ISSUE A READ TRACK DESCRIPTOR COMMAND
19     ;# : : IF TD WORD #3 <> 1 100 000 000 000 000 OR (RPCS2: ERR OR RPCS1: TRE = 1)
20     ;# : : : THEN
21     ;# : : : IF RPDA (HIGH BYTE) < LAST TRACK ADDRESS
22     ;# : : : : THEN
23     ;# : : : : INCREMENT RPDA (HIGH BYTE ONLY)
24     ;# : : : : SET RPCS2: CLR = 1
25     ;# : : : : RELOAD THE DRIVE NUMBER FOR THE DRIVE-UNDER-TEST
26     ;# : : : : ELSE
27     ;# : : : : OUTPUT MESSAGE (INCORRECTLY FORMATTING TRACK #0, REFORMAT USING
28     ;# : : : : FORMATTER UPON COMPLETION OF THIS DIAGNOSTIC)
29     ;# : : : : SET DO-REPEAT = FALSE
30     ;# : : : : ENDF
31     ;# : : : : ELSE
32     ;# : : : : SAVE TRACK NUMBER FOR FOUND NULLSET TD
33     ;# : : : : FORMAT TRACK FOUND WITH NULLSET TD INFORMATION
34     ;# : : : : IF ((RPDS: : ERR) OR (RPCS1: : TRE) = 1)
35     ;# : : : : : THEN
36     ;# : : : : : OUTPUT ERROR MESSAGE (FAILED DURING A FORMAT TRACK OPERATION)
37     ;# : : : : : OUTPUT FAULT LIST: J09, J10, J11 / J13, J14, RHXX, CABLES, TERMINATOR
38     ;# : : : : : ENDF
39     ;# : : : : SET DO-REPEAT = FALSE
40     ;# : : : : ENDF
41     ;# : : UNTIL NOT DO-REPEAT
42     ;# : ENDF
43     ;# : ISSUE A WRITE-CHECK HEADER COMMAND (WITH RPOF: CMD = 1)
44     ;# : IF ((RPDS: ERR) OR (RPCS1: TRE) = 1)
45     ;# : : THEN
46     ;# : : OUTPUT ERROR MESSAGE (FAILED OPERATION: WRITE-CHECK HEADERS, RPOF: CMD = 1)
47     ;# : : OUTPUT FAULT LIST: J09, J10, J11 / J13, J14, RHXX, CABLES, TERMINATOR
48     ;# : : ENDF
49     ;# : A:
50     ;# : WRITE A SECTOR USING DATA PATTERNS 1 TO 8, ONE AT A TIME
51     ;# : IF ((RPDS: ERR) OR (RPCS1: TRE) = 1)
52     ;# : : THEN
53     ;# : : INCREMENT RETRY-COUNTER
54     ;# : : IF RETRY COUNTER < 3
55     ;# : : : THEN
56     ;# : : : GOTO A
57     ;# : : : ELSE
    
```

```

58 :# : : : OUTPUT ERROR MESSAGE (FAILED TO WRITE A SIMPLE DATA TRANSFER)
59 :# : : : OUTPUT FAULT LIST: J11 / J13, J09, J10, J14, CABLES, RMXX, TERMINATOR
60 :# : : : ENDF
61 :# : : ENDF
62 :# : : CLEAR RETRY-COUNTER
63 :# : : B:
64 :# : : READ A SECTOR USING DATA F RNS 1 TO 8, ONE AT A TIME
65 :# : : IF ((RPDS: ERR) OR (RPCS1: TRE) = 1)
66 :# : : THEN
67 :# : : INCREMENT RETRY-COUNTER
68 :# : : IF RETRY-COUNTER < 3
69 :# : : THEN GOTO B
70 :# : : ELSE
71 :# : : OUTPUT ERROR MESSAGE (FAILED A SIMPLE READ TEST)
72 :# : : OUTPUT FAULT LIST: J11 / J13, J09, J10, J14, CABLES, RMXX, TERMINATOR
73 :# : : ENDF
74 :# : : ENDF
75 :# : : ISSUE A RIP COMMAND
76 :# : : SET UP A 6 WORD TRANSFER
77 :# : : SET RPOF: CMOO = 1
78 :# : : ISSUE A READ HEADER AND DATA COMMAND
79 :# : : IF RPER1: FER = 0
80 :# : : THEN
81 :# : : OUTPUT ERROR MESSAGE (FAILED TO DETECT RPER1: FER)
82 :# : : ENDF
83 :# : : SET RPOF: FMT16 = 1
84 :# : : RESET ALL DRIVE ERRORS
85 :# : : ENDF
86 :# : : ENDF

```

```

87 041706 T58.: JSR PC,PRELOD ;GET THE DRIVE NOW
88 041706 004737 017722 BIT #MOL,#RPDS ;IS THE DRIVE ON LINE??
89 041712 032777 010000 140604 BNE 1# ;IF 1, IT IS
90 041720 001016 JSR PC,SAVRPR ;GET THE REGISTER SNAPSHOT
91 041722 004737 017326 MOV L#TEST,-(SP)
92 041726 013746 002114 MOV #MSGMOL,-(SP)
041732 012746 006452 MOV #2,-(SP)
041736 012746 000002 MOV SP,R0
041742 010600 TRAP C#PNTF
041744 104417 ADD #6,SP
041746 062706 000006 TRAP C#EXIT
93 041752 104432 .WORD L10110-
041754 002036
94 041756 032777 004000 140540 1#: BIT #WRL,#RPDS ;IS THE DRIVE WRITE LOCKED?
95 041764 001416 BEQ 2# ;IF=0, NO
96 041766 004737 017326 JSR PC,SAVRPR ;GET THE REGISTER SNAPSHOT
97 041772 013746 002114 MOV L#TEST,-(SP)
041776 012746 006522 MOV #MSGWLO,-(SP)
042002 012746 000002 MOV #2,-(SP)
042006 010600 MOV SP,R0
042010 104417 TRAP C#PNTF
042012 062706 000006 ADD #6,SP
101 042016 104432 TRAP C#EXIT
042020 001772 .WORD L10110-
102 042022 005037 002414 2#: CLR DESTRK ;TRACK ADDRESS (DESIRED)=0
103 042026 013737 002376 002416 MOV LASCYL,DESCYL ;GO TO LAST USER CYLINDER (DESIRED)
104 042034 005237 002415 INC DESCYL ;GO TO FE CYLINDER (DESIRED)
105 042040 T58.1:

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	042040	104402			TRAP	C1BSUB	
106	042042	104404			TRAP	C1BSEG	
107	042044	012737	000005	002420	MOV	#SEEK,FUNCTN	;LOAD JP A SEEK COMMAND
108	042052	012777	100000	140456	MOV	#DMD,#RPMR1	;SET FOR DIAGNOSTIC MODE
109	042060	004737	015146		JSR	PC,DRIVER	;ISSUE THE COMMAND
110	042064	004737	017000		JSR	PC,WAIT	;STALL FOR SOME SETTLE TIME
111	042070	012777	000377	140432	MOV	#377,#RPPAS	;CLEAR OUT THE RESULTING ATTENTION BIT
112	042076	004737	017032		JSR	PC,ERRCK	;LOOK FOR ERRORS
113	042102	005737	002466		TST	ERSTAT	;IF ERRORS, THIS = -1
114	042106	001414			BEQ	3#	;IF 0, NO
115	042110	012737	001700	002404	MOV	#BIT6!BIT7!BIT8!BIT9,ERRWD1	;FORM THE MODULE CALLOUT
116	042116	012737	000406	002406	MOV	#BIT1!BIT2!BIT8,ERRWD2	;FOR BOTH WORDS
117	042124	104456			TRAP	C1ERHRD	
	042126	001445			.WORD	805	
	042130	013411			.WORD	EM32	
	042132	014172			.WORD	ERRO	
118	042134	004737	015400		JSR	PC,DRVCLR	;RESET ERRORS
119	042140				3#:		
	042140				10000#:		
	042140	104405			TRAP	C1ESEG	
120	042142	104404			TRAP	C1BSEG	
121	042144	012702	002652		4#:	MOV	#PSTACK,R2 ;INITIALIZE A BUFFER
122	042150	012701	000006		MOV	#6,R1 ;GET THE BUFFER SIZE	
123	042154	005022			5#:	CLR	(R2)+ ;BUFFER=0
124	042156	005301			DEC	R1 ;ONE LESS WORD TO GO	
125	042160	003375			BGT	5#	;DO UNTIL = 0
126	042162	012737	000075	002420	MOV	#RTD,FUNCTN	;SET UP FOR A READ TRACK DESCRIPTOR OP
127	042170	052737	000377	002414	BIS	#377,DESTRK	;SECTOR ADDRESS=-1
128	042176	052777	100000	140340	BIS	#CMOD,#RPOF	;SET THE COMMAND MODIFIER FOR A READ TD OPERATION
129	042204	012737	000006	002412	MOV	#6,NEGWRD	;SET UP FOR A 6 WORD TRANSFER
130	042212	012737	002652	002366	MOV	#PSTACK,TABADD	;LOAD THE LINK ADDRESS
131	042220	004737	015146		JSR	PC,DRIVER	;ISSUE THE COMMAND
132	042224	023727	002656	140000	CMP	PSTACK+4,#140000	;IS TRACK DESCRIPTOR NULL?
133	042232	001431			BEQ	6#	;IF EQUAL, YES!
134	042234	004737	015400		JSR	PC,DRVCLR	;RESET ANY ERROR!
135	042240	004737	017266		JSR	PC,SPIRAL	;GO TO NEXT TRACK
136	042244	105737	002415		TSTB	DESTRK+1	;DID WE TRY ALL TRACKS?
137	042250	001335			BNE	4#	;IF NOT 0, NO TRY AGAIN
138	042252	012746	007062		MOV	#MSG15,-(SP)	
	042256	012746	000001		MOV	#1,-(SP)	
	042262	010600			MOV	SP,R0	
	042264	104417			TRAP	C1PNTF	
	042266	062706	000004		ADD	#4,SP	
139	042272	012746	006763		MOV	#MSG12,-(SP)	
	042276	012746	000001		MOV	#1,-(SP)	
	042302	010600			MOV	SP,R0	
	042304	104417			TRAP	C1PNTF	
	042306	062706	000004		ADD	#4,SP	
140	042312	004737	015400		JSR	PC,DRVCLR	;CLEAR OUT ANY ERRORS NOW!!
141	042316	013746	002416		6#:	MOV	DESCYL,-(SP) ;GET THE DESIRED CYLINDER ADDRESS
142	042322	052716	030000		BIS	#BIT13!BIT12,(SP)	;AND MASK IT TO REPRESENT A TD
143	042326	032737	040000	002652	BIT	#BIT14,PSTACK	;WAS THE TD MOVED?
144	042334	001402			BEQ	7#	;IF ZERO, NO
145	042336	052716	040000		BIS	#BIT14,(SP)	;SET THE CORRECT BIT
146	042342	005737	002652		7#:	TST	PSTACK ;BIT 15 SET? (HEADER 0 MOVED)
147	042346	100002			BPL	8#	;IF ZERO, NO
148	042350	052716	100000		BIS	#BIT15,(SP)	;SET THE SAME BIT IN THE MASK


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149 042354 022637 002652      8#:  CMP      (SP)+,PSTACK      ;MATCH?
150 042360 001423              BEQ      9#              ;IF EQUAL, YES
151 042362 012737 033400 002404  MOV      #BIT8:BIT9:BIT10:BIT12:BIT13,ERRWD1,SET UP THE MODULE CALLOUT
152 042370 012737 000406 002406  MOV      #BIT1:BIT2:BIT8,ERRWD2;FOR BOTH MASKS
153 042376 013737 002652 002452  MOV      PSTACK,RCVED      ;FORM THE DATA FOR THE ERROR REPORT
154 042404 016637 177776 002454  MOV      -2(SP),EXPTED      ;AND THE EXPECTED DATA
155 042412 012737 011531 002470  MOV      #READTD,FATOF      ;LOAD THE FAILING FUNCTON
156 042420 104456              TRAP     C#ERHRD
      042422 001446              .WORD   806
      042424 013701              .WORD   EM37
      042426 014500              .WORD   ERR2
157 042430 012701 002730      9#:  MOV      #IOBUFF,R1        ;GET THE OUTPUT BUFFER ADDRESS
158 042434 042737 000377 002414  BIC      #377,DESTRK        ;SECTOR ADDRESS = 0!
159 042442 013702 002414      MOV      DESTRK,R2          ;LOAD THE BUFFER TRACK ADDRESS
160 042446 105002              CLRB    R2                  ;FOR AN INTERLEAVED FORMAT
161 042450 010203              MOV      R2,R3              ;THIS IS THE HIGH OR "ODD" SECTOR
162 042452 152703 000031      BISB    #25.,R3             ;IT STARTS AT SECTOR ADDRESS 25
163 042456 005004              CLR      R4                  ;INITIALIZE THIS, IT'S A TOGGLE REGISTER
164 042460 012705 000062      MOV      #50.,R5            ;# OF SECTORS/TRACK
165 042464 013711 002416      10#: MOV      DESCYL,(R1)        ;CYLINDER ADDRESS
166 042470 052721 150000      BIS      #150000,(R1)+      ;MARK SECTOR GOOD, IN 16 BIT MODE
167 042474 005704              TST      R4                  ;DO THIS TO GET NEXT SECTOR
168 042476 100410              BMI      11#                ;IT'S -1, LOAD HIGH OR "ODD" SECTOR
169 042500 010221              MOV      R2,(R1)+           ;LOAD LOW SECTOR
170 042502 005202              INC      R2                  ;UPDATE THE SECTOR COUNT
171 042504 032777 000004 140012  BIT      #ILEV,SRPDS        ;DRIVE INTERLEAVED ENABLED?
172 042512 001405              BEQ      12#                ;IF ZERO, NO!
173 042514 005104              COM      R4                  ;AND TOGGLE
174 042516 000403              BR       12#                ;MOVE ON...
175 042520 010321      11#: MOV      R3,(R1)+           ;LOAD HIGH SECTOR
176 042522 005203              INC      R3                  ;UPDATE SECTOR COUNT
177 042524 005004              CLR      R4                  ;TOGGLE
178 042526 012721 140000      12#: MOV      #140000,(R1)+    ;LOAD THE NULL-CASE
179 042532 012721 140000      MOV      #140000,(R1)+      ;FOR ALL FOUR WORDS
180 042536 012721 140000      MOV      #140000,(R1)+      ;THIRD WORD
181 042542 012721 140000      MOV      #140000,(R1)+      ;FOURTH WORD
182 042546 005305              DEC      R5                  ;ONE LESS SECTOR TO DO
183 042550 003345              BGT      10#                ;BUT GO ON UNTIL 0
184 042552 012737 002730 002366  MOV      #IOBUFF,TABADD     ;RELOAD THE LINK ADDRESS
185 042560 012737 000063 002420  MOV      #FORTRK,FUNCTN     ;LOAD UP FOR A FORMAT TRACK OPERATION
186 042566 012737 000454 002412  MOV      #<50.*6>,NEGWRD     ;AND THE WORD COUNT (314<8> EFF1)
187 042574 052777 100000 137742  BIS      #CMOD,SRPOF        ;COMMAND MODIFIER=1
188 042602 004737 015146      JSR      PC,DRIVER          ;NOW DO THE TRANSFER
189 042606 004737 017032      JSR      PC,ERRCK           ;LOOK FOR ERRORS
190 042612 005737 002466      TST      ERSTAT             ;IF ERRORS, THIS = -1
191 042616 001414              BEQ      13#                ;LOOKS OK IF 0!!
192 042620 012737 033400 002404  MOV      #BIT8:BIT9:BIT10:BIT12:BIT13,ERRWD1 ;LOAD THE MODULE CALLOUT LIST
193 042626 012737 000406 002406  MOV      #BIT1:BIT2:BIT8,ERRWD2 ;FOR BOTH MASK WORDS
194 042634 104456              TRAP     C#ERHRD
      042636 001447              .WORD   807
      042640 014026              .WORD   EM41
      042642 014172              .WORD   ERRO
195 042644 004737 015400      JSR      PC,DRVCLR          ;RELOAD AND RESET ERRORS!
196 042650              13#:
      042650              10001#:
      042650 104405              TRAP     C#ESEG
197 042652 104404              TRAP     C#BSEG

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198 042654 012737 000053 002420      MOV      #WCKHD,FUNCTN ;LOAD UP A WRITE-CHECK HEADERS COMMAND
199 042662 012702 002732              MOV      #IOBUFF+2,R2 ;SET-UP TO REARRANGE THE BUFFER
200 042666 012703 000062              MOV      #50.,R3 ;THIS IS THE ITERATION COUNT
201 042672 005004              CLR      R4 ;THIS IS THE SECTOR ADDRESS
202 042674 110412              14$: MOVB   R4,(R2) ;RELOAD THE SECTOR ADDRESS
203 042676 005204              INC      R4 ;NEXT SECTOR ADDRESS
204 042700 062702 000014      ADD      #14,R2 ;SKIP DATA IN CURRENT SECTOR MAP
205 042704 005303              DEC      R3 ;ONE LESS ITERATION TO GO
206 042706 003372              BGT     14$ ;IF > 0, GO-ON
207 042710 052777 100000 137626      BIS      #CMOD,SRPOF ;COMMAND MODIFIER=1
208 042716 012737 002730 002366      MOV      #IOBUFF,TABADD ;LOAD THE LINK ADDRESS
209 042724 012737 000454 002412      MOV      #<50.*6>,NEGWRD ;AND THE WORD COUNT (314<8> EFF1)
210 042732 004737 015146              JSR     PC,DRIVER ;NOW DO THE TRANSFER
211 042736 012737 011543 002470      MOV      #WTCKHD,FATOF ;LOAD THE FAILING FUNCTION
212 042744 012737 033400 002404      MOV      #BIT8!BIT9!BIT10!BIT12!BIT13,ERRWD1 ;CREATE MODULE CALLOUT
213 042752 012737 000406 002406      MOV      #BIT1!BIT2!BIT8,ERRWD2 ;LIST FOR BOTH MASKS
214 042760 032777 040000 137524      BIT     #TRE,SRPCS1 ;DID WE GET A TRANSFER ERROR?
215 042766 001407              BEQ     15$ ;IF ZERO, NO!
216 042770 004737 017150              JSR     PC,LOCATE ;FIND THE DATA FOR THE REPORT
217 042774 104456              TRAP   C#ERHRD
      042776 001450              .WORD  808
      043000 013441              .WORD  EM33
      043002 014500              .WORD  ERR2
218 043004 000411              BR     16$ ;SKIP THE NEXT DISPATCH
219 043006 004737 017032 15$: JSR     PC,ERRCK ;ANY ERRORS?
220 043012 005737 002466              TST     ERSTAT ;IF ZERO, NO
221 043016 001406              BEQ     17$ ;TAKE BRANCH IF NO ERRORS
222 043020 104456              TRAP   C#ERHRD
      043022 001451              .WORD  809
      043024 012454              .WORD  EM14
      043026 014172              .WORD  ERRO
223 043030 004737 015400 16$: JSR     PC,DRVCLR ;RESET ALL ERRORS
224 043034 17$:
225 043034 10002$:
      043034 104405              TRAP   C#ESEG
226 043036 104403  L10111: TRAP   C#ESUB
227 043040 104402  T58.2: TRAP   C#SUB
      043042 105037 002414      CLRB   DESTRK ;SECTOR ADDRESS=0
229 043046 012737 033400 002404      MOV      #BIT8!BIT9!BIT10!BIT12!BIT13,ERRWD1;SET UP THE MODULE CALLOUT
230 043054 012737 000406 002406      MOV      #BIT1!BIT2!BIT8,ERRWD2;FOR BOTH MASKS
231 043062 012737 000004 002436      MOV      #4,TEMP ;ALLOW FOR FOUR DATA ERRORS BEFORE REPORTING THE ERROR!
232 043070 012703 002344              MOV      #PATT1,R3 ;GET THE TEST PATTERN
233 043074 012701 002730 1$: MOV      #IOBUFF,R1 ;CREATE THE OUTPUT BUFFER
234 043100 012702 000400              MOV      #256.,R2 ;GET THE BUFFER SIZE
235 043104 011321 2$: MOV      (R3),(R1)+ ;START LOADING THE BUFFER
236 043106 005302              DEC      R2 ;ONE LESS WORD TO LOAD
237 043110 003375              BGT     2$ ;IF > 0, GO-ON
238 043112 104404              TRAP   C#BSEG
239 043114 012737 002730 002366 3$: MOV      #IOBUFF,TABADD ;LOAD THE LINK AGAIN
240 043122 012737 000061 002420      MOV      #WRDTA,FUNCTN ;SETUP FOR A WRITE DATA COMMAND
241 043130 012737 000400 002412      MOV      #256.,NEGWRD ;WRITE ONE SECTOR
242 043136 004737 015146              JSR     PC,DRIVER ;NOW DO IT!
243 043142 004737 017032              JSR     PC,ERRCK ;LOOK FOR ERRORS
244 043146 005737 002466              TST     ERSTAT ;IF ERRORS, THIS = -1
245 043152 001424              BEQ     4$ ;SKIP ERROR DISPATCH IF 0

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246	043154	005737	002436		TST	TEMP		;DID WE DO FOUR ITERATIONS?
247	043160	003021			BGT	4#		;IF NOT 0, NO!!
248	043162	104456			TRAP	C#ERHRD		
	043164	001452			.WORD	810		
	043166	013753			.WORD	EM40		
	043170	014172			.WORD	ERRO		
249	043172	012746	007315		MOV	#FRMT02,-(SP)		
	043176	012746	000001		MOV	#1,-(SP)		
	043202	010600			MOV	SP,R0		
	043204	104414			TRAP	C#PNTB		
	043206	062706	000004		ADD	#4,SP		
250	043212	012737	177777	002430	MOV	#-1,FASTAT		;MARK THIS SECTOR AS FAILED
251	043220	004737	015400		JSR	PC,DRVCLR		;GET RID OF ANY ERRORS
252	043224	012702	003030		MOV	#IOBUFF+64.,R2		;GET ONE BUFFER LOCATION
253	043230	005112		4#:	COM	(R2)		;AND LOUSE IT UP!
254	043232	012737	000051	002420	MOV	#WCKD,FUNCTN		;LOAD THE WRITE CHECK FUNCTION
255	043240	012737	002730	002366	MOV	#IOBUFF,TABADD		;LOAD THE LINK ADDRESS
256	043246	012737	000400	002412	MOV	#256.,NEGWRD		;AND THE WORD COUNT
257	043254	004737	015146		JSR	PC,DRIVER		;NOW DO THE COMMAND EXECUTION
258	043260	004737	017000		JSR	PC,WAIT		;WAIT FOR A SETTLE TIME
259	043264	032777	040000	137230	BIT	#WCE,#RPCS2		;DID WE GET A WRITE CHECK ERROR?
260	043272	001014			BNE	5#		;IF = 1, YES!
261	043274	004737	017372		JSR	PC,BISEXP		;FORM THE FAILING DATA
262	043300	002522			RPCS2			;THIS REGISTER FAILED
263	043302	040000			WCE			;THIS BIT FAILED TO SET
264	043304	104456			TRAP	C#ERHRD		
	043306	001453			.WORD	811		
	043310	012776			.WORD	EM22		
	043312	014172			.WORD	ERRO		
265	043314	012737	177777	002430	MOV	#-1,FASTAT		;MARK THIS FAILURE
266	043322	000424			BR	7#		;NOW GO-ON
267	043324	017746	137204		MOV	#RPDB,-(SP)		;GET THE ACTUAL DATA
268	043330	005112		5#:	COM	(R2)		;INVERT THE EXPECTED DATA
269	043332	022612			CMP	(SP)+,(R2)		;MATCH?
270	043334	001417			BEQ	7#		;LOOKS OK, GO-ON
271	043336	016637	177776	002452	MOV	-2(SP),RCVED		;AND LOG THE RESULTS FOR ERROR REPORTING
272	043344	011237	002454		MOV	(R2),EXPTD		;NOW GET THE EXPECTED DATA
273	043350	005737	002436		6#:	TST	TEMP	;WHICH ITERATION?
274	043354	003007			BGT	7#		;IF > 0, NOT THE LAST
275	043356	012737	011566	002470	MOV	#WTCKD,FATOF		;LOAD THE FUNCTION AT TIME OF FAILURE
276	043364	104456			TRAP	C#ERHRD		
	043366	001454			.WORD	812		
	043370	013505			.WORD	EM34		
	043372	014500			.WORD	ERR2		
277	043374	017746	137112		7#:	MOV	#RPCS1,-(SP)	;SAVE RPCS1 ON STACK
278	043400	042716	037777		BIC	#C<SC!TRE>,(SP)		;GET RID OF THE UNNECESSARY BITS
279	043404	022726	140000		CMP	#SC!TRE,(SP)+		;DID SC AND TRE SET?
280								
281	043410	001410			BEQ	8#		;IF SET, SKIP ERROR REPORT
282	043412	004737	017372		JSR	PC,BISEXP		;LOAD THE FAILING DATA
283	043416	002512			RPCS1			;THIS REGISTER
284	043420	140000			SC!TRE			;THESE BITS DIDN'T SET
285	043422	104456			TRAP	C#ERHRD		
	043424	001455			.WORD	813		
	043426	012776			.WORD	EM22		
	043430	014172			.WORD	ERRO		
286	043432	004737	015400		8#:	JSR	PC,DRVCLR	;RELOAD AND RESET

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287 043436 012737 002730 002366      MOV      #IOBUFF,TABADD ;NOW VERIFY DATA FOR CORRECTNESS
288 043444 012737 000400 002412      MOV      #256.,NEGWRD  ;DO 256 WORD (1 SECTOR) TRANSFER
289 043452 012737 000051 002420      MOV      #WCKD,FUNCTN ;SET UP FOR A WRITE CHECK
290 043460 004737 015146              JSR      PC,DRIVER     ;DO THE COMMAND NOW!
291 043464 004737 017032              JSR      PC,ERRCK      ;ERRORS?
292 043470 005737 002466              TST      ERSTAT        ;IF ERRORS, THIS = - 1
293 043474 001452                      BEQ      13$           ;SKIP ERROR DISPATCH IF 0
294 043476 005337 002436      9$:    DEC      TEMP      ;ALLOW ONE LESS ERROR!
295 043502 002404                      BLT      10$           ;IF < 0, REPORT THE ERROR NOW!!
296 043504 105237 002414      INCB     DESTRK        ;GO TO THE NEXT SECTOR
297 043510 000137 043114      JMP      @#3$         ;AND FOR NOW, SKIP THE ERROR DISPATCH!
298 043514 012737 011566      L02470 10$:    MOV      #WTKD,FATOF   ;LOAD THE FAILING FUNCTION
299 043522 005037 002436              CLR      TEMP          ;TEMP = 0, FOR A POSSIBLE LOOP
300 043526 032777 040000      136756  BIT      #TRE,@RPCS1  ;DID WE GET A TRANSFER ERROR?
301 043534 001417                      BEQ      11$           ;IF 0, NO
302 043536 004737 017150              JSR      PC,LOCATE     ;FIND THE ERROR
303 043542 104456      TRAP     C#ERHRD
      043544 001456      .WORD    814
      043546 013441      .WORD    EM33
      043550 014500      .WORD    ERR2
304 043552 012746 007315      MOV      #FRMT02,-(SP)
      043556 012746 000001      MOV      #1,-(SP)
      043562 010600      MOV      SP,R0
      043564 104414      TRAP     C#PNTB
      043566 062706 000004      ADD      #4,SP
305 043572 000411                      BR       12$           ;SKIP NEXT REPORT
306 043574 004737 017032      11$:    JSR      PC,ERRCK     ;LOOK FOR ANY ERROR
307 043600 005737 002466              TST      ERSTAT        ;IF ONE FOUND, THIS = - 1
308 043604 001406                      BEQ      13$           ;NO ERRORS, GO-ON
309 043606 104456      TRAP     C#ERHRD
      043610 001457      .WORD    815
      043612 012454      .WORD    EM14
      043614 014172      .WORD    ERRO
310 043616 004737 015400      12$:    JSR      PC,DRVCLR    ;RESET AND RELOAD
311 043622 005737 002430      13$:    TST      FASTAT      ;ANY ERROR?
312 043626 001403                      BEQ      14$           ;IF ZERO, NO
313 043630 005037 002430              CLR      FASTAT        ;RESET THE FAILED MARKER
314 043634 000720                      BR       9$            ;AND GO TO NEXT SECTOR
315 043636              14$:
      043636              10000$:
316 043640 104405      TRAP     C#ESEG
317 043642 020327 002362      TST      (R3)+         ;POP R3 TO THE NEXT DATA TABLE ENTRY
318 043646 101002      CMP      R3,#PATT8     ;DONE YET
319 043650 000137 043074      BHI      15$           ;IF R3 > # PATT8, YES
320 043654              JMP      @#1$         ;DO MORE!!
      043654              15$:
      043654              L10112:
321 043656 104404      TRAP     C#ESUB
322 043660 012737 000021 002420      TRAP     C#BSEG
323 043666 004737 015146      MOV      #RIP,FUNCTN  ;SET UP FOR ANOTHER READ IN PRESET
324 043672 012737 000073 002420      JSR      PC,DRIVER     ;ISSUE THE COMMAND
325 043700 052777 100000 136636      MOV      #RDHDTA,FUNCTN ;NOW PREPARE TO READ A HEADER
326 043706 012737 000006 002412      BIS      #CMOD,@RPOF   ;ONLY SIX WORDS / TRANSFER
327 043714 012737 002652 002366      MOV      #6,NEGWRD    ;LIKE I SAID, SIX WORDS ONLY!
328 043722 004737 015146      MOV      #PSTACK,TABADD ;TRANSFER TO START AT THIS BUFFER ADDRESS
329 043726 022777 000020 136572      JSR      PC,DRIVER     ;THIS SHOULD CAUSE A FORMAT ERROR
      CMP      #FER,@RPER1 ;DID IT??

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330	043734	001423			BEQ	1\$;IF MATCH, IT DID!
331	043736	012737	000020	002454	MOV	#FER,EXPTD		;FORM THE EXPECTED DATA
332	043744	017737	136556	002452	MOV	#RPER1,RCVED		;FORM THE RECEIVED DATA
333	043752	013737	002526	002456	MOV	RPER1,TESTRG		;THIS REGISTER FAILED THE TEST
334	043760	012737	004400	002404	MOV	#BIT8!BIT11,ERRWD1		;LOAD THE MODULE CALLOUT
335	043766	012737	000406	002406	MOV	#BIT1!BIT2!BIT8,ERRWD2		;FOR BOTH MASKS
336	043774	104456			TRAP	C\$ERHRD		
	043776	001460			.WORD	816		
	044000	012454			.WORD	EM14		
	044002	014172			.WORD	ERRO		
337	044004	004737	017722		JSR	PC,PRELOD		;RESET FOR 16 BIT MODE
338	044010							
	044010	104405			TRAP	C\$ESEG		
339	044012							
	044012	104401			TRAP	C\$ETST		

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.. 'L TEST 59 RPER1 NEGATIVE BIT TESTS
;# TEST 59 RPER1 NEGATIVE BIT TESTS
;# : SET UP AN ILLEGAL COMMAND (#43 - OCTAL)
;# : ISSUE THE COMMAND
;# : IF RPER1: ILF = 0
;# : THEN
;# : : OUTPUT ERROR MESSAGE (FAILED TO DETECT RPER1: ILF)
;# : : OUTPUT FAULT LIST: J12
;# : ENDF
;# : ISSUE A DRIVE CLEAR COMMAND
;# : SET UP FOR SECTOR ADDRESS 50(DECIMAL)
;# : SET UP FOR TRACK ADDRESS 31(DECIMAL)
;# : ISSUE SEEK COMMAND
;# : IF RPER1: IAE = 0
;# : THEN
;# : : OUTPUT ERROR MESSAGE (FAILED TO DETECT RPER1: IAE)
;# : ENDF
;# : ISSUE A DRIVE CLEAR
;# : DECREMENT THE SECTOR ADDRESS (49 DECIMAL)
;# : INCREMENT THE TRACK ADDRESS (32 DECIMAL)
;# : ISSUE SEEK COMMAND
;# : IF RPER1: IAE = 0
;# : THEN
;# : : OUTPUT ERROR MESSAGE (FAILED TO DETECT RPER1: IAE)
;# : : OUTPUT FAULT LIST: J7, J8, RMXX, CABLES, TERMINATOR
;# : ENDF
;# : ISSUE DRIVE CLEAR COMMAND
;# END TEST 59

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31 044014
32 044014 104404
33 044016 004737 015400
34 044022 032777 010000 136474
35 044030 001016
36 044032 004737 017326
37 044036 013746 002114
    044042 012746 006452
    044046 012746 000002
    044052 010600
    044054 104417
    044056 062706 000006
41 044062 104432
    044064 000244
42 044066 012737 000043 002420
43 044074 013737 002526 002456
44 044102 004737 015146
45 044106 022777 000001 136412
46 044114 001417
47 044116 012737 004000 002404
48 044124 005037 002406
49 044130 012737 000001 002454
50 044136 017737 136364 002452
51 044144 104456
    044146 001461
    044150 012454
    044152 014172

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T59::
TRAP C#BSEG
JSR PC,DRVCLR ;START UP WITHOUT ERRORS
BIT #MOL,#RPO5 ;DRIVE ONLINE?
BNE 1# ;IF = 1, YES
JSR PC,SAVRPR ;GET THE REGISTER SNAPSHOT
MOV L#TEST,-(SP)
MOV #MSGMOL,-(SP)
MOV #2,-(SP)
MOV SP,R0
TRAP C#PNTF
ADD #6,SP
TRAP C#EXIT
.word L10113-
1# : MOV #43,FUNCTN ;LOAD UP AN ILLEGAL FUNCION
MOV RPER1,TESTRG ;FORM UP PART OF THE ERROR MESSAGE
JSR PC,DRIVER ;ISSUE THAT ILLEGAL COMMAND
CMP #ILF,#RPER1 ;DID ILLEGAL FUNCTION ONLY SET?
BEQ 2# ;IF MATCH, YES
MOV #BIT11,ERRWD1 ;LOAD THE MASK
CLR ERRWD2 ;FOR BOTH MASKS
MOV #ILF,EXPTD ;SET UP THE EXPECTED DATA
MOV #RPER1,RCVED ;REPORT THE RECEIVED DATA
TRAP C#ERHRD
.word 817
.word EM14
.word ERRO

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52 044154          28:
   044154          100008:
   044154 104405   TRAP   C8ESEG
53 044156 104404   TRAP   C8BSEG
54 044160 004737 015400   JSR   PC,DRVCLR      ;PURGE ANY ERRORS
55 044164 012737 005700 002404   MOV   #BIT6!BIT7!BIT8!BIT9!BIT11,ERRWD1;LOAD THE MODULE CALLOUT
56 044172 012737 000406 002406   MOV   #BIT1!BIT2!BIT8,ERRWD2;FOR BOTH MASKS
57 044200 012737 001165 002416   MOV   #629.,DESCYL   ;LAST USER CYLINDER, PLEASE
58 044206 112737 000037 002415   MOVB  #31.,DESTRK*1  ;LAST USER TRACK, PLEASE
59 044214 112737 000062 002414   MOVB  #50.,DESTRK   ;ILLEGAL SECTOR ADDRESS, PLEASE
60 044222 012737 000005 002420   MOV   #SEEK,FUNCTN  ;LOAD UP A SEEK COMMAND
61 044230 004737 015146          JSR   PC,DRIVER      ;ISSUE THE COMMAND, BUT EXPECT IT TO FAIL
62 044234 022777 002000 136264   CMP   #IAE,RPER1    ;DID WE GET THE EXPECTED RESULTS?
63 044242 001413          BEQ   48             ;IF MATCH, YES
64 044244 012737 002000 002454 38:   MOV   #IAE,EXPTED   ;FORM THE EXPECTED DATA
65 044252 017737 136250 002452   MOV   RPER1,RCVED   ;GET THE ACTUAL DATA
66 044260 104456          TRAP   C8ERHRD
   044262 001462          .WORD  818
   044264 012454          .WORD  EM14
   044266 014172          .WORD  ERRO
67 044270 000414          BR     58             ;AND GET-OUT!
68 044272 105337 002414 48:   DECB  DESTRK         ;LAST LEGAL SECTOR ADDRESS, PLEASE
69 044276 105237 002415          INCB  DESTRK*1      ;ILLEGAL TRACK ADDRESS, PLEASE
70 044302 004737 015400          JSR   PC,DRVCLR      ;NO ERRORS, YET!!
71 044306 004737 015146          JSR   PC,DRIVER      ;NOW ISSUE THE BOGUS SEEK COMMAND
72 044312 022777 002000 136206   CMP   #IAE,RPER1    ;DID WE GET IAE ONLY??
73 044320 001351          BNE   38             ;TAKE BRANCH IF NOT
74 044322 004737 017722 58:   JSR   PC,PRELOD     ;RESET FURTHER ERRORS
75 044326          100018:
   044326 104405   TRAP   C8ESEG
76 044330          L10113:
   044330 104401   TRAP   C8ETST

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D16

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1      .SBTTL TEST 60 USER SELECTED MICRODIAGNOSTIC ROUTINE
2
3      ;% TEST 60 USER SELECTED MICRODIAGNOSTIC ROUTINE
4      ;% : IF MANUAL TESTING IS NOT ALLOWED
5      ;% : THEN
6      ;% : : EXIT TEST
7      ;% : ELSE
8      ;% : IF USER SELECTED INPUT ALLOWS A HEX DATA SELECTION
9      ;% : : THEN
10     ;% : : : A:
11     ;% : : : GET A 2 CHARACTER USER INPUT
12     ;% : : : IF THE USER INPUT IS NOT A VALID HEX CHARACTER
13     ;% : : : : THEN
14     ;% : : : : REJECT THE INPUT AND GOTO A
15     ;% : : : : ENDF
16     ;% : : : LEFT JUSTIFY THE INPUT DATA AND MAKE IT BYTE ORIENTED
17     ;% : : : BY PUTTING TWO HEX CHARACTERS IN ONE BYTE
18     ;% : : : MOVE THE USER DATA INTO R4
19     ;% : : : TURN ON THE DIAGNOSTIC MONITOR IN THE DRIVE
20     ;% : : : LOAD THE ROUTINE NUMBER INTO THE DRIVE
21     ;% : : : WAIT FOR THE COMMAND TO FINISH EXECUTION
22     ;% : : : IF RPER2 <> 0
23     ;% : : : : THEN
24     ;% : : : : REPORT THE ERROR (DRIVE FAILED A MICRODIAGNOSTIC ROUTINE)
25     ;% : : : : RESET ALL DRIVE AND CONTROLLER ERRORS
26     ;% : : : ENDF
27     ;% : ENDF
28     ;% END TEST 60
29
30     T60::
31     044332 005737 002342 TST SELRUN ;ALLOW A USER INPUT?
32     044336 003002 BGT 1% ;IF >0, YES
33     044340 104432 TRAP C%EXIT
34     044342 000260 .WORD L10114-.
35
36     1%:
37     044344 005737 002422 TST ROUTD0 ;USER PREVIOUSLY SELECTED INPUT??
38     044350 100470 BMI 6% ;SKIP NEXT DIALOGUE
39     044352 104450 TRAP C%MANI
40     044354 103402 BCS 2%
41     044356 104432 TRAP C%EXIT
42     044360 000242 .WORD L10114-.
43
44     2%:
45     044362 012746 010271 MOV #FRMT23,-(SP) ;PRINT 'ROUTINE NO. (2 CHAR "HEX" INPUT)'
46     044366 012746 000001 MOV #1,-(SP)
47     044372 010600 MOV SP,R0
48     044374 104417 TRAP C%PNTF
49     044376 062706 000004 ADD #4,SP
50
51     44
52     044402 104443 TRAP C%GMAN
53     044404 000406 BR 10000%
54     044406 002652 .WORD PSTACK
55     044410 000142 .WORD T%CODE
56     044412 000000 .WORD
57     044414 000001 .WORD 1
58     044416 000002 .WORD T%LOLIM
59     044420 000002 .WORD T%HILIM
60
61     10000%:
62     044422 012704 002652 MOV #PSTACK,R4 ;GET THE START OF THE STRING
63     044426 012702 000002 MOV #2,R2 ;SET AN ITERATION COUNT
  
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47 044432 112401          38:  MOVB  (R4),R1      ;GET THE DATA CHARACTER
48 044434 020127 000071  CMP    R1,#71      ;AND BEGIN TO SCALE IT
49 044440 101004          BHI    48           ;TAKE BRANCH IF ALPHA, NOT NUMERIC
50 044442 162701 000060  SUB    #60,R1      ;STRIP THE ASCII
51 044446 100745          BMI    28           ;IF MINUS, THE USER GOOFED!! DO AGAIN!
52 044450 000406          BR     51           ;OK SO-FAR, KEEP GOING
53 044452 162701 000067  48:  SUB    #67,R1      ;STRIP THE ASCII
54 044456 100741          BMI    28           ;IF MINUS, THE USER GOOFED! DO AGAIN!
55 044460 020127 000017  CMP    R1,#17      ;LEGAL CHARACTER (IN HEX)??
56 044464 003336          BGT    28           ;IF >, IT'S TOO LARGE
57 044466 110164 177777  58:  MOVB  R1,-1(R4)    ;MOVE THE HEX BACK INTO THE BUFFER (SANS ASCII)
58 044472 005302          DEC    R2           ;ONE LESS CHARACTER TO GO
59 044474 003356          BGT    38           ;DO UNTIL R2 = 0
60 044476 124444          CMPB  -(R4),-(R4)  ;BACK THE POINTER UP BY TWO BYTES
61 044500 106314          ASLB  (R4)         ;TO LEFT JUSTIFY THE LOW BYTE
62 044502 106314          ASLB  (R4)         ;SECOND SHIFT
63 044504 106314          ASLB  (R4)         ;THIRD SHIFT
64 044506 106324          ASLB  (R4)         ;FOURTH SHIFT (POP POINTER)
65 044510 151437 002652  BISB  (R4),PSTACK ;FORM THE ENTIRE 2 CHAR HEX FIELD
66 044514 105037 002653  CLRB  PSTACK+1     ;THROW THE HIGH BYTE OUT NOW!
67 044520 005137 002422  COM   ROUTDO       ;MARK THE USER SELECTED INPUT
68 044524 013737 002652 002424  MOV   PSTACK,SELNUM ;SAVE THE USER ROUTINE NUMBER
69 044532 013704 002424 68:  MOV   SELNUM,R4    ;LOAD THE ROUTINE NUMBER
70 044536 004737 015260  JSR   PC,DIAGST    ;TURN ON THE MONITOR
71 044542 000304          SWAB  R4           ;HIGH BYTE = ROUTINE NUMBER
72 044544 104404          TRAP  C1BSEG
73 044546 004737 015352  JSR   PC,DIAGLD    ;LOAD THE ROUTINE NUMBER
74 044552 017746 135774  MOV   @RPER2,-(SP) ;GET THE RESULTS OF THE TEST
75 044556 042726 177400  BIC   #177400,(SP) ;STRIP JUNK
76 044562 001414          BEQ   78           ;IF ZERO, NO!!
77 044564 104456          TRAP  C1ERHRD
    044566 000621          .WORD 401
    044570 013564          .WORD EM35
    044572 014310          .WORD ERR1
78 044574 012737 040011 002420  MOV   @TRE!DRCLR,FUNCTN ;PREPARE TO RESET THE ERRORS
79 044602 004737 015146  JSR   PC,DRIVER    ;PURGE ERRORS NOW!
80 044606 052777 100000 135722  BIS   @DMD,@RPMR1  ;TURN ON THE DMD BIT AGAIN
81 044614          78:
    044614          100018:
82 044616 004737 015312  TRAP  C1ESEG
83 044622 104401  L10114: JSR   PC,DIAGEN    ;TURN OFF THE MONITOR
    044622          TRAP  C1ETST

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1          .SBTTL TEST 61 NOP FUNCTIONAL TEST
2
3          ;# TEST 61 NOP FUNCTIONAL TEST
4          ;# : LOAD UNIT UNDER TEST INTO RPCS2
5          ;# : IF RPDS: DRY <> 1
6          ;# : : THEN
7          ;# : : OUTPUT ERROR MESSAGE (RPDS: DRY NOT SET WHEN EXPECTED)
8          ;# : : ENDF
9          ;# : WRITE NOP COMMAND TO RPCS1
10         ;# : TIME RPDS: DRY
11         ;# : IF TIME EXPIRES AND RPDS: DRY <> 1
12         ;# : : THEN
13         ;# : : OUTPUT ERROR MESSAGE (RPDS: DRY NOT SET IN TIME)
14         ;# : : ENDF
15         ;# : IF RPDS: ERR = 1
16         ;# : : THEN
17         ;# : : OUTPUT ERROR MESSAGE (COMPOSITE ERROR SET WHEN NOT EXPECTED)
18         ;# : : ENDF
19         ;# : IF RPCS1: TRE = 1
20         ;# : : THEN
21         ;# : : OUTPUT ERROR MESSAGE (RPCS1: TRE SET WHEN NOT EXPECTED)
22         ;# : : ENDF
23         ;# END TEST 61
24
25 044624          T61::
26 044624 012737 004000 002404      MOV     #BIT11,ERRWD1 ;LOAD THE ERROR MASK
27 044632 005037 002406              CLR     ERRWD2        ;FOR BOTH MASKS
28 044636 004737 016662              JSR     PC,SEIZE     ;GET THE DRIVE NOW!
29 044642 012701 000036              MOV     #30,R1      ;GET AN OVERALL WATCHDOG TIMER
30 044646 012777 000015 135636      MOV     #NOP,RPDS   ;WRITE A NOP COMMAND
31 044654 105777 135644          1#: TSTB    RPDS      ;DO WE HAVE DRIVE READY?
32 044660 100413              BMI     2#          ;IF MINUS, YES!!
33 044662 004737 017000              JSR     PC,WAIT     ;STALL, AND WASTE SOME TIME
34 044666 005301              DEC     R1          ;ONE LESS ITERATION TO-GO
35 044670 003371              BGT     1#          ;IF R1 <> 0, DO AGAIN
36 044672 004737 017326              JSR     PC,SAVRPR   ;GET THE REGISTER SNAPSHOT
37 044676 104456              TRAP   C$ERHRD
38 044700 000622              .WORD 402
39 044702 012015              .WORD EM2
40 044704 014652              .WORD ERR3
41 044706 000425              BR     4#          ;AND SKIP NEXT PART OF TEST
42 044710 032777 040000 135606 2#: BIT     #ERR,RPDS   ;COMPOSITE ERROR SET?
43 044716 001407              BEQ    3#          ;TAKE BRANCH IF NOT
44 044720 004737 017326              JSR     PC,SAVRPR   ;GET THE REGISTER SNAPSHOT
45 044724 104456              TRAP   C$ERHRD
46 044726 000623              .WORD 403
47 044730 011747              .WORD EM1
48 044732 014652              .WORD ERR3
49 044734 000412              BR     4#          ;AND TAKE EARLY EXIT
50 044736 032777 040000 135546 3#: BIT     #TRE,RPDS   ;TRANSFER ERROR SET?
51 044740 001410              BEQ    5#          ;IF ZERO, WE'RE OK
52 044744 004737 017326              JSR     PC,SAVRPR   ;GET THE REGISTER SNAPSHOT
53 044748 104456              TRAP   C$ERHRD
54 044750 000624              .WORD 404
55 044752 012562              .WORD EM16
56 044754 014652              .WORD ERR3
57 044756 004737 016662          4#: JSR     PC,SEIZE     ;PURGE REMAINING ERRORS
    
```

49 044766
044766
044766 104401
50

S#:
L10115:
TRAP C#ETST

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.SBTTL HARDWARE PARAMETER CODING SECTION

; THE HARDWARE PARAMETER CODING SECTION CONTAINS MACROS
; THAT ARE USED BY THE SUPERVISOR TO BUILD P-TABLES. THE
; MACROS ARE NOT EXECUTED AS MACHINE INSTRUCTIONS BUT ARE
; INTERPRETED BY THE SUPERVISOR AS DATA STRUCTURES. THE
; MACROS ALLOW THE SUPERVISOR TO ESTABLISH COMMUNICATIONS
; WITH THE OPERATOR.
;

.WORD L10116 L\$HARD/2
L\$HARD::

;PRINT 'RPCS1 ADRS?'

.WORD T\$CODE
.WORD MSG1
.WORD T\$LOLIM
.WORD T\$HILIM

;PRINT 'VECTOR ADRS?'

.WORD T\$CODE
.WORD MSG4
.WORD T\$LOLIM
.WORD T\$HILIM

;PRINT 'BR LEVEL?'

.WORD T\$CODE
.WORD MSG5
.WORD 340
.WORD T\$LOLIM
.WORD T\$HILIM

;PRINT 'DRIVE #?'

.WORD T\$CODE
.WORD MSG6
.WORD 7
.WORD T\$LOLIM
.WORD T\$HILIM
.EVEN

L10116:

MSG1: .ASCIZ /RPCS1 ADRS/
MSG4: .ASCIZ /VECTOR ADRS/
MSG5: .ASCIZ /BR LEVEL/
MSG6: .ASCIZ /DRIVE #/

.EVEN

```

1          .SBTTL  SOFTWARE PARAMETER CODING SECTION
2
3
4          ;**
5          ; THE SOFTWARE PARAMETER CODING SECTION CONTAINS MACROS
6          ; THAT ARE USED BY THE SUPERVISOR TO BUILD P-TABLES.  THE
7          ; MACROS ARE NOT EXECUTED AS MACHINE INSTRUCTIONS BUT ARE
8          ; INTERPRETED BY THE SUPERVISOR AS DATA STRUCTURES.  THE
9          ; MACROS ALLOW THE SUPERVISOR TO ESTABLISH COMMUNICATIONS
10         ; WITH THE OPERATOR.
11         ;--
12 045106 000022          .WORD L10117-L$SOFT/2
13 045110          L$SOFT::
14          ;PRINT 'EXECUTE TEST 25., MASSBUS INTERFACE SWITCH TEST (L
15          ;
16          .WORD T$CODE
17          .WORD MSG17
18          .WORD 1
19          ;PRINT 'EXECUTE TEST 52., PRINT CONTENTS OF INTERNAL ERROR L
20          ;
21          .WORD T$CODE
22          .WORD MSG18
23          .WORD 1
24          ;PRINT 'SELECT A TRACK FOR THE RP07 INTERNAL RD-WRT TESTS (L
25          ;
26          .WORD T$CODE
27          .WORD MSG20
28          .WORD 1
29          ;GO TO 1$ IF NO
30          ;PRINT 'TRACK ADDRESS (D) 0 ?'
31          ;
32          .WORD T$CODE
33          .WORD MSG21
34          .WORD 37
35          .WORD T$LOLIM
36          .WORD T$HILIM
37          ;PRINT 'EXECUTE TEST 60., SELECT A MICRO-DIAGNOSTIC FOR EXEC
38          ;
39          .WORD T$CODE
40          .WORD MSG22
41          .WORD 1
42          ;
43          .EVEN
44          L10117:
45          ;
46          .ASCIZ /EXECUTE TEST 25., MASSBUS INTERFACE SWITCH TEST/
47          .ASCIZ /EXECUTE TEST 52., PRINT CONTENTS OF INTERNAL ERROR LOG/
48          .ASCIZ /SELECT A TRACK FOR THE RP07 INTERNAL RD-WRT TESTS/
49          .ASCIZ /TRACK ADDRESS/
50          .ASCIZ /EXECUTE TEST 60., SELECT A MICRO-DIAGNOSTIC FOR EXECUTION/
51          ;
52          .EVEN
53          $PATCH:: .BLKW 50.          ;PROGRAM PATCH AREA (50. WORDS)
54          ;
55          .EVEN
56          .WORD T$FREE
57          .WORD T$SIZE
58          L$LAST::
59
60
61
62
63

```

```
1  
14  
16 045666 000000      .WORD 0  
    045670 000004      .WORD L10122-./2-1  
    045672      L10120: .WORD 176700  
17 045672 176700      .WORD 254  
18 045674 000254      .WORD 240  
19 045676 000240      .WORD 0  
20 045700 000000      L10122:  
21 045702      .END  
23      000001
```

SYMBOL TABLE

AD	011074 G	CONSET	020330	C#SPRI=	000041	EM17	012622 G	FRMT03	007404 G
ADR	= 000020 G	CPE	= 040000	C#SVEC=	000037	EM2	012015 G	FRMT04	007426 G
AOE	= 001000	CPU	= 020000	C#TPRI=	000013	EM20	012661 G	FRMT05	007474 G
ASSEMB=	000010	CR	= 000015 G	DCK	= 100000	EM21	012725 G	FRMT06	007545 G
ATA	= 100000	CREADY	015134	DCU	= 000040	EM22	012776 G	FRMT07	007574 G
ATABIT	002566 G	CRLF	006420 G	DECODE	020532	EM23	013051 G	FRMT10	007624 G
ATO	= 000001	CSTORE	002432 G	DESCYL	002416 G	EM24	013126 G	FRMT11	007655 G
AT1	= 000002	C#AU	= 000052	DESTRK	002414 G	EM25	013167 G	FRMT12	007713 G
AT2	= 000004	C#AUTO=	000061	DFPTBL	002320 G	EM26	013224 G	FRMT13	007756 G
AT3	= 000010	C#BRK	= 000022	DIAG	= 000035	EM27	013266 G	FRMT14	010004 G
AT4	= 000020	C#BSEG=	000004	DIAGEN	015312	EM3	012055 G	FRMT15	010031 G
AT5	= 000040	C#BSUB=	000002	DIAGLD	015352	EM30	013326 G	FRMT16	010070 G
AT6	= 000100	C#CEFG=	000045	DIAGMC=	000000	EM31	013362 G	FRMT17	010161 G
AT7	= 000200	C#CLCK=	000062	DIAGST	015260 G	EM32	013411 G	FRMT20	010202 G
A16	= 000400	C#CLEA=	000012	DLT	= 100000	EM33	013441 G	FRMT23	010271 G
A17	= 001000	C#CLOS=	000035	DMD	= 100000	EM34	013505 G	FRMT40	010337 G
BAI	= 000010	C#CLP1=	000006	DMPREG	016212	EM35	013564 G	FRMT41	010430 G
BELL	= 000007 G	C#CVEC=	000036	DPE	= 000010	EM36	013641 G	FRMT50	010510 G
BICEXP	017422 G	C#DCLN=	000044	DPR	= 000400	EM37	013701 G	FRMT51	010601 G
BISEXP	017372 G	C#DODU=	000051	DRCLR	= 000011	EM4	012100 G	FRMT60	010661 G
BITPOS	002400 G	C#DRPT=	000024	DRIVER	015146	EM40	013753 G	FRMT61	010753 G
BIT0	= 000001 G	C#DU	= 000053	DRQ	= 004000	EM41	014026 G	FRMT70	011035 G
BIT00	= 000001 G	C#EDIT=	000003	DRT0	= 000001	EM42	014075 G	FRMT71	011055 G
BIT01	= 000002 G	C#ERDF=	000055	DRT1	= 000002	EM43	014130 G	FUNCTION	002420 G
BIT02	= 000004 G	C#ERHR=	000056	DRT2	= 000004	EM5	012116 G	F#AU	= 000015
BIT03	= 000010 G	C#ERRO=	000060	DRT3	= 000010	EM6	012155 G	F#AUTO=	000020
BIT04	= 000020 G	C#ERSF=	000054	DRT4	= 000020	EM7	012217 G	F#BGN	= 000040
BIT05	= 000040 G	C#ERSO=	000057	DRT5	= 000040	ENDCYL	002374 G	F#CLEA=	000007
BIT06	= 000100 G	C#ESCA=	000010	DRT6	= 000100	ENDTRK	002370 G	F#DU	= 000016
BIT07	= 000200 G	C#ESEG=	000005	DRT7	= 000200	ERR	= 040000	F#END	= 000041
BIT08	= 000400 G	C#ESUB=	000003	DRT8	= 000400	ERRCK	017032	F#HARD=	000004
BIT09	= 001000 G	C#ETST=	000001	DRVBLT	011477 G	ERRDMP	002334	F#HW	= 000013
BIT1	= 000002 G	C#EXIT=	000032	DRVCLR	015400	ERRVEC=	000004	F#INIT=	000006
BIT10	= 002000 G	C#GETB=	000026	DRVNO	002506 G	ERRWD1	002404 G	F#JMP	= 000050
BIT11	= 004000 G	C#GETW=	000027	DRVSN	002510 G	ERRWD2	002406 G	F#MOD	= 000000
BIT12	= 010000 G	C#GMAN=	000043	DRY	= 000200	ERR0	014172 G	F#MSG	= 000011
BIT13	= 020000 G	C#GPHR=	000042	DS	011121 G	ERR1	014310 G	F#PROT=	000021
BIT14	= 040000 G	C#GPLO=	000030	DSE	= 020000	ERR2	014500 G	F#PWR	= 000017
BIT15	= 100000 G	C#GPRI=	000040	DSNMSG	006423 G	ERR3	014652 G	F#RPT	= 000012
BIT2	= 000004 G	C#INIT=	000011	DTE	= 010000	ERSTAT	002466 G	F#SEG	= 000003
BIT3	= 000010 G	C#INLP=	000020	DVA	= 004000	EVL	= 000004 G	F#SOFT=	000005
BIT4	= 000020 G	C#MANI=	000050	DVC	= 000200	EWN	= 000002	F#SRV	= 000010
BIT5	= 000040 G	C#MEM	= 000031	ECH	= 000100	EXPTED	002454 G	F#SUB	= 000002
BIT6	= 000100 G	C#MSG	= 000023	ECI	= 004000	E#END	= 002100	F#SW	= 000014
BIT7	= 000200 G	C#OPEN=	000034	EC.00	004354	E#LOAD=	000035	F#TEST=	000001
BIT8	= 000400 G	C#PNTB=	000014	EF.COM=	000036 G	FASTAT	002430 G	F1	= 000002
BIT9	= 001000 G	C#PNTF=	000017	EF.NEW=	000035 G	FATOF	002470 G	F2	= 000004
BLOWER	011361 G	C#PNTS=	000016	EF.PWR=	000034 G	FAULTS	016556	F3	= 000010
BOE	= 000400 G	C#PNTX=	000015	EF.RES=	000037 G	FER	= 000020	F4	= 000020
BSE	= 100000	C#QIO	= 000377	EF.STA=	000040 G	FLOAT	020034	F5	= 000040
BYTCNT	002410 G	C#RDBU=	000007	EM1	011747 G	FLST00	007273 G	GO	= 000001
CA	011151 G	C#REFG=	000047	EM11	012272 G	FLST01	007312 G	G#CNT0=	000200
CALMOD	016132	C#RESE=	000033	EM12	012342 G	FMT	= 010000	G#DELM=	000372
CLKSTA	002426 G	C#REVI=	000003	EM13	012410 G	FORTRK=	000063	G#DISP=	000003
CLR	= 000040	C#RFLA=	000021	EM14	012454 G	FRMT00	007161 G	G#EXCP=	000400
CMOD	= 100000	C#RPT	= 000025	EM15	012523 G	FRMT01	007214 G	G#HILI=	000002
COMPAR	020202	C#SEFG=	000046	EM16	012562 G	FRMT02	007315 G	G#LOLI=	000001

SYMBOL TABLE

G\$NO = 000000	J1 011161 G	L\$EXP4 002064 G	L10034 025032	MCUTXT 002676 G
G\$OFFS = 000400	J10 011236 G	L\$EXP5 002066 G	L10035 025356	MDPE = 000400
G\$OFSI = 000376	J11 011243 G	L\$HARD 044772 G	L10036 025536	MESG1 045036
G\$PRMA = 000001	J12 011250 G	L\$HIME 002120 G	L10037 025730	MESG10 006577 G
G\$PRMD = 000002	J13 011255 G	L\$HPCP 002016 G	L10040 026226	MESG11 006671 G
G\$PRML = 000000	J14 011262 G	L\$HPTP 002022 G	L10041 026524	MESG12 006763 G
G\$RADA = 000140	J15 011267 G	L\$HW 002320 G	L10042 027042	MESG13 011607 G
G\$RAD8 = 000000	J16 011274 G	L\$ICP 002104 G	L10043 027360	MESG14 011667 G
G\$RADD = 000040	J17 011301 G	L\$INIT 020652 G	L10044 027632	MESG15 007062 G
G\$RADL = 000120	J2 011166 G	L\$LADP 002026 G	L10045 030100	MESG17 045154 G
G\$RADO = 000020	J20 011306 G	L\$LAST 045666 G	L10046 030320	MESG18 045234 G
G\$XFER = 000004	J21 011313 G	L\$LOAD 002100 G	L10047 030512	MESG20 045323 G
G\$YES = 000010	J3 011173 G	L\$LUN 002074 G	L10050 030622	MESG21 045405 G
HCE = 000200	J4 011200 G	L\$MREV 002050 G	L10051 031014	MESG22 045423 G
HCI = 002000	J5 011205 G	L\$NAME 002000 G	L10052 031152	MESG4 045051
HCRC = 000400	J6 011212 G	L\$PRIO 002042 G	L10053 031320	MESG5 045065
HDA 011320 G	J7 011217 G	L\$PROT 020644 G	L10054 031444	MESG6 045076
HELP = 000000	J8 011224 G	L\$PRT 002112 G	L10055 031576	MOH = 020000
HERTZ 015750	J9 011231 G	L\$REPP 002062 G	L10056 031734	MOL = 010000
HOE = 100000 G	KWSRV 016104	L\$REV 002010 G	L10057 032134	MSGMOL 006452 G
IAE = 002000	K1RELA 011443 G	L\$RPT 020636 G	L10060 032300	MSGMLO 006522 G
IBE = 010000 G	LASCYL 002376 G	L\$SOFT 045110 G	L10061 032560	MSK 002450 G
IDU = 000040 G	LASTRK 002372 G	L\$SPC 002056 G	L10062 032716	MTD = 040000
IE = 000100	LBC = 002000	L\$SPCP 002020 G	L10063 033140	MTRBRK 011421 G
IER = 020000 G	LBT = 002000	L\$SPTP 002024 G	L10064 033322	MXF = 001000
ILEV = 000004	LCE = 001000	L\$STA 002030 G	L10065 033452	NBA = 100000
ILF = 000001	LCLKTB 015740	L\$SW 002332 G	L10066 033730	NED = 010000
ILOCK 002460 G	LDZERO 017572	L\$TEST 002114 G	L10067 034030	NEGWRD 002412 G
ILR = 000002	LF = 000012 G	L\$TIML 002014 G	L10070 034316	NEM = 004000
INTFLG 002462 G	LKS 015742	L\$UNIT 002012 G	L10071 034422	NEXLOC 017252
INTSRV 020630 G	LKV 015744	L10000 002330	L10072 034634	NOP = 000015
IOBUFF 002730 G	LOCATE 017150	L10001 002344	L10073 035106	OCTHEX 015416
IR = 000100	LOE = 040000 G	L10002 014306	L10074 035204	OFFDIR = 000200
IRLOCK 017672	LOT = 000010 G	L10003 014476	L10075 035322	OM = 000001
ISR = 000100 G	L\$ACP 002110 G	L10004 014650	L10076 035500	ONEFIL = 000001
ITCOUN 002402 G	L\$APT 002036 G	L10005 014676	L10077 035756	OPI = 020000
IXE = 004000 G	L\$AU 021506 G	L10006 016130	L10100 036230	OPRPNL 011455 G
IXU = 000100	L\$AUT 002070 G	L10007 020634	L10101 036740	OR = 000200
I\$AU = 000041	L\$AUTO 021346 G	L10010 020642	L10102 037710	ORLOCK 017706
I\$AUTO = 000041	L\$CCP 002106 G	L10012 021344	L10103 040136	O\$APTS = 000000
I\$CLN = 000041	L\$CLEA 021350 G	L10013 021346	L10104 040372	O\$AU = 000000
I\$DU = 000041	L\$CO 002032 G	L10014 021476	L10105 040632	O\$BGNR = 000000
I\$HRD = 000041	L\$DEPO 002011 G	L10015 021504	L10106 041164	O\$BGNS = 000001
I\$INIT = 000041	L\$DESC 006362 G	L10016 021512	L10107 041704	O\$DU = 000000
I\$MOD = 000041	L\$DESP 002076 G	L10017 021610	L10110 044012	O\$ERRT = 000000
I\$MSG = 000041	L\$DEVP 002060 G	L10020 021776	L10111 043036	O\$GNSW = 000001
I\$PROT = 000040	L\$DISP 002124 G	L10021 022140	L10112 043654	O\$POIN = 000001
I\$PTAB = 000041	L\$DLY 002116 G	L10022 022300	L10113 044330	O\$SETU = 000001
I\$PWR = 000041	L\$DTP 002040 G	L10023 022442	L10114 044622	PAR = 000010
I\$RPT = 000041	L\$DTYP 002034 G	L10024 022772	L10115 044766	PAT = 000020
I\$SEG = 000041	L\$DU 021500 G	L10025 023266	L10116 045036	PATCNT 002434 G
I\$SETU = 000041	L\$DUT 002072 G	L10026 023440	L10117 045154	PATT1 002344 G
I\$SFT = 000041	L\$DVTY 006354 G	L10027 023600	L10120 045672	PATT2 002346 G
I\$SRV = 000041	L\$EF 002052 G	L10030 023770	L10122 045702	PATT3 002350 G
I\$SUB = 000041	L\$ENVI 002044 G	L10031 024150	MASK 002446 G	PATT4 002352 G
I\$TST = 000041	L\$ETP 002102 G	L10032 024332	MCPE = 020000	PATT5 002354 G
J\$JMP = 000167	L\$EXP1 002046 G	L10033 024506	MCUTAB 004060 G	PATT6 002356 G

PATT7	002360	G	RPDS	002524	G	S#LSYM=	010000	T##DU =	010015	T45	034636	G		
PATT8	002362	G	RPDT	002540	G	TABADD	002366	G	T##HAR=	010116	T46	035110	G	
PATT9	002364	G	RPEC1	002556	G	TAP	= 040000	T##HW =	010000	T47	035206	G		
PCLKTB	015724		RPEC2	002560	G	TEMP	002436	G	T##INI=	010012	T48	035324	G	
PGE	= 100000		RPER1	002526	G	TERM	011325	G	T##MSG=	010005	T49	035502	G	
PGM	= 001000		RPER2	002552	G	TESTRG	002456	G	T##PC =	000001	T5	022302	G	
PHF	= 000400		RPER3	002554	G	TRAKAD	002340		T##PRO=	010011	T50	035760	G	
PIP	= 020000		RPLA	002532	G	TRE	= 040000		T##PTA=	010121	T51	036232	G	
PKB	015730		RPMR1	002536	G	TST03	004160	G	T##RPT=	010010	T52	036742	G	
PKC	015732		RPOF	002544	G	TST04	004172	G	T##SEG=	010001	T53	037712	G	
PKCS	015726		RPSN	002542	G	TST05	004204	G	T##SOF=	010117	T54	040140	G	
PKV	015734		RPVEC	002476	G	TST08	004216	G	T##SRV=	010007	T55	040374	G	
PNT	= 001000	G	RPWC	002514	G	TST11	004232	G	T##SUB=	010112	T56	040634	G	
PRELOD	017722		RTD	= 000075		TST12	004244	G	T##SW =	010001	T57	041166	G	
PRI	= 002000	G	RWU1	= 002000		TST28	004256	G	T##TES=	010115	T58	041706	G	
PRI00	= 000000	G	RWU2	= 004000		TST33	004272	G	T1	021514	G	T58.1	042040	
PRI01	= 000040	G	RWU3	= 010000		TST34	004302	G	T10	023602	G	T58.2	043040	
PRI02	= 000100	G	SAVRPR	017326		TST49	004330	G	T11	023772	G	T59	044014	G
PRI03	= 000140	G	SBE	= 000004		T#ARGC=	000001		T12	024152	G	T6	022444	G
PRI04	= 000200	G	SC	= 100000		T#CODE=	004130		T13	024334	G	T60	044332	G
PRI05	= 000240	G	SCF	= 000002		T#ERRN=	000624		T14	024510	G	T61	044624	G
PRI06	= 000300	G	SC1	= 000100		T#EXCP=	000000		T15	025034	G	T7	022774	G
PRI07	= 000340	G	SC16	= 002000		T#FLAG=	000040		T16	025360	G	T8	023270	G
PSEL	= 002000		SC2	= 000200		T#FREE=	045702		T17	025540	G	T9	023442	G
PSTACK	002652	G	SC32	= 004000		T#GMAN=	000000		T18	025732	G	UAM	= 000200	G
PTRANS	011376	G	SC4	= 000400		T#HILI=	000037		T19	026230	G	UNABLE	002464	G
RCVED	002452	G	SC64	= 010000		T#LAST=	000001		T2	021612	G	UNIT	002472	G
RDDTA	= 000071		SC8	= 001000		T#LOLI=	000000		T20	026526	G	UNS	= 040000	
RDHDTA	= 000073		SDF	= 000020		T#LSYM=	010000		T21	027044	G	UPE	= 020000	
RDY	= 000200		SEARCH=	000031		T#LTNO=	000075		T22	027362	G	US1	= 000001	
READTD	011531	G	SEEK	= 000005		T#NEST=	177777		T23	027634	G	US2	= 000002	
READY	015122		SEIZE	016662		T#NSO =	000000		T24	030102	G	US4	= 000004	
RECAL	= 000007		SELNUM	002424	G	T#NS1 =	000005		T25	030322	G	VV	= 000100	
REG	002576	G	SELRUN	002342		T#NS2 =	000003		T26	030514	G	WAIT	017000	
REGSET	017452		SELTRK	002336		T#NS3 =	000003		T27	030624	G	WAITMS	016756	
RELEAS=	000013		SENSOR	011341	G	T#PCNT=	000000		T28	031016	G	WATDRY	020372	
RESET	017474		SETUP	017744		T#PTAB=	010121		T29	031154	G	WATIME	016776	
RH	011132	G	SFPTBL	002332	G	T#PTHV=	000001		T3	022000	G	WCE	= 040000	
RHEXT	002502	G	SIZE70	014700		T#PTNU=	000001		T30	031322	G	WCF	= 000040	
RHTYPE	002504	G	SKI	= 040000		T#SAVL=	177777		T31	031446	G	WCKD	= 000051	
RIP	= 000021		SNDIGT	006447	G	T#SEGL=	177777		T32	031600	G	WCKHD	= 000053	
RMR	= 000004		SNK	002440	G	T#SEK0=	010001		T33	031736	G	WLE	= 004000	
ROUTDO	002422	G	SPIRAL	017266		T#SEK1=	010003		T34	032136	G	WOR	= 001000	
RPADR	002474	G	SRC	002442	G	T#SIZE=	000006		T35	032302	G	WRDTA	= 000061	
RPARDY	015042		SRCTMP	002444	G	T#SUBN=	000000		T36	032562	G	WRL	= 004000	
RPAS	002530	G	STOPCK	016054		T#TAGL=	177777		T37	032720	G	WRTD	= 000065	
RPBA	002516	G	ST.CLK	015550		T#TAGN=	010123		T38	033142	G	WRU	= 000400	
RPBAE	002562	G	ST.LCL	016016		T#TEMP=	000000		T39	033324	G	WTCKD	011566	G
RPCC	002550	G	ST.PCL	015752		T#TEST=	000075		T4	022142	G	WTCKHD	011543	G
RPCS1	002512	G	SVCGBL=	000000		T#TSTM=	177777		T40	033454	G	X#ALWA=	000000	
RPCS2	002522	G	SVCINS=	000000		T#TSTS=	000001		T41	033732	G	X#FALS=	000040	
RPCS3	002564	G	SVCSUB=	000000		T##AU =	010016		T42	034032	G	X#OFFS=	000400	
RPDA	002520	G	SVCTAG=	000000		T##AUT=	010013		T43	034320	G	X#TRUE=	000020	
RPDB	002534	G	SVCTST=	000000		T##CLE=	010014		T44	034424	G	#PATCH	045516	G
RPDC	002546	G	SWTTST	002332		T##DAT=	010122							

B1

CZRJMB RPO? FE HOST ISOLATOR MACRO V04.00 1 DEC 83 10:39:09 PAGE 99 4
SYMBOL TABLE

SEQ 0208

000000 001
ERRORS DETECTED: 0

VIRTUAL MEMORY USED: 32256 WORDS (126 PAGES)
DYNAMIC MEMORY AVAILABLE FOR 70 PAGES
CZRJMB.BIC,CZRJMB/C=[20,0]SVC34R.MLB,[20,12]CZRJMB.DOC,CZRJMB.HIS,CZRJMB

\$\$\$FRR	14 531														
\$\$\$MFG	2 17	2 30	6 3	7-362	7 424										
\$\$\$NOT	15-42	60-25	87-23	95-33											
\$PATCH	98 55#														
A16	12-7#	17-33	17 38	49-29	49 30	49 34	49 61	49 65	50 39	50-43					
A17	12-8#	17 33	17-38	49-37	49 41	50 31	50-32	50-36	50 63	50-67	50 80				
AD	13-128	16-3#													
ADR	11-57#														
AOE	12-87#														
ASSEMB	7-373	7-373													
ATO	12-103#														
AT1	12-104#														
AT2	12-105#														
AT3	12-106#														
AT4	12-107#														
AT5	12-108#														
AT6	12-109#														
AT7	12-110#														
ATA	12-73#	76-17	76-21	77-36	77-41	77-55	77-61	77-65	80-40	80-44	90-39	90-43			
ATABIT	13-89#	30-75													
BAI	12-28#														
BELL	15-14														
BICEXP	23-65#	41-44	41-78	42-62	49-39	49-63	49-76	50-41	50-65	50-78	51-39	52-41	53-29	54-28	
	55-28	56-31	58-28	65-28	66-24	73-29	74-23	75-55	76-19	77-63	81-18	83-29	89-33	89-39	
	89-45	92-76	92-82												
BISEXP	23-58#	41-54	41-62	41-69	42-42	42-54	46-39	46-45	49-32	49-52	50-34	50-54	51-28	52-30	
	53-29	53-29	53-29	54-28	54-28	54-28	55-28	55-28	55-28	56-31	56-31	56-31	57-26	75-31	
	75-37	77-39	80-42	82-23	90-41	93-261	93-282								
BIT0	11-57#	14-68	14-138	14-162	14-259	14-435	14-489	14-499	14-501	20-59	27-15	49-50	49 54	49-74	
	49-78	53-29	53-29	53-29	53-29	53-29	54-28	54-28	55-28	55-28	56-31	56-31	86-58		
BIT00	11-57	11-57#													
BIT01	11-57	11-57#													
BIT02	11-57	11-57#													
BIT03	11-57	11-57#													
BIT04	11-57	11-57#													
BIT05	11-57	11-57#													
BIT06	11-57	11-57#													
BIT07	11-57	11-57#													
BIT08	11-57	11-57#													
BIT09	11-57	11-57#													
BIT1	11-57#	14-68	14-84	14-132	14-136	14-138	14-156	14-162	14-164	14-174	14-178	14-234	14-236	37-29	
	38-18	39-20	40-19	41-36	42-33	43-40	44-29	45-29	46-29	47-23	48-23	49-25	50-28	50-52	
	50-56	50-76	51-20	52-22	53-29	54-28	54-28	54-28	54-28	55-28	56-31	57-19	58-20	61-25	
	62-36	63-29	64-23	65-32	66-28	67-18	68-16	70-62	71-33	73-37	81-22	82-27	84-57	85-31	
	91-89	92-66	92-86	92-105	92-109	93-116	93-152	93-193	93-213	93-230	93-335	94-56			
BIT10	11-57#	14-137	14-260	22-93	58-19	60-44	61-24	62-35	63-28	64-22	65-31	67-17	68-15	70-60	
	71-32	73-36	78-22	79-34	79-44	80-36	80-54	81-21	82-26	84-56	85-30	91-88	93-151	93-192	
	93-212	93-229													
BIT11	11-57#	14-139	14-206	14-208	14-218	14-258	14-260	14-270	14-290	14-294	14-296	14-298	14-300	14-302	
	14-304	14-306	14-308	14-310	14-312	14-314	14-316	14-318	14-320	14-322	14-324	14-326	14-328	14-330	
	14-332	14-334	14-336	14-338	14-340	14-342	14-344	14-346	14-348	14-350	14-352	14-354	14-356	14-358	
	14-360	14-362	14-364	14-366	14-368	14-370	14-372	14-374	14-376	14-378	14-386	14-388	14-428	14-432	
	14-442	22-90	58-19	60-44	63-28	64-22	65-31	66-27	67-17	68-15	70-52	72-39	73-36	74-27	
	75-41	75-59	76-22	77-66	78-22	79-44	83-32	84-56	85-30	89-48	90-44	92-65	92-85	92-104	
	92-108	93-334	94-47	94-55	96-26										
BIT12	11-57#	14-139	14-260	22-96	58-19	60-44	61-24	62-35	63-28	64-22	65-31	67-17	68-15	70-60	

	71-32	73-36	78-22	79-34	79-44	80-36	80-54	81-21	82-26	84-56	85-30	91-88	93-142	93-151
BIT13	93-192	93-212	93-229											
	11-57#	14-139	14-258	14-270	14-290	14-424	14-430	14-432	14-434	14-446	14-448	14-450	14-452	14-454
BIT14	14-456	14-458	14-460	14-462	14-466	93-142	93-151	93-192	93-212	93-229				
BIT15	11-57#	14-199	14-258	14-290	14-434	14-446	14-448	14-466	14-468	14-470	14-498	93-143	93-145	
	14-502	14-139	14-258	14-290	14-466	14-470	14-486	14-488	14-490	14-492	14-494	14-496	14-498	14-500
BIT2	11-57#	14-504	20-25	93-148										
	68-16	14-68	14-219	55-28	55-28	55-28	58-20	60-45	61-25	62-36	63-29	64-23	65-32	67-18
BIT3	93-152	70-62	71-33	73-37	81-22	82-27	84-57	85-31	91-89	92-66	92-86	92-105	92-109	93-116
	11-57#	93-193	93-213	93-230	93-335	94-56								
	14-144	14-60	14-62	14-64	14-66	14-86	14-88	14-90	14-92	14-94	14-96	14-98	14-100	14-142
BIT4	14-176	14-146	14-148	14-150	14-152	14-154	14-156	14-162	14-164	14-166	14-168	14-170	14-172	14-174
	14-206	14-178	14-180	14-182	14-184	14-186	14-188	14-190	14-192	14-194	14-196	14-198	14-200	14-202
	11-57#	14-208	14-210	14-214	14-230	14-232	14-234	14-236	14-394	56-31	56-31	56-31	61-25	
	14-150	14-60	14-62	14-64	14-66	14-84	14-88	14-92	14-98	14-100	14-142	14-144	14-146	14-148
	14-188	14-152	14-154	14-156	14-158	14-160	14-166	14-168	14-170	14-176	14-180	14-182	14-184	14-186
	14-230	14-190	14-192	14-194	14-196	14-198	14-200	14-204	14-206	14-210	14-222	14-224	14-226	14-228
BIT5	14-390	14-238	14-240	14-242	14-244	14-246	14-248	14-250	14-252	14-254	14-256	14-284	14-286	14-288
	11-57#	14-392	14-394	14-396	14-398	14-400	14-402	60-45	78-23	81-22				
	14-146	14-60	14-62	14-64	14-66	14-69	14-86	14-90	14-94	14-96	14-138	14-140	14-142	14-144
	14-212	14-148	14-154	14-162	14-166	14-168	14-170	14-172	14-176	14-200	14-202	14-206	14-208	14-210
BIT6	11-57#	14-214	14-222	14-224	14-226	14-228	14-282	14-400						
	14-74	14-38	14-40	14-42	14-44	14-46	14-48	14-50	14-52	14-54	14-56	14-58	14-70	14-72
	14-208	14-76	14-78	14-80	14-82	14-84	14-126	14-128	14-130	14-132	14-136	14-138	14-198	14-206
	94-55	14-222	14-224	14-230	14-258	14-262	14-268	14-304	14-376	14-480	86-20	92-65	92-108	93-115
BIT7	11-57#	14-61	14-63	14-65	14-67	14-138	14-139	14-141	14-143	14-145	14-147	14-149	14-155	14-167
	14-169	14-171	14-177	14-198	14-201	14-207	14-216	14-218	14-258	14-259	14-260	14-264	14-268	14-270
	14-276	14-280	14-282	14-290	14-291	14-296	14-300	14-304	14-310	14-312	14-314	14-316	14-318	14-336
	14-338	14-376	14-378	14-474	14-488	14-489	14-491	14-493	14-495	14-499	14-501	61-24	63-28	64-22
BIT8	65-31	66-27	67-17	68-15	69-21	70-58	85-30	86-20	92-65	92-108	93-115	94-55		
	11-57#	14-84	14-102	14-108	14-206	14-208	14-258	14-264	14-266	14-268	14-270	14-272	14-274	14-276
	14-292	14-422	14-424	14-428	14-432	14-442	14-474	58-20	60-45	61-25	62-36	63-29	64-23	65-32
	67-18	68-16	72-43	73-37	75-41	77-38	77-42	81-22	82-27	84-57	85-31	91-89	92-65	92-66
	92-85	92-86	92-104	92-105	92-108	93-115	93-116	93-151	93-152	93-192	93-193	93-212	93-213	93-229
BIT9	93-230	93-334	93-335	94-55	94-56									
	11-57#	14-102	14-104	14-106	14-108	14-110	14-112	14-114	14-116	14-118	14-120	14-122	14-124	14-132
	14-139	14-258	14-263	14-264	14-266	14-268	14-270	14-272	14-274	14-290	14-292	14-422	14-424	14-426
	14-428	14-430	14-432	14-434	14-438	14-448	14-470	14-472	14-498	72-43	75-41	77-38	77-42	91-88
	92-65	92-85	92-104	92-108	93-115	93-151	93-192	93-212	93-229	94-55				
BITPOS	13-23#	18-14	18-21	30-74*	30-75*	79-29	80-30							
BLOWER	13-134	16-30#												
BOE	11-57#													
BSE	12-181#													
BYTCNT	13-27#													
C#AU	7-373#	34-35												
C#AUTO	7-373#	31-18												
C#BRK	7-373#	18-33	18-44	24-36	24-48									
C#BSEG	7-373#	37-21	37-33	38-21	38-21	38-21	38-21	39-22	39-22	39-22	39-22	40-21	40-21	40-21
	40-21	41-38	41-39	41-50	42-35	42-36	43-42	43-42	43-42	43-42	44-31	45-31	45-34	46-31
	47-27	47-27	47-27	47-27	48-25	48-25	48-25	48-25	48-25	49-28	49-46	49-59	49-70	50-30
	50-61	50-72	51-24	51-35	52-24	52-37	53-29	53-29	53-29	54-28	54-28	54-28	55-28	55-28
	55-28	56-31	56-31	56-31	57-21	57-34	58-22	58-35	59-16	60-37	61-17	62-15	63-17	64-25
	64-25	64-25	64-25	65-20	66-14	67-21	68-20	69-25	69-25	69-25	69-25	70-36	71-19	72-20
	73-15	74-19	75-23	76-14	77-30	78-15	79-24	80-26	81-14	82-16	83-23	86-25	86-41	86-60
	86-82	88-30	89-25	90-25	91-54	92-52	92-69	92-90	93-106	93-120	93-197	93-238	93-321	94-32

EM34	16-73#	93-276												
EM35	16-74#	88-35	95 77											
EM36	16 75#	84-58												
EM37	16-76#	93-156												
EM4	16-47#													
EM40	16-78#	93-248												
EM41	16-79#	93-194												
EM42	16-80#	74-34												
EM43	16-81#	18-20												
EM5	16-48#	42-57												
EM6	16-49#	42-65												
EM7	16-50#													
ENDCYL	13-21#	30-60												
ENDTRK	13-19#	30-59												
ERR	12-72#	22-61	22-66	74-21	74-25	75-35	75-39	75-53	75-57	76 21	77-36	77-41	77-55	77-61
	77-65	83-27	83-31	91-70	92-80	92-84	92-100	96-39						
ERRO	16-96#	23-101	24-26	25-69	25-106	37-30	37-41	41-47	41-57	41-65	41-72	41-81	42-45	42-57
	42-65	44-43	45-48	46-48	49-35	49-42	49-55	49-66	49-79	50-37	50-44	50-57	50-68	50-81
	51-31	51-42	52-33	52-44	53-29	53-29	53-29	54-28	54-28	54-28	55-28	55-28	55-28	56-31
	56-31	56-31	57-29	58-31	58-41	60-46	61-26	62-37	63-30	65-33	66-29	70-66	71-34	72-44
	73-38	74-34	74-36	75-43	75-61	76-24	77-67	78-24	79-36	79-46	80-38	80-45	80-56	81-23
	82-28	83-34	84-58	85-42	86-35	86-52	86-70	86-92	89-50	90-46	91-90	92-67	92-87	92-106
	92-110	93-117	93-194	93-222	93-248	93-264	93-285	93-309	93-336	94-51	94-66			
ERR1	16-107#	18-20	88-35	95-77										
ERR2	16-126#	93-156	93-217	93-276	93-303									
ERR3	16-138#	96-37	96-42	96-47										
ERRCK	22-60#	93-112	93-189	93-219	93-243	93-291	93-306							
ERRDMP	10-11#	87-21												
ERRVEC	17-10	17-13	17-14*	17-41*										
ERRWD1	13-25#	20-199*	20-205*	27-10	30-64*	32-9*	37-28*	38-19*	39-19*	40-18*	41-35*	42-32*	43-39*	44-28*
	45-28*	46-28*	47-22*	48-22*	49-26*	50-27*	51-19*	52-21*	53-29*	54-28*	55-28*	56-31*	57-18*	58-19*
	60-44*	61-24*	62-35*	63-28*	64-22*	65-31*	66-27*	67-17*	68-15*	69-21*	70-52*	70-58*	70-60*	71-32*
	72-39*	72-43*	73-36*	74-27*	75-41*	75-59*	76-22*	77-38*	77-42*	77-66*	78-22*	79-34*	79-44*	80-36*
	80-54*	81-21*	82-26*	83-32*	84-56*	85-30*	86-20*	89-48*	90-44*	91-88*	92-65*	92-85*	92-104*	92-108*
ERRWD2	93-115*	93-151*	93-192*	93-212*	93-229*	93-334*	94-47*	94-55*	96-26*					
	13-26#	20-200*	20-206*	30-65*	32-10*	37-29*	38-18*	39-20*	40-19*	41-36*	42-33*	43-40*	44-29*	45-29*
	46-29*	47-23*	48-23*	49-25*	50-28*	51-20*	52-22*	53-29*	54-28*	55-28*	56-31*	57-19*	58-20*	60-45*
	61-25*	62-36*	63-29*	64-23*	65-32*	66-28*	67-18*	68-16*	69-22*	70-55*	70-62*	71-33*	72-40*	73-37*
	74-26*	75-42*	75-60*	76-23*	77-34*	78-23*	79-35*	79-45*	80-37*	80-55*	81-22*	82-27*	83-33*	84-57*
	85-31*	86-21*	89-49*	90-45*	91-89*	92-66*	92-86*	92-105*	92-109*	93-116*	93-152*	93-193*	93-213*	93-230*
	93-335*	94-48*	94-56*	96-27*										
ERSTAT	13-51#	22-60*	22-74*	30-69*	32-11*	70-34*	70-43*	70-49*	70-50	70-53	70-56	70-69*	72-26*	72-31*
	72-35*	72-36	72-41	72-47*	93-113	93-190	93-220	93-244	93-292	93-307				
EVL	11-57#													
EWN	12-62#													
EXPTED	13-46#	16-100	16-130	22-65*	22-66*	22-72*	22-73*	22-99*	23-61*	23-68*	23-75*	23-98*	23-100*	24-22*
	24-23*	24-24	25-54*	25-92*	37-27*	37-38*	44-27*	44-34	44-39	45-47*	60-43*	61-22*	62-27*	62-32
	63-21*	63-24*	63-25	70-64*	71-22*	72-25*	73-35*	75-51*	78-19*	79-29*	79-30	79-38	79-39*	80-30*
	80-32	80-47*	80-48	80-49*	80-50	84-55*	85-41*	85-70*	86-32*	86-33*	86-49*	86-50*	86-67*	86-68*
	86-89*	86-90*	90-34*	91-53*	91-81	92-62*	92-97*	93-154*	93-272*	93-331*	94-49*	94-64*		
F\$AU	7-373#	34-9	34-35											
F\$AUTO	7-373#	31-10	31-18											
F\$BGN	7-373#	7-399	10-26	11-51	16-96	16-107	16-126	16-138	20-179	27-39	27-43	28-40	28-46	29-8
	30-8	30-20	30-126	31-10	32-8	32-42	33-8	34-9	34-36	36-38	36-60	36-71	37-19	37-21
	37-33	37-46	38-17	38-21	38-21	38-21	38-21	38-24	39-18	39-22	39-22	39-22	39-22	39-25
	40-17	40-21	40-21	40-21	40-21	40-24	41-31	41-34	41-38	41-39	41-50	41-86	42-31	42-35

MOE	11 57#													
I\$AU	7 373#	34-9#	34-35#											
I\$AUTO	7-373#	31-10#	31-18#											
I\$CLN	7-373#	32-8#	32-42	32-57#										
I\$DU	7-373#	33-8#	33-34#											
I\$HRD	97-52#	97-61#												
I\$INIT	7-373#	30-8#	30-20	30-126	30-141#									
I\$MOD	7-373#	7-399	7-399#	10-26	10-26#	11-51	11-51#	27-43	27-43#	28-40	28-40#	34-36	34-36#	36-38
	36-38#	96-51	96-51#	97-42	97-42#	98-64	98-64#							
I\$MSG	7-373#	16-96#	16-105#	16-107#	16-124#	16-126#	16-136#	16-138#	16-142#					
I\$PROT	7-373#	29-8#												
I\$PTAB	7-373#	99-16	99-16#	99-21	99-21#									
I\$PWR	7-373#													
I\$RPT	7-373#	28-46#	28-75#											
I\$SEG	7-373#	36-60	37-19	37-21#	37-32#	37-33#	37-43#	38-17	38-21#	38-21#	38-21#	38-21#	38-21#	38-21#
	38-21#	39-18	39-22#	39-22#	39-22#	39-22#	39-22#	39-22#	39-22#	40-17	40-21#	40-21#	40-21#	40-21#
	40-21#	40-21#	40-21#	41-31	41-38#	41-39#	41-50#	41-83#	42-31	42-35#	42-36#	42-67#	43-37	43-42#
	43-42#	43-42#	43-42#	43-42#	43-42#	43-42#	44-26	44-31#	44-47#	45-26	45-31#	45-34#	45-58#	46-24
	46-31#	46-50#	47-18	47-27#	47-27#	47-27#	47-27#	47-27#	47-27#	47-27#	48-18	48-25#	48-25#	48-25#
	48-25#	48-25#	48-25#	48-25#	49-24	49-28#	49-45#	49-46#	49-49	49-58#	49-59#	49-69#	49-70#	49-73
	49-82#	50-26	50-30#	50-47#	50-48#	50-51	50-60#	50-61#	50-71#	50-72#	50-75	50-84#	51-18	51-24#
	51-34#	51-35#	51-45#	52-17	52-24#	52-36#	52-37#	52-47#	53-28	53-29#	53-29#	53-29#	53-29#	53-29#
	53-29#	54-27	54-28#	54-28#	54-28#	54-28#	54-28#	54-28#	55-27	55-28#	55-28#	55-28#	55-28#	55-28#
	55-28#	56-30	56-31#	56-31#	56-31#	56-31#	56-31#	56-31#	57-17	57-21#	57-31#	57-34#	57-42#	58-18
	58-22#	58-33#	58-35#	58-43#	59-13	59-16#	59-33#	60-22	60-37#	60-47#	61-15	61-17#	61-28#	62-13
	62-15#	62-39#	63-15	63-17#	63-32#	64-20	64-25#	64-25#	64-25#	64-25#	64-25#	64-25#	64-25#	65-18
	65-20#	65-38#	66-12	66-14#	66-33#	67-14	67-21#	67-38#	68-14	68-20#	68-48#	69-20	69-25#	69-25#
	69-25#	69-25#	69-25#	69-25#	69-25#	70-33	70-36#	70-68#	71-17	71-19#	71-36#	72-18	72-20#	72-46#
	73-13	73-15#	73-40#	74-17	74-19#	74-38#	75-21	75-23#	75-63#	76-12	76-14#	76-26#	77-28	77-30#
	77-69#	78-13	78-15#	78-26#	79-22	79-24#	79-48#	80-24	80-26#	80-58#	81-12	81-14#	81-25#	82-14
	82-16#	82-30#	83-13	83-23#	83-36#	84-18	85-25	86-17	86-25#	86-39#	86-41#	86-56#	86-60#	86-74#
	86 82#	86-96#	87-20	88-24	88-30#	88-39#	89-15	89-25#	89-52#	90-15	90-25#	90-48#	91-42	91-54#
	91-92#	92-39	92-52#	92-68#	92-69#	92-89#	92-90#	92-112#	93-87	93-105	93-106#	93-119#	93-120#	93-196#
	93-197#	93-225#	93-227	93-238#	93-315#	93-321#	93-338#	94-31	94-32#	94-52#	94-53#	94-75#	95-30	95-72#
	95-81#	96-25												
I\$SETU	7-373#	99-15	99-15#	99-16	99-22	99-22#								
I\$SFT	98-12#	98-33#												
I\$SRV	7-373#	20-179#	20-185#	27-39#	27-41#									
I\$SUB	7-373#	36-60	37-19	38-17	39-18	40-17	41-31	42-31	43-37	44-26	45-26	46-24	47-18	48-18
	49-24	50-26	51-18	52-17	53-28	54-27	55-27	56-30	57-17	58-18	59-13	60-22	61-15	62-13
	63-15	64-20	65-18	66-12	67-14	68-14	69-20	70-33	71-17	72-18	73-13	74-17	75-21	76-12
	77-28	78-13	79-22	80-24	81-12	82-14	83-13	84-18	85-25	86-17	87-20	88-24	89-15	90-15
	91-42	92-39	93-87	93-105	93-105#	93-226	93-226#	93-226#	93-227	93-227#	93-320	93-320#	93-320#	94-31
	95-30	96-25												
I\$TST	7-373#	36-60	36-60#	36-71	36-71#	36-71#	37-19	37-19#	37-46	37-46#	37-46#	38-17	38-17#	38-24
	38-24#	38-24#	39-18	39-18#	39-25	39-25#	39-25#	40-17	40-17#	40-24	40-24#	40-24#	41-31	41-31#
	41-34	41-86	41-86#	41-86#	42-31	42-31#	42-70	42-70#	42-70#	43-37	43-37#	43-46	43-46#	43-46#
	44-26	44-26#	44-50	44-50#	44-50#	44-50#	45-26	45-26#	45-61	45-61#	45-61#	46-24	46-24#	46-27
	46-53#	46-53#	47-18	47-18#	47-21	47-30	47-30#	47-30#	48-18	48-18#	48-21	48-28	48-28#	48-28#
	49-24	49-24#	49-85	49-85#	49-85#	50-26	50-26#	50-87	50-87#	50-87#	51-18	51-18#	51-49	51-49#
	51-49#	52-17	52-17#	52-20	52-51	52-51#	52-51#	53-28	53-28#	53-29	53-30	53-30#	53-30#	54-27
	54-27#	54-28	54-29	54-29#	54-29#	55-27	55-27#	55-28	55-29	55-29#	55-29#	56-30	56-30#	56-31
	56-32	56-32#	56-32#	57-17	57-17#	57-50	57-50#	57-50#	58-18	58-18#	58-32	58-48	58-48#	58-48#
	59-13	59-13#	59-40	59-40#	59-40#	60-22	60-22#	60-28	60-31	60-36	60-56	60-56#	60-56#	61-15
	61-15#	61-31	61-31#	61-31#	62-13	62-13#	62-42	62-42#	62-42#	63-15	63-15#	63-35	63-35#	63-35#
	64-20	64-20#	64-28	64-28#	64-28#	65-18	65-18#	65-41	65-41#	65-41#	66-12	66-12#	66-36	66-36#

J3	13 110	16-9#						
J4	13-111	16-10#						
J5	13-112	16-11#						
J6	13 113	16-12#						
J7	13-114	16-13#						
J8	13-115	16-14#						
J9	13-116	16-15#						
K1RELA	13-137	16-33#						
KWSRV	20-154	20-161	20-180#					
L\$ACP	7-427#							
L\$APT	7-427#							
L\$AU	34-9#							
L\$AUT	7-427#							
L\$AUTO	7-427	31-10#						
L\$CCP	7-427#							
L\$CLEA	7-427	32-8#						
L\$CO	7-427#							
L\$DEPO	7-427#							
L\$DESC	7-427	15-27#						
L\$DESP	7-427#							
L\$DEVP	7-427#							
L\$DISP	7-427	8-8#						
L\$DLY	7-427#	22-50	42-39	42-51	57-37	58-38	59-28	
L\$DTP	7-427#							
L\$DTYP	7-427#							
L\$DU	33-8#							
L\$DUT	7-427#							
L\$DVTY	7-427	15-17#						
L\$EF	7-427#							
L\$ENVI	7-427#							
L\$ETP	7-427#							
L\$EXP1	7-427#							
L\$EXP4	7-427#							
L\$EXP5	7-427#							
L\$HARD	7-427	97-52	97-52#					
L\$HIME	7-427#							
L\$HPCP	7-427#							
L\$HP1P	7-427#							
L\$HW	7-427	9-9	9-9#					
L\$ICP	7-427#							
L\$INIT	7-427	30-8#						
L\$LADP	7-427#							
L\$LAST	7-427	98-63#	99-22					
L\$LOAD	7-427#							
L\$LUN	7-427#							
L\$MREV	7-427#							
L\$NAME	7-427#							
L\$PRIO	7-427#							
L\$PROT	7-427	29-8#						
L\$PRT	7-427#							
L\$REPP	7-427#							
L\$REV	7-427#							
L\$RPT	28-46#							
L\$SOFT	7-427	98-12	98-12#					
L\$SPC	7-427#							
L\$SPCP	7-427#							

PCLKTB	20 107*	20-137*												
PGE	12 35*	12-193*												
PGM	12-67*													
PHF	12 176*													
PIP	12-71*													
PKB	20-109*	20-110*	20-140*	20-155*										
PKC	20-111*	20-112*	20-141*											
PKCS	20-108*	20-139*	20-156*	20-172*										
PKV	20-114*	20-142*	20-154	32-26										
PNT	11 57*													
PREL0D	25-8*	83-39	89-55	90-51	93-88	93-337	94-74							
PRI	11-57*													
PRI00	11-57*													
PRI01	11-57*													
PRI02	11-57*													
PRI03	11-57*													
PRI04	11-57*													
PRI05	11-57*													
PRI06	11-57*	20-154	20-161											
PRI07	11-57*	32-18	47-26	51-23	52-26	57-32	57-33	58-34	59-15	59-39				
PSEL	12-9*													
PSTACK	13-102*	16-112	16-112	16-112	16-112	16-117	16-117	16-117	16-117	20-51	20-66	25-88	84-22	84-45
	85-45	85-68	87-28	87-45	87-45	87-106	87-106	87-106	87-106	91-60	91-66	91-77	92-55	93-121
	93-130	93-132	93-143	93-146	93-149	93-153	93-327	95-44	95-45	95-65*	95-66*	95-68		
PTRANS	13-135	16-31*												
RCVED	13-45*	16-100	16-130	22-64*	22-65	22-71*	22-72	22-100*	23-74*	23-75	23-99*	24-20*	24-21*	24-24
	25-64*	25-103*	37-26*	37-40*	44-42*	45-46*	60-42*	61-19*	61-20	62-28*	62-31*	62-32	63-20*	63-22
	63-25	70-65*	71-23*	71-26*	71-29*	71-30	72-24*	72-25	72-30*	72-34*	73-34*	75-50*	78-21*	79-33*
	79-43*	80-35*	80-53*	84-53*	85-40*	86-34*	86-51*	86-69*	86-91*	90-36*	91-56*	91-78*	91-81	92-63*
	92-98*	93-153*	93-271*	93-332*	94-50*	94-65*								
RDDTA	12-218*													
RD+DTA	12-219*	93-324												
RDY	12-6*	57-23	57-24	57-28	57-36	59-27								
READTD	16-37*	93-155												
READY	18-33*	18-35	19-13	19-24										
RECAL	12-206*	92-71												
REG	13-100*	20-219	20-219	20-219	20-219	20-219	20-219	20-219	20-222	20-222	20-222	20-222	20-222	20-222
	20-225	20-225	20-225	20-225	20-225	20-225	20-225	20-225	20-230	20-230	23-36			
REGSET	23-59	23-66	23-72*											
RELEAS	12-208*													
RESET	23-90*	38-21	40-21	47-27	48-25									
RH	13-125	16-5*												
RHEXT	13-57*	17-11*	17-20*	17-24*	17-30	30-48								
RHTYPE	13-58*	17-12*	17-40*	20-226	22-88	23-40	30-46	41-32	46-25	47-19	48-19	49-47	49-71	50-49
	50-73	52-18	53-29	54-28	55-28	56-31	84-34	84-47						
RIP	12-210*	25-9	83-25	89-30	90-31	93-322								
RMR	12-80*													
ROUTDO	13-32*	30-25*	95-37	95-67*										
RPADR	13-55*	30-55*												
RPARDY	18-11*	19-28												
RPAS	13-69*	18-14	18-21*	22-22*	78-17	78-20	78-21	79-30	79-32	79-33	79-38*	79-40	79-4.	79-43
	80-32	80-34	80-35	80-48*	80-50	80-52	80-53	90-29*	93-111*					
RPBA	13-64*	13-154	13-204	19-19*	22-86	37-22*	37-23	37-25	37-26	37-34	37-36	37-39	37-40	40-21
RPBAE	13-82*	13-173	13-210	23-38	48-25	49-50	49-53	49-74	49-77	50-52	50-55	50-76	50-79	
RPCC	13-77*	92-95	92-98	92-99										
RPCS1	13-62*	13-185	13-202	18-45	19-20*	22-68	22-70	22-71	23-35	25-9*	30-35	36-63	41-42	41-45

	41-60	41-63	41-67	41-70	41-76	41-79	46-43	46-46	49-29*	49-30	49-33	49-37	49-40	49-61
	49-64	50-31*	50-32	50-35	50-39	50-42	50-63	50-66	51-25*	51-26	51-29	51-37	51-40	52-27*
	53-29	53-29	54-28	54-28	55-28	55-28	56-31	56-31	57-23*	57-24	57-27	57-36*	58-26	58-29
	58-37*	59-27*	62-17*	62-22*	62-28	62-34	65-26	65-29	67-22	68-28	70-46*	72-23*	73-21	73-30
	77-54*	81-16	81-19	82-21	82-24	83-25*	89-30*	90-31*	91-72	92-74	92-77	92-102	93-214	93-277
	93-283	93-300	96-30*	96-44										
RPCS2	13-66*	13-142	13-206	22-9*	22-10*	23-94*	24-37	24-49	26-11*	30-71*	30-73*	32-20*	32-21*	37-35*
	38-21	41-40*	41-41*	41-51*	41-52	41-55	41-74*	41-75*	42-37	42-40	42-43	42-49	42-52	42-55
	42-60	42-63	46-32*	46-33*	46-34*	46-37	46-40	49-60*	50-62*	51-36*	52-38*	53-29	53-29	53-29*
	54-28	54-28	54-28*	55-28	55-28	55-28*	56-31	56-31	56-31*	57-46*	58-24*	58-25*	58-44*	59-18*
	59-19*	59-34*	60-38*	61-18*	62-16*	62-21*	62-26*	63-18*	63-19*	70-37*	70-39*	70-40*	70-44*	72-22*
	75-25*	75-45*	75-46*	77-32*	77-53*	77-57*	79-26*	79-37*	80-28*	82-18*	90-27*	93-259	93-262	
RPCS3	13-83*	13-167	13-211	22-90	22-93	22-96	47-27	52-28	52-31	52-39	52-42	53-29	53-29	53-29
	53-29	53-29*	54-28	54-28	54-28	54-28	54-28*	55-28	55-28	55-28	55-28	55-28*	56-31	56-31
	56-31	56-31	56-31*											
RPDA	13-65*	13-179	13-186	13-205	19-18*	65-24*	66-18*	66-21	67-26	73-19*	73-20	75-26*	75-27	77-33*
	77-58*	79-27*	80-29*	82-19*	89-27*	89-31	89-34	90-28*	90-32	90-35	90-36			
RPDB	13-71*	13-160	22-100	42-48*	42-59	44-34*	44-39	44-41	44-42	45-27	45-38*	45-44	45-46	46-36*
	53-29	53-29*	54-28	54-28*	55-28	55-28	55-28*	55-28*	56-31	56-31	56-31*	56-31*	91-87	93-267
RPDC	13-76*	13-188	13-209	19-17*	67-34	68-24	68-46	89-28*	89-37	89-40	92-95	92-97		
RPDS	13-67*	18-34	22-11	22-13*	22-16	22-61	22-63	22-64	26-12	26-21	68-32	74-21	74-24	75-35
	75-38	75-53	75-56	76-17	76-20	77-36	77-40	77-44	77-55	77-61	77-64	80-40	80-43	83-15
	83-27	83-30	89-17	90-17	90-39	90-42	91-44	91-70	92-44	92-80	92-83	92-100	93-89	93-94
	93-171	94-34	96-31	96-39										
RPDT	13-73*	60-39	60-41	60-42	61-19	61-23	63-20	63-27						
RPEC1	13-80*													
RPEC2	13-81*													
RPER1	13-68*	66-19	66-22	66-25	71-21	71-24	72-28	72-32	72-38	73-24	73-33	73-34	74-28	75-29
	75-32	75-47	75-49	75-50	92-60	92-63	92-64	93-329	93-332	93-333	94-43	94-45	94-50	94-62
	94-65	94-72												
RPER2	13-78*	16-113	20-195	71-27	74-30	86-23	86-28	86-45	86-63	86-85	87-37	87-49	87-55	87-61
	87-67	87-73	87-79	87-86	87-99	88-32	95-74							
RPER3	13-79*	74-32												
RPLA	13-70*	85-29	85-34	85-40	85-54	85-60	85-61	85-62						
RPOR1	13-72*	13-191	13-207	18-19	19-40*	20-11*	20-14*	20-24*	20-25*	20-38	20-40*	70-38*	70-41	70-45*
	70-47	70-63	86-26*	86-43*	86-61*	86-83*	88-38*	92-54*	92-91*	93-108*	95-80*			
RPOF	13-75*	13-187	13-208	25-10*	67-30	89-29*	89-43	89-46	91-64*	92-53*	93-128*	93-187*	93-207*	93-325*
RFSN	13-74*	30-83												
RPVEC	13-56*	30-56*	30-57*	32-31	57-32	57-44	57-49	58-34	58-47	59-15	59-20	59-24	59-37	
RPWC	13-63*	13-148	13-203	19-16*										
RTD	12-220*	91-65	93-126											
RWU1	12-188*													
RWU2	12-189*													
RWU3	12-190*													
S&LSYM	7-373*	9-25*	10-25*	16-105*	16-124*	16-136*	16-142*	20-185*	27-41*	28-75*	30-141*	31-18*	32-57*	33-34*
	34-35*	36-71*	37-21	37-21	37-21*	37-33	37-33	37-33*	37-46*	38-21	38-21	38-21	38-21	38-21
	38-21	38-21	38-21	38-21*	38-21*	38-21*	38-21*	38-24*	39-22	39-22	39-22	39-22	39-22	39-22
	39-22	39-22	39-22*	39-22*	39-22*	39-22*	39-25*	40-21	40-21	40-21	40-21	40-21	40-21	40-21
	40-21	40-21*	40-21*	40-21*	40-21*	40-24*	41-38	41-38	41-38*	41-39	41-39	41-39*	41-50	41-50
	41-50*	41-86*	42-35	42-35	42-35*	42-36	42-36	42-36*	42-70*	43-42	43-42	43-42	43-42	43-42
	43-42	43-42	43-42	43-42*	43-42*	43-42*	43-42*	43-46*	44-31	44-31	44-31*	44-50*	45-31	45-31
	45-31*	45-34	45-34	45-34*	45-61*	46-31	46-31	46-31*	46-53*	47-27	47-27	47-27	47-27	47-27
	47-27	47-27	47-27	47-27*	47-27*	47-27*	47-27*	47-30*	48-25	48-25	48-25	48-25	48-25	48-25
	48-25	48-25	48-25*	48-25*	48-25*	48-25*	48-28*	49-28	49-28	49-28*	49-46	49-46	49-46*	49-59
	49-59	49-59*	49-70	49-70	49-70*	49-85*	50-30	50-30	50-30*	50-48	50-48	50-48*	50-61	50-61
	50-61*	50-72	50-72	50-72*	50-87*	51-24	51-24	51-24*	51-35	51-35	51-35*	51-49*	52-24	52-24

	97 60	97-60	97-61	97-61	98-12	98-12	98-14	98-14	98-14	98-14	98-14	98 16	98-16
	98 16	98-16	98-16	98-16	98-18	98-18	98-18	98-18	98-18	98-18	98-20	98 22	98-22
	98-22	98-22	98-22	98-22	98-22	98-22	98-22	98-22	98-22	98-24	98-24	98-24	98-24
	98 33	98-33	98-63	98-63	98-63	98-63	98-63	98-63	98-63	99-16	99-16	99-16	99-16
SVCSUB	7-373#	7-381#	93-105	93-105	93-105	93-227	93-227	93-227	93-227	16-105	16-105	16-105	16-124
SVCTAG	7-373#	7-383#	9-25	9-25	9-25	10-25	10-25	10-25	10-25	16-105	16-105	16-105	16-124
	16-136	16-136	16-136	16-142	16-142	16-142	20-185	20-185	20-185	27-41	27-41	27-41	28-75
	28-75	30-141	30-141	30-141	31-18	31-18	31-18	32-57	32-57	32-57	33-34	33-34	34-35
	34-35	34-35	36-71	36-71	36-71	37-32	37-32	37-32	37-32	37-43	37-43	37-46	37-46
	38-21	38-21	38-21	38-21	38-21	38-21	38-21	38-21	38-21	38-21	38-21	38-21	38-24
	38-24	39-22	39-22	39-22	39-22	39-22	39-22	39-22	39-22	39-22	39-22	39-22	39-25
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	41-86	42-47	42-47	42-47	42-67	42-67	42-70	42-70	42-70	43-42	43-42	43-42	43-42
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	48-25	48-25	48-25	48-28	48-28	48-28	49-45	49-45	49-45	49-58	49-58	49-58	49-69
	49-69	49-82	49-82	49-82	49-85	49-85	49-85	50-47	50-47	50-47	50-60	50-60	50-71
	50-71	50-71	50-84	50-84	50-84	50-87	50-87	50-87	50-87	51-34	51-34	51-34	51-45
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	63-35	63-35	64-25	64-25	64-25	64-25	64-25	64-25	64-25	64-25	64-25	64-25	64-25
	64-28	64-28	64-28	65-38	65-38	65-38	65-41	65-41	65-41	66-33	66-33	66-33	66-36
	66-36	67-38	67-38	67-38	67-41	67-41	67-41	68-48	68-48	68-48	68-51	68-51	69-25
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	70-68	70-68	70-68	70-72	70-72	70-72	71-36	71-36	71-36	71-39	71-39	71-39	72-46
	72-46	72-50	72-50	72-50	73-40	73-40	73-40	73-43	73-43	73-43	74-38	74-38	74-41
	74-41	74-41	75-63	75-63	75-63	75-66	75-66	75-66	75-66	76-26	76-26	76-29	76-29
	77-69	77-69	77-69	77-72	77-72	77-72	78-26	78-26	78-26	78-29	78-29	78-29	79-48
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	86-74	86-96	86-96	86-96	86-106	86-106	86-106	87-115	87-115	87-115	88-39	88-39	88-72
	88-72	88-72	89-52	89-52	89-52	89-56	89-56	89-56	89-56	90-48	90-48	90-52	90-52
	91-92	91-92	91-92	91-95	91-95	91-95	92-68	92-68	92-68	92-89	92-89	92-112	92-112
	92-112	92-113	92-113	92-113	93-119	93-119	93-119	93-196	93-196	93-196	93-225	93-225	93-226
	93-226	93-226	93-315	93-315	93-315	93-320	93-320	93-320	93-338	93-338	93-338	93-339	93-339
	94-52	94-52	94-52	94-75	94-75	94-75	94-76	94-76	94-76	95-44	95-44	95-81	95-81
	95-81	95-83	95-83	95-83	96-49	96-49	96-49	97-61	97-61	97-61	98-33	98-33	99-16
	99-16	99-16	99-21	99-21	99-21	99-21	99-21	99-21	99-21	99-21	99-21	99-21	99-21
SVCTST	7-373#	7-380#	36-60	36-60	36-60	37-19	37-19	37-19	38-17	38-17	38-17	39-18	39-18
	40-17	40-17	40-17	41-31	41-31	41-31	42-31	42-31	42-31	43-37	43-37	43-37	44-26
	44-26	45-26	45-26	45-26	46-24	46-24	46-24	47-18	47-18	47-18	48-18	48-18	49-24
	49-24	49-24	50-26	50-26	50-26	51-18	51-18	51-18	52-17	52-17	53-28	53-28	53-28
	54-27	54-27	54-27	55-27	55-27	55-27	56-30	56-30	56-30	57-17	57-17	58-18	58-18
	58-18	59-13	59-13	59-13	60-22	60-22	60-22	61-15	61-15	61-15	62-13	62-13	63-15
	63-15	63-15	64-20	64-20	64-20	65-18	65-18	65-18	66-12	66-12	67-14	67-14	67-14
	68-14	68-14	68-14	69-20	69-20	69-20	70-33	70-33	70-33	71-17	71-17	72-18	72-18

T\$SW	10-8	10-8#	10-25												
T\$TES	36 60#	36-71	37-19#	37-46	38-17#	38-24	39-18#	39-25	40-17#	40-24	41-31#	41-34	41-86	42-31#	
	42-70	43-37#	43-46	44-26#	44-50	45-26#	45-61	46-24#	46-27	46-53	47-18#	47-21	47-30	48-18#	
	48-21	48-28	49-24#	49-85	50-26#	50-87	51-18#	51-49	52-17#	52-20	52-51	53-28#	53-29	53-30	
	54-27#	54-28	54-29	55-27#	55-28	55-29	56-30#	56-31	56-32	57-17#	57-50	58-18#	58-32	58-48	
	59-13#	59-40	60-22#	60-28	60-31	60-36	60-56	61-15#	61-31	62-13#	62-42	63-15#	63-35	64-20#	
	64-28	65-18#	65-41	66-12#	66-36	67-14#	67-41	68-14#	68-51	69-20#	69-28	70-33#	70-72	71-17#	
	71-39	72-18#	72-50	73-13#	73-43	74-17#	74-41	75-21#	75-66	76-12#	76-29	77-28#	77-52	77-72	
	78-13#	78-29	79-22#	79-51	80-24#	80-61	81-12#	81-28	82-14#	82-33	83-13#	83-22	83-40	84-18#	
	84-64	85-25#	85-74	86-17#	86-106	87-20#	87-26	87-115	88-24#	88-72	89-15#	89-24	89-56	90-15#	
	90-24	90-52	91-42#	91-51	91-95	92-39#	92-51	92-113	93-87#	93-93	93-101	93-339	94-31#	94-41	
	94-76	95-30#	95-36	95-41	95-83	96-25#	96-49								
T\$ARGC	7-427	7-427	7-427	7-427	7-427	7-427	7-427	7-427	7-427	7-427	7-427	7-427#	7-427#	7-427#	
	7-427#	7-427#	7-427#	16-99	16-99	16-99	16-99#	16-99#	16-100	16-100	16-100	16-100#	16-100#	16-100#	
	16-100#	16-104	16-104	16-104#	16-112	16-112	16-112	16-112	16-112	16-112	16-112#	16-112#	16-112#	16-112#	
	16-112#	16-117	16-117	16-117	16-117	16-117	16-117	16-117#	16-117#	16-117#	16-117#	16-117#	16-123	16-123	
	16-123#	16-128	16-128	16-128	16-128#	16-128#	16-129	16-129	16-129	16-129#	16-129#	16-130	16-130	16-130	
	16-130	16-130#	16-130#	16-130#	16-132	16-132	16-132#	16-135	16-135	16-135#	16-141	16-141	16-141#	20-218	
	20-218	20-218#	20-219	20-219	20-219	20-219	20-219	20-219	20-219	20-219	20-219	20-219#	20-219#	20-219#	
	20-219#	20-219#	20-219#	20-219#	20-219#	20-219#	20-221	20-221	20-221#	20-222	20-222	20-222	20-222	20-222	
	20-222	20-222	20-222	20-222#	20-222#	20-222#	20-222#	20-222#	20-222#	20-222#	20-222#	20-222#	20-224	20-224	
	20-225	20-225	20-225	20-225	20-225	20-225	20-225	20-225	20-225	20-225#	20-225#	20-225#	20-225#	20-225#	
	20-225#	20-225#	20-225#	20-229	20-229	20-229#	20-230	20-230	20-230	20-230	20-230#	20-230#	20-230#	20-230#	
	21-9	21-9#	21-12	21-12	21-12	21-12#	21-18	21-18	21-18	21-18#	26-17	26-17	26-17	26-17#	
	26-17#	26-26	26-26	26-26	26-26#	26-26#	30-27	30-27	30-27#	30-82	30-82	30-82#	30-82#	30-82#	
	30-95	30-95	30-95	30-95#	30-95#	30-100	30-100	30-100#	77-47	77-47	77-47	77-47#	77-47#	77-47#	
	83-18	83-18	83-18#	83-18#	87-45	87-45	87-45	87-45	87-45#	87-45#	87-45#	87-45#	87-45#	87-45#	
	87-52#	87-52#	87-58	87-58	87-58	87-58#	87-58#	87-58#	87-64	87-64	87-64	87-64#	87-64#	87-64#	
	87-70	87-70#	87-70#	87-76	87-76	87-76	87-76#	87-76#	87-82	87-82	87-82	87-82#	87-82#	87-82#	
	87-89	87-89	87-89#	87-89#	87-91	87-91	87-91#	87-96	87-96	87-96#	87-106	87-106	87-106	87-106	
	87-106	87-106	87-106#	87-106#	87-106#	87-106#	87-106#	87-112	87-112	87-112#	89-20	89-20	89-20	89-20#	
	89-20#	90-20	90-20	90-20#	90-20#	90-20#	91-47	91-47	91-47	91-47#	91-47#	92-47	92-47	92-47	
	92-47#	92-47#	93-92	93-92	93-92	93-92#	93-97	93-97	93-97	93-97	93-97#	93-97#	93-97#	93-138	
	93-138#	93-139	93-139	93-139#	93-249	93-249	93-249#	93-304	93-304	93-304#	94-37	94-37	94-37	94-37#	
	94-37#	95-43	95-43	95-43#											
T\$CODE	60-33	60-33	60-33	60-33#	60-33#	60-33#	60-49	60-49	60-49	60-49#	60-49#	60-49#	60-49#	95-44	
	95-44	95-44#	95-44#	95-44#	97-54	97-54	97-54	97-54#	97-54#	97-54#	97-54#	97-56	97-56	97-56#	
	97-56#	97-56#	97-58	97-58	97-58	97-58#	97-58#	97-58#	97-60	97-60	97-60	97-60#	97-60#	97-60#	
	98-14	98-14	98-14	98-14#	98-14#	98-14#	98-16	98-16	98-16	98-16#	98-16#	98-16#	98-16#	98-18	
	98-18	98-18#	98-18#	98-18#	98-20	98-20	98-20	98-20	98-20	98-20	98-20#	98-20#	98-20#	98-20#	
	98-22	98 22	98-22	98-22#	98-22#	98-22#	98-24	98-24	98-24	98-24#	98-24#	98-24#	98-24#	98-24#	
T\$ERRN	7-373#	18-20	18-20#	22-21	22-21#	23-101	23-101#	24-26	24-26#	25-69	25-69#	25-106	25-106#	36-67	
	36-67#	37-30	37-30#	37-41	37-41#	41-47	41-47#	41-57	41-57#	41-65	41-65#	41-72	41-72#	41-81	
	41-81#	42-45	42-45#	42-57	42-57#	42-65	42-65#	44-43	44-43#	45-48	45-48#	46-48	46-48#	49-35	
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56-31	57-21	57-21	57-21	57-31	57-31	57-31	57-31	57-31	57-31	57-34	57-34	57-34	57-42
57-42	57-42	57-42	57-42	58-22	58-22	58-22	58-33	58-33	58-33	58-33	58-33	58-35	58-35
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60-37	60-37	60-47	60-47	60-47	60-47	60-47	60-47	61-17	61-17	61-17	61-28	61-28	61-28
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64-25	64-25	64-25	64-25	64-25	64-25	64-25	64-25	65-20	65-20	65-20	65-38	65-38	65-38
65-38	66-14	66-14	66-14	66-33	66-33	66-33	66-33	66-33	66-33	67-21	67-21	67-38	67-38
67-38	67-38	67-38	67-38	68-20	68-20	68-20	68-48	68-48	68-48	68-48	68-48	69-25	69-25
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73-40	73-40	73-40	73-40	73-40	73-40	74-19	74-19	74-19	74-38	74-38	74-38	74-38	74-38
75-23	75-23	75-63	75-63	75-63	75-63	75-63	75-63	75-63	76-14	76-14	76-14	76-26	76-26
76-26	77-30	77-30	77-30	77-69	77-69	77-69	77-69	77-69	77-69	77-69	77-69	77-69	77-69
78-26	78-26	78-26	78-26	79-24	79-24	79-24	79-48	79-48	79-48	79-48	79-48	80-26	80-26
80-58	80-58	80-58	80-58	80-58	80-58	81-14	81-14	81-14	81-25	81-25	81-25	81-25	81-25
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83-36	86-25	86-25	86-25	86-39	86-39	86-39	86-39	86-39	86-39	86-41	86-41	86-41	86-56
86-56	86-56	86-56	86-56	86-60	86-60	86-60	86-74	86-74	86-74	86-74	86-74	86-82	86-82
86-96	86-96	86-96	86-96	86-96	86-96	88-30	88-30	88-30	88-39	88-39	88-39	88-39	88-39
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92-68	92-68	92-68	92-68	92-69	92-69	92-69	92-89	92-89	92-89	92-89	92-89	92-90	92-90
92-112	92-112	92-112	92-112	92-112	92-112	93-106	93-106	93-106	93-106	93-119	93-119	93-119	93-119
93-120	93-120	93-196	93-196	93-196	93-196	93-196	93-196	93-196	93-197	93-197	93-225	93-225	93-225
93-225	93-238	93-238	93-238	93-315	93-315	93-315	93-315	93-315	93-315	93-315	93-321	93-321	93-338

G4

8 8#	8 8#	8-8#	8-8#	8-8#	8-8#	8 8#	8-8#	8-8#	8-8#	8-8#	8 8#	8-8#	
8 8#	8-8#	9-25	9-25#	10-25	10-25#	10-26	10-26#	16-105	16-105#	16-124	16-124#	16-136	16-136#
16-142	16-142#	20-185	20-185#	27-41	27-41#	27-43	27-43#	28-60	28-60#	28-75	28-75#	29-12	29-12#
30-20	30-20#	30-126	30-126#	30-141	30-141#	31-18	31-18#	32-42	32-42#	32-57	32-57#	33-19	33-19#
33-34	33-34#	34-20	34-20#	34-35	34-35#	34-36	34-36#	36-71	36-71#	37-32	37-32#	37-43	37-43#
37-46	37-46#	38-21	38-21#	38-21	38-21#	38-21	38-21#	38-21	38-21#	38-24	38-24#	39-22	39-22#
39-22	39-22#	39-22#	39-22#	39-22#	39-22#	39-25	39-25#	40-21	40-21#	40-21	40-21#	40-21#	40-21#
40-21#	40-21#	40-24	40-24#	41-34	41-34#	41-49	41-49#	41-59	41-59#	41-83	41-83#	41-86	41-86#
42-47	42-47#	42-67	42-67#	42-70	42-70#	43-42	43-42#	43-42	43-42#	43-42#	43-42#	43-42#	43-42#
43-46	43-46#	44-47	44-47#	44-50	44-50#	45-52	45-52#	45-58	45-58#	45-61	45-61#	46-27	46-27#
46-50	46-50#	46-53	46-53#	47-21	47-21#	47-27	47-27#	47-27	47-27#	47-27#	47-27#	47-27#	47-27#
47-30	47-30#	48-21	48-21#	48-25	48-25#	48-25	48-25#	48-25	48-25#	48-25#	48-25#	48-28	48-28#
49-45	49-45#	49-49	49-49#	49-49#	49-58	49-58#	49-69	49-69#	49-73	49-73#	49-73#	49-82	49-82#
49-85	49-85#	50-47	50-47#	50-51	50-51#	50-51#	50-60	50-60#	50-71	50-71#	50-75	50-75#	50-75#
50-84	50-84#	50-87	50-87#	51-34	51-34#	51-45	51-45#	51-49	51-49#	52-20	52-20#	52-36	52-36#
52-47	52-47#	52-51	52-51#	53-29	53-29#	53-29	53-29#	53-29	53-29#	53-29#	53-29#	53-30	53-30#
54-28	54-28#	54-28	54-28#	54-28#	54-28#	54-28#	54-28#	54-29	54-29#	55-28	55-28#	55-28	55-28#
55-28#	55-28#	55-28#	55-28#	55-29	55-29#	56-31	56-31#	56-31	56-31#	56-31#	56-31#	56-31#	56-31#
56-32	56-32#	57-31	57-31#	57-42	57-42#	57-50	57-50#	58-32	58-32#	58-33	58-33#	58-43	58-43#
58-48	58-48#	59-33	59-33#	59-40	59-40#	60-28	60-28#	60-31	60-31#	60-33	60-33#	60-33	60-33#
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64-25	64-25#	64-25#	64-25#	64-25#	64-25#	64-28	64-28#	65-38	65-38#	65-41	65-41#	66-33	66-33#
66-36	66-36#	67-38	67-38#	67-41	67-41#	68-48	68-48#	68-51	68-51#	69-25	69-25#	69-25	69-25#
69-25#	69-25#	69-25#	69-25#	69-28	69-28#	70-68	70-68#	70-72	70-72#	71-36	71-36#	71-39	71-39#
72-46	72-46#	72-50	72-50#	73-40	73-40#	73-43	73-43#	74-38	74-38#	74-41	74-41#	75-63	75-63#
75-66	75-66#	76-26	76-26#	76-29	76-29#	77-52	77-52#	77-69	77-69#	77-72	77-72#	78-26	78-26#
78-29	78-29#	79-48	79-48#	79-51	79-51#	80-58	80-58#	80-61	80-61#	81-25	81-25#	81-28	81-28#
82-30	82-30#	82-33	82-33#	83-22	83-22#	83-36	83-36#	83-40	83-40#	84-64	84-64#	85-74	85-74#
86-39	86-39#	86-56	86-56#	86-74	86-74#	86-96	86-96#	86-106	86-106#	87-26	87-26#	87-115	87-115#
88-39	88-39#	88-72	88-72#	89-24	89-24#	89-52	89-52#	89-56	89-56#	90-24	90-24#	90-48	90-48#
90-52	90-52#	91-51	91-51#	91-92	91-92#	91-95	91-95#	92-51	92-51#	92-68	92-68#	92-89	92-89#
92-112	92-112#	92-113	92-113#	93-93	93-93#	93-101	93-101#	93-119	93-119#	93-196	93-196#	93-225	93-225#
93-226	93-226#	93-315	93-315#	93-320	93-320#	93-338	93-338#	93-339	93-339#	94-41	94-41#	94-52	94-52#
94-75	94-75#	94-76	94-76#	95-36	95-36#	95-41	95-41#	95-44	95-44#	95-44	95-44#	95-44#	95-44#
95-81	95-81#	95-83	95-83#	96-49	96-49#	96-51	96-51#	97-54	97-54#	97-54	97-54#	97-54#	97-54#
97-56	97-56#	97-56	97-56#	97-56#	97-56#	97-58	97-58#	97-58	97-58#	97-58#	97-58#	97-60	97-60#
97-60	97-60#	97-60#	97-60#	97-61	97-61#	98-14	98-14#	98-14	98-14#	98-14#	98-14#	98-16	98-16#
98-16	98-16#	98-16#	98-16#	98-18	98-18#	98-18	98-18#	98-18#	98-18#	98-22	98-22#	98-22	98-22#
98-22#	98-22#	98-24	98-24#	98-24	98-24#	98-24#	98-24#	98-33	98-33#	98-64	98-64#	98-64	98-64#
T&TEST	7-373#	36-60	36-60#	36-60#	37-19	37-19#	37-19#	38-17	38-17#	38-17#	39-18	39-18#	40-17
40-17	40-17#	41-31	41-31#	41-31#	42-31	42-31#	42-31#	43-37	43-37#	43-37#	44-26	44-26#	44-26#
45-26	45-26#	45-26#	46-24	46-24#	47-18	47-18#	47-18#	48-18	48-18#	48-18	49-24	49-24#	49-24
49-24#	50-26	50-26	50-26#	51-18	51-18#	52-17	52-17#	52-17	52-17#	53-28	53-28#	54-27	54-27#
54-27	54-27#	55-27	55-27#	55-27#	56-30	56-30#	56-30#	57-17	57-17#	57-17#	58-18	58-18#	58-18#
59-13	59-13#	59-13#	60-22	60-22#	60-22#	61-15	61-15#	62-13	62-13#	62-13	63-15	63-15#	63-15
63-15#	64-20	64-20	64-20#	65-18	65-18#	66-12	66-12#	66-12#	67-14	67-14#	67-14#	68-14	68-14#
68-14	68-14#	69-20	69-20#	69-20#	70-33	70-33#	70-33#	71-17	71-17#	71-17#	72-18	72-18#	72-18#
73-13	73-13#	73-13#	74-17	74-17#	74-17#	75-21	75-21#	75-21	75-21#	76-12	76-12#	77-28	77-28#
77-28#	78-13	78-13	78-13#	79-22	79-22#	79-22#	80-24	80-24#	80-24#	81-12	81-12#	81-12#	82-14
82-14	82-14#	83-13	83-13#	83-13#	84-18	84-18#	84-18#	85-25	85-25#	85-25#	86-17	86-17#	86-17#
87-20	87-20#	87-20#	88-24	88-24#	88-24#	89-15	89-15#	89-15#	90-15	90-15#	90-15#	91-42	91-42#
91-42#	92-39	92-39	92-39#	93-87	93-87#	93-87#	93-105	93-227	94-31	94-31#	94-31#	95-30	95-30#
95-30#	96-25	96-25	96-25#	98-63	16-99	16-99	16-100	16-104	16-105	16-112	16-117	16-123	16-124
T&TSTM	7-373#	16-136	16-141	16-142	18-20	18-33	18-44	20-101	20-120	20-154	20-161	20-218	20-219
16-136	16-141	16-142	18-20	18-33	18-44	20-101	20-120	20-154	20-161	20-218	20-219	20-221	20-222

T22	8 8	57-17#												
T23	8-8	58-18#												
T24	8-8	59-13#												
T25	8 8	60-22#												
T26	8 8	61-15#												
T27	8-8	62-13#												
T28	8-8	63-15#												
T29	8-8	64-20#												
T3	8-8	38-17#												
T30	8 8	65-18#												
T31	8-8	66-12#												
T32	8-8	67-14#												
T33	8-8	68-14#												
T34	8-8	69-20#												
T35	8-8	70-33#												
T3c	8-8	71-17#												
T37	8-8	72-18#												
T38	8-8	73-13#												
T39	8-8	74-17#												
T4	8-8	39-18#												
T40	8-8	75-21#												
T41	8-8	76-12#												
T42	8-8	77-28#												
T43	8-8	78-13#												
T44	8-8	79-22#												
T45	8-8	80-24#												
T46	8-8	81-12#												
T47	8-8	82-14#												
T48	8-8	83-13#												
T49	8-8	84-18#												
T5	8-8	40-17#												
T50	8-8	85-25#												
T51	8-8	86-17#												
T52	8-8	87-20#												
T53	8-8	88-24#												
T54	8-8	89-15#												
T55	8-8	90-15#												
T56	8-8	91-42#												
T57	8-8	92-39#												
T58	8-8	93-87#												
T58.1	93-105#													
T58.2	93-227#													
T59	8-8	94-31#												
T6	8-8	41-31#												
T60	8-8	95-30#												
T61	8-8	96-25#												
T7	8-8	42-31#												
T8	8-8	43-37#												
T9	8-8	44-26#												
TABADD	13-18#	19-19	91-66*	92-55*	93-130*	93-184*	93-208*	93-239*	93-255*	93-287*	93-327*			
TAP	12-130#													
TEMP	13-39#	38-21	38-21*	39-22	39-22*	40-21	40-21*	43-42	43-42*	47-27	47-27*	48-25	48-25*	64-25
	64-25*	69-25	69-25*	84-21*	84-27	84-28	84-29*	84-32*	84-39	84-40	84-41*	85-33*	85-36*	85-51*
	85-52*	93-231*	93-246	93-273	93-294*	93-299*								
TERM	13-132	16-28#												
TESTRG	13-47#	16-99	22-63*	22-70*	23-72*	23-97*	25-34*	25-102*	37-25*	37-39*	44-41*	45-27*	60-41*	61-23*

ENDHW	1-465#	7-373#	9-25											
ENDINI	1-475#	7-373#	30-141											
ENDMOD	1-487#	7-373#	10-26	27-43	34-36	96-51	98-64							
ENDMSG	1 500#	7-373#	16-105	16-124	16 136	16-142								
ENDPRO	1-512#	7-373#	29-12											
ENDPTA	1-520#	7-373#	99-21											
ENDRPT	1-529#	7-373#	28-75											
ENDSEG	1-541#	7-373#	37-32	37-43	38-21	38-21	38-21	38-21	39-22	39-22	39-22	39-22	40-21	40-21
	40-21	40-21	41-49	41-59	41-83	42-47	42-67	43-42	43-42	43-42	43-42	44-47	45-52	45-58
	46 50	47-27	47-27	47-27	47-27	48-25	48-25	48-25	48-25	49-45	49-58	49-69	49-82	50-47
	50-60	50-71	50-84	51-34	51-45	52-36	52-47	53-29	53-29	53-29	54-28	54-28	54-28	55-28
	55-28	55-28	56-31	56-31	56-31	57-31	57-42	58-33	58-43	59-33	60-47	61-28	62-39	63-32
	64-25	64-25	64-25	64-25	65-38	66-33	67-38	68-48	69-25	69-25	69-25	69-25	70-68	71-36
	72-46	73-40	74-38	75-63	76-26	77-69	78-26	79-48	80-58	81-25	82-30	83-36	86-39	86-56
	86-74	86-96	88-39	89-52	90-48	91-92	92-68	92-89	92-112	93-119	93-196	93-225	93-315	93-338
	94-52	94-75	95-81											
ENDSET	1-555#	7-373#	99-22											
ENDSFT	1-568#	7-373#	98-33											
ENDSRV	1-580#	7-373#	20-185	27-41										
ENDSUB	1-596#	7-373#	93-226	93-320										
ENDSW	1-614#	7-373#	10-25											
ENDTST	1-624#	7-373#	36-71	37-46	38-24	39-25	40-24	41-86	42-70	43-46	44-50	45-61	46-53	47-30
	48-28	49-85	50-87	51-49	52-51	53-30	54-29	55-29	56-32	57-50	58-48	59-40	60-56	61-31
	62-42	63-35	64-28	65-41	66-36	67-41	68-51	69-28	70-72	71-39	72-50	73-43	74-41	75-66
	76-29	77-72	78-29	79-51	80-61	81-28	82-33	83-40	84-64	85-74	86-106	87-115	88-72	89-56
	90-52	91-95	92-113	93-339	94-76	95-83	96-49							
EQUALS	1-642#	7-373#	11-57											
ERRDF	1-714#	7-373#	22-21											
ERRHRD	1-718#	7-373#	18-20	23-101	24-26	25-69	25-106	36-67	37-30	37-41	41-47	41-57	41-65	41-72
	41-81	42-45	42-57	42-65	44-43	45-48	46-48	49-35	49-42	49-55	49-66	49-79	50-37	50-44
	50-57	50-68	50-81	51-31	51-42	52-33	52-44	53-29	53-29	53-29	53-29	54-28	54-28	54-28
	54-28	55-28	55-28	55-28	55-28	56-31	56-31	56-31	56-31	57-29	57-40	58-31	58-41	59-31
	60-46	61-26	62-37	63-30	65-33	66-29	70-66	71-34	72-44	73-38	74-34	74-36	75-43	75-61
	76-24	77-67	78-24	79-36	79-46	80-38	80-45	80-56	81-23	82-28	83-34	84-58	85-42	86-35
	86-52	86-70	86-92	88-35	89-50	90-46	91-90	92-67	92-87	92-106	92-110	93-117	93-156	93-194
	93-217	93-222	93-248	93-264	93-276	93-285	93-303	93-309	93-336	94-51	94-66	95-77	96-37	96-42
	96-47													
ERROR	1-722#	7-373#												
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ERRSOF	1-730#	7-373#												
ERRTBL	1-734#	7-373#												
ESCAPE	1-744#	7-373#												
EXIT	1-771#	7-373#	28-60	30-20	30-126	32-42	33-19	34-20	41-34	46-27	47-21	48-21	49-49	49-73
	50-51	50-75	52-20	53-29	54-28	55-28	56-31	58-32	60-28	60-31	60-36	77-52	83-22	87-26
	89-24	90-24	91-51	92-51	93-93	93-101	94-41	95-36	95-41					
FEQUAL	1-810#	7-373#												
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GETPRI	1-834#	7-373#												
GETWOR	1-829#	7-373#												
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GMANID	1-848#	7-373#	95-44											
GMANIL	1-859#	7-373#	60-33	60-49										
GPHARD	1-868#	7-373#	30-37											
GPRMA	1-874#	7-373#	97-54	97-56										
GPRMD	1-903#	7-373#	95-44	95-44#	97-58	97-60	98-22							
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M3

HEADER	1-954 0	7-373 0	7-427											
INLOOP	1-962 0	7-373 0												
IOSETU	1-966 0	7-373 0												
IOSTAR	1 974 0	7-373 0												
IPCKTS	7-127 0	53-29	54-28	55-28	56-31									
KT11	1-982 0	7-373 0												
LASTAD	1-;47 0	7-373 0	98-63											
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	90-24	90-24 0	91-51	91-51 0	92-51	92-51 0	93-93	93-93 0	93-101	93-101 0	94-41	94-41 0	95-36	95-36 0
	95-41	95-41 0												
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MSEXCP	1-E01#	7-373#	95-44	95-44	95-44#	97-54	97-54	97-54#	97-56	97-56	97-56#	97-58	97-58	97-58#
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	54-28#	55-28	55-28#	56-31	56-31#	58-32	58-32#	60-28	60-28#	60-31	60-31#	60-36	60-36#	77-52
	77-52#	83-22	83-22#	87-26	87-26#	89-24	89-24#	90-24	90-24#	91-51	91-51#	92-51	92-51#	93-93
MSEXSE	93-93#	93-101	93-101#	94-41	94-41#	95-36	95-36#	95-41	95-41#					
	1-D22#	7-373#	28-60#	30-20#	30-126#	32-42#	33-19#	34-20#	41-34#	46-27#	47-21#	48-21#	49-49	49-49#
	49-73	49-73#	50-51	50-51#	50-75	50-75#	52-20#	53-29#	54-28#	55-28#	56-31#	58-32#	60-28#	60-31#
	60-36#	77-52#	83-22#	87-26#	89-24#	90-24#	91-51#	92-51#	93-93#	93-101#	94-41#	95-36#	95-41#	95-41#
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93-194	93-194#	93-194#	93-194#	93-194#	93-194#	93-196	93-196	93-197	93-197#	93-217	93-217	93-217	93-217
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93-225	93-225#	93-226	93-226#	93-227	93-227#	93-238	93-238#	93-248	93-248	93-248	93-248	93-248#	93-248#
93-248#	93-248#	93-248#	93-249	93-249	93-249	93-249	93-249	93-249#	93-249#	93-249#	93-249#	93-264	93-264
93-264	93-264	93-264#	93-264#	93-264#	93-264#	93-264#	93-264#	93-276	93-276	93-276	93-276	93-276#	93-276#
93-276#	93-276#	93-285	93-285	93-285	93-285	93-285#	93-285#	93-285#	93-285#	93-285#	93-285#	93-303	93-303
93-303	93-303#	93-303#	93-303#	93-303#	93-303#	93-304	93-304	93-304	93-304	93-304	93-304	93-304#	93-304#
93-304#	93-309	93-309	93-309	93-309	93-309#	93-309#	93-309#	93-309#	93-309#	93-309#	93-315	93-315#	93-320
93-321	93-321#	93-336	93-336	93-336	93-336	93-336#	93-336#	93-336#	93-336#	93-336#	93-338	93-338#	93-339
93-339#	94-32	94-32#	94-37	94-37	94-37	94-37	94-37	94-37	94-37#	94-37#	94-37#	94-37#	94-37#
94-41	94-41	94-41#	94-41#	94-51	94-51	94-51	94-51	94-51	94-51#	94-51#	94-51#	94-51#	94-52
94-52#	94-53	94-53#	94-66	94-66	94-66	94-66	94-66#	94-66#	94-66#	94-66#	94-66#	94-75	94-75#
94-76	94-76#	95-36	95-36	95-36#	95-36#	95-39	95-39#	95-40	95-40#	95-41	95-41	95-41#	95-41#
95-43	95 43	95-43	95-43	95-43	95-43#	95-43#	95-43#	95-43#	95-43#	95-44	95-44	95-44	95-44
95 44	95-44	95-44	95-44#	95-44#	95-44#	95-44#	95-72	95-72#	95-77	95-77	95-77	95-77	95-77#
95-77#	95-77#	95-77#	95-77#	95-81	95-81#	95-83	95-83#	96-37	96-37	96-37	96-37	96-37#	96-37#
96-37#	96-37#	96-37#	96-42	96-42	96-42	96-42	96-42#	96-42#	96-42#	96-42#	96-42#	96-47	96-47
96 47	96-47	96-47#	96-47#	96-47#	96-47#	96-47#	96-49	96-49#	97-52	97-52#	97-54	97-54	97-54
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98-22#	98-24	98-24	98-24	98-24#	98-33	98-33#	98-63	98-63	98-63	98-63#	99-16	99-16	99-16#
99-16#	1-C13#	7-373#	37-32	37-32#	37-43	37-43#	38-21	38-21	38-21	38-21	38-21#	38-21#	38-21#
M&GNLS	39-22	39-22	39-22	39-22#	39-22#	39-22#	39-22#	39-22#	40-21	40-21	40-21	40-21#	40-21#
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	43-42	43-42	43-42#	43-42#	43-42#	43-42#	44-47	44-47#	45-52	45-52#	45-58	45-58#	46-50

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	92-68	92-68	92-89	92-89	92-112	92-112	93-119	93-119	93-196	93-196	93-225	93-225	93-315	93-315
	93-338	93-338	94-52	94-52	94-75	94-75	95-44	95-44	95-81	95-81				
M\$GNSU	1-898	7-373	93-105	93-105	93-227	93-227								
M\$GNTA	1-890	7-373	9-25	9-25	10-25	10-25	16-105	16-105	16-124	16-124	16-136	16-136	16-142	16-142
	20-185	20-185	27-41	27-41	28-75	28-75	30-141	30-141	31-18	31-18	32-57	32-57	33-34	33-34
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	84-64	84-64	85-74	85-74	86-106	86-106	87-115	87-115	88-72	88-72	89-56	89-56	90-52	90-52
	91-95	91-95	92-113	92-113	93-226	93-226	93-320	93-320	93-339	93-339	94-76	94-76	95-83	95-83
M\$GNTE	96-49	96-49	97-61	97-61	98-33	98-33	99-16	99-16	99-21	99-21				
	1-894	7-373	36-60	36-60	37-19	37-19	38-17	38-17	39-18	39-18	40-17	40-17	41-31	41-31
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	84-18	84-18	85-25	85-25	86-17	86-17	87-20	87-20	88-24	88-24	89-15	89-15	90-15	90-15
M\$HAPT	91-42	91-42	92-39	92-39	93-87	93-87	94-31	94-31	95-30	95-30	96-25	96-25		
M\$HNAP	1-A39	7-373	7-427	7-427										
M\$INCR	1-824	7-373	7-427	7-427										
	1-026	7-373	7-399	7-399	9-9	9-9	9-9	9-9	10-8	10-8	10-8	10-8	11-51	11-51
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	16-138	16-138	16-141	16-142	18-20	18-33	18-44	20-101	20-120	20-154	20-161	20-179	20-179	20-179
	20-179	20-218	20-219	20-221	20-222	20-224	20-225	20-229	20-230	21-9	21-12	21-18	22-21	23-101
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	40-17	40-17	40-21	40-21	40-21	40-21	40-21	40-21	40-21	40-21	40-17	40-17	40-17	40-17

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41-47#	41-49#	41-50	41-50	41-50	41-50#	41-50#	41-50#	41-50#	41-50#	41-57#	41-59#	41-65#	41-72#
41-83#	41-86#	42-31	42-31	42-31	42-31#	42-31#	42-31#	42-31#	42-35	42-35	42-35	42-35#	42-35#
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43-42	43-42	43-42	43-42	43-42#	43-42#	43-42#	43-42#	43-42#	43-42#	43-42#	43-42#	43-42#	43-42#
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44-26#	44-26#	44-26#	44-31	44-31	44-31	44-31#	44-31#	44-31#	44-31#	44-31#	44-43#	44-26	44-26
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45-34	45-34#	45-34#	45-34#	45-34#	45-48#	45-52#	45-58#	45-58#	45-61#	46-24	46-24	46-24	45-34
46-24#	46-27#	46-31	46-31	46-31	46-31#	46-31#	46-31#	46-31#	46-31#	46-48#	46-50#	46-53#	46-24#
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49-46#	49-46#	49-46#	49-46#	49-49#	49-55#	49-58#	49-59	49-59	49-59	49-59	49-59	49-59#	49-46
49-66#	49-69#	49-70	49-70	49-70	49-70#	49-70#	49-70#	49-70#	49-70#	49-73#	49-79#	49-82#	49-59#
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50-61#	50-61#	50-61#	50-61#	50-68#	50-71#	50-72	50-72	50-72	50-72	50-72#	50-60#	50-61	50-61
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54-27#	54-27#	54-28	54-28	54-28	54-28	54-28	54-28	54-28	54-28	54-28	54-28	54-28#	54-27#
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56-30	56-30#	56-30#	56-30#	56-31	56-31	56-31	56-31	56-31	56-31	56-31	56-31	56-31	56-30
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57-21	57-21#	57-21#	57-21#	57-21#	57-29#	57-31#	57-32#	57-32#	57-34	57-34	57-34	57-34#	57-21
57-34#	57-35#	57-40#	57-42#	57-49#	57-50#	58-18	58-18	58-18	58-18	58-18#	58-18#	58-18#	57-34#
58-22	58-22#	58-22#	58-22#	58-22#	58-31#	58-32#	58-33#	58-34#	58-35	58-35	58-35	58-35#	58-22
58-35#	58-35#	58-36#	58-41#	58-43#	58-47#	58-48#	59-13	59-13	59-13	59-13#	59-13#	59-13#	58-35#
59-16	59-16	59-16	59-16#	59-16#	59-16#	59-16#	59-26#	59-31#	59-33#	59-37#	59-39#	59-40#	59-15#
60-22	60-22	60-22#	60-22#	60-22#	60-28#	60-29#	60-31#	60-33#	60-33#	60-33#	60-36#	60-37	60-22
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61-15#	61-15#	61-15#	61-17	61-17	61-17	61-17#	61-17#	61-17#	61-17#	61-26#	61-15	61-15	61-15
62-13	62-13	62-13#	62-13#	62-13#	62-15	62-15	62-15	62-15	62-15#	62-15#	62-15#	62-37#	62-13
62-42#	63-15	63-15	63-15	63-15#	63-15#	63-15#	63-17	63-17	63-17	63-17#	63-17#	63-17#	62-39#
63-30#	63-32#	63-35#	64-20	64-20	64-20	64-20#	64-20#	64-20#	64-20#	64-25	64-25	64-25	63-17#
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65-38#	65-41#	66-12	66-12	66-12	66-12#	66-12#	66-12#	66-12#	66-14	66-14	66-14	66-14#	65-33#
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16-142	16-142#	20-185	20-185#	27-41	27-41#	27-43	27-43#	28-75	28-75#	29-12	29-12#	30-141	30-141#
31-18	31-18#	32-57	32-57#	33-34	33-34#	34-35	34-35#	34-36	34-36#	36-71	36-71#	37-32	37-32#
37-32#	37-43	37-43	37-43#	37-46	37-46#	38-21	38-21#	38-21	38-21#	38-21	38-21#	38-21	38-21#
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41-83#	41-86	41-86#	41-86#	42-47	42-47#	42-47	42-47#	42-67	42-67#	42-70	42-70#	43-42	43-42#
43-42	43-42	43-42	43-42#	43-42	43-42#	43-42#	43-42#	43-42#	43-42#	43-46	43-46#	44-47	44-47#
44-50	44-50#	45-52	45-52#	45-52#	45-58	45-58	45-58#	45-61	45-61#	46-50	46-50#	46-50#	46-53
46-53#	47-27	47-27	47-27#	47-27	47-27#	47-27	47-27#	47-27	47-27#	47-27#	47-27#	47-27#	47-30
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48-28#	49-45	49-45	49-45#	49-58	49-58#	49-58#	49-69	49-69	49-69#	49-82	49-82#	49-82#	49-85
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56-31#	56-31#	56-31#	56-32	56-32#	57-31	57-31#	57-31#	57-42	57-42#	57-42#	57-50	57-50#	58-33
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63-32	63-32#	63-35	63-35#	64-25	64-25#	64-25	64-25#	64-25	64-25#	64-25	64-25#	64-25#	64-25#
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70-72#	71-36	71-36	71-36#	71-39	71-39#	72-46	72-46#	72-46#	72-50	72-50#	73-40	73-40#	73-40#
73-43	73-43#	74-38	74-38#	74-38#	74-41	74-41#	75-63	75-63#	75-66	75-66#	76-26	76-26#	76-26
76-26#	76-29	76-29#	77-69	77-69#	77-69#	77-72	77-72#	78-26	78-26#	78-26#	78-29	78-29#	79-48
79-48	79-48#	79-51	79-51#	80-58	80-58#	80-58#	80-61	80-61#	81-25	81-25#	81-25#	81-28	81-28#
82-30	82-30	82-30#	82-33	82-33#	83-36	83-36#	83-36#	83-40	83-40#	84-64	84-64#	85-74	85-74#
86-39	86-39	86-39#	86-56	86-56#	86-56#	86-74	86-74#	86-74#	86-96	86-96#	86-96#	86-106	86-106#
87-115	87-115#	88-39	88-39#	88-39#	88-72	88-72#	89-52	89-52#	89-52#	89-56	89-56#	90-48	90-48#
90-48#	90-52	90-52#	91-92	91-92#	91-92#	91-95	91-95#	92-68	92-68#	92-68#	92-89	92-89	92-89#
92-112	92-112	92-112#	92-113	92-113#	93-119	93-119#	93-119#	93-196	93-196#	93-196#	93-225	93-225	93-225#
93-226	93-226#	93-315	93-315#	93-315#	93-320	93-320#	93-338	93-338#	93-338#	93-339	93-339#	94-52	94-52#
94-52#	94-75	94-75#	94-75#	94-76	94-76#	95-81	95-81#	95-81#	95-83	95-83#	96-49	96-49#	96-51
96-51#	97-61	97-61#	98-33	98-33#	98-64	98-64#	16-104#	16-104#	16-112	16-112#	16-117	16-117#	16-123
M\$PRIN 1-836#	7-373#	16-99	16-99#	16-100	16-100#	16-104	16-104#	16-112	16-112#	16-117	16-117#	16-123	16-123#
16-128	16-128#	16-129	16-129#	16-130	16-130#	16-132	16-132#	16-135	16-135#	16-141	16-141#	20-218	20-218#
20-219	20-219#	20-221	20-221#	20-222	20-222#	20-224	20-224#	20-225	20-225#	20-229	20-229#	20-230	20-230#
21-9	21-9#	21-12	21-12#	21-18	21-18#	26-17	26-17#	26-26	26-26#	30-27	30-27#	30-82	30-82#
30-95	30-95#	30-100	30-100#	77-47	77-47#	83-18	83-18#	87-45	87-45#	87-52	87-52#	87-58	87-58#
87-64	87-64#	87-70	87-70#	87-76	87-76#	87-82	87-82#	87-89	87-89#	87-91	87-91#	87-96	87-96#
87-106	87-106#	87-112	87-112#	89-20	89-20#	90-20	90-20#	91-47	91-47#	92-47	92-47#	93-92	93-92#
93-97	93-97#	93-138	93-138#	93-139	93-139#	93-249	93-249#	93-304	93-304#	94-37	94-37#	95-43	95-43#
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16-126	16-126#	16-138	16-138#	20-179	20-179#	27-39	27-39#	28-40	28-40#	28-46	28-46#	29-8	29-8#
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41-39	41-39#	41-50	41-50#	41-50#	42-31	42-31#	42-35	42-35#	42-35#	42-36	42-36#	42-36#	43-37
43-37#	43-42	43-42	43-42#	43-42	43-42	43-42	43-42	43-42	43-42#	43-42#	43-42#	43-42#	44-26
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66-14	66-14#	67-14	67-14#	67-21	67-21	67-21#	68-14	68-14#	68-20	68-20	68-20	68-20#	68-20#	
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70-36	70-36	70-36#	71-17	71-17#	71-19	71-19	71-19#	72-18	72-18#	72-20	72-20	72-20#	73-13	
73-13#	73-15	73-15	73-15#	74-17	74-17#	74-19	74-19	74-19#	75-21	75-21#	75-23	75-23	75-23#	
76-12	76-12#	76-14	76-14	76-14#	77-28	77-28#	77-30	77-30	77-30#	78-13	78-13#	78-15	78-15	
78-15#	79-22	79-22#	79-24	79-24	79-24#	80-24	80-24#	80-26	80-26	80-26#	81-12	81-12#	81-14	
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86-82	86-82#	87-20	87-20#	88-24	88-24#	88-30	88-30#	88-30#	89-15	89-15#	89-25	89-25	89-25#	
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92-52#	92-69	92-69	92-69#	92-90	92-90	92-90#	93-87	93-87#	93-105	93-105#	93-106	93-106	93-106#	
93-120	93-120	93-120#	93-197	93-197	93-197#	93-227	93-227#	93-238	93-238	93-238#	93-321	93-321	93-321#	
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96-25#	97-42	97-42#	97-52	97-52#	98-12	98-12#								
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	16-123	16-123	16-123#	16-128	16-128	16-128#	16-129	16-129	16-129	16-129#	16-130	16-130	16-130	16-130
	16-130	16-130#	16-132	16-132	16-132#	16-135	16-135#	16-141	16-141	16-141#	20-154	20-154	20-154	20-154
	20-154	20-154#	20-161	20-161	20-161	20-161#	20-218	20-218	20-218#	20-219	20-219	20-219	20-219	20-219
	20-219	20-219	20-219	20-219	20-219	20-219#	20-221	20-221	20-221#	20-222	20-222	20-222	20-222	20-222
	20-222	20-222	20-222	20-222	20-222#	20-224	20-224#	20-225	20-225#	20-225	20-225	20-225	20-225	20-225
	20-225	20-225	20-225	20-225#	20-229	20-229	20-229#	20-230	20-230#	20-230	20-230	20-230	20-230#	21-9
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	26-26	26-26#	30-27	30-27	30-27#	30-82	30-82	30-82#	30-82#	30-95	30-95	30-95	30-95#	30-100
	30-100	30-100#	36-62	36-62	36-62#	36-62	36-62#	57-32	57-32	57-32	57-32	57-32#	58-34	58-34
	58-34	58-34#	59-15	59-15	59-15#	59-15	59-15#	77-47	77-47	77-47	77-47	77-47#	83-18	83-18
	83-18	83-18#	87-45	87-45	87-45#	87-45	87-45#	87-52	87-52	87-52	87-52#	87-58	87-58	87-58
	87-58#	87-64	87-64	87-64#	87-70	87-70	87-70#	87-70	87-70#	87-76	87-76	87-76	87-76#	87-82
	87-82	87-82	87-82#	87-89	87-89	87-89#	87-91	87-91	87-91#	87-96	87-96	87-96	87-96#	87-106
	87-106	87-106	87-106	87-106	87-106#	87-112	87-112	87-112#	89-20	89-20	89-20	89-20#	89-20	89-20
	90-20	90-20	90-20#	91-47	91-47	91-47#	92-47	92-47	92-47	92-47#	93-92	93-92	93-92	93-92
	93-92#	93-97	93-97	93-97	93-97#	93-138	93-138	93-138#	93-139	93-139	93-139#	93-249	93-249	93-249#
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M&PUT1	1-C81#	7-373#	16-99	16-99	16-99	16-99#	16-99#	16-100	16-100	16-100	16-100	16-100#	16-100#	16-100#
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	16-129	16-129#	16-129#	16-129#	16-130	16-130	16-130	16-130	16-130#	16-130#	16-130#	16-130#	16-132	16-132
	16-132#	16-132#	16-135	16-135	16-135#	16-135#	16-141	16-141	16-141#	16-141#	20-154	20-154	20-154	20-154
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	20-230	20-230	20-230#	20-230#	20-230#	20-230#	21-9	21-9	21-9#	21-9#	21-12	21-12	21-12	21-12#
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	30-95	30-95	30-95	30-95#	30-95#	30-95#	30-100	30-100	30-100#	30-100#	36-62	36-62	36-62	36-62
	36-62#	36-62#	36-62#	36-62#	57-32	57-32	57-32	57-32	57-32#	57-32#	57-32#	57-32#	58-34	58-34
	58-34	58-34	58-34#	58-34#	58-34#	58-34#	59-15	59-15	59-15	59-15	59-15#	59-15#	59-15#	59-15#
	77-47	77-47	77-47	77-47#	77-47#	77-47#	83-18	83-18	83-18	83-18#	83-18#	83-18#	87-45	87-45
	87-45	87-45	87-45#	87-45#	87-45#	87-45#	87-52	87-52	87-52	87-52#	87-52#	87-52#	87-58	87-58
	87-58	87-58#	87-58#	87-58#	87-64	87-64	87-64	87-64#	87-64#	87-64#	87-70	87-70	87-70	87-70#
	87-70#	87-70#	87-76	87-76	87-76	87-76#	87-76#	87-76#	87-82	87-82	87-82	87-82#	87-82#	87-82#
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	93-92	93-92#	93-92#	93-92#	93-97	93-97	93-97	93-97#	93-97#	93-97#	93-97#	93-97#	93-138	93-138#
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	97-60	97-60#	98-14	98-14#	98-16	98-16#	98-16#	98-16#	98-22	98-22#	98-24	98-24#		
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	16-126	16-126#	16-138	16-138#	20-179	20-179#	27-39	27-39#	28-40	28-40#	28-46	28-46#	29-8	29-8#
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	43-42#	43-42#	43-42#	43-42#	43-42#	43-42#	43-42#	43-42#	44-26	44-26#	44-31	44-31	44-31#	44-31#
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20 222#	20-224	20-224#	20-225	20-225#	20-229	20-229#	20-230	20-230#	21-9	21-9#	21-12	21-12#	21-18
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MEMORY	1-:66	7-373														
OPEN	1-:71	7-373														
POINTE	1-:76	7-373	7-405													
POP	7-341	21-19														
PRINTB	1-<39	7-373	16-99	16-100	16-104	16-112	16-117	16-123	16-128	16-129	16-130	16-132	16-135	16-141		
	21-9	21-12	21-18	93-249	93-304											
PRINTF	1-<79	7-373	26-17	26-26	30-27	30-82	30-95	30-100	77-47	83-18	87-45	87-52	87-58	87-64		
	87-70	87-76	87-82	87-89	87-91	87-96	87-106	87-112	89-20	90-20	91-47	92-47	93-92	93-97		
	93-139	93-139	94-37	95-43												
PRINTS	1-:19	7-373														
PRINTX	1-:59	7-373	20-218	20-219	20-221	20-222	20-224	20-225	20-229	20-230						
PUSH	7-330	21-10														
READBU	1-:99	7-373														
READEF	1->03	7-373	30-12	30-16	30-22											
RFLAGS	1->08	7-373														
SETPRI	1->13	7-373	32-18	47-26	51-23	51-48	52-26	52-50	57-35	58-36	59-26	59-39				
SETVEC	1->18	7-373	20-154	20-161	36-62	57-32	58-34	59-15								
SLASH	1->24	7-373														
STARS	1->38	7-263	7-373	18-3	18-9	18-26	18-31	18-38	18-42	19-2	19-10	19-31	19-37	20-2		
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	27-38															
SVC	1->52	7-372	7-373													
TSTFL	7-53	38-21	39-22	40-21	43-42	47-27	48-25	64-25	69-25							
WAIT.M	7-24	30-77														
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