

RF11

STATIC TESTS
MD-11-DZRFA-B

EP-DZRFA-B-DL

JUN 1978

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digital

FICHE 1 OF 1

MADE IN USA

Frame 1	Frame 2	Frame 3	Frame 4	Frame 5	Frame 6
Frame 7	Frame 8	Frame 9	Frame 10	Frame 11	Frame 12
Frame 13	Frame 14	Frame 15	Frame 16	Frame 17	Frame 18
Frame 19	Frame 20	Frame 21	Frame 22	Frame 23	Frame 24
Frame 25	Frame 26	Frame 27	Frame 28	Frame 29	Frame 30
Frame 31	Frame 32	Frame 33	Frame 34	Frame 35	Frame 36
Frame 37	Frame 38	Frame 39	Frame 40	Frame 41	Frame 42
Frame 43	Frame 44	Frame 45	Frame 46	Frame 47	Frame 48
Frame 49	Frame 50	Frame 51	Frame 52	Frame 53	Frame 54
Frame 55	Frame 56	Frame 57	Frame 58	Frame 59	Frame 60

IDENTIFICATION

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PRODUCT CODE:	MAINDEC-11-DZRFA-B-D
REPLACES:	MAINDEC-11-D50A
	SUPERSEDES D50A
PRODUCT NAME:	RF11 STATIC TESTS
DATE CREATED:	31 MARCH 1973
MAINTAINER:	DIAGNOSTIC GROUP
AUTHOR:	EARL HAIGHT/C CASWELL

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1. ABSTRACT

THE RF11 STATIC TEST IS A SERIES OF STATIC AND ADDRESS AND DATA RELIABILITY ROUTINES WHICH VERIFY TO THE USER THE DISK CONTROL (RF11) AND DISK (RS11) ARE OPERATING CORRECTLY. THIS TEST USED IN CONJUNCTION WITH THE RF11 DISK DATA AND RF11 MULTI DISK ASSURES THE USER OF AN ERROR FREE SYSTEM, WHEN USED IN ITS ENTIRETY.

2. REQUIREMENTS

2.1 EQUIPMENT

PDP-11
RF11 AND RS11

2.2 STORAGE

STATIC TEST
PROGRAM OCCUPIES FROM 0 TO 11546

3. LOADING PROCEDURE

3.1 METHOD OF LOADING BOTH STATIC AND DATA TEST TAPES

PROGRAM FORMAT ABSOLUTE

A. VERIFY THE BOOT LOADER IS IN MEMORY.

B. SET SWITCH REGISTER EQUAL TO *500

MEMORY SIZE *

4K	17
8K	37
12K	57
16K	77
20K	117
24K	137
28K	157

C. DEPRESS LOAD ADDRESS.

D. DEPRESS START.

4. STARTING PROCEDURE

4.1 WORST CASE DISK TEST UNIT ZERO

- A) SET SWITCH REGISTER EQUAL TO 200
- B) DEPRESS LOAD ADDRESS
- C) SET SWITCH REGISTER EQUAL TO ZERO
- D) DEPRESS START

4.2 UNDER MONITOR CONTROL THE TESTS START AUTOMATICALLY

4.3 ADDRESS ENTRY POINTS FOR TEST ROUTINES

300	JMP	STAI1	TEST RESET TO CONTROL REGISTER
304	JMP	STAI2	TEST RESET TO CURRENT ADDRESS REGISTER
310	JMP	STAI3	TEST RESET TO WORD COUNT REGISTER
314	JMP	STAI4	TEST RESET TO DISK ADDRESS REGISTER
320	JMP	STAI5	TEST RESET TO DISK EXT. ADDRESS REGISTER
324	JMP	STAI6	TEST RESET TO DAT BUFFER REGISTER
330	JMP	STAI7	TEST RESET TO MAINTENANCE REGISTER
334	JMP	STAI10	CAN WE SET W/R BITS IN DCS REGISTER
340	JMP	STAI11	CAN WE CLEAR THE DCS REGISTER USING DISK CLEAR.
344	JMP	STAI12	CAN WE SET ALL CMA BITS
350	JMP	STAI13	CAN WE CLEAR ALL CMA BITS USING DISK CLEAR
354	JMP	STAI14	CAN WE SET ALL WC BITS
360	JMP	STAI15	CAN WE CLEAR ALL WC BITS USING DISK CLEAR
364	JMP	STAI16	CAN WE SET ALL THE DAR BITS
370	JMP	STAI17	CAN WE CLEAR ALL THE DAR BITS USING DISK CLEAR
374	JMP	STAI20	CAN WE SET ALL THE DAE BITS
400	JMP	STAI21	CAN WE CLEAR ALL THE DAE BITS, USING DISK CLEAR
404	JMP	STAI22	EXECUTE A ONE WORD WRITE FOLLOWED BY A ONE WORD WRITE CONTINUE
410	JMP	STAI40	EXECUTE A ONE WORD WRITE CHECK FOLLOWED BY A ONE WORD WRITE CHECK CONTINUE
420	JMP	STAI74	TEST TRACK INCREMENT
424	JMP	STAI77	TEST DISK INCREMENT
430	JMP	STAI03	TEST THAT NED RAISES ERROR FLAG
434	JMP	ST105X	CHECK CMA INHIBIT
440	JMP	NXMTSM	TEST NON-EXISTENT MEMORY ERROR
444	JMP	STAI06	TEST THAT THE DISK WILL NOT TRAP AT PRIORITY 7
450	JMP	STAI10	TEST THAT THE DISK WILL NOT TRAP AT PRIORITY 6
454	JMP	STAI12	TEST THAT THE DISK WILL NOT TRAP AT PRIORITY 5
460	JMP	STAI14	TEST THAT THE DISK WILL TRAP AT PRIORITY 4
464	JMP	ADT1	ADDRESS TEST 1 CHECK TIMING BY EXECUTING A ONE WORD WRITE
470	JMP	ADT2X	ADDRESS TEST 2 CHECK TIMING BY EXECUTING A ONE WORD READ

(4.3 CONT'D)

MAINTENANCE ROUTINES
ROUTINES IN STATIC AND DATA TEST BOTH

650	JMP	SELWC	LOAD WORD COUNT REG. WITH SWITCH REGISTER
654	JMP	SELCMA	LOAD CURRENT MEMORY ADDR REG. WITH SWITCH REGISTER
660	JMP	SELDAR	LOAD DISK ADDR. REGISTER WITH SWITCH REGISTER
664	JMP	SELDAE	LOAD DISK ADDR. EXT. WITH SWITCH REGISTER
670	JMP	SELDBR	LOAD DATA BUFFER REGISTER WITH SWITCH REGISTER
674	JMP	MOVLR	MOVE CONTENTS OF LOOK AHEAD REGISTER INTO DATA LIGHTS
700	JMP	SELDCS	LOAD DISK CONTROL REGISTER WITH SWITCH REGISTER
704	JMP	STAMP	ENABLE READ AMPLIFIERS TO TRACK SELECTED

5. OPERATING PROCEDURE

5.1 CONTROL SWITCH SETTINGS

DELETE TYPEOUT

SR14 SET DELETE TYPEOUTS
RESET REPORT MESSAGE

LOOP ON TEST

SR11 SET LOOP ON TEST
RESET CONTINUE TO NEXT TEST

HALT ON ERROR

SR10 SET HALT AFTER ERROR REPORT
RESET CONTINUE AFTER ERROR REPORT

SELECT TRACK FROM SR (DURING DYNAMIC TESTING)

SR7 SET SELECT TRACK FROM SR
RESET SELECT TRACK UNDER PROGRAM CONTROL
TRACK SELECTION

6 5 4 3 2 1 0

SELECT ONE OF 177(8) TRACKS

NOTE:

• SWITCH SETTING APPLICABLE ONLY IN DATA TEST

5.2 SUBROUTINE ABSTRACTS

STATIC TEST

ABSTRACTS FOR THE LOGIC TESTS IN THE STATIC TEST ARE NOT INCLUDED IN THIS WRITE-UP. EACH SMALL TEST HAS A DESCRIPTION WITH IT IN THE ASSEMBLY.

ADDRESS TESTS

ADT1 - TEST WORD ACCESS DURING A WRITE

IN THIS TEST A ONE WORD WRITE IS ATTEMPTED ON EACH ADDRESS OF TRACK ZERO. IF NO ACCESS IS ACCOMPLISHED WITHIN 100 MILLI-SECONDS THE ERROR CONDITION MISSED TRANSFER (MXF) SHOULD SET. IF THIS FLAG SHOULD FAIL TO SET, A PROGRAM TIME OUT WILL BE REPORTED. IF NO CONTROL ERROR OCCURS AND ADDRESS CONFIRMED TAKES PLACE, THE ROUTINE THEN CHECKS THE ADDRESS POINTER FOR THE CORRECT TERMINATING ADDRESS.

ADT2X - TEST WORD ACCESS DURING A READ

IN THIS TEST A ONE WORD READ IS ATTEMPTED ON EACH ADDRESS OF TRACK ZERO. IF NO ACCESS IS ACCOMPLISHED WITHIN 100 MILLI-SECONDS THE ERROR CONDITION MISSED TRANSFER (MXF) SHOULD SET. IF THIS FLAG SHOULD FAIL TO SET A PROGRAM TIME OUT WILL BE REPORTED. IF NO CONTROL ERROR OCCURS AND ADDRESS CONFIRMED TAKES PLACE, THE ROUTINE THEN CHECKS THE ADDRESS POINTER REGISTER FOR THE CORRECT TERMINATING ADDRESS.

ADDRESS TEST IN DATA TEST ONLY

ADT2 - TEST FOR ALTERATION OF WORD ADDRESS

IN THIS ADDRESS TEST, TRACK ZERO IS LOADED WITH ALL ONES IN BLOCK OF 2K. THEN THE TEST STARTING WITH ADDRESS 0 AND PROGRESSING UP THROUGH AND INCLUDING ADDRESS 3777(8), THE OCTAL VALUE OF THE ADDRESS, IS WRITTEN ON ITSELF AND ALL OTHER ADDRESSES ARE CHECKED FOR MODIFICATION. THEY SHOULD EQUAL ALL ONES. AFTER CHECK IS COMPLETED AND ALL ERRORS ARE REPORTED IF ANY, THE ROUTINE THEN RE-WRITES THE ADDRESS WITH ALL ONES AND THEN CONTINUES ON WITH THE NEXT ADDRESS.

ADT3 : VERIFY THAT ALL ADDRESSES EXIST ON DISK SURFACE TRACK

IN THIS ROUTINE THE OCTAL VALUE OF EACH ADDRESS IS WRITTEN ON ITSELF IN 2K WORD BLOCKS. THE ROUTINE THEN READS THE DISK AND VERIFIES THAT ALL ADDRESSES CAN BE ACCESSED. ERRORS MAY BE REPORTED

IN THIS TEST WHICH ARE NOT ADDRESS ERRORS BUT DATA ERRORS. THE OPERATOR IS CAUTIONED TO CAREFULLY EXAMINE THE ERRORS TO DISTINGUISH BETWEEN THE ADDRESS AND DATA ERRORS.

ADT4 - TEST TRACK "X" AND "Y" MATRIX

THIS ROUTINE WAS DESIGNED TO ENABLE THE OPERATOR AN EASY AND SURE METHOD OF DETECTING DEFECTIVE MATRIX SWITCHES. IN THIS ROUTINE THE FIRST AND LAST LOCATION OF EACH TRACK (0 AND 3777(R)) ARE WRITTEN WITH ALL ONES. AFTER THE INITIAL WRITE HAS TAKEN PLACE, THE ROUTINE THEN STARTS WITH THE FIRST WORD OF THE ABOVE INDICATED LOCATION AND WRITES THE ADDRESS ON ITSELF. THE NEXT STEP OF THE ROUTINE IS TO CHECK ALL OTHER ADDRESSES TO SEE IF THEY HAVE BEEN ALTERED. AFTER ALL ERRORS HAVE BEEN REPORTED, IF ANY, THE ROUTINE RE-WRITES THE ADDRESS WITH ALL ONES AND CONTINUES ON WITH THE NEXT ADDRESS.

ADT5 - TEST LOOK AHEAD FEATURE

THE DISK LOOK AHEAD FEATURE WAS DESIGNED FOR THE USER WHO WANTED OPTIMUM USE OF THE DISK, BY KNOWING AT WHAT ADDRESS THE DISK READ HEADS ARE LOCATED AT ALL TIMES. THE ADDRESS LOADED INTO THE ADS REGISTER IS THE PHYSICAL ADDRESS OF THE DISK. THE PROGRAM LOCATES THE PHYSICAL ADDRESS BY WRITE A WORD AND UPON RECEIVING THE COMPLETION FLAG THE PROGRAM READS THE ADS REGISTER. THE ADDRESS MAY BE UP TO 2 ADDRESSES OFF.

SPIRAL - TEST DISK TRACK SPIRAL

IN THIS ROUTINE THE ABILITY OF THE CONTROL (RF09/15) TO SPIRAL FROM ONE TRACK TO ANOTHER DURING A READ AND A WRITE. IN ORDER TO CHECK THE READ SPIRAL, THE LAST ADDRESS (3777(8)) OF TRACK ZERO IS WRITTEN WITH PRE-DETERMINED DATA AND THE FIRST ADDRESS (0) OF TRACK ONE, IS ALSO WRITTEN WITH PRE-DETERMINED DATA. THEN A TWO WORD READ STARTING AT LOCATION 3777(8) OF TRACK ZERO IS ACCOMPLISHED. THE TWO WORDS THEN ARE COMPARED TO THE DATA WRITTEN AND ANY ERRORS ARE REPORTED.

TO CHECK WRITE SPIRAL, THE ROUTINE WRITES TWO WORDS STARTING AT ADDRESS 3777(8) OF TRACK ZERO AND TERMINATES AT LOCATION 0 OF TRACK ONE. THE ROUTINE THEN READS THE TWO LOCATIONS WITH ONE WORD TRANSFERS, AND VERIFIES THE CORRECT DATA WAS STORED IN EACH LOCATION.

SUBROUTINE ABSTRACTS

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ERRORS TO DISTINGUISH BETWEEN THE ADDRESS AND DATA ERRORS.

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WRITTEN AND ANY ERRORS ARE REPORTED.

TO CHECK WRITE SPIRAL, THE ROUTINE WRITES TWO WORDS STARTING AT ADDRESS 3777(8) OF TRACK ZERO AND TERMINATES AT LOCATION 0 OF TRACK ONE. THE ROUTINE THEN READS THE TWO LOCATIONS WITH ONE WORD TRANSFERS, AND VERIFIES THE CORRECT DATA WAS STORED IN EACH LOCATION.

DATA TESTS

RANEX - RANDOM DATA, RANDOM ADDRESS RANDOM WORD COUNT TEST

THIS ROUTINES TESTS THE ABILITY OF THE SYSTEM TO ACCESS RANDOM ADDRESS WITH RANDOM DATA AND AN INCREMENTAL WORD COUNT. THE DATA IS FIRST WRITTEN ON THE DISK AND THEN DATA IS WRITE-CHECKED. ALL ERRORS ARE REPORTED. THE WORD COUNT RUNS FROM 1 TO 1000(8) WORDS.

DATA RELIABILITY - DATA PATTERN TEST

IN THIS PORTION OF THE TEST, THE ABILITY OF THE COMPLETE DISK SURFACE TO WRITE, WRITE-CHECK, AND READ DATA IS TESTED. THE ROUTINE FIRST WRITES THE COMPLETE SURFACE WITH A SET DATA PATTERN, THEN A WRITE CHECK OF THE COMPLETE SURFACE IS ACCOMPLISHED, THUS REPORTING ALL ERRORS BETWEEN THE DATA WRITTEN AND THE DATA IN MEMORY. THREE READS ARE ACCOMPLISHED FOR EACH BUFFER AREA ON THE DISK. THE OPERATOR AT THIS POINT HAS SEVERAL OPTIONS AS TO WHAT COURSE OF ACTION THE PROGRAM WILL TAKE NEXT. (REF. SEC. 5.1)

IN THE DATA RELIABILITY, ALL PROGRAM PARAMETERS CAN BE CHANGED,
REF. SEC. 5.2

MAINTENANCE TOOL

STAMP - STATIC TRACK SELECTION

THIS ROUTINE WAS DESIGNED TO ENABLE THE OPERATOR TO HAVE A QUICK
METHOD OF SELECTING TRACKS FOR AMPLITUDE ADJUSTMENTS.

STAMP - OPERATING PROCEDURE

STEP A. SET SWITCH REGISTER EQUAL TO 704

STEP B. DEPRESS LOAD ADDRESS

STEP C. SET SWITCH REGISTER 9 THRU 7 EQUAL TO DISK 00 THRU 7

STEP D. DEPRESS START

STEP E. SET SWITCH REGISTER 6 THRU 0 EQUAL TO TRACK 6

STEP F. DEPRESS CONTINUE

6 5 4 3 2 1 0

TRACK NUMBER
(0 THRU 177(8))

STEP G. TRACK NUMBER CAN BE CHANGED ARBITRARILY.

6. ERROR REPORTS

6.1 STATIC AND ADDRESS REPORT.

XX ERR CNT XXXXXWRD1XXXXWRD2

ERRCNT = IS THE TAG FOR THE LISTING

WRD1 = WHAT WAS EXPECTED

WRD2 = WHAT WAS RECEIVED

WHEN A REPORT ONLY CONTAINS ONE WORD THE PROGRAM WAS EXPECTING
ZEPOS BUT RECEIVED WHAT WAS REPORTED.

6.2 ERROR REPORTS

STATUS ERROR

STATUS ERROR XXDAE XXXXXXDAR XXXXXXDCS

A B C

A=THE DISK NUMBER AND EXTENDED DISK ADDRESS BITS,
B=THE DISK ADDRESS REGISTER
C=THE DISK CONTROL REGISTER

LAYOUT OF DISK ADDRESS BITS

DAE DAR
XXX XXX XXX XXX XXX XXX XXX

DISK NO. TRACK ADDRESS WORD ADDRESS

BIT LAYOUT OF DCS REGISTER

BIT15= ERROR
BIT14= DISK FREEZE
BIT13= WRITE CHECK ERROR
BIT12= DATA PARITY ERROR
BIT11= NON-EXISTENT DISK
BIT10= WRITE LOCKOUT
BIT9= MISSED TRANSFER
BIT8= DISK CLEAR
BIT7= READY
BIT6= INTERRUPT ENABLE
BIT5= EXTENDED MEMORY 1 (XM1)
BIT4= EXTENDED MEMORY 0 (XM0)
BIT3= MAINTENANCE
BIT2-1= FUNCTION REGISTER

BIT 2	BIT 1	OPERATION
0	0	NOP
1	0	READ
0	1	WRITE
1	1	WRITE CHECK

IF THE ERROR OCCURRED WHEN PEADING THE PROGRAM WILL REPORT WHICH READ.

(6.2 CONT'D)

NOTE: WHEN A FREEZE ERROR OCCURS AN ADDITIONAL ERROR MESSAGE WILL BE REPORTED, AS FOLLOWS:

XXX HRD ERR

LAYOUT OF BITS 0 - 7

BIT0= CMA INH. (NOT AN ERROR CONDITION)
BIT1= UNUSED
BIT2= NON-EXISTENT MEMORY ERROR
BIT3= UNUSED
BIT4= TRACK C TIMING ERROR
BIT5= TRACK B TIMING ERROR
BIT6= TRACK A TIMING ERROR
BIT7= ADDRESS PARITY ERROR

6.3 MEMORY PARITY ERRORS

THIS MESSAGE IS REPORTED IF THE PROGRAM DETECTS A PARITY ERROR

DURING PROGRAM EXECUTION.

6.4 POWER HAS FAILED

THIS MESSAGE IS REPORTED TO INDICATE A POWER FAILURE AND A PROGRAM RESTARTS.

6.5 END

END

THIS MESSAGE IS REPORTED AT THE END OF ONE COMPLETE PASS OF THE DISK SYSTEM.

7. MISCELLANEOUS

IN SOME ADDRESS TESTS THE PROGRAM DEPENDS ON WRITTING AND
READING DATA CORRECTLY FROM THE DISK, AND IF IT DOES NOT IT MAY
REPORT AN ADDRESS FAILURE, WHEN IN FACT IT WAS A DATA FAILURE.

8. RUNTIME

TYPEOUT WILL OCCUR WITHIN 5 MIN.

```

1      .TITLE  MAINDEC-11-DZPFA-B RF-11 STATIC TEST REPLACES D50A
2      ;COPYRIGHT 1973, DIGITAL EQUIPMENT CORP., MAYNARD, MASS.
3      ;PROGRAM BY E. HAIGHT/C.CASSWELL
4      .ENABL  ABS
5      M=0
6      RIT0=1
7      RIT1=2
8      RIT2=4
9      RIT3=10
10     RIT4=20
11     RIT5=40
12     RIT6=100
13     RIT7=200
14     RIT8=400
15     RIT9=1000
16     RIT10=2000
17     RIT11=4000
18     RIT12=10000
19     RIT13=20000
20     RIT14=40000
21     RIT15=100000
22     SCOPE=IOT
23     I
24     I
25     I
26     104403  WRITE=TRAP+3
27     104407  WRCHECK=TRAP+7
28     104405  READ=TRAP+5
29     000000  .=0
30
31     ;MACRO FOR SETTING UP ERROR COUNT
32
33     .=200
34     000200 000167 000672  JMP      START
35
36     ;STATIC ROUTINES
37     .=300
38     000300 000167 000716  JMP      STAI1
39     000304 000167 000774  JMP      STAI2
40     000310 000167 001020  JMP      STAI3
41     000314 000167 001044  JMP      STAI4
42     000320 000167 001070  JMP      STAI5
43     000324 000167 001114  JMP      STAI6
44     000330 000167 001140  JMP      STAI7
45     000334 000167 001164  JMP      STAI10
46     000340 000167 001230  JMP      STAI11
47
48     000344 000167 001274  JMP      STAI12
49     000350 000167 001340  JMP      STAI13
50
51     000354 000167 001472  JMP      STAI14
52     000360 000167 001536  JMP      STAI15
53
54     000364 000167 001574  JMP      STAI16

```

;TEST RESET TO CONTROL REGISTER
 ;TEST RESET TO CURRENT ADDRESS REGISTER
 ;TEST RESET TO WORD COUNT REGISTER
 ;TEST RESET TO DISK ADDRESS REGISTER
 ;TEST RESET TO DISK EXT. ADDRESS REGISTER
 ;TEST RESET TO DATE BUFFER REGISTER
 ;TEST RESET TO MAINTENANCE REGISTER
 ;CAN WE SET W/R BITS IN DCS REGISTER
 ;CAN WE CLEAR THE DCS REGISTER
 ;USING DISK CLEAR.
 ;CAN WE SET ALL CMA BITS
 ;CAN WE CLEAR ALL CMA BITS
 ;USING DISK CLEAR
 ;CAN WE SET ALL WC BITS
 ;CAN WE CLEAR ALL WC BITS
 ;USING DISK CLEAR
 ;CAN WE SET ALL THE DAR BITS

55 000370 000167 001640
56

JMP STAI17

!CAN WE CLEAR ALL THE DAP BITS
!USING DISK CLEAR

57							
58	000374	000167	001702	JMP	STAI20	ICAN WE SET ALL THE DAE BITS	
59	000400	000167	001746	JMP	STAI21	ICAN WE CLEAR ALL THE DAE BITS, USING DISK CLEAR	
60	000404	000167	002004	JMP	STAI22	EXECUTE A ONE WORD WRITE	
61						FOLLOWED BY A ONE WORD WRITE CONTINUE	
62	000410	000167	002724	JMP	STAI40	EXECUTE A ONE WORD WRITE CHECK	
63						FOLLOWED BY A ONE WORD WRITE CHECK CONTINUE	
64	000414	000167	003674	JMP	STAI56	EXECUTE A ONE WORD READ	
65						FOLLOWED BY A ONE WORD READ CONTINUE	
66	000420	000167	004620	JMP	STAI74	TEST TRACK INCREMENT	
67	000424	000167	005022	JMP	STAI77	TEST DISK INCREMENT	
68	000430	000167	005270	JMP	STAI03	TEST THAT NED RAISES EPROP FLAG	
69	000434	000167	005460	JMP	ST105X	CHECK CMA INHIBIT	
70	000440	000167	005656	JMP	NXMTSM	TEST NON-EXISTENT MEMORY ERROR	
71	000444	000167	006224	JMP	STAI06	TEST THAT THE DISK WILL NOT TRAP	
72						PRIORITY 7	
73	000450	000167	006354	JMP	STAI10	TEST THAT THE DISK WILL NOT TRAP	
74						PRIORITY 6	
75	000454	000167	006504	JMP	STAI12	TEST THAT THE DISK WILL NOT TRAP	
76						PRIORITY 5	
77	000460	000167	006634	JMP	STAI14	TEST THAT THE DISK WILL TRAP	
78						PRIORITY 4	
79	000464	000167	006742	JMP	ADT1	ADDRESS TEST 1	
80						CHECK TIMING BY EXECUTING	
81						A ONE WORD WRITE	
82	000470	000167	007136	JMP	ADT2X	ADDRESS TEST 2	
83						CHECK TIMING BY EXECUTING	
84						A ONE WORD READ	
85		000650			.=650		
86							
87						MAINTENANCE ROUTINES	
88							
89	000650	000167	007326	JMP	SELWC	LOAD WORD COUNT REG WITH SWR	
90	000654	000167	007332	JMP	SELCMA	LOAD CURRENT ADDRESS REG WITH SWR	
91	000660	000167	007336	JMP	SELDAR	LOAD DISK ADDRESS REG WITH SWR	
92	000664	000167	007342	JMP	SELDAE	LOAD DISK EXT. ADDRESS REG WITH SWR	
93	000670	000167	007346	JMP	SELDBP	LOAD DATA BUFFER REG WITH SWR	
94	000674	000167	007352	JMP	MOVLK	MOVE LOOK AHEAD INTO LIGHTS	
95	000700	000167	007360	JMP	SELDCS	LOAD FUNCTION REG WITH SWR	
96							
97							
98	000704	000167	007424	JMP	STAMP	SELECT TRACKS STATICLY	
99							
100							
101							
102							
103							
104							
105						RF11 DATA TEST	
106						VECTORS USED IN PROGRAM	
107						101 LOC 204 DISK INTERRUPT	
108						102 LOC 30 EMT (TELETYPE OUTPUT)	
109						103 LOC 34 TRAP (DISK HANDLERS)	
110							

111
112

001000

.=1000

113				
114			.EVEN	
115				
116			I/O ADDRESS POINTERS	
117	001000	177570	SWR: 177570	SWITCH REGISTER
118	001002	177776	PS: 177776	PROCESSOR STATUS REGISTER
119	001004	177566	TPB: 177566	TELETYPE REGISTERS
120	001006	177562	TKR: 177562	
121	001010	177564	TPS: 177564	
122	001012	177560	TKS: 177560	
123				
124			DISK I/O REGISTERS	
125				
126	001014	177460	DCS: 177460	DISK CONTROL REGISTER
127	001016	177462	WC: 177462	WORD COUNT REGISTER
128	001020	177464	CMA: 177464	CURRENT MEMORY ADDRESS REGISTER
129	001022	177466	DAR: 177466	LOWER 16 BITS OF DISK ADDRESS
130	001024	177470	DAE: 177470	EXTENSION ADDRESS REGISTER
131	001026	177472	DBR: 177472	DATA BUFFER REGISTER
132	001030	177474	MA: 177474	MAINTENANCE REGISTER
133	001032	177476	ADS: 177476	LOOK AHEAD REGISTER
134				
135				
136				
137				
138				
139				
140			RF11 DEDICATE REGISTERS (MEMORY)	
141				
142	001034	000000	FLAG: 0	INTERNAL PROGRAM FLAG
143	001036	146723	RANNU: 146723	RANDOM NUMBER PRIME
144	001040	000000	WPDCT: 0	WORKING WORD COUNT
145	001042	000000	TRACK: 0	WORKING DAE
146	001044	000000	DMA: 0	WORKING DAR
147	001046	000000	PATNU: 0	DATA PATTERN INDEX
148	001050	000000	BUF: 0	WORKING DATA BUFFER (OUT-IN)
149	001052	000000	TWRDCT: 0	TEMP WORD COUNT
150	001054	000000	TDMA: 0	TEMP DAR
151	001056	000000	SWPDCT: 0	STANDARD WORD COUNT
152	001060	000000	ERCOUNT: 0	ERROR COUNT FOR MESSAGES.
153	001062	000000	SAVE: 0	
154	001064	000000	SAV1: 0	
155	001066	000000	PASS: 0	
156				
157			RF11 WORK REGISTERS	
158			(CAN BE CHANGED IN ANY ROUTINE)	
159	001070	000000	WORK: 0	
160	001072	000000	WORK1: 0	
161	001074	000000	WORK2: 0	

162								
163	001076	000005			STAPT: RESET			ICLEAR THE WORLD
164	001100	012706	001000		MOV	#1000,86		ISSET UP STACK
165	001104	012767	000006	176672	MOV	#6,4		
166	001112	005067	176670		CLR	6		
167	001116	012767	000340	177062	MOV	#340,206		!LOCK UP INTEPRUPTS
168	001124	012767	010662	176676	MOV	#FYTHP,30		!SET UP TTY POINTER
169	001132	012767	000340	176672	MOV	#340,32		!LOCK UP INTERRUPTS
170	001140	012767	010130	176666	MOV	#DISK,34		!SET UP DISK HANDLER POINTER
171	001146	012767	000340	176662	MOV	#340,36		!LOCK UP INTEPRUPTS
172	001154	012777	000340	177620	MOV	#340,8PS		!LOCK UP INTERRUPT LEVELS
173	001162	012767	010060	176630	MOV	#LOOP,20		!SET UP FOR SCOPE LOOP
174	001170	012767	000340	176624	MOV	#340,27		!LOCK UP PRIORITY
175	001176	012767	011214	176620	MOV	#DOWN,24		!SET UP PWRFAIL
176	001204	012767	000340	176614	MOV	#340,26		!LOCK UP PRIORITYS
177	001212	005067	177624		CLR	TRACK		!CLEAR TRACK REGISTERS
178	001216	005067	177622		CLR	DMA		!CLEAR DAP REGISTERS

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192
193 001222 000005
194 001224 004767 010042
195 001230 017767 177560 177632
196 001236 032767 177577 177624
197 001244 001405
198 001246 012767 000000 177604
199 001254 004567 007242
200 001260 105767 177604
201 001264 001005
202 001266 012767 000001 177564
203 001274 004567 007222
204 001300 000004
205 001302 001222
206
207
208 001304 000005
209 001306 017767 177506 177554
210 001314 001405
211 001316 012767 000002 177534
212 001324 004567 007172
213 001330 000004
214 001332 001304
215
216
217
218 001334 000005
219 001336 017767 177454 177524
220 001344 001405
221 001346 012767 000003 177504
222 001354 004567 007142
223 001360 000004
224 001362 001334

;WE ARE NOW ENTERING THE STATIC TEST
;IF THE OPERATOR WOULD LIKE TO CHECK
;THE DISK REGISTERS PRIOR TO ENTERING THIS
;TEST WE HAVE SOME HANDY ROUTINES
;WHICH WOULD ALLOW YOU TO LOAD THESE
;REGISTERS UNDER SWITCH REGISTER CONTROL
;PLEASE REFERENCE THE STARTING ADDRESS
;TO SEE WHICH ROUTINE BEST SUITS YOUR
;PREFEREN.
;
;THIS TEST IS DESIGNED TO TEST THE ABILITY OF RESET
;TO CLEAR ALL THE DISK REGISTERS
;TEST CONTROL REGISTER
STAI1: RESET
;CLEAR THE WORLD
JSR %7,WAMP ;SET PARITY SWITCHES
MOV %DCS,WORK ;FETCH CONTROL REGISTER
BIT %177577,WORK ;IS IT CLEARED
BEQ XSTAI1 ;REGISTER OK (TEST READY)
ERR0: MOV %0,ERCOUNT ;SET UP ERROR COUNT 0
JSR %5,STAER ;REPORT STATIC ERROR
XSTAI1: TSTB WORK ;TEST FOR READY
BNE LPST1 ;BRANCH IF READY
ERR1: MOV %1,ERCOUNT ;SET UP ERROR COUNT 1
JSR %5,STAER ;REPORT READY NOT SET
LPST1: SCOPE
;ENTER SCOPE LOOP
STAI1
;TEST CURRENT ADDRESS REGISTER
;
STAI2: RESET
;CLEAR THE WORLD
MOV %CMA,WORK ;FETCH CMA REGISTER
BEQ LPST2 ;REGISTER OK
ERR2: MOV %2,ERCOUNT ;SET UP ERROR COUNT 2
JSR %5,STAER ;REPORT ERROR
LPST2: SCOPE
;ENTER SCOPE LOOP
STAI2
;
;TEST WORD COUNT REGISTER
;
STAI3: RESET
;CLEAR THE WORLD
MOV %WC,WORK ;FETCH WC REG.
BEQ LPST3 ;REGISTER OK
ERR3: MOV %3,ERCOUNT ;SET UP ERROR COUNT 3
JSR %5,STAER ;REPORT ERROR
LPST3: SCOPE
;ENTER SCOPE LOOP
STAI3

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225
226
227      I
228      ITEST DISK ADDRESS REGISTER
229      I
230      STAI4: RESET          ICLEAR THE WORLD
231      MOV      @DAR,WORK    IFETCH DAR REGISTER
232      BEQ      LPST4        IREGISTER CLEARED
233      ERR4:  MOV      @4,ERCOUNT ISET UP EPROP COUNT 4
234      JSR      @5,STAEP     IREPORT ERROR
235      LPST4:  SCOPE          IENTER SCOPE LOOP
236      STAI4
237      I
238      ITEST DISK EXT. ADDRESS REGISTER
239      I
240      STAI5: RESET          ICLEAR THE WORLD
241      MOV      @DAE,WORK    IFETCH DAE REGISTERS
242      BEQ      LPST5        IDAE CLEARED
243      ERR5:  MOV      @5,ERCOUNT ISET UP ERROR COUNT 5
244      JSR      @5,STAEP     IREPORT ERROR
245      LPST5:  SCOPE          IENTER SCOPE LOOP
246      STAI5
247      I
248      ITEST DATA BUFFER REGISTER
249      I
250      STAI6: RESET          ICLEAR THE WORLD
251      MOV      @DBR,WORK    IFETCH DBR REGISTER
252      BEQ      LPST6        IDBR CLEARED
253      ERR6:  MOV      @6,ERCOUNT ISET UP ERROR COUNT 6
254      JSR      @5,STAEP     IREPORT ERROR
255      LPST6:  SCOPE          IENTER SCOPE LOOP
256      STAI6
257      I
258      ITEST MAINTENANCE REGISTER
259      I
260      STAI7: RESET          ICLEAR THE WORLD
261      MOV      @MA,WORK     IFETCH MAINTENANCE REG
262      BEQ      LPST7        IMA CLEARED
263      ERR7:  MOV      @7,ERCOUNT ISET UP ERROR COUNT 7
264      JSR      @5,STAEP     IREPORT ERROR
265      LPST7:  SCOPE          IENTER SCOPE LOOP
266      STAI7
267      I
268      ICAN WE SET THE FUNCTION BITS IN THE DCS REG.
269      IBITS 7,6,5,4,3,2,1
270      I
271      STAI10: MOV      @176,@DCS ISET DISK FUNCTION BITS
272      MOV      @DCS,WORK    IFETCH FUNCTION BITS
273      CMP      @376,WORK    IARE THE FUNCTION BITS SET
274      BEQ      LPST10       IFUNCTION BITS SET
275      ERR10: MOV      @376,WORK1 ISET UP FOR ERROR REPORT
276      JSR      @10,ERCOUNT ISET UP ERROR COUNT 10
277      LPST10: SCOPE          IREPORT ERROR (ERROR IN FUNCTION BITS)
278      STAI10: SCOPE          IENTER SCOPE LOOP
                STAI10

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279
280
281      ; WILL DISK CLEAR CLEAR THE FUNCTION BITS
282      ;
283 001574 012777 000176 177212 STAI11: MOV      #176,@DCS      ;SET DISK FUNCTION BITS
284 001602 052777 000400 177204      BIS      @BIT0,@DCS    ;EXECUTE DISK CLEAR
285 001610 017767 177200 177252      MOV      @DCS,WORK    ;FETCH CONTROL REG
286 001616 022767 000200 177244      CMP      @200,WORK    ;IS ONLY READY SET
287 001624 001405                      BEQ      LPST11       ;REGISTER CLEARED
288 001626 012767 000011 177224 ERR11:  MOV      #11,ERCOUNT  ;SET UP ERROR COUNT 11
289 001634 004567 006662                      JSR      %5,STAEP     ;REPORT ERROR
290 001640 000004                      LPST11: SCOPE        ;ENTER SCOPE LOOP
291 001642 001574                      STAI11
292
293      ; CAN WE SET ALL THE CMA BITS
294      ;
295 001644 012767 177777 177220 STAI12: MOV      #177777,WORK1  ;SET UP CURRENT ADDR. OF ALL ONES
296 001652 016777 177214 177140      MOV      WORK1,@CMA   ;LOAD CMA
297 001660 017767 177134 177202      MOV      @CMA,WORK    ;FETCH CMA
298 001666 026767 177200 177174      CMP      WORK1,WORK   ;COMPARE FOR ALL BITS SET
299 001674 001405                      BEQ      LPST12       ;ALL BITS SET?
300 001676 012767 000012 177154 ERR12:  MOV      #12,ERCOUNT  ;SET UP ERROR COUNT 12
301 001704 004567 006664                      JSR      %5,STAER1   ;REPORT ERROR
302 001710 000004                      LPST12: SCOPE        ;ENTER SCOPE LOOP
303 001712 001644                      STAI12
304
305      ; WILL DISK CLEAR - CLEAR THE CMA REGISTER
306      ;
307 001714 012777 177777 177076 STAI13: MOV      #177777,@CMA  ;SET CMA EQUAL TO ALL ONES
308 001722 052777 000400 177064      BIS      @BIT0,@DCS   ;EXECUTE DISK CLEAR
309 001730 005777 177064                      TST      @CMA         ;TEST FOR BIT0 SET IN CMA (PEAD ONLY BIT)
310 001734 001410                      BEQ      LPST13       ;WAS THE REST OF CMA CLEARED?
311 001736 017767 177052 177124      MOV      @DCS,WORK    ;NO! FETCH CMA REG.
312 001744 012767 000013 177106 ERR13:  MOV      #13,ERCOUNT  ;SET UP ERROR COUNT 13
313 001752 004567 006544                      JSR      %5,STAER    ;REPORT ERROR
314 001756 000004                      LPST13: SCOPE        ;ENTER SCOPE LOOP
315 001760 001714                      STAI13
316      ; TEST CMA WITH RANDOM NUMBERS USING
317      ; CONTENTS OF CORE
318      ;
319      ;
320 001762 012706 001000          ERR500: MOV      #1000,%6
321 001766 012767 002040 176010      MOV      @STUP,4
322 001774 005000                      CLR      %0
323 001776 011077 177016          CATST1: MOV      (%0),@CMA
324 002002 027720 177012          CMP      @CMA,(%0)+
325 002006 001773                      BEQ      CATST1
326 002010 014067 177056          MOV      -(%0),WORK1
327 002014 017767 177000 177046      MOV      @CMA,WORK
328 002022 012767 000500 177030      MOV      #500,ERCOUNT
329 002030 004567 006540          JSR      %5,STAEP1
330 002034 000167 177722          JMP      ERP500
331
332 002040 012767 000006 175736 STOP:  MOV      #6,4
  
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333	002046	000004				SCOPE		
334	002050	001762				ERR500		
335								
336								
337								
338	002052	012767	177777	177012	STAI14:	MOV	#177777,WORK1	!SET UP MAX. WORD COUNT
339	002060	016777	177006	176730		MOV	WORK1,@WC	!LOAD WC REGISTER
340	002066	026777	177000	176722		CMP	WORK1,@WC	!ARE ALL BITS SET
341	002074	001410				BEG	LPST14	!YES! EXIT
342	002076	017767	176714	176764		MOV	@WC,WORK	!NO! FETCH WC REG.
343	002104	012767	000014	176746	ERR14:	MOV	#14,ERRCOUNT	!SET UP ERROR COUNT 14
344	002112	004567	006456			JSR	@5,STAE1	!REPORT ERROR
345	002116	000004			LPST14:	SCOPE		!ENTER SCOPE LOOP
346	002120	002052				STAI14		


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347
348
349      |
350      | WILL DISK CLEAR-CLEAR THE WORD COUNT REGISTER
351      |
351 002122 012777 177777 176666 STAI15: MOV      #177777,@WC      |SET WC REGISTER EQUAL TO ALL ONES
352 002130 052777 000400 176656      BIS      @BIT0,@DCS      |EXECUTE DISK CLEAR
353 002136 017767 176654 176724      MOV      @WC,WORK      |FETCH WORD COUNT REGISTER
354 002144 001405      BEQ      LPST15      |YES! EXIT
355 002146 012767 000015 176704 ERR15: MOV      #15,ERCOUNT      |SET UP ERROR COUNT 15
356 002154 004567 006342      JSR      @5,STAER      |REPORT ERROR
357 002160 000004      LPST15: SCOPE
358 002162 002122      STAI15
359      |
360      | CAN WE SET ALL THE BITS IN THE DAR REGISTER.
361      |
362 002164 012767 177777 176700 STAI16: MOV      #177777,WORK1
363 002172 016777 176674 176622      MOV      WORK1,@DAR      |SET DAR TO ALL ONES
364 002200 017767 176616 176662      MOV      @DAR,WORK      |FETCH DAR REGISTER
365 002206 026767 176660 176654      CMP      WORK1,WORK      |ARE ALL BITS SET
366 002214 001405      BEQ      LPST16      |YES! EXIT
367 002216 012767 000016 176634 ERR16: MOV      #16,ERCOUNT      |SET UP ERROR COUNT 16
368 002224 004567 006344      JSR      @5,STAER1     |NOT ALL BITS SET REPORT ERROR
369 002230 000004      LPST16: SCOPE
370 002232 002164      STAI16
371      |
372      | CAN WE CLEAR THE DAR REG. WITH DISK CLEAR.
373      |
374 002234 012777 177777 176560 STAI17: MOV      #177777,@DAR      |SET DAR TO ALL ONES
375 002242 052777 000400 176544      BIS      @BIT0,@DCS      |EXECUTE DISK CLEAR
376 002250 005777 176546      TST      @DAR      |TEST FOR ZERO DAR
377 002254 001410      BEQ      LPST17      |YES EXIT
378 002256 017767 176540 176604      MOV      @DAR,WORK      |NO BITS SET IN DAR
379 002264 012767 000017 176566 ERR17: MOV      #17,ERCOUNT      |SET UP ERROR COUNT 17
380 002272 004567 006224      JSR      @5,STAER      |REPORT ERROR
381 002276 000004      LPST17: SCOPE
382 002300 002234      STAI17
383      |
384      | CAN WE SET THE EXT. ADDRESS BITS IN THE DAE REGISTER
385      |
386 002302 012767 000037 176562 STAI20: MOV      #37,WORK1
387 002310 016777 176556 176506      MOV      WORK1,@DAE      |SET EXT. ADDRESS BITS
388 002316 017767 176502 176544      MOV      @DAE,WORK      |FETCH CONTENTS OF DAE REG.
389 002324 026767 176542 176536      CMP      WORK1,WORK      |ARE ALL EXT. ADDRESS BITS SET
390 002332 001405      BEQ      LPST20      |YES! EXIT
391 002334 012767 000020 176516 ERR20: MOV      #20,ERCOUNT      |SET UP ERROR COUNT 20
392 002342 004567 006226      JSR      @5,STAER1     |REPORT ERROR
393 002346 000004      LPST20: SCOPE
394 002350 002302      STAI20

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395
396
397      I
398      I CAN WE CLEAR THE EXT ADDRESS BITS IN THE DAE REG.
399      I USING DISK CLEAR
400      I
400 002352 012777 000037 176444 STAI21: MOV      #37,0DAE      ISET EXT. ADDRESS BITS
401 002360 052777 000400 176426      BIS      @BIT0,@DCS    IEXECUTE DISK CLEAR
402 002366 017767 176432 176474      MOV      @DAE,@ORK    IFEICH CONTENTS OF DAE REG
403 002374 001405                      BEQ      LPST21       IYES! EXIT
404 002376 012767 000021 176454 ERR21:  MOV      #21,ERCOUNT  ISET UP ERROR COUNT 21
405
406 002404 004567 006112                      JSR      #5,STAER    IREPORT FRROP
407 002410 000004                      LPST21: SCOPE        IENTER SCOPE LOOP
408 002412 002352                      STAI21
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409
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411      |
412      |DO ONE WORD WRITE FOLLOWED BY ONE WORD WRITE CONTINUE
413      |ERROR1=BUSY FAILED TO SET
414      |ERROR2=BUSY FAILED TO CLEAR
415      |ERROR3=CONTROL ERROR WHEN X-FERING DATA
416      |ERROR4=DAE INCREMENTED WHEN X-FERING DATA
417      |ERROR5=DAR FAILED TO INCREMENT WHEN X-FERING DATA
418      |ERROR6=WORD COUNT FAILED TO OVERFLOW
419      |ERROR7=CMA FAILED TO INCREMENT
420      |
421      |
422      |* * * EXECUTE THE ONE WORD WRITE * * *
422 002414 052777 000400 176372 STAI22: RIS      @BIT0,@DCS      |CLEAR THE DISK WORLD
423 002422 012767 177777 007170      MOV      @177777,OUTBUF |DATA TO BE X-FERED
424 002430 012777 011620 176362      MOV      @OUTBUF,@CMA   |SET UP CURRENT ADDRESS
425 002436 012777 177777 176352      MOV      @-1,@WC       |SET WORD COUNT TO -1
426 002444 052777 000003 176342      RIS      @3,@DCS      |GO WRITE
427 002452 105777 176336      TSTB    @DCS          |TEST FOR PDY=0
428 002456 100011      BPL     STAI23        |PDY=0
429 002460 017767 176330 176402      MOV      @DCS,WORK    |BUSY NOT SET; FETCH DCS
430 002466
431 002466 012767 000022 176364 ERROR1: MOV      @22,ERCOUNT |SET UP ERROR COUNT 22
432 002474 004567 006022      JSR     @5,STAEP     |REPORT ERROR
433 002500 000745      BR      STAI22       |RESTART TEST
434 002502 005067 176362      STAI23: CLR     WORK
435 002506 005267 176356      INCWAT: INC     WORK  |WAIT FOR BUSY=0
436 002512 105777 176276      TSTB    @DCS        |IS BUSY CLEARED
437 002516 100417      BMI     STAI24       |FLAG CLEARED
438 002520 005767 176344      TST     WORK        |HAVE WE WAITED LONG ENOUGH
439 002524 001370      BNE     INCWAT      |PDY FAILED TO SET
440 002526 017767 176262 176334      MOV      @DCS,WORK    |FETCH CONTENTS OF DCS REG
441 002534 052767 000002 176330      RIS      @2,WORK1    |WANT DCS SHOULD CONTAIN
442 002542
443 002542 012767 000023 176310 ERROR2: MOV      @23,ERCOUNT |SET UP ERROR COUNT 23
444 002550 004567 006020      JSR     @5,STAEP1   |REPORT ERROR
445 002554 000717      BR      STAI22       |RESTART TEST
446 002556 017767 176232 176304 STAI24: MOV      @DCS,WORK |FETCH CONTENTS OF DCS REG
447 002564 005767 176300      TST     WORK        |IS ERROR FLAG SET
448 002570 100012      BPL     STAI25      |NO; X-FER OK
449 002572 012767 000202 176272      MOV      @202,WORK1  |WHAT DCS SHOULD CONTAIN
450 002600
451 002600 012767 000024 176252 ERROR3: MOV      @24,ERCOUNT |SET UP ERROR COUNT 24
452 002606 004567 005762      JSR     @5,STAEP1   |REPORT ERROR
453 002612 000167 177576      JMP     STAI22       |RESTART TEST
454 002616 017767 176202 176244 STAI25: MOV      @DAE,WORK |IS EXT. ADDRESS CLEAR
455 002624 001407      BEQ     STAI26      |DAE OK
456 002626
457 002626 012767 000025 176224 ERROR4: MOV      @25,ERCOUNT |SET UP ERROR COUNT 25
458 002634 004567 005662      JSR     @5,STAEP   |REPORT ERROR
459 002640 000167 177550      JMP     STAI22       |RESTART TEST
460 002644 017767 176152 176216 STAI26: MOV      @DAR,WORK |WAS DAR INCREMENTED BY 1
461 002652 022767 000001 176210      CMP     @BIT0,WORK   |IS DAR CORRECT
462 002660 001412      BEQ     STAI27      |DAR OK

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463	002662	012767	000001	176202		MOV	#R110,WORK1	!WHAT DAP SHOULD CONTAIN
464	002670				ERRR5:			
465	002670	012767	000026	176162	ERRR26:	MOV	#26,ERRCOUNT	!SET UP ERROR COUNT 26
466	002676	004567	005672			JSR	#5,STAFF1	!REPORT ERROR
467	002702	000167	177506			JMP	STAI22	!RESTART TEST

468									
469	002706	017767	176104	176154	STAI27:	MOV	@WC,WORK		IFETCH WORD COUNT
470	002714	001407				BEQ	STAI30		IFWORD COUNT DID OVERFLOW
471	002716				EROP6:				
472	002716	012767	000027	176134	ERR27:	MOV	@27,ERCOUNT		IFSET UP ERROR COUNT 27
473	002724	004567	005572			JSR	@5,STAER		IFWORD COUNT FAILED TO OVERFLOW
474	002730	000167	177460			JMP	STAI22		IFRESTART TEST
475	002734	017767	176060	176126	STAI30:	MOV	@CMA,WORK		IFETCH CURRENT ADDRESS
476	002742	012767	011622	176122		MOV	@OUTBUF+2,WORK1		IFWHAT CMA SHOULD EQUAL
477	002750	026767	176116	176112		CMP	WORK1,WORK		IFIS CMA CORRECT
478	002756	001407				REQ	STAI31		IFYES EXECUTE CONTINUE
479	002760				EROR7:				
480	002760	012767	000030	176072	ERR30:	MOV	@30,ERCOUNT		IFSET UP ERROR COUNT 30
481	002766	004567	005602			JSR	@5,STAER1		IFREPORT ERROR IN CMA
482	002772	000167	177416			JMP	STAI22		IFERROR RESTART TEST

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497 002776 012777 177777 176012
498 003004 052777 000001 176002
499 003012 105777 175776
500 003016 100012
501 003020 017767 175770 176042
502 003026
503 003026 012767 000031 176024
504 003034 004567 005462
505 003040 000167 177350
506 003044 005067 176020
507 003050 105777 175740
508 003054 100415
509 003056 005267 176006
510 003062 001372
511 003064 017767 175724 175776
512 003072
513 003072 012767 000032 175760
514 003100 004567 005416
515 003104 000167 177304
516 003110 005777 175700
517 003114 100015
518 003116 017767 175672 175744
519 003124 017767 175674 175740
520 003132
521 003132 012767 000033 175720
522 003140 004567 005430
523 003144 000167 177244
524 003150 005777 175650
525 003154 001412
526 003156 017767 175642 175704
527 003164
528 003164 012767 000034 175666
529 003172 004567 005324
530 003176 000167 177212
531 003202 017767 175614 175660
532 003210 012767 000002 175654
533 003216 026767 175650 175644
534 003224 001407
535 003226
536 003226 012767 000035 175624

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; TEST WRITE
;A WRITE CONTINUE WILL BE EXECUTED NOW
;WORD COUNT WILL BE SET TO -1 AGAIN
;
;EROR10=BUSY NOT SET BY GO
;EROR11=BUSY NOT CLEARED BY OVERFLOW
;EROR12=DISK ERROR OCCURED WHILE X-FERING
;EROR13=DAE INCREMENTED WHEN CONTINUE WAS EXECUTED
;EROR14=DAR DID NOT EQUAL 2 AFTER SECOND X-FER
;EROR15=WC DID NOT OVERFLOW AT THE END OF X-FER
;EROR16=CMA DID NOT EQUAL OUTBUF+2 AT END OF X-FER
;
;
;STAI31: MOV #177777,@WC ;SET WC TO -1
; BIS @BIT0,@DCS ;SET GO TO CONTINUE
; TSTB @DCS ;TEST FOR RDY SET
; BPL STAI32 ;BUSY WAS SET BY GO
; MOV @DCS,WORK ;FETCH CONTENTS OF DCS
;
;EROR10:
ERR31: MOV #31,ERCOUNT ;SET UP ERROR COUNT 31
; JSP %5,STAER ;REPORT BUSY NOT SET
; JMP STAI22
;
;STAI32: CLP WORK
; INCBUSY: TSTB @DCS ;TST FOR RDY SET BY OVERFLO
; BMI STAI33 ;READY SFT CONTINUE
; INC WORK ;WAIT FOR RDY=1
; BNE INCBUSY ;GO WAIT FOR RDY
; MOV @DCS,WORK ;FETCH CONTENTS OF DCS
;
;EROR11:
ERR32: MOV #32,ERCOUNT ;SET UP ERROR COUNT 32
; JSP %5,STAER ;REPORT BUSY NOT CLEARED
; JMP STAI22 ;RESTART ROUTINE
;
;STAI33: TST @DCS ;DID AN ERROR OCCUR WHILE X-FERING
; BPL STAI34 ;NO CONTINUE
; MOV @DCS,WORK ;YES! CONTENTS OF DCS
; MOV @DAE,WORK1 ;EXT ERROR BITS
;
;EROR12:
ERR33: MOV #33,ERCOUNT ;SET UP ERROR COUNT 33
; JSP %5,STAER1 ;REPORT ERROR OCCURRED.
; JMP STAI22 ;RESTART ROUTINE
;
;STAI34: TST @DAE ;DID DAE INC. BY DATA WAS X-FERRED
; BEQ STAI35 ;OK IT DID NOT INC
; MOV @DAE,WORK ;ERROR IT INCREMENTED
;
;EROR13:
ERR34: MOV #34,ERCOUNT ;SET UP ERROR COUNT 34
; JSP %5,STAER ;REPORT DAE INCREMENTED
; JMP STAI22
;
;STAI35: MOV @DAR,WORK ;DID DAR INCREMENT ON CONTINUE
; MOV #2,WORK1 ;WHAT DAR SHOULD CONTAIN
; CMP WORK1,WORK ;IS DAR CORRECT
; BEQ STAI36 ;DAR OK
;
;EROR14:
ERR35: MOV #35,ERCOUNT ;SET UP ERROR COUNT 35

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537	003234	004567	005334			JSR	85,STAEF1	;REPORT DAP INCORRECT
538	003240	000167	177150			JMP	STAI22	;RE-START ROUTINE
539	003244	017767	175546	175616	STAI36:	MOV	B+C,WORK	;FETCH WORD COUNT
540	003252	001407				REQ	STAI37	;WORD COUNT OVERFLOWED
541	003254				FROR15:			
542	003254	012767	000036	175576	FRR36:	MOV	836,ERCOUNT	;SET UP ERROR COUNT 36
543	003262	004567	005234			JSR	85,STAEF	;REPORT WORD COUNT FAILED TO CLEAR
544	003266	000167	177122			JMP	STAI22	;RESTART ROUTINE
545	003272	017767	175522	175570	STAI37:	MOV	8CMA,WORK	;FETCH CMA
546	003300	012767	011624	175564		MOV	8OUTRUF+4,WORK1	;WHAT CMA SHOULD EQUAL
547	003306	026767	175560	175554		CMP	WORK1,WORK	;IS CMA CORRECT
548	003314	001407				REQ	LPST22	;CMA WAS CORRECT
549	003316				FROR16:			
550	003316	012767	000037	175534	FRR37:	MOV	837,ERCOUNT	;SET UP ERROR COUNT 37
551	003324	004567	005244			JSR	85,STAEF1	;REPORT CMA INCORRECT
552	003330	000167	177060			JMP	STAI22	;RESTART ROUTINE
553	003334	000004			LPST22:	SCOPE		;ENTER SCOPE LOOP
554	003336	002414				STAI22		

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570 003340 052777 000400 175446
571 003346 012767 177777 006244
572 003354 012777 011620 175436
573 003362 012777 177777 175426
574 003370 052777 000007 175416
575 003376 105777 175412
576 003402 100011
577 003404 017767 175404 175456
578 003412
579 003412 012767 000040 175440
580 003420 004567 005076
581 003424 000745
582 003426 005067 175436
583 003432 005267 175432
584 003436 105777 175352
585 003442 100417
586 003444 005767 175420
587 003450 001370
588 003452 017767 175336 175410
589 003460 052767 000006 175404
590 003466
591 003466 012767 000041 175364
592 003474 004567 005074
593 003500 000717
594 003502 017767 175306 175360
595 003510 100021
596 003512 026727 175352 120006
597 003520 001006
598 003522 012767 120000 175342
599 003530 052767 000006 175334
600 003536
601 003536 012767 000042 175314
602 003544 004567 005024
603 003550 000167 177564
604 003554 017767 175244 175306
605 003562 001407
606 003564
607 003564 012767 000043 175266
608 003572 004567 004724

; TEST WRITE CHECK
; DO A ONE WORD WRITE CHECK FOLLOWED BY
; A ONE WORD WRITE CHECK CONTINUE
;
; EROR17=BUSY FAILED TO SET
; EROR20=BUSY FAILED TO CLEAR
; EROR21=DISK ERROR WHEN X-FERING DATA
; EROR22=DAE INCREMENTED WHEN X-FERING DATA
; EROR23=DAR FAILED TO INCREMENT WHEN X-FERING DATA
; EROR24=WORD COUNT FAILED TO OVERFLOW
; EROR25=CMA FAILED TO INCREMENT
;
;
; * * * EXECUTE THE ONE WORD WRITE CHECK * * *
STAI40: BIS #BIT8,DCS ;CLEAR THE DISK WORLD
MOV #177777,OUTBUF ;DATA TO BE X-FERED
MOV #OUTBUF,CMA ;SET UP CURRENT ADDRESS
MOV #-1,WCC ;SET WORD COUNT TO -1
BIS #7,DCS ;GO WRITE CHECK
TSTB @DCS ;TEST FOR READY
RPL STAI41 ;NOT READY
MOV @DCS,WORK ;SET! FETCH DCS

EROR17:
ERR40: MOV #40,ERCOUNT ;SET UP ERROR COUNT 40
JSR %5,STAER ;REPORT ERROR
BR STAI40 ;RESTART TEST

STAI41: CLR WORK
WCWAT: INC WORK ;WAIT FOR READY
TSTB @DCS
BMI STAI42 ;FLAG SET
TST WORK ;HAVE WE WAITED LONG ENOUGH
BNE WCWAT ;READY FAILED TO SET
MOV @DCS,WORK ;FETCH CONTENTS OF DCS REG
BIS #6,WORK1 ;WHAT DCS SHOULD CONTAIN

EROR20:
ERR41: MOV #41,ERCOUNT ;SET UP ERROR COUNT 41
JSR %5,STAER1 ;REPORT ERROR
BR STAI40 ;RESTART TEST

STAI42: MOV @DCS,WORK ;FETCH CONTENTS OF DCS REG
RPL STAI43 ;NO! X-FER OK
CMP WORK,#120006 ;DID WCE OCCUR
BNE EROR21 ;
MOV #120000,WORK1 ;YES WCE OCCURRED
BIS #6,WORK1 ;WHAT DCS SHOULD CONTAIN

EROR21:
ERR42: MOV #42,ERCOUNT ;SET UP ERROR COUNT 42
JSR %5,STAER1 ;REPORT ERROR
JMP STAI40 ;RESTART TEST

STAI43: MOV @DAE,WORK ;IS EXT. ADDRESS CLEAR
REQ STAI44 ;DAE OK

EROR22:
ERR43: MOV #43,ERCOUNT ;SET UP ERROR COUNT 43
JSR %5,STAER ;REPORT ERROR

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609	003576	000167	177536		JMP	STAI40	;	RESTART TEST	
610	003602	017767	175214	175260	STAI44:	MOV	@DAP,WORK	;	WAS DAP INCREMENTED BY 1
611	003610	022767	000001	175252		CMP	@BIT0,WORK	;	IS DAP CORRECT
612	003616	001412				REQ	STAI45	;	DAP OK
613	003620	012767	000001	175244		MOV	@BIT0,WORK1	;	WHAT DAP SHOULD CONTAIN
614	003626				EROP23:				
615	003626	012767	000044	175224	ERR44:	MOV	@44,ERCOUNT	;	SET UP ERROR COUNT 44
616	003634	004567	004734			JSR	@5,STAEP1	;	REPORT ERROR
617	003640	000167	177474			JMP	STAI40	;	RESTART TEST
618	003644	017767	175146	175216	STAI45:	MOV	@WC,WORK	;	FETCH WORD COUNT
619	003652	001407				REQ	STAI46	;	WORD COUNT DID OVERFLOW
620	003654				EROP24:				
621	003654	012767	000045	175176	ERR45:	MOV	@45,ERCOUNT	;	SET UP ERROR COUNT 45
622	003662	004567	004634			JSR	@5,STAER	;	WORD COUNT FAILED TO OVERFLOW
623	003666	000167	177446			JMP	STAI40	;	RESTART TEST
624	003672	017767	175122	175170	STAI46:	MOV	@CMA,WORK	;	FETCH CURRENT ADDRESS
625	003700	012767	011622	175164		MOV	@OUTBUF+2,WORK1	;	WHAT CMA SHOULD EQUAL
626	003706	026767	175160	175154		CMP	WORK1,WORK	;	IS CMA CORRECT
627	003714	001407				REQ	STAI47	;	YES EXECUTE CONTINUE
628	003716				EROP25:				
629	003716	012767	000046	175134	ERR46:	MOV	@46,ERCOUNT	;	SET UP ERROR COUNT 46
630	003724	004567	004644			JSR	@5,STAER1	;	REPORT ERROR IN CMA
631	003730	000167	177404			JMP	STAI40	;	ERROR RESTART TEST

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633
634      ;
635      ;A WRITE CHECK CONTINUE CONTINUE WILL BE EXECUTED NOW
636      ;WORD COUNT WILL BE SET TO -1 AGAIN
637      ;
638      ;EROP26=BUSY WAS NOT SET BY GO
639      ;EROP27=BUSY NOT CLEARED BY OVEPFLOW
640      ;EPOR30=DISK ERROR OCCURRED WHILE X-FERING
641      ;EROR31=DAE INCREMENTED WHEN CONTINUE WAS EXECUTED
642      ;EROR32=DAR DID NOT EQUAL 2 AFTER SECOND X-FER
643      ;EROR33=WC DID NOT=0 AFTER X-FER
644      ;EROR34=CMA DID NOT=OUTBUF+2 AT END OF X-FER
645      ;
646      ;
646 003734 012777 177777 175054 STAI47: MOV      #177777,@WC      ;SET WC TO -1
647 003742 052777 000001 175044      BIS      @BIT0,@DCS      ;SET GO TO CONTINUE
648 003750 105777 175040      TSTB     @DCS            ;TEST FOR READY
649 003754 100012      RPL      STAI50          ;
650 003756 017767 175032 175104      MOV      @DCS,@WORK      ;FETCH CONTENTS OF DCS
651 003764
652 003764 012767 000047 175066 EROP26: MOV      #47,ERCOUNT      ;SET UP ERROR COUNT 47
653 003772 004567 004524      JSR      @S,STAEP        ;REPORT BUSY NOT SET
654 003776 000167 177336      JMP      STAI40
655 004002 005067 175062      STAI50: CLR      WORK
656 004006 105777 175002      WCRUSI: TSTB     @DCS            ;TST FOR RDY SET BY OVEPFLOW
657 004012 100415      BMI      STAI51          ;BRANCH IF READY SET
658 004014 005267 175050      INC      WORK            ;WAIT FOR BUSY=0
659 004020 001372      BNF      WCBUSI          ;GO WAIT FOR RDY
660 004022 017767 174766 175040      MOV      @DCS,WORK      ;FETCH CONTENTS OF DCS
661 004030
662 004030 012767 000050 175022 EROP27: MOV      #50,ERCOUNT      ;SET UP ERROR COUNT 50
663 004036 004567 004460      JSR      @S,STAEP        ;REPORT RDY NOT SET
664 004042 000167 177272      JMP      STAI40          ;RESTART ROUTINE
665 004046 005777 174742      STAI51: TST      @DCS            ;DID AN ERROR OCCUR WHILE X-FERING
666 004052 100024      RPL      STAI52          ;NO CONTINUE
667 004054 017767 174734 175006      MOV      @DCS,WORK      ;YES! CONTENTS OF DCS
668 004062 026727 175002 120006      CMP      WORK,#120006
669 004070 001006      BNE      EPR51
670 004072 012767 120000 174772      MOV      #120000,WORK1
671 004100 052767 000006 174764      BIS      #6,WORK1        ;EXT ERROR BITS
672 004106
673 004106 012767 000051 174744 EROP30: MOV      #51,ERCOUNT      ;SET UP ERROR COUNT 51
674 004114 004567 004454      JSR      @S,STAEP1       ;REPORT ERROR OCCURRED
675 004120 000167 177214      JMP      STAI40          ;RESTART ROUTINE
676 004124 005777 174674      STAI52: TST      @DAE            ;DID DAE INC. BY DATA WAS X-FERED
677 004130 001412      BEQ      STAI53          ;OK IT DID NOT INC
678 004132 017767 174666 174730      MOV      @DAE,WORK      ;ERROR IT INCREMENTED
679 004140
680 004140 012767 000052 174712 EROP31: MOV      #52,ERCOUNT      ;SET UP ERROR COUNT 52
681 004146 004567 004350      JSR      @S,STAEP        ;REPORT DAE INCREMENTED
682 004152 000167 177162      JMP      STAI40
683 004156 017767 174640 174704      STAI53: MOV      @DAR,WORK      ;DID DAR INCREMENT ON CONTINUE
684 004164 012767 000002 174700      MOV      #2,WORK1        ;WHAT DAR SHOULD CONTAIN
685 004172 026767 174674 174670      CMP      WORK1,WORK      ;IS DAR CORRECT

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686	004200	001407			REQ	STAI54		;DAR OK
687	004202				EROP32:			
688	004202	012767	000053	174650	ERR53:	MOV	#53,ERCOUNT	;SET UP ERROR COUNT 53
689	004210	004567	004360			JSP	#5,STAER1	;REPORT DAR INCORRECT
690	004214	000167	177120			JMP	STAI40	;RE-START ROUTINE
691	004220	017767	174572	174642	STAI54:	MOV	#WC,WORK	;FETCH WORD COUNT
692	004226	001407			REQ	STAI55		;WORD COUNT OVERFLOWED
693	004230				EROP33:			
694	004230	012767	000054	174622	ERR54:	MOV	#54,ERCOUNT	;SET UP ERROR COUNT 54
695	004236	004567	004260			JSP	#5,STAER	;REPORT WORD COUNT FAILED TO CLEAR
696	004242	000167	177072			JMP	STAI40	;RESTART ROUTINE
697	004246	017767	174546	174614	STAI55:	MOV	#CMA,WORK	;FETCH CMA
698	004254	012767	011624	174610		MOV	#OUTBUF+4,WORK1	;WHAT CMA SHOULD EQUAL
699	004262	026767	174604	174600		CMP	WORK1,WORK	;IS CMA CORRECT
700	004270	001407			REQ	LPST40		;CMA WAS CORRECT
701	004272				EROP34:			
702	004272	012767	000055	174560	ERR55:	MOV	#55,ERCOUNT	;SET UP ERROR COUNT 55
703	004300	004567	004270			JSP	#5,STAER1	;REPORT CMA INCORRECT
704	004304	000167	177030			JMP	STAI40	;RESTART ROUTINE
705	004310	000004			LPST40:	SCOPE		;ENTER SCOPE LOOP
706	004312	003340				STAI40		

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722 004314 052777 000400 174472
723 004322 012767 177777 005270
724 004330 012777 011620 174462
725 004336 012777 177777 174452
726 004344 052777 000005 174442
727 004352 105777 174436
728 004356 100011
729 004360 017767 174430 174502
730 004366
731 004366 012767 000056 174464
732 004374 004567 004122
733 004400 000745
734 004402 005067 174462
735 004406 005267 174456
736 004412 105777 174376
737 004416 100417
738 004420 005767 174444
739 004424 001370
740 004426 017767 174362 174434
741 004434 052767 000005 174430
742 004442
743 004442 012767 000057 174410
744 004450 004567 004120
745 004454 000717
746 004456 017767 174332 174404
747 004464 005767 174400
748 004470 100012
749 004472 012767 000003 174372
750 004500
751 004500 012767 000060 174352
752 004506 004567 004062
753 004512 000167 177576
754 004516 017767 174302 174344
755 004524 005767 174340
756 004530 001407
757 004532
758 004532 012767 000061 174320
759 004540 004567 003756
760 004544 000167 177544

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; TEST READ
; ONE WORD READ FOLLOWED BY A ONE WORD
; READ CONTINUE.
;
; EROR35=BUSY WAS NOT SET BY GO
; EROR36=BUSY NOT CLEARED BY OVERFLOW
; EROR37=DISK ERROR OCCURRED WHILE X-FERING DATA
; EROR40=DAE INCREMENTED WHEN X-FERING DATA
; EROR41=DAR FAILED TO INCREMENT WHEN X-FERING DATA
; EROR42=WORD COUNT FAILED TO OVERFLOW
; EROR43=CMA FAILED TO INCREMENT
;
;
; * * * EXECUTE THE ONE WORD READ * * *
STAI56: BIS      @BITR,@DCS      ;CLEAR THE DISK WORLD
        MOV      @177777,OUTBUF ;DATA TO BE X-FERED
        MOV      @OUTBUF,@CMA   ;SET UP CURRENT ADDRESS
        MOV      @-1,@WC       ;SET WORD COUNT TO -1
        BIS      @5,@DCS       ;GO READ
        TSTB    @DCS           ;TEST FOR BUSY=1
        BPL     STAI57         ;BUSY SET
        MOV      @DCS,@ORK      ;BUSY NOT SET; FETCH DCS
;
; EROR35:
ERR56:  MOV      @56,ERCOUNT    ;SET UP ERROR COUNT 56
        JSR     @5,STAER       ;REPORT ERROR
        BR      STAI56         ;RESTART TEST
;
; STAI57: CLR     WORK           ;WAIT FOR BUSY=0
RDWAT:  INC     WORK           ;IS BUSY CLEARED
        TSTB    @DCS           ;FLAG CLEARED
        BMI     STAI60         ;HAVE WE WAITED LONG ENOUGH
        BNE     RDWAT          ;BUSY FAILED TO CLEAR
        MOV      @DCS,@ORK      ;FETCH CONTENTS OF DCS REG
        BIS      @5,@ORK1      ;WANT DCS SHOULD CONTAIN
;
; EROR36:
ERR57:  MOV      @57,ERCOUNT    ;SET UP ERROR COUNT 57
        JSR     @5,STAER1      ;REPORT ERROR
        BR      STAI56         ;RESTART TEST
;
; STAI60: MOV     @DCS,@ORK      ;FETCH CONTENTS OF DCS REG
        TST     WORK           ;IS ERROR FLAG SET
        BPL     STAI61         ;NO! X-FER OK
        MOV      @3,@ORK1      ;WHAT DCS SHOULD CONTAIN
;
; EROR37:
ERR60:  MOV      @60,ERCOUNT    ;SET UP ERROR COUNT 60
        JSR     @5,STAER1      ;REPORT ERROR
        JMP     STAI56         ;RESTART TEST
;
; STAI61: MOV     @DAE,@ORK      ;IS EXT. ADDRESS CLEAR
        TST     WORK           ;DAE SHOULD NOT HAVE INC.
        BEQ     STAI62         ;DAE OK
;
; EROR40:
ERR61:  MOV      @61,ERCOUNT    ;SET UP ERROR COUNT 61
        JSR     @5,STAER       ;REPORT ERROR
        JMP     STAI56         ;RESTART TEST

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761	004550	017767	174246	174312	STAI62:	MOV	@DAP,WORK	;WAS DAP INCREMENTED BY 1
762	004556	022767	000001	174304		CMP	@BIT0,WORK	;IS DAP CORRECT
763	004564	001412				REQ	STAI63	;DAP OK
764	004566	012767	000001	174276		MOV	@BIT0,WORK1	;WHAT DAP SHOULD CONTAIN
765	004574				EROR41:			
766	004574	012767	000062	174256	ERR62:	MOV	@62,ERCOUNT	;SET UP ERROR COUNT 62
767	004602	004567	003766			JSP	@5,STAER1	;REPORT ERROR
768	004606	000167	177502			JMP	STAI56	;RESTART TEST
769	004612	017767	174200	174250	STAI63:	MOV	@WC,WORK	;FETCH WORD COUNT
770	004620	001407				REQ	STAI64	;WORD COUNT DID OVERFLOW
771	004622				EROR42:			
772	004622	012767	000063	174230	ERR63:	MOV	@63,ERCOUNT	;SET UP ERROR COUNT 63
773	004630	004567	003666			JSP	@5,STAER	;WORD COUNT FAILED TO OVERFLOW
774	004634	000167	177454			JMP	STAI56	;RESTART TEST
775	004640	017767	174154	174222	STAI64:	MOV	@CMA,WORK	;FETCH CURRENT ADDRESS
776	004646	012767	011622	174216		MOV	@OUTBUF+2,WORK1	;WHAT CMA SHOULD EQUAL
777	004654	026767	174212	174206		CMP	WORK1,WORK	;IS CMA CORRECT
778	004662	001407				REQ	STAI65	;YES EXECUTE CONTINUE
779	004664				EROR43:			
780	004664	012767	000064	174166	ERR64:	MOV	@64,ERCOUNT	;SET UP ERROR COUNT 64
781	004672	004567	003676			JSR	@5,STAER1	;REPORT ERROR IN CMA
782	004676	000167	177412			JMP	STAI56	;ERROR RESTART TEST

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783
784      ;A READ CONTINUE WILL BE EXECUTED NOW
785      ;WORD COUNT WILL BE SET TO -1 AGAIN
786      ;
787      ;EROR44=BUSY NOT SET BY GO
788      ;EROR45=BUSY NOT CLEARED BY OVERFLOW
789      ;EROR46=DISK ERROR OCCURRED WHILE X-FERING
790      ;EROR47=DAE INCREMENTED WHEN CONTINUE WAS EXECUTED
791      ;EROR50=DAR DID NOT EQUAL 2 AFTER SECOND X-FER
792      ;EROR51=WC FAILED TO OVERFLOW ON READ CONTINUE
793      ;EROR52=CMA DID NOT EQUAL OUTBUF+2 AFTER READ CONTINUE
794      ;
795      ;
796 004702 012777 177777 174106 STAI65: MOV      @177777,@WC      ;SET WC TO -1
797 004710 052777 000001 174076      BIS      @BIT0,@DCS      ;SET GO TO CONTINUE
798 004716 105777 174072      TSTB     @DCS           ;TEST FOR RDY=0
799 004722 100012      BPL      STAI66         ;RDY SET
800 004724 017767 174064 174136      MOV      @DCS,WORK      ;FETCH CONTENTS OF DCS
801 004732
802 004732 012767 000065 174120 EROR44: MOV      @65,ERCOUNT      ;SET UP ERROR COUNT 65
803 004740 004567 003556      JSR      @5,STAEP       ;REPORT BUSY NOT SET
804 004744 000167 177344      JMP      STAI56
805 004750 005067 174114      STAI66: CLP      WORK
806 004754 105777 174034 INCRD:  TSTB     @DCS           ;TST FOR RDY SET BY OVERFLOW
807 004760 100415      BMI      STAI67         ;RDY SET CONTINUE
808 004762 005267 174102      INC      WORK           ;WAIT FOR BUSY=0
809 004766 001372      RNE      INCRD          ;GO WAIT FOR BUSY
810 004770 017767 174020 174072      MOV      @DCS,WORK      ;FETCH CONTENTS OF DCS
811 004776
812 004776 012767 000066 174054 EROR45: MOV      @66,ERCOUNT      ;SET UP ERROR COUNT 66
813 005004 004567 003512      JSR      @5,STAEP       ;REPORT BUSY NOT CLEARED
814 005010 000167 177300      JMP      STAI56         ;RESTART ROUTINE
815 005014 005777 173774      STAI67: TST      @DCS           ;DID AN ERROR OCCUR WHILE X-FERING
816 005020 100015      BPL      STAI70         ;NO CONTINUE
817 005022 017767 173766 174040      MOV      @DCS,WORK      ;YES! CONTENTS OF DCS
818 005030 017767 173770 174034      MOV      @DAE,WORK1     ;EXT ERROR BITS
819 005036
820 005036 012767 000067 174014 EROR46: MOV      @67,ERCOUNT      ;SET UP ERROR COUNT 67
821 005044 004567 003524      JSR      @5,STAER1      ;REPORT ERROR OCCURRED
822 005050 000167 175340      JMP      STAI22         ;RESTART ROUTINE
823 005054 005777 173744      STAI70: TST      @DAE           ;DID DAE INC. BY DATA WAS X-FERED
824 005060 001412      BEQ      STAI71         ;OK IT DID NOT INC
825 005062 017767 173736 174000      MOV      @DAE,WORK      ;ERROR IT INCREMENTED
826 005070
827 005070 012767 000070 173762 EROR47: MOV      @70,ERCOUNT      ;SET UP ERROR COUNT 70
828 005076 004567 003420      JSR      @5,STAER       ;REPORT DAE INCREMENTED
829 005102 000167 177206      JMP      STAI56
830 005106 017767 173710 173754 STAI71: MOV      @DAR,WORK      ;DID DAR INCREMENT ON CONTINUE
831 005114 012767 000002 173750      MOV      @2,WORK1       ;WHAT DAR SHOULD CONTAIN
832 005122 026767 173744 173740      CMP      WORK1,WORK      ;IS DAR CORRECT
833 005130 001407      BEQ      STAI72         ;DAR OK
834 005132
835 005132 012767 000071 173720 EROR50: MOV      @71,ERCOUNT      ;SET UP ERROR COUNT 71
836 005140 004567 003430      JSR      @5,STAER1      ;REPORT DAR INCORRECT

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837	005144	000167	177144			JMP	STAI56	;RESTART ROUTINE
838	005150	017767	173642	173712	STAI72:	MOV	@WC,WORK	;FETCH WORD COUNT
839	005156	001407				REQ	STAI73	;WORD COUNT OVERFLOWED
840	005160				EROR51:			
841	005160	012767	000072	173672	ERR72:	MOV	@72,ERCOUNT	;SET UP ERROR COUNT 72
842	005166	004567	003330			JSR	@5,STAFR	;REPORT WORD COUNT FAILED TO CLEAR
843	005172	000167	177116			JMP	STAI56	;RESTART ROUTINE
844	005176	017767	173616	173664	STAI73:	MOV	@CMA,WORK	;FETCH CMA
845	005204	012767	011624	173660		MOV	@OUTRUF+4,WORK1	;WHAT CMA SHOULD EQUAL
846	005212	026767	173654	173650		CMP	WORK1,WORK	;IS CMA CORRECT
847	005220	001407				REQ	LPST56	;CMA WAS CORRECT
848	005222				EROR52:			
849	005222	012767	000073	173630	ERR73:	MOV	@73,ERCOUNT	;SET UP ERROR COUNT 73
850	005230	004567	003340			JSR	@5,STAFR1	;REPORT CMA INCORRECT
851	005234	000167	177054			JMP	STAI56	;RESTART ROUTINE
852	005240	000004			LPST56:	SCOPE		;ENTER SCOPE LOOP
853	005242	004314				STAI56		

```

854
855
856      ;
857      ;IN THIS STATIC TEST THE ABILITY OF THE DISK CONTROL
858      ;TO INCREMENT THE TRACK REGISTER WILL BE TESTED,
859      ;
860      ;A ONE WORD WRITE WILL BE EXECUTED
861      ;DAE=0
862      ;DAP=177777
863      ;WC=-1
864      ;CMA=OUTBUF
865      ;
866      ;AT THE COMPLETION OF THE WRITE
867      ;DAR=0
868      ;DAE=1
869      ;
869 005244 052777 000400 173542 STAI74: BIS      @BITR,@DCS      ;CLEAR THE DISK
870 005252 012777 177777 173536      MOV      @177777,@WC      ;SET WORD COUNT TO -1
871 005260 012777 011620 173532      MOV      @OUTBUF,@CMA     ;SET UP CURRENT ADDRESS
872 005266 005077 173532      CLR      @DAE             ;CLEAR EXT. ADDR BITS
873 005272 012777 177777 173522      MOV      @177777,@DAR     ;SET DAR TO ALL ONES
874 005300 012777 000003 173506      MOV      @3,@DCS          ;GO WRITE ONE WORD
875 005306 005067 173556      CLR      WORK             ;LET'S WAIT FOR COMPLETION
876 005312 105777 173476      LTSWT: TSTB @DCS          ;TEST FOR NOT BUSY
877 005316 100414      RMI      STAI75           ;X-FER COMPLETE
878 005320 005267 173544      INC      WORK             ;+1 WAIT REG.
879 005324 001372      BNE     LTSWT            ;GO WAIT FOR NOT BUSY
880 005326 017767 173462 173534      MOV      @DCS,WORK        ;FETCH CONTENTS OF DCS
881 005334 012767 000074 173516 ERR74: MOV      @74,ERCOUNT      ;SET UP ERROR COUNT 74
882 005342 004567 003154      JSR      %5,STAER         ;REPORT ERROR X-FER NEVER COMPLETED
883 005346 000736      BR       STAI74           ;RESTART ROUTINE
884 005350 005777 173446      STAI75: TST      @DAR      ;DOES DAR=0
885 005354 001412      BEQ     STAI76           ;DAR OK
886 005356 017767 173440 173504      MOV      @DAR,WORK        ;FETCH DAR
887 005364 012767 000075 173466 ERR75: MOV      @75,ERCOUNT      ;SET UP ERROR COUNT 75
888 005372 004567 003124      JSR      %5,STAER         ;REPORT DAR DID NOT INC TO 0
889 005376 000167 177642      JMP     STAI74           ;ERROR RE-START ROUTINE
890 005402 017767 173416 173460 STAI76: MOV      @DAE,WORK    ;FETCH DAE
891 005410 042767 177774 173452      BIC     @177774,WORK      ;CLEAR DISK AND ERROR BITS
892 005416 022767 000001 173444      CMP     @1,WORK           ;DID DAE INC
893 005424 001410      BEQ     LPST74           ;DAE SHOULD EQUAL 1
894 005426 012767 000001 173436      MOV     @1,WORK1          ;WHAT DAE SHOULD CONTAIN
895 005434 012767 000076 173416 ERR76: MOV      @76,ERCOUNT      ;SET UP ERROR COUNT 76
896 005442 004567 003126      JSR     %5,STAER1         ;REPORT DAE NOT CORRECT
897 005446 000004      LPST74: SCOPE
898 005450 005244      STAI74
  
```



```

909
900
901      I
902      I IN THIS ROUTINE THE ABILITY OF THE CONTROL
903      I TO INCREMENT THE DISK NO. IS CHECKED
904      I
905      I ROUTINE PARAMETERS AT START
906      I DAE=00C0X3      (X=EXISTING DISK NO)
907      I DAP=177777
908      I AC=1
909      I CMA=OUTBUF
910      I DCS=3
911      I
912      I PARAMETERS AT THE END OF ROUTINE
913      I DAE=X+1
914      I DAP=0
915      I AC=0
916      I CMA=OUTBUF+2
917      I DCS=0
918      I
919      I
920      I
921      I
922      I
923      I
924      I
925      I
926      I
927      I
928      I
929      I
930      I
931      I
932      I
933      I
934      I
935      I
936      I
937      I
938      I
939      I
940      I
941      I
942      I
943      I
944      I
945      I
946      I
947      I
948      I
949      I
950      I
951      I
952      I
    STA177: MOV      FLAG,WORK1      I FETCH PROGRAM FLAG
    BIC      @17743,WORK1      I MASK DISK NO.
    BIS      @3,WORK1      I SET ADDR EXT. BITS
    MOV      WORK1,@DAE      I SET DAE REG
    MOV      @17777,@DAR      I DAR EQUALS ALL ONES
    MOV      @17777,@AC      I WORD COUNT SET FOR ONE WORD
    MOV      @OUTBUF,@CMA      I CURRENT ADDRESS SET UP
    BIS      @3,@DCS      I GO WRITE
    TSTB     @DCS      I IS RDY CLEARED
    BPL      STA100      I
    MOV      @DCS,WORK      I FETCH CONTROL WUG
    ERR77:  MOV      @77,ERCOUNT      I SET UP ERROR COUNT 77
    JSR      @5,STAER      I REPORT BUSY NOT SET
    BR       STA177      I RESTART ROUTINE
    STA100: CLR      WORK      I
    INXDSK: TSTB     @DCS      I IS X-FER COMPLETE
    BMI      STA101
    INC      WORK      I TEST READY SHOULD BE SET
    RNE      INXDSK      I GO CHECK AGAIN
    MOV      @DCS,WORK      I FETCH CONTENTS OF DCS
    ERR100: MOV      @100,ERCOUNT      I SET UP ERROR COUNT 100
    JSR      @5,STAER      I REPORT X-FER NOT COMPLETE
    JMP      STA177      I RESTART ROUTINE
    STA101: TST      @DAP      I IS DAR CLEARED
    BEQ      STA102      I YES
    MOV      @DAR,WORK      I FETCH DAR ITS NOT CLEAR
    ERR101: MOV      @101,ERCOUNT      I SET UP ERROR COUNT 101
    JSR      @5,STAER      I REPORT DAR NOT CLEAR.
    JMP      STA177      I RESTART ROUTINE
    STA102: INC      WORK1      I DAE SHOULD=THIS AT END X-FER
    CMP      WORK1,@DAE      I IS DAE CORRECT
    BEQ      LPST77      I DAE IS CORRECT
    MOV      @DAE,WORK      I FETCH CONTENTS OF DAE
    ERR102: MOV      @102,ERCOUNT      I SET UP ERROR COUNT 102
    
```

953 005710 004567 002660
954 005714 000167 177532
955 005720 000004
956 005722 005452

JSR 85,STAEP1
JMP STAI77
LPST77: SCOPE
STAI77

;REPORT DAE INCORRECT
;RESTART ROUTINE
;ENTER SCOPE LOOP

```

957
958
959
960      ;IN THIS ROUTINE THE PROGRAM WILL GENERATE A
961      ;NON-EXISTENT DISK ERROR THIS WILL BE DONE
962      ;BY ATTEMPTING A 2 WORD WRITE ON DISK 7
963      ;THE LAST TRACK AND THE LAST WORD ON THE
964      ;LAST TRACK
965      ;
966      ;IF DISK 7 IS THERE WE WILL RECEIVE
967      ;A NON-EXISTENT DISK ERROR WITH OVERFLOW
968      ;SET
969      ;
970      ;IF DISK 7 IS NOT THERE WE WILL
971      ;JUST RECEIVE A NON-EXISTENT DISK ERROR
972      ;
973      ;
974      ;
975      ;
976 005724 052777 000400 173062 STA103: BIS      @BIT0,@DCS      ;CLEAR THE DISK
977 005732 012777 000037 173064      MOV      @37,@DAE      ;SET ALL EXT ADDR. BITS
978 005740 012777 177777 173054      MOV      @177777,@DAR    ;SET DAR=TO ALL ONES
979 005746 012777 177776 173042      MOV      @177776,@WC     ;WORD COUNT=-2
980 005754 012777 011620 173036      MOV      @OUTBUF,@CMA    ;CURRENT ADDRESS=OUTBUF
981 005762 052777 000003 173024      BIS      @3,@DCS        ;GO WRITE
982 005770 005067 173074      CLR      WORK
983 005774 105777 173014      WAFBUS: TSTB     @DCS      ;IS RDY SET
984 006000 100414      BMI      STA104        ;YES EXIT
985 006002 005267 173062      INC      WORK          ;NO BUSY STILL SET
986 006006 001372      RNF      WAFBUS        ;GO WAIT FOR BUSY=0
987 006010 017767 173000 173052      MOV      @DCS,WORK      ;FETCH CONTENTS OF DCS
988 006016 012767 000103 173034 ERR103: MOV      @103,ERCOUNT    ;SET UP ERROR COUNT 103
989 006024 004567 002472      JSR      @5,STAER      ;REPORT BUSY SET
990 006030 000735      BR       STA103        ;RESTART ROUTINE
991 006032 032777 004000 172754 STA104: BIT      @BIT11,@DCS  ;IS NCD SET
992 006040 001011      BNE      STA105        ;YES! IS ERROR SET
993 006042 017767 172746 173020      MOV      @DCS,WORK      ;FETCH DCS
994 006050 012767 000104 173002 ERR104: MOV      @104,ERCOUNT    ;SET UP ERROR COUNT 104
995 006056 004567 002440      JSR      @5,STAER      ;REPORT NEED NOT SET
996 006062 000720      BR       STA103        ;RESTART ROUTINE
997 006064 005777 172724      STA105: TST      @DCS     ;IS ERROR FLAG SET
998 006070 100411      BMI      LPSX103       ;ERROR IS SET
999 006072 017767 172716 172770      MOV      @DCS,WORK      ;FETCH CONTENTS OF DCS
1000 006100 012767 000105 172752 ERR105: MOV      @105,ERCOUNT    ;SET UP ERROR COUNT 105
1001 006106 004567 002410      JSR      @5,STAER      ;REPORT ERROR NOT SET
1002 006112 000704      BR       STA103        ;RESTART ROUTINE
1003 006114 000004      LPSX103:SCOPE
1004 006116 005724      STA103      ;ENTER SCOPE LOOP

```

```

1005      |
1006      |; IN THIS TEST THE FEATURE OF CURRENT
1007      |; ADDRESS INHIBIT IS TESTED
1008      |
1009      |; DO A ONE WORD WRITE AND SEE
1010      |; IF CMA INCREMENTED AFTER THE X-FER
1011      |
1012      |
1013 006120 052777 000400 172666 ST105X: BIS      @BIT0,@DCS      ;CLEAR THE DISK
1014 006126 012777 011620 172664      MOV      @OUTBUF,@CMA ;SET UP CURRENT ADDR
1015 006134 012777 177777 172654      MOV      @-1,@WC      ;SET WORD COUNT TO -1
1016 006142 052777 000400 172654      BIS      @BIT0,@DAE    ;SET CURRENT ADDR, INHIBIT
1017 006150 105777 172640      TSTB    @DCS          ;TEST FOR READY
1018 006154 100406      BMI     LPX105        ;BRANCH IF READY SET
1019 006156 012767 000106 172674 ERR106: MOV      @106,ERCOUNT ;SET UP ERROP COUNT 106
1020 006164 004567 002332      JSR     @5,STAER      ;REPORT READY NOT SET
1021 006170 000753      BR      ST105X        ;TRY AGAIN
1022 006172 012777 000003 172614 LPX105: MOV      @3,@DCS      ;GO WRITE
1023 006200 105777 172610      TSTB    @DCS          ;TEST FOR NOT RDY
1024 006204 100006      BPL     LPX106        ;BRANCH IF RDY=0
1025 006206 012767 000107 172644 ERR107: MOV      @107,ERCOUNT ;SET UP ERROR COUNT 107
1026 006214 004567 002302      JSR     @5,STAER      ;REPORT RDY NOT CLEARED BY CMD.
1027 006220 000737      BR      ST105X        ;LOOP ON ERROR
1028 006222 005067 172642      LPX106: CLR     WORK      ;
1029 006226 105777 172562      WATRDY: TSTB    @DCS          ;
1030 006232 100411      BMI     LPX107        ;BRANCH IF RDY SET
1031 006234 005267 172630      INC     WORK          ;WAIT FOR RDY
1032 006240 001372      BNE     WATRDY        ;
1033 006242 012767 000110 172610 ERR110: MOV      @110,ERCOUNT ;SET UP ERROR COUNT 110
1034 006250 004567 002246      JSR     @5,STAER      ;READY NEVER SET AFTER X-FER
1035 006254 000721      BR      ST105X        ;LOOP ON EPROR
1036 006256 012767 011620 172606 LPX107: MOV      @OUTBUF,WORK1 ;WHAT CMA SHOULD BE
1037 006264 017767 172530 172576      MOV      @CMA,WORK    ;WHAT CMA IS
1038 006272 026767 172572 172572      CMP     WORK,WORK1    ;COMPARE
1039 006300 001406      BEQ     LPX108        ;BRANCH IF EQUAL
1040 006302 012767 000111 172550 ERR111: MOV      @111,ERCOUNT ;SET UP ERROR COUNT 111
1041 006310 004567 002260      JSR     @5,STAER1     ;REPORT THEY DID NOT CMP
1042 006314 000701      BR      ST105X        ;LOOP ON ERROR
1043 006316 000004      LPX108: SCOPE      ;ENTER SCOPE LOOP
1044 006320 006120      ST105X

```

1045									
1046									
1047									
1048									
1049									
1050									
1051									
1052									
1053									
1054	006322	052777	000400	172464	NXMTSM:	BIS	#BIT8,@DCS		ICLEAR THE DISK
1055	006330	012777	000340	172444		MOV	#340,@PS		ILOCK UP PROCESSOR
1056	006336	012777	177776	172452		MOV	#-2,@WC		ISSET UP WORD COUNT
1057	006344	012777	177776	172446		MOV	#177776,@CMA		ISSET UP CURRENT ADDRESS
1058	006352	052777	000063	172434		BIS	#63,@DCS		ISSUE WRITE
1059	006360	005067	172504			CLR	WORK		
1060	006364	005777	172424		INCNEM:	TST	@DCS		ITEST FOR ERROR
1061	006370	100430				BMI	TSTNEM		IBRANCH IF ERROR SET
1062	006372	105777	172416			TSTB	@DCS		ITEST FOR EPROP
1063	006376	100414				BMI	RDYERX		IREPORT NEM NOT SET
1064	006400	005267	172464			INC	WORK		IWAIT FOR ERROR
1065	006404	001367				RNE	INCNEM		
1066	006406	012767	000112	172444	ERR112:	MOV	#112,ERCOUNT		ISSET UP ERROR COUNT 112
1067	006414	017767	172374	172446		MOV	@DCS,WORK		IFETCH DCS FOR REPORT
1068	006422	004567	002074			JSR	#5,STAER		IREPORT ERROR
1069	006426	000735				BR	NXMTSM		ILOOP ON ERROR
1070	006430				RDYERX:				
1071	006430	012767	000113	172422	ERR113:	MOV	#113,ERCOUNT		ISSET UP ERROR COUNT 113
1072	006436	017767	172352	172424		MOV	@DCS,WORK		IREPORT TIME OUT
1073	006444	004567	002052			JSR	#5,STAER		ICONTROL NEVER COMPLETED WRITE
1074	006450	000724				BR	NXMTSM		ILOOP ON ERROR
1075	006452	032777	040000	172334	TSTNEM:	BIT	#BIT14,@DCS		
1076	006460	001011				BNE	HWDOK		IBRANCH IF HARD ERROR SET
1077	006462	012767	000114	172370	ERR114:	MOV	#114,ERCOUNT		ISSET UP ERROR COUNT 114
1078	006470	017767	172320	172372		MOV	@DCS,WORK		IREPORT HWD NOT SET BY NEM
1079	006476	004567	002020			JSR	#5,STAER		IREPORT HWD NOT SET
1080	006502	000707				BR	NXMTSM		ILOOP ON ERROR
1081	006504	032777	002000	172312	HWDOK:	BIT	#BIT10,@DAE		ITEST FOR NEM SET
1082	006512	001011				BNE	CLRNEM		INEM SET BE X-FER OK
1083	006514	012767	000115	172336	ERR115:	MOV	#115,ERCOUNT		ISSET UP ERROR COUNT 115
1084	006522	017767	172276	172340		MOV	@DAE,WORK		IREPORT HARD ERROR REGISTER
1085	006530	004567	001766			JSR	#5,STAER		IREPORT NEM NOT SET BY X-FER
1086	006534	000672				BR	NXMTSM		ILOOP ON ERROR
1087	006536	052777	000400	172250	CLRNEM:	BIS	#BIT8,@DCS		ICLEAR THE DISK
1088	006544	022777	000200	172242		CMF	#200,@DCS		IS ERROR CLEARED
1089	006552	001412				BEQ	CKHWD		ERROR FLAG CLEARED
1090	006554	012767	000116	172276	ERR116:	MOV	#116,ERCOUNT		ISSET UP ERROR COUNT 116
1091	006562	017767	172226	172300		MOV	@DCS,WORK		IFERROR NOT CLEARED BY DISK CLEAR
1092	006570	004567	001726			JSR	#5,STAER		IREPORT ERROR
1093	006574	000167	177522			JMP	NXMTSM		ILOOP ON ERROR
1094	006600	032777	040000	172206	CKHWD:	BIT	#BIT14,@DCS		IS HARD ERROR SET
1095	006606	001412				BEQ	CKNEM		IHWD CLEARED BY DISK CLEAR
1096	006610	012767	000117	172242	ERR117:	MOV	#117,ERCOUNT		ISSET UP ERROR COUNT 117
1097	006616	017767	172172	172244		MOV	@DCS,WORK		IREPORT HWD NOT CLEARED
1098	006624	004567	001672			JSR	#5,STAER		

1099	006630	000167	177466			JMP	NXMTSM	;LOOP ON ERROR
1100	006634	032777	002000	172162	CKNEM:	RIT	#BIT10,#DAE	;IS NEM CLEARED BY DISK CLEAR
1101	006642	001412				REQ	LPNEM	;NEM CLEARED BY DISK CLEAR
1102	006644	012767	000120	172206	ERR120:	MOV	#120,ERCOUNT	;SET UP ERROR COUNT 120
1103	006652	017767	172146	172210		MOV	#DAE,#ORK	;REPORT NEM NOT CLEARED BY DISK CLEAR
1104	006660	004567	001636			JSR	#5,STAEP	
1105	006664	000167	177432			JMP	NXMTSM	;LOOP ON ERROR
1106	006670	000004			LPNEM:	SCOPE		;ENTER SCOPE LOOP
1107	006672	006322				NXMTSM		

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1108
1109
1110
1111
1112
1113
1114
1115
1116 006674 012767 007000 171302 STA106: MOV      #INT106,204    ;SET UP INTERRUPT VECTOR
1117 006702 012777 000340 172072      MOV      #340,@PS      ;LOCK OUT ALL INTERRUPTS
1118 006710 005077 172110      CLR      @DAE         ;CLEAR ADDRESS REGISTERS
1119 006714 005077 172102      CLR      @DAP
1120 006720 012777 177777 172070      MOV      #177777,@WC   ;SET WORD COUNT TO -1
1121 006726 012777 011620 172064      MOV      @OUTBUF,@CMA  ;LOAD CURRENT ADDRESS
1122 006734 052777 000103 172052      BIS      #103,@DCS    ;GO WRITE (INTERRUPT ENABLED)
1123 006742 005000      CLR      %0          ;WAIT FOR RDY
1124 006744 005200      INC      %0
1125 006746 001376      RNE      ,-2
1126 006750 105777 172040      TSTB    @DCS         ;IS CONTROL STILL NOT RDY
1127 006754 100423      BMI     LP106        ;NO
1128 006756 017767 172032 172104      MOV      @DCS,WORK    ;YES!
1129 006764 012767 000121 172066 ERR121: MOV      #121,ERCOUNT  ;SET UP ERROR COUNT 121
1130 006772 004567 001524      JSR     %5,STAER     ;REPORT CONTROL STILL BUSY
1131 006776 000414      BR      STA110
1132
1133
1134
1135
1136 007000      ;
1137 007000 012767 000122 172052 INT106: MOV      #122,ERCOUNT  ;SET UP ERROR COUNT 122
1138 007006 017767 171770 172054 ERR122: MOV      @PS,WORK  ;FETCH PROCESSOR PRIORITY
1139 007014 022626      CMP     (6)+,(6)+
1140 007016 004567 001500      JSR     %5,STAER     ;REPORT DISK INTERRUPTED
1141 007022 000724      BR      STA106
1142 007024 000004      LP106: SCOPE        ;ENTER SCOPE LOOP
1143 007026 006674      STA106

```

```

1144
1145
1146      ;
1147      ;IN THIS ROUTINE THE PROGRAM WILL TEST
1148      ;THAT THE DISK WILL ONLY TRAP
1149      ;AT BR5 ONLY WHEN A INTERRUPT IS GENERATED
1150      ;BY CLEARING THE DONE
1151      ;PROCESSOR OPERATING AT PRIORITY6
1152      ;
1152 007030 012767 007134 171146 STA110: MOV      #INT110,204      ;SET UP INTERRUPT VECTOR
1153 007036 012777 000300 171736      MOV      #300,#PS      ;LOCK OUT ALL INTERRUPTS ABOVE
1154 007044 005077 171754      CLR      @DAE          ;CLEAR ADDRESS REGISTERS
1155 007050 005077 171746      CLR      @DAP
1156 007054 012777 177777 171734      MOV      #177777,#WC   ;SET WORD COUNT TO -1
1157 007062 012777 011620 171730      MOV      @OUTBUF,@CMA  ;LOAD CURRENT ADDRESS
1158 007070 052777 000103 171716      BIS      #103,@DCS     ;GO WRITE (INTERRUPT ENABLED)
1159 007076 005000      CLR      @0           ;WAIT FOR NOT BUSY
1160 007100 005200      INC      @0
1161 007102 001376      BNE     #-2
1162 007104 105777 171704      TSTB    @DCS          ;IS CONTROL STILL BUSY
1163 007110 100423      BMI     LP110         ;NO
1164 007112 017767 171676 171750      MOV      @DCS,WORK     ;YES!
1165 007120 012767 000123 171732 ERR123: MOV      #123,ERCOUNT   ;SET UP ERROR COUNT 123
1166 007126 004567 001370      JSR     @5,STAER      ;REPORT CONTROL STILL BUSY
1167 007132 000414      BR      STA112
1168
1169      ;
1170      ;PROCESSOR SHOULD NOT TRAP TO INT106
1171      ;PROCESSOR PRIORITY IS LOCKED AT 6
1172      ;
1172 007134 INT110:
1173 007134 012767 000124 171716 ERR124: MOV      #124,ERCOUNT   ;SET UP ERROR COUNT 124
1174 007142 017767 171634 171720      MOV      @PS,WORK     ;FFICH PROCESSOR PRIORITY
1175 007150 022626      CMP     (6)+,(6)+
1176 007152 004567 001344      JSR     @5,STAER      ;REPORT DISK INTERRUPTED
1177 007156 000402      BR      STA112
1178
1179 007160 LP110: SCOPE          ;ENTER SCOPE LOOP
1180 007162 007030      STA110
1181
1182      ;
1183      ;IN THIS ROUTINE THE PROGRAM WILL TEST
1184      ;THAT THE DISK WILL ONLY TRAP
1185      ;AT BR5 ONLY WHEN A INTERRUPT IS GENERATED
1186      ;BY CLEARING THE DONE
1187      ;PROCESSOR OPERATING AT PRIORITY5
1188      ;
1188 007164 012767 007270 171012 STA112: MOV      #INT112,204   ;SET UP INTERRUPT VECTOR
1189 007172 012777 000240 171602      MOV      #240,#PS     ;LOCK OUT ALL INTERRUPTS ABOVE
1190 007200 005077 171620      CLR      @DAE          ;CLEAR ADDRESS REGISTERS
1191 007204 005077 171612      CLR      @DAP
1192 007210 012777 177777 171600      MOV      #177777,#WC   ;SET WORD COUNT TO -1
1193 007216 012777 011620 171574      MOV      @OUTBUF,@CMA  ;LOAD CURRENT ADDRESS
1194 007224 052777 000103 171562      BIS      #103,@DCS     ;GO WRITE (INTERRUPT ENABLED)
1195 007232 005000      CLR      @0           ;WAIT FOR NOT BUSY
1196 007234 005200      INC      @0
1197 007236 001376      BNE     #-2

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1198 007240 105777 171550          TSTB   @DCS           ;IS CONTROL STILL BUSY
1199 007244 100423                   RMT    LP112         ;NO
1200 007246 017767 171542 171614   MOV    @DCS,WORK    ;YES!
1201 007254 012767 000125 171576   FRP125: MOV   @125,ERCOUNT ;SET UP ERROR COUNT 125
1202 007262 004567 001234           JSR    @5,STAER     ;REPORT CONTROL STILL BUSY
1203 007266 000414                   BR     STA114
1204
1205           ;PROCESSOR SHOULD NOT TRAP TO INT106
1206           ;PROCESSOR PRIORITY IS LOCKED AT 7
1207
1208 007270                   ;
1209 007270 012767 000126 171562   ERR126: MOV   @126,ERCOUNT ;SET UP ERROR COUNT 126
1210 007276 017767 171500 171564   MOV    @PS,WORK    ;FETCH PROCESSOR PRIORITY
1211 007304 022626                   CMP    (6)+,(6)+
1212 007306 004567 001210           JSR    @5,STAER     ;REPORT DISK INTERRUPTED
1213 007312 000402                   BR     STA114
1214
1215 007314 000004                   LP112: SCOPE        ;ENTER SCOPE LOOP
1216 007316 007164                   STA112
1217
1218
1219
1220           ;THIS ROUTINE WILL TEST THE ABILITY OF THE DISK CONTROL
1221           ;TO TRAP AT BR5 WHEN THE DONE FLAG IS SET.
1222
1223 007320 052777 000400 171466   STA114: BIS   @BIT0,@DCS   ;CLEAR THE DISK
1224 007326 012767 007424 170650   MOV    @INT114,204 ;SET UP DISK TRAP VECTOR
1225 007334 012777 000200 171440   MOV    @200,@PS     ;SET PROCESSOR TO PRIORITY 4
1226 007342 005077 171456           CLR    @DAE        ;CLEAR EXT ADDRESS BITS
1227 007346 005077 171450           CLR    @DAP        ;CLEAR LOW ORDER ADDRESS BITS
1228 007352 012777 177777 171436   MOV    @177777,@WC  ;SET WORD COUNT TO -1
1229 007360 012777 011620 171432   MOV    @OUTRUF,@CMA ;LOAD CURRENT ADDRESS
1230 007366 052777 000103 171420   BIS   @103,@DCS    ;WRITE (INTERRUPT ENABLE
1231 007374 005000                   CLR    @0
1232 007376 005200                   INC    @0           ;WAIT FOR INTERRUPT TO OCCUR
1233 007400 001376                   BNE   @-2
1234 007402 012767 000127 171450   ERR127: MOV   @127,ERCOUNT ;SET UP ERROR COUNT 127
1235 007410 017767 171400 171452   MOV    @DCS,WORK   ;FETCH CONTENTS OF DCS
1236 007416 004567 001100           JSR    @5,STAER     ;REPORT INTERRUPT NO INTERRUPT
1237 007422 000403                   BR     ADT1         ;RESTART ROUTINE
1238
1239
1240
1241 007424 022626                   ;
1242 007426 000004                   INT114: CMP   (6)+,(6)+   ;TRAP OK
1243 007430 007320                   SCOPE        ;ENTER SCOPE LOOP
1244                   STA114
1245           ;* * * ADDRESS TEST 1 * * *
1246           ;EXECUTE A ONE WORD WRITE
1247           ;IF THE TIMING ON THE DISK IS CORRECT
1248           ;THE TERMINATING ADDRESS IN THE DAP REGISTER
1249           ;WILL EQUAL THE ADDRESS +1 OF THE WORD
1250           ;THAT WAS WRITTEN
1251           ;
           ;NOTE: DATA IS NOT CHECKED IN THIS TEST.

```

```

1252
1253 007432 012706 001000      ;
1254 007436 012767 000001 171374 ADT1:  MOV      #1000,%6      ;SET UP STACK
1255 007444 012767 011620 171376      MOV      #1,WRDCT      ;SET UP WORD COUNT
1256 007452 005067 171366      MOV      @OUTBUF,BUF   ;SET UP CURRENT ADDRESS
1257 007456 005067 171360      CLR      DMA
1258 007462 052777 000400 171324 WRADT:  CLR      TRACK
1259 007470 104403      RIS      @BIT0,@DCS    ;CLEAR THE DISK
1260 007472 105777 171316      WRITE
1261 007476 100375      TSTB     @DCS          ;CHECK FOR READY
1262 007500 005777 171310      BPL      #-4
1263 007504 100011      TST      @DCS          ;CHECK FOR ERROR
1264 007506 017767 171302 171354      BPL      CHKADT        ;BRANCH IF NO ERROR
1265 007514 012767 000130 171336 ERR130: MOV      @DCS,WORK      ;SET UP ERROR COUNT 130
1266 007522 004567 000774      JSR      %5,STAER      ;REPORT ERROR
1267 007526 000755      BR       WRADT         ;LOOP ON ERROR
1268 007530 016767 171310 171334 CHKADT: MOV      DMA,WORK1
1269 007536 005267 171330      INC      WORK1         ;WHAT DAR SHOULD CONTAIN
1270 007542 017767 171254 171320      MOV      @DAP,WORK
1271 007550 026767 171316 171312      CMP      WORK1,WORK
1272 007556 001406      REQ      INCDAR        ;IS DAR CORRECT
1273 007560 012767 000131 171272 ERR131: MOV      #131,ERCOUNT  ;YES DAR IS CORRECT
1274 007566 004567 001002      JSR      %5,STAER1     ;SET UP ERROR COUNT 131
1275 007572 000733      BR       WRADT         ;REPORT DAR NOT CORRECT
1276 007574 022767 004000 171270 INCDAR: CMP      #4000,WORK1  ;LOOP ON ERROR
1277 007602 001405      REQ      LPADT         ;IS IT THE LAST ADDR.
1278 007604 016767 171262 171232      MOV      WORK1,DMA     ;LAST ADDRESS EXIT
1279 007612 000167 177644      JMP      WRADT         ;SET UP FOR NEXT ADDR.
1280 007616 032777 004000 171154 LPADT:  BIT      @BIT11,@SWR   ;CHECK NEXT ADDRESS
1281 007624 001402      BEQ      #-6          ;LOOP ON TEST
1282 007626 000167 177600      JMP      ADT1         ;NO:
1283      ;
1284      ;
1285      ;
1286      ;
1287      ;
1288      ;
1289      ;
1290      ;
1291      ;
1292      ;
1293      ;
1294      ;
1295      ;
1296 007632 012706 001000      ;
1297 007636 012767 000001 171174 ADT2X:  MOV      #1000,%6      ;SET UP STACK
1298 007644 012767 011630 171176      MOV      #1,WRDCT      ;SET UP WORD COUNT
1299 007652 005067 171166      MOV      @INBUF,BUF   ;SET UP CURRENT ADDRESS
1300 007656 005067 171160      CLR      DMA
1301 007662 052777 000400 171124 ROADT:  CLR      TRACK
1302 007670 104405      RIS      @BIT0,@DCS    ;CLEAR THE DISK
1303 007672 105777 171116      READ
1304 007676 100375      TSTB     @DCS          ;CHECK FOR READY
1305 007700 005777 171110      BPL      #-4
1306      TST      @DCS          ;CHECK FOR ERROR

```

1306	007704	100011				RPL	XCHKDI		;BRANCH IF NO ERROR
1307	007706	017767	171102	171154		MOV	@DCS,WORK		
1308	007714	012767	000132	171136	EPR132:	MOV	@132,ERCOUNT		;SET UP ERROR COUNT 132
1309	007722	004567	000574			JSR	%5,STAER		;REPORT ERROR
1310	007726	000755				RP	ROADT		;LOOP ON ERROR
1311	007730	016767	171110	171134	XCHKDI:	MOV	DMA,WORK1		
1312	007736	005267	171130			INC	WORK1		;WHAT DAR SHOULD CONTAIN
1313	007742	017767	171054	171120		MOV	@DAR,WORK		
1314	007750	026767	171116	171112		CMP	WORK1,WORK		;IS DAR CORRECT
1315	007756	001406				REQ	ADDAR		;YES DAR IS CORRECT
1316	007760	012767	000133	171072	ERR133:	MOV	@133,ERCOUNT		;SET UP ERROR COUNT 133
1317	007766	004567	000602			JSR	%5,STAER1		;REPORT DAR NOT CORRECT
1318	007772	000733				RR	ROADT		;LOOP ON ERROR
1319	007774	022767	004000	171070	ADDAR:	CMP	@4000,WORK1		;IS IT THE LAST ADDR.

1320	010002	001405			REQ	LPADT2		!LAST ADDRESS EXIT
1321	010004	016767	171062	171032	MOV	WORK1,DMA		!SET UP FOR NEXT ADDR
1322	010012	000167	177644		JMP	ROADT		!CHECK NEXT ADDRESS
1323	010016	032777	004000	170754	LPADT2: BIT	@BIT11,@SWP		!LOOP ON TEST
1324	010024	001402			REQ	,+6		!NO:
1325	010026	000167	177600		JMP	ADT2X		!YES! BIT11 SET IN SWP
1326								
1327								
1328								
1329								
1330								
1331								
1332	010032	104001			EMT+1			!REPORT END
1333	010034	011542			END			
1334	010036	013700	000042		MOV	@42,%0		!GET MONITOR ADDRESS
1335	010042	001404			BEQ	LXIT		!SKIP IF NOT MONITOR LOAD
1336	010044	004710			LOGICAL: JSR	7,(0)		!GO TO MONITOR
1337	010046	000240			NOP			
1338	010050	000240			NOP			
1339	010052	000240			NOP			
1340	010054	000167	171142		LXIT: JMP	STAI1		!RESTART TEST
1341								
1342								
1343								
1344								
1345	010060	032777	004000	170712	LOOP: BIT	@BIT11,@SWP		!TST FOR BIT 11
1346	010066	001402			BEQ	,+6		!BIT 11 NOT SET
1347	010070	013646			MOV	@(6)+,-(6)		
1348	010072	000002			PTI			!BIT 11 SET! LOOP ON TEST
1349	010074	005767	170766		TST	PASS		!TEST TO SET UP PASS COUNT
1350	010100	001003			BNE	,+10		!PASS COUNT SET
1351	010102	012767	000025	170756	MOV	@25,PASS		!SET UP PASS COUNT
1352	010110	005367	170752		DEC	PASS		!SUB, =1 EACH PASS
1353	010114	001402			BEQ	,+6		
1354	010116	013646			MOV	@(6)+,-(6)		
1355	010120	000002			PTI			!LOOP ON TEST
1356	010122	062716	000002		ADD	@2,(6)		!INDEX POINTER FOR NEXT TEST
1357	010126	000002			PTI			!EXIT TO NEXT TEST

```
1358
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1360
1361
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1363
1364
1365
1366
1367
1368 010130 016705 170672
1369 010134 016745 170702
1370 010140 016745 170700
1371 010144 016745 170700
1372 010150 016745 170664
1373 010154 005115
1374 010156 005215
1375 010160 011604
1376 010162 014467 170702
1377 010166 042767 177600 170674
1378 010174 016745 170670
1379 010200 000002
1380
1381
1382
1383
1384
1385
1386
```

DISK: MOV DBR,85 ;SET UP TO LOAD DISK REG
MOV TRACK,-(5) ;LOAD TRACK NUMBER
MOV DMA,-(5) ;LOAD WORD ADDRESS
MOV RUF,-(5) ;SET UP CURRENT ADDRESS
MOV WPDCT,-(5) ;LOAD WORD COUNT
COM (5) ;SET UP TWO'S COMPLEMENT
INC (5)
MOV (6),84
MOV -(4),WORK ;
BIC 8177600,WORK ;MASK FUNCTION BITS
MOV WORK,-(5) ;LOAD FUNCTION REG.
PTI ;RETURN FROM TRAP

```

1387      |
1388      |
1389      |
1390      |
1391      |
1392      |
1393      |
1394      |ROUTINE TO ALLOW THE OPERATOR TO SET BITS
1395      |IN THE I/O REGISTERS VIA THE SWITCH REGISTER
1396      |
1397      |WORD COUNT REGISTER
1398      010202 017777 170572 170606 SELWC: MOV    @SWR,@WC          ;MOV SWR INTO WORD COUNT REG
1399      010210 000774          BR      SELWC
1400      |
1401      |CURRENT ADDRESS REGISTER
1402      010212 017777 170562 170600 SELCMA: MOV   @SWR,@CMA        ;MOV SWR INTO CURRENT ADDR REG
1403      010220 000774          BR      SELCMA
1404      |
1405      |DISK ADDRESS REGISTER
1406      010222 017777 170552 170572 SELDAR: MOV   @SWR,@DAR        ;MOV SWR INTO DISK ADDR REG
1407      010230 000774          BR      SELDAR
1408      |
1409      |DISK ADDRESS EXT AND ERROR REGISTER
1410      010232 017777 170542 170564 SELDAE: MOV   @SWR,@DAE        ;MOV SWR INTO DISK ADDR EXT REG
1411      010240 000774          BR      SELDAE
1412      |
1413      |DATA BUFFER REGISTER
1414      010242 017777 170532 170556 SELDBR: MOV   @SWR,@DBR        ;MOV SWR INTO DATA BUFFER
1415      010250 000774          BR      SELDBR
1416      |
1417      |
1418      |LOOK AHEAD REGISTER
1419      010252 017700 170554  MOVLK: MOV    @ADS,@O          ;FETCH LOOK AHEAD
1420      010256 000005          RESET          ;DISPLAY IN LIGHTS
1421      010260 000005          RESET
1422      010262 000773          BR      MOVLK
1423      |
1424      |DISK CONTROL STATUS REGISTER
1425      010264 012777 000340 170510 SELDCS: MOV    @340,@PS          ;LOCK UP INTERRUPTS
1426      010272 012777 177777 170516          MOV    @177777,@WC          ;SET WORD COUNT =1 WORD
1427      010300 012777 011620 170512          MOV    @OUTBUF,@CMA        ;SET UP CURRENT ADDRESS
1428      010306 017777 170466 170500          MOV    @SWR,@DCS          ;MOV SWR INTO CONTROL REG
1429      010314 032777 000001 170472          BIT    @BIT0,@DCS          ;IS FUNCTION BITS SET
1430      010322 001760          REQ    SELDCS              ;FUNCTION BITS NOT SET
1431      010324 105777 170464          DKBUSY: TSTB  @DCS          ;TEST FOR DISK READY
1432      010330 100375          BPL   DKRUSY              ;DISK STILL NOT READY
1433      010332 000754          BR    SELDCS              ;DISK NOT BUSY SELECT NEW CR
1434      |
1435      |
1436      |
1437      |
1438      |
1439      |
1440      |

```

```

1441
1442
1443      ;
1444      ;THIS ROUTINE ENABLES THE OPERATOR TO SELECT A TRACK STATICLY
1445      ;THE ROUTINE DOES A ONE WORD READ TO SELECT THE TRACK
1446      ;THE OPERATOR MAY CHANGE THE SWITCH REGISTER AT ANY TIME
1447      ;SWR6=0 EQUALS THE TRACK NUMBER
1448      ;SWR9=7 EQUALS THE DISK NUMBER
1449      ;
1449 010334 052777 000400 170452 STAMP:  BIS      @BITB,@DCS
1450 010342 017767 170432 170522      MOV      @SWR,WORK1      ;FETCH SWR
1451 010350 016767 170516 170512      MOV      WORK1,WORK
1452 010356 042767 176000 170504      BIC      @176000,WORK      ;MASK DISK AND TRACK NO.
1453 010364 006067 170500      ROR      WORK
1454 010370 006067 170474      ROR      WORK
1455 010374 006067 170470      ROR      WORK
1456 010400 006067 170464      ROR      WORK
1457 010404 006067 170460      ROR      WORK
1458 010410 016777 170454 170406      MOV      WORK,@DAE      ;DISK EXT. ADDR. REG. LOADED
1459 010416 017767 170356 170444      MOV      @SWR,WORK
1460 010424 000367 170440      SWAB     WORK
1461 010430 006167 170434      ROL      WORK
1462 010434 006167 170430      ROL      WORK
1463 010440 006167 170424      ROL      WORK
1464 010444 042767 003777 170416      BIC      @3777,WORK
1465 010452 016777 170412 170342      MOV      WORK,@DAR      ;DISK ADDRESS REG LOADED
1466 010460 012777 011630 170332      MOV      @INBUF,@CMA      ;LOAD CURRENT ADDRESS
1467 010466 012777 177777 170322      MOV      @177777,@WC      ;LOAD WORD COUNT
1468 010474 052777 000005 170312      BIS      @5,@DCS      ;GO AND READ
1469 010502 105777 170306      CTIBUSY: TSTB @DCS      ;TEST FOR CONTROL READY
1470 010506 100375      BPL      CTIBUSY      ;WAIT FOR CONTROL READY
1471 010510 026777 170356 170262 SRCHG:  CMP      WORK1,@SWR
1472 010516 001306      BNE      STAMP      ;SWR HAS CHANGED
1473 010520 000773      BR       SRCHG      ;SWR HAS NOT CHANGED
1474      ;
1475      ;
1476      ;
1477      ;
1478      ;
1479      ;

```

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1480
1481
1482      ;
1483      ;ROUTINE TO REPORT ERROR COUNT AND CONTENTS OF ONE REGISTER
1484      ;
1485      ;STAER1: JSP      %5,CONV      ;CONVERT OCTAL TO ASCII
1486      ;        WORK      ;DATA TO BE CONVERTED
1487      ;        MES6      ;ADDRESS OF MESSAGE
1488      ;        6
1489      ;        JSP      %5,CONV      ;CONVERT OCTAL TO ASCII
1490      ;        ERPCOUNT   ;ERROR COUNT TO BE CONVERTED
1491      ;        HED5      ;ADDRESS OF MESSAGE
1492      ;        3
1493      ;        EMT      +0          ;REPORT MESSAGE
1494      ;        HED5A
1495      ;        HED5
1496      ;        MES6
1497      ;        -1
1498      ;        BIT      @BIT10,@SWR
1499      ;        REQ      ,+4
1500      ;        HALT
1501      ;        RTS      %5          ;EXIT ROUTINE
1502
1503      ;
1504      ;ROUTINE TO REPORT ERROR COUNT AND THE CONTENTS OF TWO REGISTERS
1505      ;
1506      ;
1507      ;STAER1: JSR      %5,CONV      ;CONVERT OCTAL TO ASCII
1508      ;        WORK      ;DATA TO BE CONVERTED
1509      ;        MES6      ;ADDRESS OF MESSAGE
1510      ;        6
1511      ;        JSR      %5,CONV      ;CONVERT OCTAL TO ASCII
1512      ;        WORK1     ;DATA TO BE CONVERT
1513      ;        MES5      ;ADDRESS OF MESSAGE
1514      ;        6
1515      ;        JSR      %5,CONV      ;CONVERT OCTAL TO ASCII
1516      ;        ERPCOUNT   ;ERROR COUNT TO BE CONVERTED
1517      ;        HED5      ;ADDRESS OF MESSAGE
1518      ;        3
1519      ;        EMT      +0          ;REPORT MESSAGE
1520      ;        HED5A
1521      ;        HED5
1522      ;        MES5
1523      ;        MES6
1524      ;        -1
1525      ;        BIT      @BIT10,@SWR
1526      ;        REQ      ,+4
1527      ;        HALT
1528      ;        RTS      %5          ;EXIT ROUTINE
1529
1530      ;
1531      ;ROUTINE TO DECODE EMT CALLS
1532      ;EMT+1=TYPE ONE LINE OF TEXT
1533      ;EMT+0=TYPE A SERIES OF LINES
1533      ;EMTRP: MOV      (6),%0
  
```


1534 010664 022740 104001
1535 010670 001103
1536 010672 000400

CMP @EMT+1,-(0)
RNE TYP
RP TYP

;WAS THE CALL EMT+1
;NO! TYPE A SERIES OF LINES OF TEXT
;YES TYPE ONE LINE OF TEXT

```

1537
1538
1539 010674 011600
1540 010676 062716 000002
1541 010702 011000
1542 010704 112067 000164
1543 010710 122767 000100 000156
1544 010716 001005
1545 010720 005067 000150
1546 010724 004767 000030
1547 010730 000002
1548 010732 122767 000045 000134
1549 010740 001442
1550 010742 122767 000042 000124
1551 010750 001443
1552 010752 004767 000002
1553 010756 000752
1554 010760 032777 040000 170012
1555 010766 001026
1556 010770 116777 000100 170006
1557 010776 105777 170006
1558 011002 100375
1559 011004 122767 000015 000062
1560 011012 001003
1561 011014 012767 000011 000054
1562 011022 005767 000050
1563 011026 001406
1564 011030 005367 000042
1565 011034 116767 166740 000032
1566 011042 000746
1567 011044 000207
1568 011046 112767 000015 000020
1569 011054 004767 177700
1570 011060 112767 000012 000006
1571 011066 004767 177666
1572 011072 000704
1573 011074 000000
1574 011076 000000
1575
1576 011100 011600
1577 011102 062716 000002
1578 011106 011067 000014
1579 011112 022767 177777 000006
1580 011120 001001
1581 011122 000002
1582 011124 104001
1583 011126 000000
1584 011130 000763
1585
1586
1587
1588
1589
1590

;SUBROUTINE TO OUTPUT ASCII MESSAGE ON TELETYPE PRINTER.
TYP:  MOV  @%6,%0 ;GET ADDRESS THAT CONTAINS MESSAGE ADDRESS
      ADD  @2,%%6 ;SET UP EXIT.
      MOV  @%0,%0 ;ADDRESS OF MESSAGE TO FO.
TYPA: MOVB (0)+,TYPDAT ;GET CHARACTER
      CMPB @100,TYPDAT ;CHECK FOR "0" CHARACTER
      BNE  TYPC ;BRANCH IF NOT "0".
      CLR  TYPDAT ;OUTPUT NULL TO
      JSR  %7,TYPD ;CLEAR BUFFER
      RTI  ;TERMINATOR CHAR, DONE, EXIT.
TYPC: CMPB  @45,TYPDAT ;CHECK FOR "%".
      BEQ  TYPF ;BRANCH IF "%".
      CMPB  @42,TYPDAT ;NOT "%". CHECK FOR "0".
      BEQ  TYPG ;BRANCH IF "0"
      JSR  %7,TYPD ;TYPE CHAR IN TYPDAT
      BR   TYPA
TYPD: BIT  @BIT14,@SWR
      BNE  TYEXIT
      MOVB TYPDAT,@TPB ;OUTPUT CHARACTER TO PRINTER
      TSTB @TPS ;WAIT FOR DONE FLAG.
      BPL  .-4
      CMPB @15,TYPDAT ;CHECK FOR CR
      BNE  18 ;NO - SKIP
      MOV  @9,,NULL ;SET NULL COUNTER
      TST  NULL ;TEST COUNTER
      BEQ  TYEXIT ;ZERO - EXIT
      DEC  NULL ;DECREMENT
      MOVB 0,TYPDAT ;ZERO OUTPUT
      BR   TYPD ;OUTPUT NULL
TYEXIT: RTS  %7 ;EXIT
TYPF:  MOVB @15,TYPDAT ;MOVE CARRIAGE RETURN CODE TO TYPDAT
      JSR  %7,TYPD ;GO TYPE CHAR.
TYPG:  MOVB @12,TYPDAT ;MOVE LF CODE TO TYPDAT.
      JSR  %7,TYPD ;GO TYPE CHAR.
      BR   TYPA
TYPDAT: 0
NULL: 0
;SUBROUTINE TO OUTPUT A SERIES OF ASCII MESSAGES ON TELETYPE PRINTER
TYP5:  MOV  @%6,%0 ;GET ADDRESS THAT CONTAINS MESSAGE ADDRESS
      ADD  @2,%%6 ;UPDATE TO NEXT MESSAGE ADDRESS
      MOV  @%0,TYPSB ;ADDRESS OF MESSAGE TO TYPSB
      CMP  @-1,TYPSR ;CHECK FOR TERMINATOR
      BNE  TYP5A ;BRANCH IF NOT TERMINATOR.
      RTI  ;TERMINATOR, EXIT
TYP5A: EMT  +1 ;CALL ON TYP SUB TO TYPE MESSAGE
TYP5B: 0 ;ADDRESS OF MESSAGE GOES HERE
      BR   TYP5 ;GO PROCESS NEXT MESSAGE
;
;
;
;OCTAL TO ASCII CONVERT ROUTINE
;

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ES

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1591          ;ENTER ROUTINE AS FOLLOWS
1592          ;JSR#5,CONV
1593          ;ADDR#ADDRESS OF NUMBER TO BE CONVERTED
1594          ;ADDR BYTE#LSB OF WHERE ASCII IS GOING
1595          ;ASCII#THE NUMBER OF ASCII CHAR. TO BE CONVERTED
1596          ;
1597          ;
1598 011132 013567 000054  CONV:  MOV    @5+,ACNVX    ;VALUE OF # TO BE CONVERTED
1599 011136 012501          MOV    5+,@1      ;ASCII ADDR
1600 011140 012502          MOV    5+,@2      ;# OF ASCII CHAR
1601 011142 060201          ADD    @2,@1
```

```

1602
1603 011144 016703 000042          ACVNI  MOV    ACNVX,%3
1604 011150 042703 177770          BIC    #177770,%3      ;ISOLATE LEAST SIGNIFICANT OCTAL#
1605 011154 062703 000060          ADD    #60,%3         ;SET UP ASCII#
1606 011160 110341          MOVNB  %3,-(1)        ;STORE ASCII CHAR
1607 011162 042767 000007 000022          BIC    #7,ACNVX
1608 011170 006067 000016          ROR    ACNVX          ;ROTATE OCTAL#
1609 011174 006067 000012          ROR    ACNVX
1610 011200 006067 000006          ROR    ACNVX
1611 011204 005302          DEC    %2             ;-1 FROM ASCII CHAR COUNT
1612 011206 001356          RNE    ACVN
1613 011210 000205          RTS    %5             ;EXIT # CONVERTED
1614 011212 000000          ACNVX: 0             ;WORK REGISTER#
1615
1616
1617          ;
1618          ;POWER DOWN ROUTINE
1619          ;ABORT DISK AND HALT
1620 011214 052777 000400 167572 DOWN:  RIS    #BIT0,%DCS      ;ABORT DISK
1621 011222 012767 011232 166574          MOV    #UP,24
1622 011230 000000          HALT
1623
1624 011232 012767 011214 166564 UP:    MOV    #DOWN,24
1625 011240 012706 001000          MOV    #1000,%6
1626 011244 012767 177324 167616          MOV    #-300,,WORK
1627 011252 000005          TIMCNT: RESET
1628 011254 005267 167610          INC    WORK          ;TIMEOUT
1629 011260 001374          RNE    TIMCNT
1630 011262 104001          FMT+1          ;REPORT
1631 011264 011574          PRWF
1632 011266 000167 167604          JMP    START        ;START TEST
1633
1634
1635
1636          ;ROUTINE TO SET ACTION ENABLE OF MA/MF PARITY MEMORIES
1637          ;CALL JSR PC,MAMF
1638
1639          172100          PARCSR=172100
1640          000114          PARVEC=114
1641          000004          ERRVEC=4
1642          000006          SP=%6
1643
1644 011272 012737 011364 000114 MAMF:  MOV    #PARSRV,%PARVEC ;SET PARITY INTERRUPT VECTOR
1645 011300 012737 000340 000116          MOV    #340,%PARVEC+2 ;AND PRIORITY LEVEL 7 ON INTERRUPT
1646 011306 013746 000004          MOV    #ERRVEC,-(SP) ;SAVE CURRENT ERROR VECTOR
1647 011312 013746 000006          MOV    #ERRVEC+2,-(SP) ;AND PRIORITY LEVEL
1648 011316 012737 000006 000004          MOV    #ERRVEC+2,%ERRVEC
1649 011324 012737 000002 000006          MOV    #PTI,%ERRVEC+2
1650 011332 012700 172100          MOV    #PARCSR,%0    ;GET FIRST CSR ADDRESS
1651 011336 012702 000001          MOV    #1,%2
1652 011342 012720 000001 18:    MOV    #1,(0)+      ;SET ACTION ENABLE IF AVAILABLE
1653 011346 006302          ASL    %2           ;SHIFT AVAILABILITY INDICATOR
1654 011350 103374          BCC    18
1655 011352 012637 000006          MOV    (SP)+,%ERRVEC+2 ;RESTORE ERROR VECTOR

```

```

1656 011356 012637 000004      MOV      (SP)+,0@ERRVEC ;PRIORITY LEVEL AND INTERRUPT VECTOR
1657 011362 000207              RTS      @7
1658                               ;PARITY ERROR SERVICE ROUTINE
1659                               ;WHEN A PARITY ERROR IS DETECTED THE ROUTINE SEARCHES
1660                               ;MEMORY FOR THE PARITY ERROR. WHEN THE ERROR
1661                               ;IS DETECTED THE PROGRAM HALTS WITH THE ADDRESS
1662                               ;CAUSING THE ERROR IN R0.
1663                               ;TO CONTINUE PRESS CONTINUE.
1664 011364 104001      PARSRV; EMT+1
1665 011366 011547      PARERR
1666 011370 012737 011416 000114      MOV      @28,@@PARVEC ;REPOSITION PARITY ERROR INTERRUPT
1667 011376 012737 011444 000004      MOV      @48,@@ERRVEC ;SET TIME OUT TRAP
1668 011404 005037 000006      CLR      @@ERRVEC+2
1669 011410 005000      CLR      @0
1670 011412 005720      18:    TST      (0)+ ;SCAN MEMORY
1671 011414 000776      BR      18
1672 011416 000000      28:    HALT ;PARITY ERROR = ADDRESS CAUSING
1673                               ;ERROR IS IN REGISTER 0
1674 011420 000005      38:    RESET
1675 011422 012737 011364 000114      MOV      @PARSRV,@@PARVEC ;RESTORE PARITY VECTOR
1676 011430 012737 000006 000004      MOV      @ERRVEC+2,@@ERRVEC ;RESTORE TIME OUT HALT
1677 011436 004767 177630      JSP     @7,MAMP
1678 011442 000002      PTI
1679 011444 000000      48:    HALT ;ERROR = PARITY ERROR NOT DETECTED ON SCAN.
1680 011446 000764      BR      38 ;4(SP) CONTAINS PC WHERE
1681                               ;PARITY ERROR WAS ORIGINALLY DETECTED.

```

1682						
1683	011450	000000			TEXBUF: 0	
1684	011452	000000			TSTCH: 0	
1685						
1686						
1687						
1688						
1689						
1690					ERROR MESSAGE HEADERS	
1691						
1692						
1693						
1694	011454	040045			HED5A: .EVEN	
1695	011456	020040	020040	051105	HED5: .ASCII /%#/	
1696	011464	047522	020122	047503		ERROR COUNT %/
1697	011472	047125	020124	100		
1698						
1699						
1700					MESSAGE TRAILERS	
1701						
1702						
1703						
1704						
1705	011477	040	020040	020040	MESS: .ASCII /	GOOD DATA %/
1706	011504	020040	047507	042117		
1707	011512	042040	052101	020101		
1708	011520	040040				
1709						
1710						
1711						
1712	011522	020040	020040	020040	MESS: .ASCII /	BAD DATA %/
1713	011530	041040	042101	042040		
1714	011536	052101	040101			
1715						
1716						
1717						
1718	011542	042445	042116	100	END: .ASCII /%END%/	
1719	011547	045	042515	047515	PARERR: .ASCII /%MEMORY PARITY ERROR%/	
1720	011554	054522	050040	051101		
1721	011562	052111	020131	051105		
1722	011570	047522	040122			
1723	011574	020045	047520	042527	PRWF: .ASCII /% POWER HAS FAILED%/	
1724	011602	020122	040510	020123		
1725	011610	040506	046111	042105		
1726	011616	100				
1727						
1728						
1729		011620				
1730	011620	000000	000000	000000	OUTBUF: .EVEN	0,0,0,0
1731	011626	000000			.WORD	
1732						
1733						
1734	011630	000000	000000	000000	INBUF: .WORD	0,0,0,0
1735	011636	000000				

1736			
1737			
1738			
1739			
1740	000001		.END

ACNVX	011212	1598*	1603	1607*	1608*	1609*	1610*	1614*						
ACVN	011144	1603*	1612											
ADDAP	007774	1315	1319*											
ADS	001032	133*	141*											
ADT1	007432	79	1237	1253*	1287									
ADT2X	007632	82	1296*	1325										
BIT0	= 000001	6*	461	463	498	611	613	647	762	764	797	1429		
BIT1	= 000002	7*												
BIT10	= 002000	16*	1081	1100	1497	1524								
BIT11	= 004000	17*	991	1280	1323	1345								
BIT12	= 010000	18*												
BIT13	= 020000	19*												
BIT14	= 040000	20*	1075	1094	1554									
BIT15	= 100000	21*												
BIT2	= 000004	8*												
BIT3	= 000010	9*												
BIT4	= 000020	10*												
BIT5	= 000040	11*												
BIT6	= 000100	12*												
BIT7	= 000200	13*												
BIT8	= 000400	14*	284	308	352	375	401	422	570	722	869	976	1013	1016
		1054	1087	1223	1258	1301	1449	1620						
BIT9	= 001000	15*												
BUF	001050	14*	1255*	1298*	1371									
CATST1	001776	323*	325											
CHKADT	007530	1263	1268*											
CKHWD	006600	1089	1094*											
CKNEM	006634	1095	1100*											
CLRNEM	006536	1082	1087*											
CMA	001020	12*	209	296*	297	307*	309	323*	324	327	424*	475	545	572*
		624	697	724*	775	844	871*	925*	980*	1014*	1037	1057*	1121*	1157*
		1193*	1229*	1402*	1427*	1466*								
CONV	011132	1484	1488	1506	1510	1514	1598*							
CTBUSY	010502	1469*	1470											
DAE	001024	130*	240	387*	388	400*	402	454	519	524	526	604	676	678
		754	818	823	825	872*	890	922*	949	951	977*	1016*	1081	1084
		1100	1103	1118*	1154*	1190*	1226*	1410*	1458*					
DAR	001022	129*	230	363*	364	374*	376	378	460	531	610	683	761	830
		873*	884	886	923*	942	944	978*	1119*	1155*	1191*	1227*	1270	1313
		1406*	1465*											
DBR	001026	131*	250	1368	1414*									
DCS	001014	126*	195	270*	271	283*	284*	285	308*	311	352*	375*	401*	422*
		426*	427	429	436	440	446	498*	499	501	507	511	516	518
		570*	574*	575	577	584	588	594	647*	648	650	656	660	665
		667	722*	726*	727	729	736	740	746	797*	798	800	806	810
		815	817	869*	874*	876	880	926*	927	929	934	938	976*	981*
		983	987	991	993	997	999	1013*	1017	1022*	1023	1029	1054*	1058*
		1060	1062	1067	1072	1075	1078	1087*	1088	1091	1094	1097	1122*	1126
		1128	1158*	1162	1164	1194*	1198	1200	1223*	1230*	1235	1258*	1260	1262
		1264	1301*	1303	1305	1307	1428*	1429	1431	1449*	1468*	1469	1620*	
DISK	010130	170	1368*											
DKBUSY	010324	1431*	1432											
DMA	001044	146*	178*	1256*	1268	1278*	1299*	1311	1321*	1370				
DOWN	011214	175	1620*	1624										

EMTRP	010662	168	1533*																
END	011542	1333	1718*																
ERCOUN	001060	152*	198*	202*	211*	221*	232*	242*	252*	262*	275*	288*	300*	312*					
		328*	343*	355*	367*	379*	391*	404*	431*	443*	451*	457*	465*	472*					
		480*	503*	513*	521*	528*	536*	542*	550*	579*	591*	601*	607*	615*					
		621*	629*	652*	662*	673*	680*	688*	694*	702*	731*	743*	751*	758*					
		766*	772*	780*	802*	812*	820*	827*	835*	841*	849*	881*	887*	895*					
		930*	939*	945*	952*	988*	994*	1000*	1019*	1025*	1033*	1040*	1066*	1071*					
		1077*	1083*	1090*	1096*	1102*	1129*	1137*	1165*	1173*	1201*	1209*	1234*	1265*					
		1273*	1308*	1316*	1489	1515													
EROR1	002466	430*																	
FROR10	003026	502*																	
EROR11	003072	512*																	
EROR12	003132	520*																	
EROR13	003164	527*																	
EROR14	003226	535*																	
EROR15	003254	541*																	
EROR16	003316	549*																	
EROR17	003412	578*																	
FROR2	002542	442*																	
EROR20	003466	590*																	
EROR21	003536	597	600*																
FROR22	003564	606*																	
FROR23	003626	614*																	
EROR24	003654	620*																	
EROR25	003716	628*																	
EROR26	003764	651*																	
EROR27	004030	661*																	
EROR3	002600	450*																	
EROR30	004106	672*																	
EROR31	004140	679*																	
EROR32	004202	687*																	
EROR33	004230	693*																	
EROR34	004272	701*																	
EROR35	004366	730*																	
EROR36	004442	742*																	
FROR37	004500	750*																	
EROR4	002626	456*																	
FROR40	004532	757*																	
FROR41	004574	765*																	
EROR42	004622	771*																	
FROR43	004664	779*																	
EROR44	004732	801*																	
EROR45	004776	811*																	
EROR46	005036	819*																	
FROR47	005070	826*																	
FROR5	002670	464*																	
EROR50	005132	834*																	
FROR51	005160	840*																	
FROR52	005222	848*																	
EROR6	002716	471*																	
EROR7	002760	479*																	
FRPVEC =	000004	1641*	1646	1647	1648*	1649*	1655*	1656*	1667*	1668*	1676*								
ERRO	001246	198*																	

ERR1	001266	2020
ERR10	001556	2750
ERR100	005610	9390
ERR101	005642	9450
ERR102	005702	9520
ERR103	006016	9880
ERR104	006050	9940
ERR105	006100	10000
ERR106	006156	10190
ERR107	006206	10250
ERR11	001626	2880
ERR110	006242	10330
ERR111	006302	10400
ERR112	006406	10660
ERR113	006430	10710
ERR114	006462	10770
ERR115	006514	10830
ERR116	006554	10900
ERR117	006610	10960
ERR12	001676	3000
ERR120	006644	11020
ERR121	006764	11290
ERR122	007000	11370
ERR123	007120	11650
ERR124	007134	11730
ERR125	007254	12010
ERR126	007270	12090
ERR127	007402	12340
ERR13	001744	3120
ERR130	007514	12650
ERR131	007560	12730
ERR132	007714	13080
ERR133	007760	13160
ERR14	002104	3430
ERR15	002146	3550
ERR16	002216	3670
ERR17	002264	3790
ERR2	001316	2110
ERR20	002334	3910
ERR21	002376	4040
ERR22	002466	4310
ERR23	002542	4430
ERR24	002600	4510
ERR25	002626	4570
ERR26	002670	4650
ERR27	002716	4720
ERR3	001346	2210
ERR30	002760	4800
ERR31	003026	5030
ERR32	003072	5130
ERR33	003132	5210
ERR34	003164	5280
ERR35	003226	5360
ERR36	003254	5420

ERP37	003316	550#				
FRR4	001376	232#				
ERP40	003412	579#				
ERP41	003466	591#				
FRR42	003536	601#				
ERR43	003564	607#				
ERP44	003626	615#				
FRR45	003654	621#				
ERP46	003716	629#				
FRR47	003764	652#				
FRR5	001426	242#				
ERP50	004030	662#				
ERP500	001762	320#	330	334		
ERP51	004106	669#	673#			
ERP52	004140	680#				
FRR53	004202	688#				
FRR54	004230	694#				
ERP55	004272	702#				
FRR56	004366	731#				
ERR57	004442	743#				
ERP6	001456	252#				
ERP60	004500	751#				
ERP61	004532	758#				
FRR62	004574	766#				
ERP63	004622	772#				
ERP64	004664	780#				
ERP65	004732	802#				
ERP66	004776	812#				
ERR67	005036	820#				
ERP7	001506	262#				
FRR70	005070	827#				
ERR71	005132	835#				
FRR72	005160	841#				
FRR73	005222	849#				
ERP74	005334	881#				
FRR75	005364	887#				
ERP76	005434	895#				
FRR77	005546	930#				
FLAG	001034	142#	919			
HED5	011456	1490	1494	1516	1520	1695#
HED5A	011454	1493	1519	1694#		
HWDOK	006504	1076	1081#			
INBUF	011630	1298	1466	1734#		
INCBUS	003050	507#	510			
INCDAR	007574	1272	1276#			
INCNEM	006364	1060#	1065			
INCRD	004754	806#	809			
INCWAT	002506	435#	439			
INT106	007000	1116	1136#			
INT110	007134	1152	1172#			
INT112	007270	1188	1208#			
INT114	007424	1224	1241#			
INXDSK	005566	934#	937			
LOGICA	010044	1336#				

LOOP	010060	173	1345#												
LPADT	007616	1277	1280#												
LPADT2	010016	1320	1323#												
LPNEM	006670	1101	1106#												
LPST1	001300	201	204#												
LPST10	001570	273	277#												
LPST11	001640	287	290#												
LPST12	001710	299	302#												
LPST13	001756	310	314#												
LPST14	002116	341	345#												
LPST15	002160	354	357#												
LPST16	002230	366	369#												
LPST17	002276	377	381#												
LPST2	001330	210	213#												
LPST20	002346	390	393#												
LPST21	002410	403	407#												
LPST22	003334	548	553#												
LPST3	001360	220	223#												
LPST4	001410	231	234#												
LPST40	004310	700	705#												
LPST5	001440	241	244#												
LPST56	005240	847	852#												
LPST6	001470	251	254#												
LPST7	001520	261	264#												
LPST74	005446	893	897#												
LPST77	005720	950	955#												
LPSX10	006114	998	1003#												
LPX105	006172	1018	1022#												
LPX106	006222	1024	1028#												
LPX107	006256	1030	1036#												
LPX108	006316	1039	1043#												
LP106	007024	1127	1142#												
LP110	007160	1163	1179#												
LP112	007314	1199	1215#												
LTSWT	005312	876#	879												
LXIT	010054	1335	1340#												
MA	001030	132#	260												
MAHF	011272	194	1644#	1677											
MES5	011477	1512	1521	1705#											
MES6	011522	1486	1495	1508	1522	1712#									
MOVLK	010752	94	1419#	1422											
N	= 000134	5#	198	199#	202	203#	211	212#	221	222#	232	233#	242	243#	
		252	253#	262	263#	275	276#	288	289#	300	301#	312	313#	343	
		344#	355	356#	367	368#	379	380#	391	392#	404	405#	430	432#	
		442	444#	450	452#	456	458#	464	466#	471	473#	479	481#	502	
		504#	512	514#	520	522#	527	529#	535	537#	541	543#	549	551#	
		578	580#	590	592#	600	602#	606	608#	614	616#	620	622#	628	
		630#	651	653#	661	663#	672	674#	679	681#	687	689#	693	695#	
		701	703#	730	732#	742	744#	750	752#	757	759#	765	767#	771	
		773#	779	781#	801	803#	811	813#	819	821#	826	828#	834	836#	
		840	842#	848	850#	881	882#	887	888#	895	896#	930	931#	939	
		940#	945	946#	952	953#	988	989#	994	995#	1000	1001#	1019	1020#	
		1025	1026#	1033	1034#	1040	1041#	1066	1067#	1070	1072#	1077	1078#	1083	
		1084#	1090	1091#	1096	1097#	1102	1103#	1129	1130#	1136	1138#	1165	1166#	

		1172	1174*	1201	1202*	120*	1210*	1234	1235*	1265	1266*	1273	1274*	130*
		1309*	1316	1317*										
NULL	011076	1561*	1562	1564*	1574*									
NXMTSM	006322	70	1054*	1069	1074	1080	1086	1093	1099	1105	1107			
OUTBUF	011620	423*	424	476	546	571*	572	625	698	723*	724	776	845	871
		925	980	1014	1036	1121	1157	1193	1229	1255	1427	1730*		
PARCSR	= 172100	1639*	1650											
PAPERR	011547	1665	1719*											
PARSPV	011364	1644	1664*	1675										
PARVFC	= 000114	1640*	1644*	1645*	1666*	1675*								
PASS	001066	155*	1349	1351*	1352*									
PATNU	001046	147*												
PRWF	011574	1631	1723*											
PS	001002	118*	172*	1055*	1117*	1138	1153*	1174	1189*	1210	1225*	1425*		
RANNU	001036	143*												
RDWAT	004406	735*	739											
RDYERX	006430	1063	1070*											
READ	= 104405	2*	1302											
ROADT	007662	1301*	1310	1318	1322									
SAVE	001062	153*												
SAV1	001064	154*												
SCOPE	= 000004	22*	204	213	223	234	244	254	264	277	290	302	314	333
		345	357	369	381	393	407	553	705	852	897	955	1003	1043
		1106	1142	1179	1215	1242								
SELCMA	010212	90	1402*	1403										
SELDAE	010232	92	1410*	1411										
SELDAR	010222	91	1406*	1407										
SELDBR	010242	93	1414*	1415										
SELDCS	010264	95	1425*	1430	1433									
SELWC	010202	89	1398*	1399										
SP	= 0000006	1642*	1646*	1647*	1655	1656								
SRCHG	010510	1471*	1473											
STAER	010522	199	203	212	222	233	243	253	263	289	313	356	380	406
		432	458	473	504	514	529	543	580	608	622	653	663	681
		695	732	759	773	803	813	828	842	882	888	931	940	946
		989	995	1001	1020	1026	1034	1068	1073	1079	1085	1092	1098	1104
		1130	1140	1166	1176	1202	1212	1236	1266	1309	1484*			
STAER1	010574	276	301	329	344	368	392	444	452	466	481	522	537	551
		592	602	616	630	674	689	703	744	752	767	781	821	836
		850	896	953	1041	1274	1317	1506*						
STAI1	001222	38	193*	205	1340									
STAI10	001524	45	270*	278										
STAI11	001574	46	283*	291										
STAI12	001644	48	295*	303										
STAI13	001714	49	307*	315										
STAI14	002052	51	338*	346										
STAI15	002122	52	351*	358										
STAI16	002164	54	362*	370										
STAI17	002234	55	374*	382										
STAI2	001304	39	208*	214										
STAI20	002302	58	386*	394										
STAI21	002352	59	400*	408										
STAI22	002414	60	422*	433	445	453	459	467	474	482	505	515	523	530
		538	544	552	554	822								

STAI23	002502	428	434#																		
STAI24	002556	437	446#																		
STAI25	002616	448	454#																		
STAI26	002644	455	460#																		
STAI27	002706	462	469#																		
STAI3	001334	40	218#	224																	
STAI30	002734	470	475#																		
STAI31	002776	478	497#																		
STAI32	003044	500	506#																		
STAI33	003110	508	516#																		
STAI34	003150	517	524#																		
STAI35	003202	525	531#																		
STAI36	003244	534	539#																		
STAI37	003272	540	545#																		
STAI4	001364	41	229#	235																	
STAI40	003340	62	570#	581	593	603	609	617	623	631	654	664	675	682							
		690	696	704	706																
STAI41	003426	576	582#																		
STAI42	003502	585	594#																		
STAI43	003554	595	604#																		
STAI44	003602	605	610#																		
STAI45	003644	612	618#																		
STAI46	003672	619	624#																		
STAI47	003734	627	646#																		
STAI5	001414	42	239#	245																	
STAI50	004002	649	655#																		
STAI51	004046	657	665#																		
STAI52	004124	666	676#																		
STAI53	004156	677	683#																		
STAI54	004220	686	691#																		
STAI55	004246	692	697#																		
STAI56	004314	64	722#	733	745	753	760	768	774	782	804	814	829	837							
		843	851	853																	
STAI57	004402	728	734#																		
STAI6	001444	43	249#	255																	
STAI60	004456	737	746#																		
STAI61	004516	748	754#																		
STAI62	004550	756	761#																		
STAI63	004612	763	769#																		
STAI64	004640	770	775#																		
STAI65	004702	778	796#																		
STAI66	004750	799	805#																		
STAI67	005014	807	815#																		
STAI7	001474	44	259#	265																	
STAI70	005054	816	823#																		
STAI71	005106	824	830#																		
STAI72	005150	833	838#																		
STAI73	005176	839	844#																		
STAI74	005244	66	869#	883	889	898															
STAI75	005350	877	884#																		
STAI76	005402	885	890#																		
STAI77	005452	67	919#	932	941	947	954	956													
STAMP	010334	98	1449#	1472																	
STAPT	001076	34	163#	1632																	

STA100	005562	928	933*															
STA101	005626	935	942*															
STA102	005660	943	948*															
STA103	005724	68	976*	990	996	1002	1004											
STA104	006032	984	991*															
STA105	006064	992	997*															
STA106	006674	71	1116*	1141	1143													
STA110	007030	73	1131	1152*	1180													
STA112	007164	75	1167	1177	1188*	1216												
STA114	007320	77	1203	1213	1223*	1243												
STOP	002040	321	332*															
ST105X	006120	69	1013*	1021	1027	1035	1042	1044										
SWR	001000	117*	1280	1323	1345	1398	1402	1406	1410	141*	1428	1450	1459	1471				
		1497	1524	1554														
SWPDCI	001056	151*																
TDMA	001054	150*																
TEXBUF	011450	1683*																
TIVCNT	011252	1627*	1629															
TKB	001006	120*																
TKS	001012	122*																
TPB	001004	119*	1556*															
TPS	001010	121*	1557															
TRACK	001042	145*	177*	1257*	1300*	1369												
TSTCH	011452	1684*																
TSTNEM	006452	1061	1075*															
TWRDCT	001052	149*																
TYEXIT	011044	1555	1563	1567*														
TYP	010674	1536	1539*															
TYPA	010704	1542*	1553	1572														
TYPC	010732	1544	1548*															
TYPD	010760	1546	1552	1554*	1566	1569	1571											
TYPDAT	011074	1542*	1543	1545*	1548	1550	1556	1559	1565*	1568*	1570*	1573*						
TYPF	011046	1549	1568*															
TYPG	011060	1551	1570*															
TYPS	011100	1535	1576*	1584														
TYPSA	011124	1580	1582*															
TYPSR	011126	1578*	1579	1583*														
UP	011232	1621	1624*															
WAFBUS	005774	983*	986															
WATRDY	006226	1029*	1032															
WC	001016	127*	219	339*	340	342	351*	353	425*	469	497*	539	573*	618				
		646*	691	725*	769	796*	838	870*	924*	979*	1015*	1056*	1120*	1156*				
		1192*	1228*	1398*	1426*	1467*												
WCBUSI	004006	656*	659															
WCWAT	003432	583*	587															
WORK	001070	159*	195*	196	200	209*	219*	230*	240*	250*	260*	271*	272	285*				
		286	297*	298	311*	327*	342*	353*	364*	365	378*	388*	389	402*				
		429*	434*	435*	438	440*	446*	447	454*	460*	461	469*	475*	477				
		501*	506*	509*	511*	518*	526*	531*	533	539*	545*	547	577*	582*				
		583*	586	588*	594*	596	604*	610*	611	618*	624*	626	650*	655*				
		658*	660*	667*	668	678*	683*	685	691*	697*	699	729*	734*	735*				
		738	740*	746*	747	754*	755	761*	762	769*	775*	777	800*	805*				
		808*	810*	817*	825*	830*	832	838*	844*	846	875*	878*	880*	886*				
		890*	891*	892	929*	933*	936*	938*	944*	951*	982*	985*	987*	993*				

		999*	1028*	1031*	1037*	103R	1059*	1064*	1067*	1072*	107R*	1084*	1091*	1097*
		1103*	112R*	1138*	1164*	1174*	1200*	1210*	1235*	1264*	1270*	1271	1307*	1313*
		1314	1376*	1377*	137R	1451*	1452*	1453*	1454*	1455*	1456*	1457*	145R	1459*
		1460*	1461*	1462*	1463*	1464*	1465	1485	1507	1626*	162R*			
WORK1	001072	160*	274*	295*	296	29R	326*	33R*	339	340	362*	363	365	386*
		387	389	441*	449*	463*	476*	477	519*	532*	533	546*	547	589*
		59R*	599*	613*	625*	626	670*	671*	684*	685	69R*	699	741*	749*
		764*	776*	777	81R*	831*	832	845*	846	894*	919*	920*	921*	922
		94R*	949	1036*	103R	126R*	1269*	1271	1276	1278	1311*	1312*	1314	1319
		1321	1450*	1451	1471	1511								
WORK2	001074	161*												
WRADT	007462	125R*	1267	1275	1279									
WRCHFC	= 104407	27*												
WRDCT	001040	144*	1254*	1297*	1372									
WRITE	= 104403	26*	1259											
XCHKDI	007730	1306	1311*											
XSTAT1	001260	197	200*											
.	= 011640	29*	32	33*	37*	85*	112*	1125	1161	1197	1233	1261	1281	1304
		1324	1346	1350	1353	149R	1525	155R	1729*					

ERROR	328	198	202	211	221	232	242	252	262	275	288	300	312	343	355
	367	379	391	404	430	442	450	456	464	471	479	502	512	520	527
	535	541	549	578	590	600	606	614	620	628	651	661	672	679	687
	693	701	730	742	750	757	765	771	779	801	811	819	826	834	840
	848	881	887	895	930	939	945	952	988	994	1000	1019	1025	1033	1040
	1066	1070	1077	1083	1090	1096	1102	1129	1134	1165	1172	1201	1208	1234	1265
	1273	1308	1316												

ADD	1356	1540	1577	1601	1605										
ASL	1653														
BCC	1654														
BEQ	197	210	220	231	241	251	261	273	287	299	310	325	341	354	366
	377	390	403	455	462	470	478	525	534	540	548	605	612	619	627
	677	686	692	700	756	763	770	778	824	833	839	847	885	893	943
	950	1039	1089	1095	1101	1272	1277	1281	1315	1320	1324	1335	1346	1353	1430
	1498	1525	1549	1551	1563										
BIC	891	920	1377	1452	1464	1604	1607								
RIS	284	308	352	375	401	422	426	441	498	570	574	589	599	647	671
	722	726	741	797	869	921	926	976	981	1013	1016	1054	1058	1087	1122
	1158	1194	1223	1230	1258	1301	1449	1468	1620						
BIT	196	991	1075	1081	1094	1100	1280	1323	1345	1429	1497	1524	1554		
BMI	437	508	565	657	737	807	877	935	984	998	1018	1030	1061	1063	1127
	1163	1199													
BNE	201	439	510	587	597	659	669	739	809	879	937	986	992	1032	1065
	1076	1082	1125	1161	1197	1233	1350	1472	1535	1544	1555	1560	1580	1612	1629
BPL	428	448	500	517	576	595	649	666	728	748	799	816	928	1024	1261
	1263	1304	1306	1432	1470	1558									
BR	433	445	581	593	733	745	883	932	990	996	1002	1021	1027	1035	1042
	1069	1074	1080	1086	1131	1141	1167	1177	1203	1213	1237	1267	1275	1310	1318
	1399	1403	1407	1411	1415	1422	1433	1473	1536	1553	1566	1572	1584	1671	1680
CLP	166	177	178	322	434	506	582	655	734	805	872	875	933	982	1028
	1059	1118	1119	1123	1154	1155	1159	1190	1191	1195	1226	1227	1231	1256	1257
	1299	1300	1545	1668	1669										
CMP	272	286	298	324	340	365	389	461	477	533	547	596	611	626	668
	685	699	762	777	832	846	892	949	1038	1088	1139	1175	1211	1241	1271
	1276	1314	1319	1471	1534	1579									
CMPR	1543	1548	1550	1559											
COV	1373														
DEC	1352	1564	1611												
EMT	1332	1492	1518	1534	1582	1630	1664								
HALT	32	1499	1526	1622	1672	1679									
INC	435	509	583	658	735	808	878	936	948	985	1031	1064	1124	1160	1196
	1232	1269	1312	1374	1628										
IoT	22														
JMP	34	38	39	40	41	42	43	44	45	46	48	49	51	52	54
	55	58	59	60	62	64	66	67	68	69	70	71	73	75	77
	79	82	89	90	91	92	93	94	95	98	330	453	459	467	474
	482	505	515	523	530	538	544	552	603	609	617	623	631	654	664
	675	682	690	696	704	753	760	768	774	782	804	814	822	829	837
	843	851	889	941	947	954	1093	1099	1105	1279	1282	1322	1325	1340	1632
JSP	194	199	203	212	222	233	243	253	263	276	289	301	313	329	344
	356	368	380	392	406	432	444	452	458	466	473	481	504	514	522
	529	537	543	551	580	592	602	608	616	622	630	653	663	674	681
	689	695	703	732	744	752	759	767	773	781	803	813	821	828	836
	842	850	882	888	896	931	940	946	953	989	995	1001	1020	1026	1034
	1041	1068	1073	1079	1085	1092	1098	1104	1130	1140	1166	1176	1202	1212	1236
	1266	1274	1309	1317	1336	1484	1488	1506	1510	1514	1546	1552	1569	1571	1677
MOV	164	165	167	168	169	170	171	172	173	174	175	176	195	198	202
	209	211	219	221	230	232	240	242	250	252	260	262	270	271	274
	275	283	285	288	295	296	297	300	307	311	312	320	321	323	326
	327	328	332	338	339	342	343	351	353	355	362	363	364	367	374
	378	379	386	387	388	391	400	402	404	423	424	425	429	431	440

	443	446	449	451	454	457	460	463	465	469	472	475	474	480	497
	501	503	511	513	518	519	521	526	528	531	532	536	539	542	545
	546	550	571	572	573	577	579	588	591	594	598	601	604	607	610
	613	615	618	621	624	625	629	646	650	652	660	662	667	670	673
	678	680	683	684	688	691	694	697	698	702	723	724	725	729	731
	740	743	746	749	751	754	758	761	764	766	769	772	775	776	780
	796	800	802	810	812	817	818	820	825	827	830	831	835	838	841
	844	845	849	870	871	873	874	880	881	884	887	890	894	895	919
	922	923	924	925	929	930	938	939	944	945	951	952	977	978	979
	980	987	988	993	994	999	1000	1014	1015	1019	1022	1025	1033	1036	1037
	1040	1055	1056	1057	1066	1067	1071	1072	1077	1078	1083	1084	1090	1091	1096
	1097	1102	1103	1116	1117	1120	1121	1128	1129	1137	1138	1152	1153	1156	1157
	1164	1165	1173	1174	1188	1189	1192	1193	1200	1201	1209	1210	1224	1225	1228
	1229	1234	1235	1253	1254	1255	1264	1265	1268	1270	1273	1278	1296	1297	1298
	1307	1308	1311	1313	1316	1321	1334	1347	1351	1354	1368	1369	1370	1371	1372
	1375	1376	1378	1398	1402	1406	1410	1414	1419	1425	1426	1427	1428	1450	1451
	1458	1459	1465	1466	1467	1533	1539	1541	1561	1576	1578	1598	1599	1600	1603
	1621	1624	1625	1626	1644	1645	1646	1647	1648	1649	1650	1651	1652	1655	1656
	1666	1667	1675	1676											
MOV B	1542	1556	1565	1568	1570	1606									
NOP	1337	1338	1339												
RESET	163	193	208	218	229	239	249	259	1420	1421	1627	1674			
ROL	1461	1462	1463												
ROR	1453	1454	1455	1456	1457	1608	1609	1610							
RTI	1348	1355	1357	1379	1547	1581	1649	1678							
PTS	1500	1527	1567	1613	1657										
SWAB	1460														
TRAP	26	27	28												
TST	309	376	438	447	516	524	586	665	676	738	747	755	815	823	884
	942	997	1060	1262	1305	1349	1562	1670							
TSTB	200	427	436	499	507	575	584	648	656	727	736	798	806	876	927
	934	983	1017	1023	1029	1062	1126	1162	1198	1260	1303	1431	1469	1557	
.ASCII	1694	1695	1705	1712	1718	1719	1723								
.ENABL	4														
.END	1740														
.EVEN	114	1693	1729												
.LIST	2	32	199	203	212	222	233	243	253	263	276	289	301	313	344
	356	368	380	392	405	432	444	452	458	466	473	481	504	514	522
	529	537	543	551	580	592	602	608	616	622	630	653	663	674	681
	689	695	703	732	744	752	759	767	773	781	803	813	821	828	836
	842	850	882	888	896	931	940	946	953	989	995	1001	1020	1026	1034
	1041	1067	1072	1078	1084	1091	1097	1103	1130	1138	1166	1174	1202	1210	1235
	1266	1274	1309	1317											
.MACP	32														
.NLIST	2	32	199	203	212	222	233	243	253	263	276	289	301	313	344
	356	368	380	392	405	432	444	452	458	466	473	481	504	514	522
	529	537	543	551	580	592	602	608	616	622	630	653	663	674	681
	689	695	703	732	744	752	759	767	773	781	803	813	821	828	836
	842	850	882	888	896	931	940	946	953	989	995	1001	1020	1026	1034
	1041	1067	1072	1078	1084	1091	1097	1103	1130	1138	1166	1174	1202	1210	1235
	1266	1274	1309	1317											
.REPT	32														
.TITLE	1														
.WORD	1730	1734													

ERRORS DETECTED: 0

MAINDEC-11-DZRFAB-B RF-11 STATIC TEST REPLACES D50A
DZRFAB,BIC

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*DZPFAB,DZRFAB/SOL/CRF_DZRFAB,BIC
RUN-TIME: 6 13 3 SECONDS
CORE USED: 8K