

TC-130
MAGNETIC TAPE
DIAGNOSTIC AND RELIABILITY PROGRAM
LISTINGS

P/N 130013



western peripherals

1100 CLAUDINA PLACE
ANAHEIM, CALIFORNIA 92805

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LISTINGS

P/N 130013

Use Tape #130011 Diagnostic
Use Tape #130012 Reliability

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1          | *****
2          | * WP / PDP11 MAG TAPE FUNCTIONAL DIAGNOSTIC *
3          | * PROGRAM LISTING 466.2 *
4          | * AUTHOR: ALEX SILOTI *
5          | *****
6
7          | 11.  ABSTRACT
8          | THE MAG TAPE INSTRUCTION TEST CONTAINS A SERIES OF BASIC TESTS Y
9          | CHECK CONTROLLER REGISTERS FOR PROPER OPERATION WHILE NOT INVOLV
10         | TAPE MOTION. ALL TAPE MOTION FUNCTIONS, DATA TRANSFERS, EXTENDED
11         | MEMORY, AND MANUAL INTERVENTION TESTS OF THE TAPE TRANSPORT SWIT
12         | 12.  REQUIREMENTS
13         | 12.1  EQUIPMENT
14         | PDP11 WITH MAG TAPE CONTROLLER AND 1 TAPE UNIT
15         | 12.2  STORAGE
16         | THE ROUTINE REQUIRES 4K OF MEMORY.
17         | 13.  LOADING PROCEDURE
18         | PROCEDURE FOR NORMAL BINARY TAPES SHOULD BE FOLLOWED.
19         | 1.  ABSOLUTE LOADER MUST BE IN MEMORY.
20         | 2.  PLACE BINARY TAPE IN READER.
21         | 3.  LOAD ADDRESS +7500 (* DETERMINED BY LOCATION OF LOADER)
22         | 4.  PRESS "START" (PROGRAM WILL LOAD).
23         | 14.  STARTING PROCEDURE
24         | 14.1  STARTING ADDRESS
25         | 200
26         | 14.2  PROGRAM AND/OR OPERATOR ACTION
27         | 1.  LOAD PROGRAM INTO MEMORY.
28         | 2.  PLACE ONE TAPE UNIT, ON-LINE, AT LOAD POINT (BOT)
29         | 3.  SET SWITCH REGISTER TO STARTING ADDRESS.
30         | 4.  LOAD ADDRESS.
31         | 5.  PRESS START.
32         | 6.  PROGRAM WILL TYPE "SET SW REG ACCORDING TO OPERATING INSTRUCTION
33         | AND PRESS CONTINUE"
34         | 7.  SET SWITCH REGISTER TO APPROPRIATE SETTINGS IN ACCORDANCE WITH 5.
35         | AND PRESS CONTINUE
36         | 8.  THE PROGRAM WILL BEGIN TESTING.
37
38         | 15.  OPERATING PROCEDURE
39         | 15.1  OPERATIONAL SWITCH SETTINGS
40         | 15.1.1 WITH SWITCHES 13 THROUGH 15 DOWN THE PROGRAM WILL PRINT OUT ON E
41         | AND CONTINUE IN TEST. (BELL WILL RING AT COMPLETION OF A PASS).
42         | 15.1.2 SWITCH SETTINGS ARE:
43         | SW15 = 1 OR UP ... HALT ON ERROR
44         | SW14 = 1 OR UP ... SCOPE LOOP
45         | SW13 = 1 OR UP ... INHIBIT PRINTOUT.
46         | SW12 = 1 OR UP ... INHIBIT SUBTEST ITERATION
47         | SW11 = 1 OR UP ... INHIBIT MANUAL INTERVENTION TEST
48         | SW10 = 1 OR UP ... UNIT SELECT BIT 2 TRUE
49         | SW9 = 1 OR UP ... UNIT SELECT BIT 1 TRUE
50         | SW8 = 1 OR UP ... UNIT SELECT BIT 0 TRUE
51         | SW7 = 1 OR UP ... MAG TAPE BUS LEVEL BIT 2 TRUE
52         | SW6 = 1 OR UP ... MAG TAPE BUS LEVEL BIT 1 TRUE
53         | SW5 = 1 OR UP ... MAG TAPE BUS LEVEL BIT 0 TRUE
54         | SW4 = 1 OR UP ... ALTERNATE MAG TAPE ADDRESSES & INT VECTORS
55         | SW3 = 1 OR UP ... TEST IBM PACKING / UNPACKING
56         | SW2 = 1 OR UP ... TEST PHASE ENCODED TAPE UNIT
57         | SW0 = 1 OR UP ... TEST 7 CHANNEL TAPE UNIT.
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58      15.1.3 MANUAL INTERVENTION TEST
59      | THIS TEST WILL REQUIRE THE OPERATOR TO PERFORM CERTAIN OPERATION
60      | WITH THE TAPE TRANSPORT AS DIRECTED BY MESSAGES PRINTED ON THE
61      | TELETYPE.
62      15.2 SUBROUTINE ABSTRACTS
63      |SCOPE (TEST LOOP ONLY TEST)
64      | THIS SUBROUTINE CALL IS PLACED BETWEEN EACH SUB-TEST IN THE INST
65      | SECTION. IT RECORDS THE STARTING ADDRESS OF EACH SUB-TEST AS IT
66      | BEING ENTERED. IF A SCOPE LOOP IS REQUESTED, IT WILL JUMP TO THE
67      | START OF THE SUB-TEST THAT THE SCOPE LOOP IS REQUESTING.
68      |HLT (ERROR HALT)
69      | THIS SUBROUTINE CALL PRINTS THE ADDRESS THAT TAGS THE FAILING
70      | SUBTEST AND THE CONTENTS OF ALL THE CONTROLLER REGISTERS
71      | IN FORMAT DESCRIBED IN 6.1
72      |TSTCLR (TEST FOR CONTROLLER READY)
73      | THIS SUBROUTINE CALL WAITS A FINITE TIME FOR THE CONTROLLER
74      | TO GO READY. IF CONTROLLER READY OCCURS BEFORE TIMEOUT, EXIT IS
75      | TO RETURN ADDRESS+2. IF TIMEOUT OCCURES BEFORE CONTROLLER READY,
76      | EXIT IS TO RETURN ADDRESS.
77      |WAITTR (WAIT FOR TAPE UNIT READY)
78      | THIS SUBROUTINE CALL WAITS A FINITE TIME FOR THE TAPE UNIT
79      | TO GO READY. IF TAPE UNIT READY OCCURES BEFORE TIMEOUT, EXIT IS
80      | TO RETURN ADDRESS+2. IF TIMEOUT OCCURES BEFORE TAPE UNIT READY,
81      | EXIT IS TO RETURN ADDRESS.
82      |TSTNGR (TEST FOR REGISTER BIT(S) RESET)
83      | THIS SUBROUTINE CALL WAITS A FINITE TIME FOR THE DESIGNATED BIT(
84      | OF THE SPECIFIED REGISTER TO GO RESET. IF RESET OF BIT(S) OCCUR
85      | BEFORE TIMEOUT, EXIT IS TO RETURN ADDRESS+2. IF TIMEOUT OCCURS
86      | BEFORE THE DESIGNATED BIT(S) RESET, EXIT IS TO RETURN ADDRESS.
87      | ARGUMENTS:
88      | R2 CONTAINS ADDRESS OF REGISTER TO BE TESTED
89      | R3 CONTAINS MASK FOR BIT(S) TO BE TESTED
90      | R4 CONTAINS DELAY TIMEOUT CONSTANT
91      |TSTNRS (TEST FOR REGISTER BIT(S) SET)
92      | THIS SUBROUTINE CALL WAITS A FINITE TIME FOR THE DESIGNATED BIT(
93      | OF THE SPECIFIED REGISTER TO GO SET. IF RESET OF BIT(S) OCCUR
94      | BEFORE TIMEOUT, EXIT IS TO RETURN ADDRESS+2. IF TIMEOUT OCCURS
95      | BEFORE THE DESIGNATED BIT(S) SET, EXIT IS TO RETURN ADDRESS.
96      | ARGUMENTS:
97      | R2 CONTAINS ADDRESS OF REGISTER TO BE TESTED
98      | R3 CONTAINS MASK FOR BIT(S) TO BE TESTED
99      | R4 CONTAINS DELAY TIMEOUT CONSTANT
100     |PRMSG (PRINT MESSAGE)
101     | THIS SUBROUTINE CALL PRINTS AN ASCII 2 MESSAGE WHOSE STARTING AD
102     | IS CONTAINED IN R2
103     |PRTOCT (PRINT OCTAL)
104     | THIS SUBROUTINE CALL PRINTS THE OCTAL VALUE CONTAINED IN R2
105     |MTTRP (MAG TAPE TRAP)
106     | THIS SUBROUTINE CALL IS USED TO SERVICE UNEXPECTED OR ILLEGAL
107     | MAG TAPE INTERRUPTS.
108     |PRTOJT (PRINTOUT)
109     | THIS SUBROUTINE CALL TRANSFERS THE LOWER BYTE OF "CHAR" TO THE
110     | PRINTOUT DEVICE. (USUALLY A TELETYPE)
111     |XCLOR (EXCLUSIVE OR)
112     | THIS SUBROUTINE CALL EXCLUSIVE OR'S THE CONTENTS OF R1 & R2

113     |ROTCMP (ROTATE COMPARE)
114     | THIS SUBROUTINE CALL GENERATES THE CRC CHARACTER FROM THE

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115      I      CONTENTS OF RO
116
117      I THE FOLLOWING SUBROUTINE CALLS EXECUTE COMMONLY USED
118      I "MOV" AND "BIT" INSTRUCTIONS OF THE SPECIFIED FUNCTIONS.
119      I PWRLR (POWER CLEAR)
120      I      SETS BIT 12 OF MTC
121      I WRITE (WRITE ONE RECORD)
122      I      INITIATES WRITE COMMAND
123      I READ (READ ONE RECORD)
124      I      INITIATES READ COMMAND
125      I WPEUF (WRITE END OF FILE)
126      I      INITIATES WRITE FILE MARK
127      I REWIND (REWIND TAPE)
128      I      INITIATES REWIND OF TAPE UNIT
129      I SPACEF (SPACE FORWARD)
130      I      INITIATES SPACE FORWARD COMMAND
131      I SPACEB (SPACE BACKWARDS)
132      I      INITIATES SPACE BACKWARDS COMMAND
133      I SELECT (SELECT TAPE UNIT)
134      I      SELECTS TAPE UNIT TO BE TESTED
135      I WBUFCA (WRITE BUFFER TO CA)
136      I      SETS CA TO START OF WRITE BUFFER
137      I RBUFCA (READ BUFFER TO CA)
138      I      SETS CA TO START OF READ BUFFER
139      I MIN13C (MINUS ONE TO BC)
140      I      SETS BC TO MINUS ONE
141      I MIN33C (MINUS THREE TO BC)
142      I      SETS BC TO MINUS THREE
143      I MIN43C (MINUS FOUR TO 3C)
144      I      SETS BC TO MINUS FOUR
145      I TSTEOF (TEST FOR EOF)
146      I      TESTS FOR FILE MARK DETECTION
147
148      I 16. ERRORS
149
150      I 16.1 ERROR PRINTOUT FORMAT
151      I WITH SW13=0 (OR DOWN) THE FOLLOWING PRINTOUT WILL APPEAR ON AN E
152      I PC STATUS COMAND BYTE CA DATA B READ L TEMP CRC CAL
153      I XXXXXX XXXXXX XXXXXX XXXXXX XXXXXX XXXXXX XXXXXX XXXXXX
154      I PC = ADDRESS OF TEST WHERE ERROR OCCURED
155      I STATUS = CONTENTS OF STATUS REGISTER AT TIME OF ERROR
156      I COMAND = CONTENTS OF COMMAND REGISTER AT TIME OF ERROR
157      I BYTE = CONTENTS OF BYTE COUNTER AT TIME OF ERROR
158      I CA = CONTENTS OF CURRENT MEMORY ADDRESS AT TIME OF ERROR
159      I DATA B = CONTENTS OF DATA BUFFER AT TIME OF ERROR
160      I READ L = CONTENTS OF TUIO REGISTER AT TIME OF ERROR
161      I TEMP = CONTENTS OF ADDRESS "TEMP" USED BY SOME TESTS
162      I CRC CAL = CRC CHARACTER CALCULATED (USEFUL ONLY FOR CRC TEST)
163
164      I NOTE THAT NOT ALL OF THE INFORMATION PRINTED IS INTENDED TO BE
165      I USEFUL FOR EVERY TYPE OF ERROR; THIS IS SIMPLY A STANDARD ERROR
166      I REPORT FOR ALL ERRORS. THE OPERATOR MUST REFER TO THE PROGRAM
167      I LISTING AT THE ADDRESS OF THE ERROR FOR A DESCRIPTION OF THE
168      I CAUSE OF THE ERROR; IT IS THEN UP TO HIM TO DETERMINE WHICH
169      I OF THE INFORMATION IS USEFUL.
170      I 16.2 ERROR RECOVERY
171      I WITH SW15=1 OR JP THE PROGRAM WILL HALT ON AN ERROR, DEPRESS

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172      |      CONTINUE SWITCH TO RESTART TEST,
173      |7.      RESTRICTIONS
174      |7.1     STARTING RESTRICTION
175      |      BEFORE STARTING PROGRAM THE OPERATOR MUST MAKE CERTAIN THAT THE
176      |      TRANSPORT IS "ON-LINE" AND AT "LOAD POINT".
177      |7.2     OPERATIONAL RESTRICTIONS
178      |      MANUAL INTERVENTION TEST MUST BE PERFORMED ON EACH PASS THRU
179      |      THE PROGRAM UNLESS INHIBITED WITH SW11=1 (OR UP).
180      |8.      MISCELLANEOUS
181      |8.1     EXECUTION TIME
182      |      WITH MANUAL INTERVENTION TEST INHIBITED IT TAKES 1 MINUTE
183      |      FOR ONE PASS THRU PROGRAM. MANUAL INTERVENTION TEST IS
184      |      OPERATOR DEPENDENT BUT SHOULD TAKE APPROXIMATELY 2 MINUTES.
185      |9.      PROGRAM DESCRIPTION
186      |9.1     LISTING
187      |      STATUS AND COMMAND REGISTER BIT ASSIGNMENTS
188
189      |      COMMAND REGISTER
190      |15      ERROR (ERR)
191
192      |14      DEN 8      00 = LO DENS 7 TRACK  10 = HI DENS 7 TRACK
193      |13      DEN 5      01 = LO DENS 7 TRACK  11 = CORE DP 7 TRACK
194      |12      POWER CLEAR (PWCLR)
195
196      |11      PARITY      0 = ODD 1 = EVEN (EVP)
197      |10      UNIT SEL. BIT 2 (FAD1)
198      |9       UNIT SEL. BIT 1 (S1)
199
200      |8       UNIT SEL. BIT 0 (S0)
201      |7       CONTROL UNIT READY (CUR)
202      |6       INTERRUPT ENABLE (IEN)
203
204      |15      ADDRESS BIT 17 (AD17)
205      |14      ADDRESS BIT 16 (AD16)
206      |13      FUNCTION BIT 2 000 = OFF LINE    100 = SPACE FORWARD
207      |      001 = READ                        101 = SPACE REVERSE
208
209      |12      FUNCTION BIT 1 010 = WRITE     110 = WRITE XIRG
210      |11      FUNCTION BIT 0 011 = WRITE EOF  111 = REWIND
211      |10      GO
212
213      |      STATUS REGISTER
214
215      |15      ILLEGAL COMMAND (ILC)
216
217      |14      END OF FILE (EOF)
218      |13      CORRECTABLE PARITY ERROR (PHASE ENCODED ONLY) (CRE)
219      |12      PARITY ERROR (PAE)
220
221      |11      BUS GRANT LATE (BGL)
222      |10      END OF TAPE (EOT)
223      |9       RECORD LENGTH ERROR (RLE)
224
225      |8       BAD TAPE ERROR (BTE)
226      |7       NON EXISTENT MEMORY (NXM)
227      |6       SELECT REMOTE (SELR)
228

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229          15 BEGINNING OF TAPE (BOT)
230          14 7 CHANNEL (CH)
231          13 SETTLE DOWN (SDWN)
232
233          12 WRITE LOCK (WRL)
234          11 REWIND STATUS (AWS)
235          10 TAPE UNIT READY (TUR)
236          1 *****ASSEMBLY LISTING*****

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237          000000 .ENABL ABS
238          .ENABL AMA
239

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240          .NLIST TTM
241
242          000000 .=0
243          000020 .REPT 20
244          .+2
245          HALT
246          .ENDR
247          000034 .=34
248          000034 011516 TRAP34
249          000036 000340 340
250          000060 .=60
251          000044 .REPT 44
252          MTRP
253          340
254          .ENDR
255
256          104400 HLT =104400
257          104402 SCOPE =104402
258          104404 TSTCUR=104404
259          104406 TSTRGS=104406
260          104410 TSTNGR=104410
261          104412 PRTMSG=104412
262          104414 PWRCLR=104414
263          104416 WRITE =104416
264          104420 READ =104420
265          104422 WREOF =104422
266          104424 REWIND=104424
267          104426 SPACEF=104426
268          104430 SPACLU=104430
269          104432 SELECT=104432
270          104434 WBUFCA=104434
271          104436 RBUFCA=104436
272          104440 MINIBC=104440
273          104442 MINJUC=104442
274          104444 MIN4BC=104444
275          104446 TSTEOF=104446
276          104450 WAITTR=104450
277          104452 XCLON =104452
278          104454 ROTCMP=104454
279          104456 PRTOCT=104456
280          104460 PRTOUT=104460
281
282          177570 SR=177570
283          177776 CC=177776
284          000240 NUP=240
285          000776 BUFF=776

```

ITRAPPED TO PREVIOUS A DRESS

!!SETUP ALL UNUSED INT RRUPT VECTORS

ITRAP SUBROUTINE TABLE EQUATES

```

286      000000
287      000001
288      000002
289      000003
290      000004
291      000005
292      000006
293      000007
294      000200
295 000200 000107 001160
296      001000
297 001000 172520
298 001002 172720
299 001004 000224
300 001006 000226
301 001010 000260
302 001012 000262
303 001014 000224
304 001016 000226
305 001020 172520
306 001022 172522
307 001024 172524
308 001026 172526
309 001030 172530
310 001032 172532
311 001034 177566
312 001036 177564
313 001040 000000
314 001042 000000
315 001044 000000
316 001046 000000
317 001050 000000
318 001052 000000
319 001054 000000
320 001056 000000
321 001060 000000
322 001062 000000
323 001064 000000
324 001066 000000
325 001070 000000
326 001072 000000
327 001074 000000
328 001076 000000
329 001100 000000
330 001102 001300
331 001104 000000
332 001106 000000
333 001110 000000
334
335 001112 000000
336 001114 000000
337 001116 000000
338 001120 000000
339 001122 000000
340 001124 000000
341 001126 000000
342 001130 000000
    
```

```

R0=X0
R1=X1
R2=X2
R3=X3
R4=X4
R5=X5
SP=X6
PC=X7
.=200
JMP      START
.=1000
MTNAD: 172520
MTAAD: 172720
MTNV: 224
MTNS: 226
MTAV: 260
MTAS: 262
MTV: 224
MTVS: 226
MTS: 172520
MTC: 172522
BC: 172524
CA: 172526
MTD: 172530
MTRD: 172532
YDBR: 177566
TCSR: 177564
IGTST: 0
TMTNFL: 0
TEMP: 0
TEMPP: 0
TEMPS: 0
CRXOR1: 0
CRROT1: 0
CRXOR2: 0
CRROT2: 0
CRXOR3: 0
CRROT3: 0
CRXOR4: 0
CRROT4: 0
CXCWRT: 0
OCT: 0
CHAR: 0
PRINT1: 0
RETURN: BEGIN
MTP: 0
TCSL: 0
MTPM: 0
ICOMMAND CODES TABLE
TCOL: 0
TCRD: 0
TCWT: 0
TCWF: 0
TCSF: 0
TCRS: 0
TCWE: 0
TCRW: 0
    
```

INORMAL MAG TAPE ADDRESS
 ALTERNATE MAG TAPE ADDRESS

! INTERRUPT VECTOR
 ! INTERRUPT STATUS
 ! STATUS REGISTER
 ! COMMAND REGISTER
 ! BYTE COUNT
 ! CURRENT MEMORY ADDRESS
 ! DATA BUFFER
 ! TUIO READ LINES

! ADDRESS OF LAST TEST
 ! MAG TAPE PRIORITY BUS LEVEL
 ! SELECT COMMAND
 ! MAG TAPE PRIORITY BUS LEVEL MINUS ONE

! OFF LINE COMMAND
 ! READ COMMAND
 ! WRITE COMMAND
 ! WRITE FILE MARK COMMAND
 ! SPACE FORWARD COMMAND
 ! SPACE REVERSE COMMAND
 ! WRITE WITH EXTENDED G P COMMAND
 ! REWIND COMMAND

343	001132	000000			USLEN:	0	
344	001134	001160			SAVE:	.,+20.	TEMP STORAGE FOR TAPE REGISTERS FOR ERROR P
345	001160				START:		
346	001160	012706	000776		MOV	#BUFF,SP	RESET STACK
347	001164	012702	012711		MOV	#MSG0,R2	
348	001170	104412			PRMSG		PRINT MESSAGE IN R2
349	001172	000000			HALT		
350					RESET	CYCLE COUNTER	
351	001174	112707	000060	014552	MOVB	#60,MSG13+11	
352	001202	112707	000060	014553	MOVB	#60,MSG13+12	
353	001210	112707	000061	014554	MOVB	#61,MSG13+13	
354					MODIFY	MAG TAPE REGISTERS ADDRESS ACCORDI G TO SW 4	
355	001216	012702	001020		MOV	#MTS,R2	
356	001222	013701	001000		MOV	#MTNAD,R1	
357	001226	032707	000020	177570	BIT	#20,SR	IS SW 4 SET?
358	001234	001402			BEQ	TAMD	NO. GENERATE NORMAL M G TAPE ADDRESSES
359	001236	013701	001002		MOV	#MTAAD,R1	YES. GENERATE ALTERNA E MAG TAPE ADDRESSES
360	001242	010102			MOV	R1,(R2)+	
361	001244	062701	000002		ADD	#2,R1	GENERATE NEXT ADDRESS
362	001250	020207	001032		CMP	R2,#MTRD	
363	001254	003772			BLE	TAMD	
364					MODIFY	MAG TAPE INTERRUPT VECTOR ACCORDIN TO SW 4	
365	001256	032707	000020	177570	BIT	#20,SR	IS SW 4 SET?
366	001264	001416			BEQ	MTVN	NO. GENERATE NORMAL I TERRUPT VECTOR
367	001266	013707	001010	001014	MOV	#MTAV,MTV	YES. GEN ALTERNATE IN ERRUPT VECTOR
368	001274	013707	001012	001016	MOV	#MTAS,MTVS	
369	001302	012777	011450	177474	MOV	#MTRP,#MTNV	
370	001310	012707	000340	001006	MOV	#340,MTNS	
371	001316	000414			BR	BEGIN	
372	001320	013707	001004	001014	MOV	#MTNV,MTV	
373	001326	013707	001006	001016	MOV	#MTNS,MTVS	
374	001334	012777	011450	177446	MOV	#MTRP,#MTAV	
375	001342	012777	000340	177442	MOV	#340,#MTAS	
376	001350	012707	001350	001102	BEGIN:	MOV	#BEGIN,RETURN;SET UP RESTART OF PRO RAM
377	001356	012706	000776		MOV	#BUFF,SP	RESET STACK
378	001362	005007	001042		CLR	#TMTNFL	CLEAR TAPE MOTION FLA
379	001366	005007	177776		CLR	CC	SET PROCESSOR PRIORIT TO 0
380	001372	005007	000036		CLR	#36	SET TRAP PRIORITY TO
381	001376	012777	011450	177410	MOV	#MTRP,#MTV	SET UP ILLEGAL INTERR PT RETURN
382	001404	012707	000340	001016	MOV	#340,MTVS	SET INTERRUPT VECTOR C
383	001412	005007	001100		CLR	PRINT1	INITIALIZE ERROR PRIN OUT HEADING
384	001416	005007	001072		CLR	CRCWRT	INITIALIZE CRC CALCUL TED FOR PRINTOUT
385	001422	005007	000006		CLR	6	INITIALIZE ERROR TRAP VECTOR
386					CALCULATE	MAG TAPE PRIORITY BUS #	
387	001426	013700	177570		MOV	SR,R0	
388	001432	042700	177437		BIC	#177437,R0	CHECK SWITCHES
389	001436	010007	001104		MOV	R0,MTP	STORE MAG TAPE PRIORI Y BUS #
390	001442	162700	000040		SUB	#40,R0	DECREMENT BUS #
391	001446	010007	001110		MOV	R0,MTPM	STORE MAG TAPE BUS LE EL MINUS ONE
392					GENERATE	MAG TAPE COMMAND TABLE	
393	001452	013700	177570		MOV	SR,R0	
394	001456	042700	174377		BIC	#174377,R0	
395	001462	010007	001106		MOV	R0,TCSL	STORE SELECT COMMAND
396	001466	052700	060001		BIS	#60001,R0	
397	001472	012701	001112		MOV	#TCOL,R1	
398	001476	010001			MOV	R0,(R1)+	STORE NEXT COMMAND
399	001500	062700	000002		ADD	#2,R0	

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400 001504 022701 001132      CMP      #TCOL+20,R1  ITEST FOR TABLE COMPLETE
401 001510 0013/2              BNE      #-12        ILOOP IF NOT COMPLETE
402
403
404
405
406
407 001512 104402              I*****
408 001514 000005              ITEST ALL BITS OF COMMAND REGISTER (EXCEPT CU READ , BIT 7)TO BE CLEARED
409 001516 032777 177577 177276  SCOPE
410 001524 001401              RESET
411 001526 104400              BIT      #177577,@MTC
412
413
414 001530 104402              BEQ     .+4
415 001532 000005              HLT     IERROR, INIT DIDN'T CLEAR COMMAND REGISTER
416 001534 032777 137600 177256  I*****
417 001542 001401              ITEST BITS 7-13,15 OF STATUS REGISTER TO BE CLEARE AFTER INIT
418 001544 104400              SCOPE
419
420
421 001546 104402              RESET
422 001550 000005              BIT     #137600,@MYS
423 001552 005777 177246              BEQ     .+4
424 001556 001401              HLT     IERROR, INIT DIDN'T CLEAR ROPER BITS IN STATUS
425 001560 104400              I*****
426
427
428 001562 104402              ITEST UNIT TO CLEAR BYTE RECORD COUNT
429 001564 000005              SCOPE
430 001566 005777 177234              RESET
431 001572 001401              TST     @BC
432 001574 104400              BEQ     .+4
433
434
435 001576 104402              HLT     IERROR, INIT DIDN'T CLEAR YTE COUNT
436 001600 000005              I*****
437 001602 005777 177222              ITEST INIT TO CLEAR CURRENT MEMORY ADDRESS REGISTE
438 001606 001401              SCOPE
439 001610 104400              RESET
440
441
442 001612 104402              TST     @CA
443 001614 000005              BEQ     .+4
444 001616 105777 177200              HLT     IERROR,INIT DIDN'T CLEAR C RRENT MEMORY ADDRESS
445 001622 100401              I*****
446 001624 104400              ITEST INIT TO CLEAR DATA BUFFER
447
448
449 001626 104402              SCOPE
450 001630 000005              RESET
451 001632 032777 040000 177172              TST     @MTD
452 001640 001401              BEQ     .+4
453 001642 104400              HLT     IERROR, INIT DIDN'T CLEAR ATA BUFFER
454
455
456 001644 104402              I*****
457
458
459 001646 104402              ITEST CU READY (BIT 7 COMMAND REGISTER) TO BE SET N INIT,
460 001648 000005              SCOPE
461 001650 105777 177200              RESET
462 001652 100401              TSTR   @MTC
463 001654 104400              BMI     .+4
464
465
466 001656 104402              HLT     IERROR, INIT DIDN'T SET CU READY
467
468
469 001658 104402              I*****
470 001660 000005              ITEST BIT 14 OF TU10 READ LINES TO BE CLEARED BY I IT
471 001662 032777 040000 177172  SCOPE
472 001664 001401              RESET
473 001666 104400              BIT     #40000,@MTRD
474
475
476 001668 104402              BEQ     .+4
477
478
479 001670 104402              HLT     IERROR, INIT FAILED TO CLE R BIT 14 OF MTRD
480
481
482 001672 104402              I*****
483 001674 104402              ITEST COMMAND REGISTER (EXCEPT CU READY,BIT 7)TO B CLEARED BY POWER CLE
484
485
486 001676 104402              SCOPE

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457 001646 104414          PWRCLR
458 001650 032777 177577 177144 BIT #177577,@MTC
459 001656 001401          BEQ .+4
460 001660 104400          HLT          IERROR, POWER CLEAR DIDN'T CLEAR COMMAND REGISTE
*****
462
463          ITEST BITS 7-13, 15 OF STATUS REGISTER TO BE CLEAR D BY POWER CLEAR (BIT
SCOPE
464 001662 104402          PWRCLR
465 001664 104414          BIT #137600,@MTS
466 001666 032777 137600 177124 BEQ .+4
467 001674 001401          HLT          IERROR, POWER CLEAR DIDN'T CLEAR PROPER BITS IN
*****
469
470          ITEST POWER CLEAR (BIT 12) TO CLEAR BYTE RECORD CO NT
SCOPE
471 001700 104402          PWRCLR
472 001702 104414          TST @BC
473 001704 005777 177114 BEQ .+4
474 001710 001401          HLT          IERROR, POWER CLEAR DIDN'T CLEAR BYTE COUNT
*****
476
477          ITEST POWER CLEAR (BIT 12) TO CLEAR CURRENT MEMORY ADDRESS REGISTER
SCOPE
478 001714 104402          PWRCLR
479 001716 104414          TST @CA
480 001720 005777 177102 BEQ .+4
481 001724 001401          HLT          IERROR, POWER CLEAR DI N'T CLEAR CURRENT ADD
*****
483
484          ITEST POWER CLEAR (BIT 12) TO CLEAR DATA BUFFER
SCOPE
485 001730 104402          PWRCLR
486 001732 104414          TST @MTD
487 001734 005777 177070 BEQ .+4
488 001740 001401          HLT          IERROR, POWER CLEAR DIDN'T CLEAR DATA BUFFER
*****
490
491          ITEST CU READY (BIT 7 COMMAND REGISTER) TO BE SET Y POWER CLEAR
SCOPE
492 001744 104402          PWRCLR
493 001746 104414          TSTB @MTC
494 001750 105777 177046 BMI .+4
495 001754 100401          HLT          IERROR, POWER CLEAR DIDN'T SET CU READY
*****
498
499          ITEST BIT 14 OF TU10 HEAD LINES TO BE CLEARD BY PO ER CLEAR
SCOPE
500 001762 104414          PWRCLR
501 001764 032777 040000 177040 BIT #40000,@MTRD
502 001772 001401          BEQ .+4
503 001774 104400          HLT          IERROR, POWER CLEAR FA LED TO CLEAR BIT14 OF
*****
505
506          ITEST FUNCTION BITS (1,2,3) OF COMMAND REGISTER CA BE SET
SCOPE
507 002000 012777 000016 177014 MOV #16,@MTC
508 002006 122777 000216 177006 CMPB #216,@MTC
509 002014 001401          BEQ .+4
510 002016 104400          HLT          IERROR, CU READY AND ALL F NCTION BITS NOT SET
*****
512
513 002020 104402          ITEST FUNCTION BITS (1,2,3) OF COMMAND REGISTER CA BE CLEARED
SCOPE

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514	002022	052777	000016	176772	BIS	#16,@MTC	
515	002030	042777	000016	176764	BIC	#16,@MTC	
516	002036	032777	000016	176756	BIT	#16,@MTC	
517	002044	001401			BEQ	+.4	
518	002046	104400			HLT		!ERROR, ALL FUNCTION BITS OT CLEARED
519							*****
520							!TEST FUNCTIONS BITS (1,2,3,) OF COMMAND REGISTER AN BE SET AND CLEARED
521	002050	104402			SCOPE		
522	002052	012777	000002	176742	MOV	#2,@MTC	
523	002060	122777	000202	176734	CMPB	#202,@MTC	
524	002066	001401			BEQ	+.4	
525	002070	104400			HLT		!ERROR, FUNCTION NOT #001 READ)
526	002072	104402			SCOPE		
527	002074	012777	000004	176720	MOV	#4,@MTC	
528	002102	122777	000204	176712	CMPB	#204,@MTC	
529	002110	001401			BEQ	+.4	
530	002112	104400			HLT		!ERROR, FUNCTION NOT #010 WRITE)
531	002114	104402			SCOPE		
532	002116	012777	000006	176676	MOV	#6,@MTC	
533	002124	122777	000206	176670	CMPB	#206,@MTC	
534	002132	001401			BEQ	+.4	
535	002134	104400			HLT		!ERROR, FUNCTION NOT #011 WRITE EOF)
536	002136	104402			SCOPE		
537	002140	012777	000010	176654	MOV	#10,@MTC	
538	002146	122777	000210	176646	CMPB	#210,@MTC	
539	002154	001401			BEQ	+.4	
540	002156	104400			HLT		!ERROR, FUNCTION NOT #100 SPACE FORWARD)
541	002160	104402			SCOPE		
542	002162	012777	000012	176632	MOV	#12,@MTC	
543	002170	122777	000212	176624	CMPB	#212,@MTC	
544	002176	001401			BEQ	+.4	
545	002200	104400			HLT		!ERROR, FUNCTION NOT #101 SPACE REVERSE)
546	002202	104402			SCOPE		
547	002204	012777	000014	176610	MOV	#14,@MTC	
548	002212	122777	000214	176602	CMPB	#214,@MTC	
549	002220	001401			BEQ	+.4	
550	002222	104400			HLT		!ERROR, FUNCTION NOT #110 WRITE XIRG)
551	002224	104402			SCOPE		
552	002226	012777	000016	176566	MOV	#16,@MTC	
553	002234	122777	000216	176560	CMPB	#216,@MTC	
554	002242	001401			BEQ	+.4	!ERROR, FUNCTION NOT #111 REWIND)
555	002244	104400			HLT		
556							*****
557	002246	104402			SCOPE		
558							!TEST ADDRESS BITS (4,5) OF COMMAND REGISTER CAN B SET
559	002250	012777	000060	176544	MOV	#60,@MTC	
560	002256	122777	000260	176536	CMPB	#260,@MTC	
561	002264	001401			BEQ	+.4	
562	002266	104400			HLT		!ERROR, CU READY AND ADDRE S BITS NOT SET
563							*****
564							!TEST ADDRESS BITS (4,5) OF COMMAND REGISTER CAN B CLEARED
565	002270	104402			SCOPE		
566	002272	052777	000060	176522	BIS	#60,@MTC	
567	002300	042777	000060	176514	BIC	#60,@MTC	
568	002306	032777	000060	176506	BIT	#60,@MTC	
569	002314	001401			BEQ	+.4	
570	002316	104400			HLT		!ERROR, ADDRESS BITS NOT C EARED

571					*****
572					TEST ADDRESS BITS (4,5,6) OF COMMAND REGISTER CAN BE SET AND CLEARED IN
573	002320	104402			SCOPE
574	002322	012777	000020	176472	MOV #20,@MTC
575	002330	122777	000220	176464	CMPB #220,@MTC
576	002336	001401			BEQ .+4
577	002340	104400			HLT ERROR ADDRESS BITS NOT =2
578	002342	104402			SCOPE
579	002344	012777	000040	176450	MOV #40,@MTC
580	002352	122777	000240	176442	CMPB #240,@MTC
581	002360	001401			BEQ .+4
582	002362	104400			HLT ERROR, ADDRESS BITS NOT = 2
583	002364	104402			SCOPE
584	002366	012777	000060	176426	MOV #60,@MTC
585	002374	122777	000260	176420	CMPB #260,@MTC
586	002402	001401			BEQ .+4
587	002404	104400			HLT ERROR, ADDRESS BITS NOT = 1
588					*****
589					TEST UNIT SELECT BITS (8,9,10) OF COMMAND REGISTE CAN BE SET
590	002406	104402			SCOPE
591	002410	012777	003400	176404	MOV #3400,@MTC
592	002416	022777	003600	176376	CMP #3600,@MTC
593	002424	001401			BEQ .+4
594	002426	104400			HLT ERROR, CU READY AND ALL U IT SELECT BITS NOT SE
595					*****
596					TEST UNIT SELECT BITS (8,9,10) OF COMMAND REGISTE CAN BE CLEARED
597	002430	104402			SCOPE
598	002432	052777	003400	176362	BIS #3400,@MTC
599	002440	042777	003400	176354	BIC #3400,@MTC
600	002446	032777	003400	176346	BIT #3400,@MTC
601	002454	001401			BEQ .+4
602	002456	104400			HLT ERROR, UNIT SELECT BITS N T CLEARED
603					*****
604					TEST UNIT SELECT BITS (8,9,10) OF COMMAND REGISTE CAN BE SET AND CLEAR
605	002460	104402			SCOPE
606	002462	012777	000400	176332	MOV #400,@MTC
607	002470	022777	000600	176324	CMP #600,@MTC
608	002476	001401			BEQ .+4
609	002500	104400			HLT ERROR, UNIT SELECT NOT =0 1
610	002502	104402			SCOPE
611	002504	012777	001000	176310	MOV #1000,@MTC
612	002512	022777	001200	176302	CMP #1200,@MTC
613	002520	001401			BEQ .+4
614	002522	104400			HLT ERROR, UNIT SELECT NOT =2 0
615	002524	104402			SCOPE
616	002526	012777	001400	176266	MOV #1400,@MTC
617	002534	022777	001600	176260	CMP #1600,@MTC
618	002542	001401			BEQ .+4
619	002544	104400			HLT ERROR, UNIT SELECT NOT =0 1
620	002546	104402			SCOPE
621	002550	012777	002000	176244	MOV #2000,@MTC
622	002556	022777	002200	176236	CMP #2200,@MTC
623	002564	001401			BEQ .+4
624	002566	104400			HLT ERROR, UNIT SELECT NOT =1 0
625	002570	104402			SCOPE
626	002572	012777	002400	176222	MOV #2400,@MTC
627	002600	022777	002600	176214	CMP #2600,@MTC

628	002606	001401			BEQ	•+4	
629	002610	104400			HLT		!ERROR, UNIT SELECT NOT =1 1
630	002612	104402			SCOPE		
631	002614	012777	003000	176200	MOV	#3000,AMTC	
632	002622	022777	003200	176172	CMP	#3200,AMTC	
633	002630	001401			BEQ	•+4	
634	002632	104400			HLT		!ERROR, UNIT SELECT NOT =1 0
635	002634	104402			SCOPE		
636	002636	012777	003400	176156	MOV	#3400,AMTC	
637	002644	022777	003600	176150	CMP	#3600,AMTC	
638	002652	001401			BEQ	•+4	
639	002654	104400			HLT		!ERROR, UNIT SELECT NOT =1 1
640					*****		
641					!TEST PARITY BIT (BIT 11) CAN BE SET		
642					SCOPE		
643	002656	104402			BIS	#4000,AMTC	
644	002660	052777	004000	176134	BIT	#4000,AMTC	
645	002666	032777	004000	176126	BNE	•+4	
646	002674	001001			HLT		!ERROR, PARITY NOT SET
647	002676	104400			*****		
648					!TEST PARITY BIT (BIT 11) CAN BE CLEARED		
649					SCOPE		
650	002700	104402			BIS	#4000,AMTC	
651	002702	052777	004000	176112	BIC	#4000,AMTC	
652	002710	042777	004000	176104	BIT	#4000,AMTC	
653	002716	032777	004000	176076	BEQ	•+4	
654	002724	001401			HLT		!ERROR, PARITY BIT NOT CLEARED
655	002726	104400			*****		
656					!TEST DENSITY BITS (13,14) OF COMMAND REGISTER CAN BE SET		
657					SCOPE		
658	002730	104402			MOV	#60000,AMTC	
659	002732	012777	060000	176062	CMP	#60200,AMTC	
660	002740	022777	060200	176054	BEQ	•+4	
661	002746	001401			HLT		!ERROR, CU READY AND DENSITY BITS NOT SET
662	002750	104400			*****		
663					!TEST DENSITY BITS (13,14) OF COMMAND REGISTER CAN BE CLEARED		
664					SCOPE		
665	002752	104402			BIS	#60000,AMTC	
666	002754	052777	060000	176040	BIC	#60000,AMTC	
667	002762	042777	060000	176032	BIT	#60000,AMTC	
668	002770	032777	060000	176024	BEQ	•+4	
669	002776	001401			HLT		!TEST DENSITY BITS (13,14) OF COMMAND REGISTER CAN BE SET AND CLEARED IN
670	003000	104400			SCOPE		
671					MOV	#20000,AMTC	
672	003002	104402			CMP	#20200,AMTC	
673	003004	012777	020000	176010	BEQ	•+4	
674	003012	022777	020200	176002	HLT		!ERROR, DENSITY NOT =01
675	003020	001401			SCOPE		
676	003022	104400			MOV	#40000,AMTC	
677	003024	104402			CMP	#40200,AMTC	
678	003026	012777	040000	175766	BEQ	•+4	
679	003034	022777	040200	175760	HLT		!ERROR, DENSITY NOT =10
680	003042	001401			SCOPE		
681	003044	104400			MOV	#60000,AMTC	
682	003046	104402			CMP	#60200,AMTC	
683	003050	012777	060000	175744			
684	003056	022777	060200	175736			

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685 003064 001401          BEQ    .+4
686 003066 104400          HLT      !ERROR DENSITY NOT =11
687                                     !*****
688                                     !TEST ALL BITS OF BYTE COUNT TO ACCEPT COUNT PATTE N
689 003070 104402          SCOPE
690 003072 005007 001044    CLR     TEMP
691 003076 013777 001044 175720 TBC:   MOV    TEMP,@BC
692 003104 023777 001044 175712    CMP    TEMP,@BC
693 003112 001401          BEQ    .+4
694 003114 104400          HLT      !ERROR, BYTE COUNT NOT =TE P
695 003116 032707 010000 177570    BIT    #10000,SR
696 003124 001002          BNE    .+6      !INHIBIT ITERATION?
697 003126 005207 001044          INC    TEMP
698 003132 001301          BNE    TBC
699                                     !*****
700                                     !TEST ALL BITS OF CURRENT MEMORY ADDRESS REGISTER 0 ACCEPT COUNT PATTERN
701 003134 104402          SCOPE
702 003136 005007 001044    CLR     TEMP
703 003142 013777 001044 175656 TMA:   MOV    TEMP,@CA
704 003150 023777 001044 175650    CMP    TEMP,@CA
705 003156 001401          BEQ    .+4
706 003160 104400          HLT      !ERROR, CA NOT = TEMP
707 003162 032707 010000 177570    BIT    #10000,SR
708 003170 001002          BNE    .+6      !INHIBIT ITERATION?
709 003172 005207 001044          INC    TEMP
710 003176 001301          BNE    TMA
711                                     !*****
712                                     !TEST BITS 0-7 OF DATA-BUFFER TO ACCEPT COUNT PATT RN
713 003200 104402          SCOPE
714 003202 005007 001044    CLR     TEMP
715 003206 013777 001044 175614 TDB:   MOVN  TEMP,@MTD
716 003214 023777 001044 175606    CMPB  TEMP,@MTD
717 003222 001401          BEQ    .+4
718 003224 104400          HLT      !ERROR, DATA BUFFER NOT = EMP
719 003226 032707 010000 177570    BIT    #10000,SR
720 003234 001002          BNE    .+6      !INHIBIT ITERATION?
721 003236 005207 001044          INCB  TEMP      !NO
722 003242 001301          BNE    TDB
723                                     !*****
724                                     !TEST BIT 14 OF MTRD CAN BE SET AND CLEARED
725 003244 104402          SCOPE
726 003246 052777 040000 175556    BIS    #40000,@MTRD
727 003254 032777 040000 175550    BIT    #40000,@MTRD
728 003262 001001          BNE    .+4
729 003264 104400          HLT      !ERROR, BIT 14 OF MTRD NOT =1
730 003266 042777 040000 175536    BIC    #40000,@MTRD
731 003274 032777 040000 175530    BIT    #40000,@MTRD
732 003302 001401          BEQ    .+4
733 003304 104400          HLT      !ERROR, BIT 14 OF MTRD NOT =0
734                                     !TEST FOR TAPE UNIT READY (BIT 0) SET
735                                     !*****
736 003306 104402          SCOPE
737 003310 104402          SELECT
738 003312 032777 000001 175500    BIT    #1,@MTS
739 003320 001001          BNE    .+4
740 003322 104400          HLT      !ERROR TU READY NOT SET
741                                     !*****

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742                                ITEST FOR REWIND STATUS (BIT 1) CLEARED
743 003324 104402                SCOPE
744 003326 032777 000002 175464  BIT #2,AMTS
745 003334 001401                BEQ .+4
746 003336 104400                HLT IERROR, REWIND STATUS IS S T
747                                I*****
748                                ITEST FOR WRITE LOCK (BIT 2) CLEARED
749 003340 104402                SCOPE
750 003342 032777 000004 175450  BIT #4,AMTS
751 003350 001401                BEQ .+4
752 003352 104400                HLT IERROR, WRITE LOCK IS SET
753                                I*****
754                                ITEST FOR SETTLEDOWN (BIT 3) CLEARED
755 003354 104402                SCOPE
756 003356 032777 000010 175434  BIT #10,AMTS
757 003364 001401                BEQ .+4
758 003366 104400                HLT IERROR, SETTLEDOWN IS SET
759                                I*****
760                                ITEST FOR 7 CHANNEL (BIT 4) CLEARED IF 9 CHANNEL S LECTED
761 003370 006007 177570        ROR SR IIS SW0=1
762 003374 103407                BCS T7CH IYES SKIP 9 CHANNEL TEST
763 003376 104402                SCOPE
764 003400 032777 000020 175412  BIT #20,AMTS
765 003406 001401                BEQ .+4
766 003410 104400                HLT IERROR, 7 CHANNEL SET WITH 9 TRACK SELECTED
767 003412 000406                OR TSR ISKIP 7 CHANNEL TEST
768                                I*****
769                                ITEST FOR 7 CHANNEL (BIT 4) SET IF 7 CHANNEL SELEC ED
770 003414 104402                T7CH: SCOPE
771 003416 032777 000020 175374  BIT #20,AMTS
772 003424 001001                BNE .+4
773 003426 104400                HLT IERROR, 7 CHANNEL NOT SET
774                                I*****
775                                ITEST FOR BEGINNING OF TAPE (BIT 5) SET
776 003430 104402                TSR: SCOPE
777 003432 104432                SELECT
778 003434 032777 000040 175356  BIT #40,AMTS
779 003442 001001                BNE .+4
780 003444 104400                HLT IERROR, BOT NOT SET (DRIVE SHOULD BE AT BOT)
781                                I*****
782                                ITEST FOR SELECT/REMOTE (BIT 6) SET
783 003446 104402                SCOPE
784 003450 032777 000100 175342  BIT #100,AMTS
785 003456 001001                BNE .+4
786 003460 104400                HLT IERROR, SELECT/REMOTE NOT ET
787 003462 005007 001040        CLR IDTST IALLOW IDEN STATUS CHE K (PE ONLY)
788
789                                I**** TAPE MOTION TESTS ****
790
791                                I*****
792                                ITEST WRITE EOF
793 003466 005207 001042        INC TMNFL ISET TAPE MOTION FLAG
794 003472 104402                SCOPE
795 003474 104404                TSTCUR ITEST CONTROLLER READY
796 003476 104400                HLT IERROR, CONTROLLER DID NOT GO READY
797 003500 104440                MIN10C ISET BYTE COUNT TO MIN S ONE
798 003502 104404                WBUFCA

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799	003504	104422			WREOF		
800	003506	105777	175310		TSTB	@MTC	
801	003512	100001			DPL	+.4	
802	003514	104400			HLT		!ERROR, CONTROLLER DID NOT GO BUSY
803	003516	013702	001020		MOV	MTS,R2	!ASSIGN STATUS REG TO E TESTED
804	003522	012703	000040		MOV	#40,R3	!MASK BOT
805	003526	012704	000005		MOV	#5,R4	
806	003532	104410			TSTRGR		!TEST REG FOR RESET
807	003534	104400			HLT		!ERROR, BOT (BIT 5) NOT CL ARED
808	003536	104404			TSTCUR		!TEST CONTROLLER READY
809	003540	104400			HLT		!ERROR, CONTROLLER DID NOT GO READY
810	003542	104400			WAITTR		
811	003544	104400			HLT		!ERROR, TAPE UNIT READ DID NOT GO SET
812	003546	104445			TSTEOF		
813	003550	001001			BNE	+.4	
814	003552	104400			HLT		!ERROR, EOF (BIT 14) NOT =
815	003554	005777	175244		TST	@BC	
816	003560	001001			BNE	+.4	
817	003562	104400			HLT		!ERROR, BYTE COUNT SHOULD OT INCREMENT ON WRITE
818	003564	022777	014556	175234	CMP	#WBUF,@CA	
819	003572	001401			BEQ	+.4	
820	003574	104400			HLT		!ERROR, CURRENT ADDRESS SH ULD NOT INCREMENT ON
821	003576	104414			PWRCLR		
822	003600	104446			TSTEOF		
823	003602	001401			BEQ	+.4	
824	003604	104400			HLT		!ERROR, POWER CLEAR DID NO CLEAR EOF (BIT 14)
825					*****		
826					!TEST REWIND FUNCTION *****		
827	003606	104402			SCOPE		
828	003610	104404			TSTCUR		!TEST CONTROLLER READY
829	003612	104400			HLT		!ERROR, CONTROLLER DID NOT GO READY
830	003614	104422			WREOF		!WRITE EOF, GO
831	003616	104404			TSTCUR		!TEST CONTROLLER READY
832	003620	104400			HLT		!ERROR, CONTROLLER DID NOT GO READY
833	003622	104424			REWIND		
834	003624	104404			TSTCUR		!TEST CONTROLLER READY
835	003626	104400			HLT		!ERROR, CONTROLLER DID NOT GO READY
836	003630	032777	000002	175162	BIT	#2,@MTS	
837	003636	001001			BNE	+.4	
838	003640	104400			HLT		!ERROR, REWIND STATUS (BIT 1) NOT = 1 DURING REW
839	003642	006077	175152		ROR	@MTS	
840	003646	103001			BCC	+.4	
841	003650	104400			HLT		!ERROR, TU READY NOT =0
842	003652	013702	001020		MOV	MTS,R2	!ASSIGN STATUS REG TO E TESTED
843	003656	012703	000002		MOV	#2,R3	!MASK REWIND BIT
844	003662	012704	000007		MOV	#7,R4	
845	003666	104410			TSTRGR		!TEST REG FOR RESET
846	003670	104400			HLT		!ERROR, REWIND STATUS ID NOT CLEAR
847	003672	057702	175122		BIS	@MTS,R2	!DELAY A SHORT TIME
848	003676	032777	000010	175114	BIT	#10,@MTS	!CHECK SETTLE DOWN BIT
849	003704	001001			BNE	+.4	
850	003706	104400			HLT		!ERROR, SETTLEDOWN STA US DID NOT SET
851	003710	032777	000040	175102	BIT	#40,@MTS	
852	003716	001001			BNE	+.4	
853	003720	104400			HLT		!ERROR, BOT (BIT 5) NOT =1 WHEN SDOWN (BIT 3) SET
854	003722	013702	001020		MOV	MTS,R2	!ASSIGN STATUS REG TO E TESTED
855	003726	012703	000010		MOV	#10,R3	!MASK SETTLEDOWN STATU

856	003732	012704	000001	MOV	#1,R4	
857	003736	104410		TSTRGR		!TEST REG FOR RESET
858	003740	104400		HLT		!ERROR, SETTLEDOWN STA US DID NOT RESET
859	003742	006077	175052	ROR	@MTS	
860	003746	103401		BCS	+.4	
861	003750	104400		HLT		!ERROR, TU READY NOT SET A TER SDWN CLEARED ON R
862	003752	104414		PWRCLR		
863				!TEST REWIND WHILE AT BOT TO BE IGNORED		
864	003754	104402		SCOPE		
865	003756	104424		REWIND		
866	003760	104404		TSTCUR		!TEST CONTROLLER READY
867	003762	104400		HLT		!ERROR, CONTROLLER DID NOT GO READY
868	003764	005777	175030	TST	@MTS	
869	003770	100001		BPL	+.4	
870	003772	104400		HLT		!ERROR, ILC(BIT15)=1 AFTER REWIND WHILE AT BOT
871	003774	104414		PWRCLR		
872				!*****		*****
873				!SPACE OVER EOF TEST		
874				!TEST SPACE FORWARD TO STOP ON FIRST EOF		
875	003776	104402		SCOPE		
876	004000	104424		REWIND		
877	004002	104400		WAITTR		
878	004004	104400		HLT		!ERROR, TAPE UNIT READ DID NOT GO SET
879	004006	012777	177776 175010	MOV	#-2,@BC	
880	004014	104406		RBUFCA		
881	004016	104426		SPACEF		
882	004020	105777	174776	TSTB	@MTC	
883	004024	100001		BPL	+.4	
884	004026	104400		HLT		!ERROR, CONTROLLER DID NOT GO BUSY
885	004030	104404		TSTCUR		!TEST CONTROLLER READY
886	004032	104400		HLT		!ERROR, CONTROLLER DID NOT GO READY
887	004034	104446		TSTEOF		
888	004036	001001		BNE	+.4	
889	004040	104400		HLT		!ERROR, EOF (BIT 14) NOT =
890	004042	005777	174754	TST	@MTC	
891	004046	100401		BMI	+.4	
892	004050	104400		HLT		!ERROR, (BIT 15) OF COMMAN REGISTER NOT=1 WITH
893	004052	022777	177777 174744	CMP	#-1,@BC	
894	004060	001401		BEQ	+.4	
895	004062	104400		HLT		!ERROR, BYTE COUNT SHOULD AVE INCREMENT#0 FROM
896	004064	022777	014722 174734	CMP	#RBUF,@CA	
897	004072	001401		BEQ	+.4	
898	004074	104400		HLT		!ERROR, CURRENT ADDRESS RE ISTER SHOULD NOT INCR
899	004076	104414		PWRCLR		
900	004100	104446		TSTEOF		
901	004102	001401		BEQ	+.4	
902	004104	104400		HLT		!ERROR, PWR CLEAR DIDN'T C EAR EOF (BIT 14)
903				!TEST SPACE REVERSE TO STOP IN FIRST EOF		
904	004106	012777	177776 174710	MOV	#-2,@BC	
905	004114	104406		RBUFCA		
906	004116	104400		SPACEB		
907	004120	104404		TSTCUR		!TEST CONTROLLER READY
908	004122	104400		HLT		!ERROR, CONTROLLER DID NOT GO READY
909	004124	104446		TSTEOF		
910	004126	001001		BNE	+.4	
911	004130	104400		HLT		!ERROR, EOF (BIT 14) NOT =
912	004132	032777	000040 174660	BIT	#40,@MTS	

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913 004140 001401
914 004142 104400
915 004144 022777 177777 174652
916 004152 001401
917 004154 104400
918 004156 022777 014722 174642
919 004164 001401
920 004166 104400
921 004170 104414
922 004172 104424
923 004174 104450
924 004176 104400
925
926
927
928
929 004200 104402
930 004202 104440
931 004204 104404
932 004206 104416
933 004210 104404
934 004212 104400
935 004214 032757 000004 177570
936 004222 001412
937 004224 005707 001040
938 004230 001007
939 004232 005207 001040
940 004236 032777 001000 174566
941 004244 001001
942 004246 104400
943 004250 005777 174550
944 004254 001401
945 004256 104400
946 004260 022777 014557 174540
947 004266 001401
948 004270 104400
949 004272 104414
950
951
952
953
954 004274 104402
955 004276 104424
956 004300 104450
957 004302 104400
958 004304 032777 000040 174506
959 004312 001001
960 004314 104400
961 004316 104440
962 004320 104436
963 004322 104420
964 004324 013702 001020
965 004330 012703 000040
966 004334 012704 000005
967 004340 104410
968 004342 104400
969 004344 104404

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BEQ      .+4
HLT      IERROR, BOT=1. SHOULD NOT AVE REACHED BOT
CMP      #1,ABC
BEQ      .+4
HLT      IERROR, BYTE COUNT SHOULD AVE INCREMENTED FROM
CMP      #RBUF,ACA
BEQ      .+4
HLT      IERROR, CURRENT ADDRESS REGISTER SHOULD NOT INCR
PWRCLR
REWIND
WAITTR
HLT      IERROR, TAPE UNIT READ DID NOT GO TRUE
*****
IWRITE 1 BYTE RECORD FROM BOT
IBOT (BIT 5) SHOULD CLEAR, CU READY SHOULD SET, BY E COUNT AND
ICURRENT ADDRESS SHOULD INCREMENT
SCOPE
MIN1BC           ISET BYTE COUNT TO MIN S ONE
WBUFCA
WRITE
TSTCUR          ITEST CONTROLLER READY
HLT            IERROR, CONTROLLER DID NOT GO READY
BIT      #4,SR   ITEST IF PHASE ENCODED
IDBYP
TST      IDTST   IBYPASS IDEN TEST IF N Z
BNE      IDBYP   IIS THIS FIRST OPER FR M BOT
INC      IDTST   INO
BIT      #1000,AMTRD ITEST FOR IDEN STATUS
BNE      .+4
HLT      IERROR, IDEN STATUS NO SET
TST      ABC     ITEST BYTE COUNT TO = 0
BEQ      .+4
HLT      IERROR, BYTE COUNT DIDN'T INCREMENT
CMP      #WBUF+1,ACA ITEST CURRENT MEMORY ADDRESS TO COUNT
BEQ      .+4
HLT      IERROR, CURRENT MEMORY ADDRESS DIDN'T INCREMENT
PWRCLR
*****
IREAD 1 BYTE RECORD FROM BOT
IBOT (BIT 5) SHOULD CLEAR, CU READY SHOULD SET, BY E COUNT AND
ICURRENT ADDRESS SHOULD INCREMENT
SCOPE
REWIND
WAITTR
HLT      IERROR, TAPE UNIT READ DID NOT GO SET
BIT      #40,AMTS
BNE      .+4
HLT      IERROR, DRIVE NOT AT BOT
MIN1BC           ISET BYTE COUNT TO MIN S ONE
RBUFCA
READ
MOV      MTS,R2   IASSIGN STATUS REG TO E TESTED
MOV      #40,R3  IMASK BOT
MOV      #5,R4
TSTRGR
HLT      ITEST REG FOR RESET
HLT      IERROR, BOT (BIT 5) NOT CLARED
TSTCUR          ITEST CONTROLLER READY

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970	004346	104400	HLT		IEHROR, CONTROLLER DID NOT GO READY
971	004350	005777	TST	0BC	ITEST BYTE COUNT TO =0
972	004354	001401	BEQ	.+4	
973	004356	104400	HLT		IEHROR, BYTE COUNT DIDN'T INCREMENT
974	004360	022777	CMP	#RBUF+1,0CA	ITEST CURRENT MEMORY ADDRESS TO COUNT
975	004366	001401	BEQ	.+4	
976	004370	104400	HLT		IEHROR, CURRENT MEMORY ADDRESS DIDN'T INCREMENT
977	004372	104414	PWRCLR		
978	004374	104424	REWIND		
979	004376	104400	WAITTR		
980	004400	104400	HLT		IEHROR, TAPE UNIT READ DID NOT GO TRUE
981			*****		
982			ITEST WRITE A 3 BYTE RECORD		
983	004402	104402	SCOPE		
984	004404	104442	MIN3BC		ISSET BYTE COUNT TO MIN S THREE
985	004406	104404	WBUFCA		
986	004410	104416	WRITE		
987	004412	104404	TSTCUR		ITEST CONTROLLER READY
988	004414	104400	HLT		IEHROR, CONTROLLER DID NOT GO READY
989	004416	022777	CMP	#WBUF+3,0CA	
990	004424	001401	BEQ	.+4	
991	004426	104400	HLT		IEHROR, CURRENT MEMORY ADDRESS DIDN'T INCREMENT
992	004430	005777	TST	0BC	
993	004434	001401	BEQ	.+4	
994	004436	104400	HLT		IEHROR, BYTE COUNT DIDN'T INCREMENT TO 0
995	004440	005777	TST	0MTC	
996	004444	100001	BPL	.+4	
997	004446	104400	HLT		IEHROR, BIT 15 SET IN COMMAND REGISTER
998	004450	104414	PWRCLR		
999			*****		
1000			ITEST READ A 3 BYTE RECORD		
1001	004452	104402	SCOPE		
1002	004454	104424	REWIND		
1003	004456	104400	WAITTR		
1004	004460	104400	HLT		IEHROR, TAPE UNIT READ DID NOT GO SET
1005	004462	104406	RBUFCA		
1006	004464	104442	MIN3BC		ISSET BYTE COUNT TO MIN S THREE
1007	004466	104420	READ		
1008	004470	104404	TSTCUR		ITEST CONTROLLER READY
1009	004472	104400	HLT		IEHROR, CONTROLLER DID NOT GO READY
1010	004474	022777	CMP	#RBUF+3,0CA	
1011	004502	001401	BEQ	.+4	
1012	004504	104400	HLT		IEHROR, CURRENT MEMORY ADDRESS DIDN'T INCREMENT
1013	004506	005777	TST	0BC	
1014	004512	001401	BEQ	.+4	
1015	004514	104400	HLT		IEHROR, BYTE COUNT DIDN'T INCREMENT TO 0
1016	004516	005777	TST	0MTC	
1017	004522	100001	BPL	.+4	
1018	004524	104400	HLT		IEHROR, BIT 15 SET IN COMMAND REGISTER
1019	004526	104414	PWRCLR		
1020			*****		
1021			ITEST SPACE FORWARD & REVERSE		
1022			IFIRST WRITE 2 RECORDS FOLLOWED BY EOF		
1023			ISPACE FORWARD 2 RECORDS, SHOULD NOT REACH EOF		
1024	004530	104402	SCOPE		
1025	004532	104404	TSTCUR		ITEST CONTROLLER READY
1026	004534	104400	HLT		IEHROR, CONTROLLER DID NOT GO READY

1027	004536	104424		REWIND		
1028	004540	104404		TSTCUR		!TEST CONTROLLER READY
1029	004542	104400		HLT		!ERROR, CONTROLLER DID NOT GO READY
1030	004544	104442		MIN3BC		!SET BYTE COUNT TO MIN S THREE
1031	004546	104434		WBUFCA		
1032	004550	104416		WRITE		
1033	004552	104404		TSTCUR		!TEST CONTROLLER READY
1034	004554	104400		HLT		!ERROR, CONTROLLER DID NOT GO READY
1035	004556	104442		MIN3BC		!SET BYTE COUNT TO MIN S THREE
1036	004560	104434		WBUFCA		
1037	004562	104416		WRITE		
1038	004564	104404		TSTCUR		!TEST CONTROLLER READY
1039	004566	104400		HLT		!ERROR, CONTROLLER DID NOT GO READY
1040	004570	104422		WREOF		
1041	004572	104404		TSTCUR		!TEST CONTROLLER READY
1042	004574	104400		HLT		!ERROR, CONTROLLER DID NOT GO READY
1043	004576	104424		REWIND		
1044	004600	104404		TSTCUR		!TEST CONTROLLER READY
1045	004602	104400		HLT		!ERROR, CONTROLLER DID NOT GO READY
1046	004604	012777	177776 174212	MOV	#-2,ABC	
1047	004612	104426		SPACEF		
1048	004614	104404		TSTCUR		!TEST CONTROLLER READY
1049	004616	104400		HLT		!ERROR, CONTROLLER DID NOT GO READY
1050	004620	104446		TSTEOF		
1051	004622	001401		BEQ	++.	
1052	004624	104400		HLT		!ERROR, EOF (BIT 14)=1, SH ULDN'T SPACE THIS FAR
1053	004626	005777	174172	TST	ABC	!TEST BYTE COUNT TO =0
1054	004632	001401		BEQ	++.	
1055	004634	104400		HLT		!ERROR, BYTE COUNT DIDN'T INCREMENT TO ZERO
1056				INOW	SPACE FORWARD TO EOF	
1057	004636	005077	174162	CLR	ABC	
1058	004642	104426		SPACEF		
1059	004644	104404		TSTCUR		!TEST CONTROLLER READY
1060	004646	104400		HLT		!ERROR, CONTROLLER DID NOT GO READY
1061	004650	104446		TSTEOF		
1062	004652	001001		ONE	++.	
1063	004654	104400		HLT		!ERROR, EOF NOT =1
1064	004656	022777	000001 174140	CMP	#1,ABC	
1065	004664	001401		BEQ	++.	
1066	004666	104400		HLT		!ERROR BYTE COUNT SHOULD =
1067				INOW	SPACE REVERSE 2 RECORDS (FIRST MUST BACKSPACE OVER EOF)	!SET BYTE COUNT TO MIN S THREE
1068	004670	104442		MIN3BC		
1069	004672	104434		WBUFCA		
1070	004674	104430		SPACEB		
1071	004676	104404		TSTCUR		!TEST CONTROLLER READY
1072	004700	104400		HLT		!ERROR, CONTROLLER DID NOT GO READY
1073	004702	104446		TSTEOF		
1074	004704	001001		ONE	++.	
1075	004706	104400		HLT		!ERROR, EOF (BIT 14) NOT = AFTER BACKSPACE OVER
1076	004710	104430		SPACEB		!RESUME BACKSPACE
1077	004712	104404		TSTCUR		!TEST CONTROLLER READY
1078	004714	104400		HLT		!ERROR, CONTROLLER DID NOT GO READY
1079	004716	105777	174102	TSTR	ABC	
1080	004722	001401		BEQ	++.	
1081	004724	104400		HLT		!ERROR, BYTE COUNT NOT=0
1082	004726	022777	014556 174072	CMP	#WBUF,ACA	
1083	004734	001401		BEQ	++.	

1084	004736	104400			HLT		IERROR, CURRENT MEMORY ADDRESS SHOULDN'T COUNT 0
1085	004740	032777	000040	174052	BIT	#40,AMTS	
1086	004746	001401			BEQ	.+4	
1087	004750	104400			HLT		IERROR, BACKSPACE SHOULD NOT HAVE REACHED BOT
1088	004752	104414			PWRCLR		
1089					*****		
1090					ITEST READ TO FIND EOF		
1091	004754	104462			SCOPE		
1092	004756	104464			TSTCUR		ITEST CONTROLLER READY
1093	004760	104400			HLT		IERROR, CONTROLLER DID NOT GO READY
1094	004762	104422			WREOF		
1095	004764	104404			TSTCUR		ITEST CONTROLLER READY
1096	004766	104400			HLT		IERROR, CONTROLLER DID NOT GO READY
1097	004770	104430			SPACEB		
1098	004772	104404			TSTCUR		ITEST CONTROLLER READY
1099	004774	104400			HLT		IERROR, CONTROLLER DID NOT GO READY
1100	004776	005037	014722		CLR	RBUF	
1101	005002	012777	177771	174014	MOV	#-7,ABC	
1102	005010	104436			RBUFCA		
1103	005012	104420			READ		
1104	005014	104404			TSTCUR		ITEST CONTROLLER READY
1105	005016	104400			HLT		IERROR, CONTROLLER DID NOT GO READY
1106	005020	032777	040000	173774	BIT	#40000,AMTC	
1107	005026	001001			BNE	.+4	
1108	005030	104400			HLT		IERROR, EOF (BIT 14) NOT - DURING A READ OPERAT
1109	005032	032737	000004	177570	BIT	#4,SR	IIS TAPE PHASE ENCODED
1110	005040	001024			BNE	TRLE	IYES
1111	005042	006037	177570		ROR	SR	IIS 7 CHANNEL SELECTED
1112	005046	103406			BCE	TREOF	IYES
1113	005050	022737	011423	014722	CMP	#11423,RBUF	
1114	005056	001401			BEQ	.+4	
1115	005060	104400			HLT		IERROR, EOF (23) NOT TRANSERRED FOR 2 BYTES DUR
1116	005062	000413			BR	TRLE	
1117	005064	032737	000010	177570	TREOF: BIT	#10,SR	IIS CONTROLLER CONFIGURED FOR IBM
1118	005072	001402			BEQ	.+6	INO
1119	005074	000337	014722		SWAB	RBUF	IYES
1120	005100	022737	000377	014722	CMP	#377,RBUF	
1121	005106	001401			BEQ	.+4	
1122	005110	104400			HLT		IERROR, EOF (17-7 CHANNEL) NOT XFERED DURING REA
1123					*****		
1124					ITEST RECORD LENGTH ERROR		
1125	005112	104414			TRLE: PWRCLR		
1126	005114	104462			SCOPE		
1127	005116	104404			TSTCUR		ITEST CONTROLLER READY
1128	005120	104400			HLT		IERROR, CONTROLLER DID NOT GO READY
1129	005122	012737	177777	014556	MOV	#-1,WBUF	
1130	005130	012737	177777	014560	MOV	#-1,WBUF+2	
1131	005136	104444			MIN4BC		ISSET BYTE COUNT TO MIN S FOUR
1132	005140	104434			WBUFCA		
1133	005142	104416			WRITE		
1134	005144	104404			TSTCUR		ITEST CONTROLLER READY
1135	005146	104400			HLT		IERROR, CONTROLLER DID NOT GO READY
1136	005150	104440			MIN1BC		ISSET BYTE COUNT TO MIN S ONE
1137	005152	104400			SPACEB		
1138	005154	104404			TSTCUR		ITEST CONTROLLER READY
1139	005156	104400			HLT		IERROR, CONTROLLER DID NOT GO READY
1140	005160	005037	014722		CLR	RBUF	

1141	005164	005057	014724	CLR	RBUF+2	
1142	005170	104442		MIN3BC		ISSET BYTE COUNT TO MIN 3 THREE
1143	005172	104456		RBUFC		
1144	005174	104460		READ		
1145	005176	104404		TSTCUR		ITEST CONTROLLER READY
1146	005200	104400		HLT		IEERROR, CONTROLLER DID NOT GO READY
1147	005202	032777	001000 173610	BIT	#1000,AMTS	
1148	005210	001001		BNE	+.4	
1149	005212	104460		HLT		IEERROR, RECORD LENGTH ERRO (BIT 9) NOT =1
1150	005214	005777	173602	TST	AMTC	
1151	005220	100401		BMI	+.4	
1152	005222	104460		HLT		IEERROR, BIT 15 NOT =1 WHEN ALS (BIT 9) =1
1153	005224	022757	177777 014722	CMP	#-1,RBUF	
1154	005232	001401		BEQ	+.4	
1155	005234	104460		HLT		IEERROR, BYTES 1+2 NOT READ PROPERLY
1156	005236	032757	000010 177570	BIT	#10.SR	ISIS CONTROLLER CONFIGU ED FOR IBM
1157	005244	001402		BEQ	+.6	INO
1158	005246	000357	014724	SWAB	RBUF+2	IYES
1159	005252	022757	000377 014724	CMP	#377,RBUF+2	
1160	005260	001401		BEQ	+.4	
1161	005262	104400		HLT		IEERROR, BYTE 3 READ ERROR 0 SOMETHING XFERED TO ISIS DEC/IBM SWITCH IN CORR CT POSITION?
1162						
1163	005264	104414		PWRCLR		
1164	005266	032777	001000 173524	BIT	#1000,AMTS	
1165	005274	001401		BEQ	+.4	
1166	005276	104400		HLT		IEERROR PWR CLEAR DIDN'T CL RLE (BIT 9)
1167						*****
1168						ITEST ILLEGAL COMMAND TO =1 ON A DATO OR DATOB TO TC WITH CU READY=0
1169						
1170	005300	104402		SCOPE		
1171	005302	104404		TSTCUR		ITEST CONTROLLER READY
1172	005304	104400		HLT		IEERROR, CONTROLLER DID NOT GO READY
1173	005306	104442		MIN3BC		ISSET BYTE COUNT TO MIN 3 THREE
1174	005310	104454		WBUFC		
1175	005312	104422		WREOF		
1176	005314	104424		REWIND		
1177	005316	104404		TSTCUR		ITEST CONTROLLER READY
1178	005320	104400		HLT		IEERROR, CONTROLLER DID NOT GO READY
1179	005322	005777	173472	TST	AMTS	
1180	005326	100401		BMI	+.4	
1181	005330	104400		HLT		IEERROR, ILLEGAL COMMAND (BIT 15) NOT =1
1182	005332	005777	173464	TST	AMTC	
1183	005336	100401		BMI	+.4	
1184	005340	104400		HLT		IEERROR, (BIT 15) NOT =1 WITH ILLEGAL COMMAND
1185	005342	104400		WAITTR		
1186	005344	104400		HLT		IEERROR, TAPE UNIT READ DID NOT GO SET
1187	005346	104414		PWRCLR		
1188						*****
1189						ITEST ILLEGAL COMMAND BY ISSUING A COMMAND TO TYPE A UNIT WITH SELECT RE
1190	005350	104402		SCOPE		
1191	005352	013700	001106	MOV	TCSL,R0	
1192	005356	032700	002000	BIT	#2000,R0	IMASK UNIT SELECT MSB
1193	005362	001004		BNE	+.12	ISIS UNIT SELECT MSB SE ?
1194	005364	042757	010000 005414	BIC	#10000,CINST	INO, MAKE CINST A BIC INSTRUCTION
1195	005372	000403		BR	+.10	
1196	005374	052757	010000 005414	BIS	#10000,CINST	IYES, MAKE CINST A BIS INSTRUCTION
1197	005402	013757	001106 001044	MOV	TCSL,TEMP	

1198	005410	105237	001045		INCR	TEMP+1	
1199	005414	042737	002000	001044	CINST:	BIC	#2000,TEMP
1200	005422	013777	001044	173372		MOV	TEMP,@MTC
1201	005430	104404				TSTCUR	
1202	005432	104400				HLT	
1203	005434	006077	173360			ROR	@MTC
1204	005440	103001				BCC	+.4
1205	005442	104400				HLT	
1206	005444	032777	000100	173346		BIT	#100,@MTC
1207	005452	001401				BCQ	+.4
1208	005454	104400				HLT	
1209	005456	052777	000017	173336		BIS	#17,@MTC
1210	005464	104404				TSTCUR	
1211	005466	104400				HLT	
1212	005470	005777	173324			TST	@MTC
1213	005474	100401				BMI	+.4
1214	005476	104400				HLT	
1215	005500	104414				PWRCLR	
1216	005502	005777	173312			TST	@MTC
1217	005506	100001				BPL	+.4
1218	005510	104400				HLT	
1219							
1220							
1221	005512	104402					
1222	005514	104404				SCOPE	
1223	005516	104404				REWIND	
1224	005520	104400				TSTCUR	
1225	005522	104400				HLT	
1226	005524	104400				WAITTR	
1227	005526	104440				HLT	
1228	005530	104430				MIN1BC	
1229	005532	104404				SPACEB	
1230	005534	104400				TSTCUR	
1231	005536	005777	173256			HLT	
1232	005542	100001				TST	@MTC
1233	005544	104400				BPL	+.4
1234	005546	032777	000040	173244		HLT	
1235	005554	001001				BIT	#40,@MTC
1236	005556	104400				BNE	+.4
1237						HLT	
1238							
1239							
1240	005560	104402					
1241	005562	032737	000004	177570		SCOPE	
1242	005570	001041				BIT	#4,SR
1243	005572	104444				BNE	NXMT
1244	005574	104434				MIN4BC	
1245	005576	104404				WBUFCA	
1246	005600	104400				TSTCUR	
1247	005602	104416				HLT	
1248	005604	013702	001024			WRITE	
1249	005610	012703	177777			MOV	BC,R2
1250	005614	012704	000001			MOV	#-1,R3
1251	005620	104410				MOV	#1,R4
1252	005622	104400				TSTRGH	
1253	005624	052777	020000	173200		HLT	
1254	005632	104400				BIS	#20000,@MTRD
						WAITTR	

I CAN BE A BIC OR BIS I STRUCTION
 I SELECT OFF LINE UNIT
 I TEST CONTROLLER READY
 I ERROR, CONTROLLER DID NOT GO READY
 I ERROR NON DESIGNATED TAPE UNIT ON LINE
 I ERROR, SELECT REMOTE (BIT 6) NOT =0 WITH NONEXI
 I ISSUE REWIND
 I TEST CONTROLLER READY
 I ERROR, CONTROLLER DID NOT GO READY
 I ERROR, ILLEGAL COMMAND (B T 15) NOT =1
 I ERROR, POWER CLEAR DIDN'T CLEAR ILC (BIT 15)
 I TEST BACKSPACE WHILE AT BOT TO BE IGNORED
 I TEST CONTROLLER READY
 I ERROR, CONTROLLER DID NOT GO READY
 I ERROR, TAPE UNIT READ DID NOT GO SET
 I SET BYTE COUNT TO MIN S ONE
 I TEST CONTROLLER READY
 I ERROR, CONTROLLER DID NOT GO READY
 I ERROR, ILC (BIT 15) =1 AF ER BACKSPACE WHILE AT
 I ERROR, NOT AT BOT AFTER B CKSPACE
 I TEST BAD TAPE ERROR (BIT 8) TO =1
 I USE MAINTENANCE BIT 13 OF MTRD TO SET PREMATURE G READY TO CAUSE BAD T
 I IS TAPE PHASE ENCODED
 I YES
 I SET BYTE COUNT TO MIN S FOUR
 I TEST CONTROLLER READY
 I ERROR, CONTROLLER DID NOT GO READY
 I ASSIGN BYTE COUNT REG TO BE TESTED
 I TEST ALL OF REG
 I TEST REG FOR RESET
 I ERROR, BYTE COUNT DID NOT GO TO ZERO
 I SET PREMATURE CU REA Y


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1255 005634 104400
1256 005636 032777 000400 173154
1257 005644 001001
1258 005646 104400
1259 005650 005777 173146
1260 005654 100401
1261 005656 104400
1262 005660 104414
1263 005662 032777 000400 173130
1264 005670 001401
1265 005672 104400
1266
1267
1268 005674 104402
1269 005676 104440
1270 005700 012777 173000 173120
1271 005706 104404
1272 005710 104400
1273 005712 012777 000060 173102
1274 005720 053777 001116 173074
1275 005726 104404
1276 005730 104400
1277 005732 032777 000200 173060
1278 005740 001001
1279 005742 104400
1280 005744 005777 173052
1281 005750 100401
1282 005752 104400
1283 005754 104414
1284 005756 032777 000600 173034
1285 005764 001401
1286 005766 104400
1287
1288
1289
1290 005770 104402
1291 005772 012706 000776
1292 005776 013707 001110 177776
1293 006004 013777 001110 173004
1294 006012 012777 006040 172774
1295 006020 012777 000100 172774
1296 006026 005777 172770
1297 006032 005077 172764
1298 006036 104400
1299
1300
1301 006040 104414
1302 006042 104402
1303 006044 012706 000776
1304 006050 013707 001104 177776
1305 006056 013777 001104 172732
1306 006064 013707 001104 000036
1307 006072 012777 006114 172714
1308 006100 012777 000100 172714
1309 006106 005777 172710
1310 006112 000401
1311 006114 104400

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HLT                                IERROR, TAPE UNIT READ DID NOT GO SET
BIT #400,AMTS
BNE .+4
HLT                                IERROR, BAD TAPE ERROR (BI 8) NOT =1
TST @MTC
BMI .+4
HLT                                IERROR, BIT 15 NOT =1 WITH BTE=1
PWRCLR
BIT #400,AMTS
BEQ .+4
HLT                                IERROR, POWER CLEAR DIDN'T CLEAR BTE (BIT 8)
*****
I TEST NON-EXISTENT MEMORY (BIT 7) AND ERROR (BIT 1 ) TO =1.
NXMT: SCOPE
MINIHC ISET BYTE COUNT TO MIN S ONE
MOV #173000,@CA IINIT CURRENT MEMORY A DRESS FOR NON EXISTEN
TSTCUR ITEST CONTROLLER READY
HLT IERROR, CONTROLLER DID NOT GO READY
MOV #60,@MTC ISET EA=3
BIS TCWT,@MTC IWRITE, EA=3, 800 BPI, 60
TSTCUR ITEST CONTROLLER READY
HLT IERROR, CONTROLLER DID NOT GO READY
BIT #200,AMTS
BNE .+4
HLT                                IERROR, NON-EXISTENT MEMOR (BIT 7) NOT =1
TST @MTC
BMI .+4
HLT                                IERROR, (BIT 15) NOT =1 WI H NXM (BIT 7) =1
PWRCLR
BIT #600,AMTS
BEQ .+4
HLT                                IERROR, POWER CLEAR DIDN'T CLEAR BTE (BIT 8) OR
I**** INTERRUPT TESTS ****
*****
I TEST FOR PROCESSOR PRIORITY LEVEL MTPM TO ALLOW I TERRUPT
SCOPE
MOV #BUFF,SP ISET UP STACK
MOV MTPM,CC ISET PRIORITY LEVEL
MOV MTPM,@MTVS ISET INTERRUPT VECTOR C
MOV #IR1,@MTV;INIT INTERRUPT RETURN
MOV #100,@MTC;ISET INT ENABLE
TST @MTC IWAIT FOR INTERRUPT
CLR @MTC IWAITED TOO LONG WITHOUT I TERRUPT, CLEAR INT EN
HLT IERROR, INT ENABLE FAILED TO CAUSE INT
*****
I TEST FOR PROCESSOR PRIORITY LEVEL MTP TO SUPPRESS INTERRUPT
IR1: PWRCLR
SCOPE
MOV #BUFF,SP ISET UP STACK
MOV MTP,CC ISET PROCESSOR PRIORIT TO MAG TAPE LEVEL
MOV MTP,@MTVS ISET INTERRUPT VECTOR C
MOV MTP,36
MOV #IR2,@MTV;INIT INTERRUPT RETURN
MOV #100,@MTC;ISET INIT ENABLE
TST @MTC IWAIT FOR INTERRUPT
BR IR2A
IR2: HLT IERROR, SHOULDN'T HAVE INT RRUPT WITH PROCESSOR

```

1312
1313
1314
1315 006116 104414
1316 006120 104402
1317 006122 012706 000776
1318 006126 013737 001110 177776
1319 006134 013737 001110 001016
1320 006142 013737 001110 000036
1321 006150 012777 006214 172636
1322 006156 104452
1323 006160 104404
1324 006162 104400
1325 006164 013700 001120
1326 006170 052700 000100
1327 006174 010077 172622
1328 006200 104404
1329 006202 000411
1330 006204 005777 172612
1331 006210 104400
1332 006212 000406
1333 006214 105777 172602
1334 006220 100401
1335 006222 104400
1336 006224 000401
1337 006226 104400
1338 006230 104414
1339
1340
1341
1342 006232 104402
1343 006234 012706 000776
1344 006240 013737 001110 177776
1345 006246 013737 001110 000036
1346 006254 012777 006326 172532
1347 006262 104452
1348 006264 104404
1349 006266 104400
1350 006270 104422
1351 006272 104404
1352 006274 104400
1353 006276 013700 001130
1354 006302 052700 000100
1355 006306 010077 172510
1356 006312 104404
1357 006314 000416
1358 006316 005777 172500
1359 006322 104400
1360 006324 000413
1361 006326 105777 172470
1362 006332 100401
1363 006334 104400
1364 006336 032777 000040 172454
1365 006344 100001
1366 006346 104400
1367 006350 000401
1368 006352 104400

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*****
!TEST CU READY TO CAUSE INTERRUPT WITH INT ENABLE 1
!INT ENABLE (BIT6) AND GO (BIT 0) SET AT SAME TIME SHOULDN'T CAUSE INTER
IR2A: PWRCLR
SCOPE
MOV #BUFF,SP !SET UP STACK
MOV MTPM,CC !SET PRIORITY LEVEL
MOV MTPM,MTVS !SET INTERRUPT VECTOR C
MOV MTPM,36
MOV #IR3,@MTV
SELECT
TSTCUR !TEST CONTROLLER READY
HLT !ERROR, CONTROLLER DID NOT GO READY
MOV TCRW,R0
BIS #100,R0
MOV R0,@MTC !WRITE EOF, INT ENABLE GO
TSTCUR !TEST CONTROLLER READY
BR IR3A-2
TST @MTC !WAIT FOR INTERRUPT
HLT !ERROR, NO INTERRUPT A COMPLETION OF WRITE
BR IR3A
IR3: TSTB @MTC
BMI .+4 !ERROR, INTERRUPT NOT CAUS D BY CU READY
HLT IR3A !ERROR, CONTROLLER DID NOT GO READY
IR3A: PWRCLR
*****
!TEST REWIND TO CAUSE TWO INTERRUPTS
!1ST AFTER CU READY AND 2ND AFTER REWIND COMPLETE
SCOPE
MOV #BUFF,SP !SET UP STACK
MOV MTPM,CC !SET PRIORITY LEVEL
MOV MTPM,36
MOV #IR4,@MTV
SELECT
TSTCUR !TEST CONTROLLER READY
HLT !ERROR, CONTROLLER DID NOT GO READY
WRLOF
TSTCUR !1ST CONTROLLER READY
HLT !ERROR, CONTROLLER DID NOT GO READY
MOV TCRW,R0
BIS #100,R0
MOV R0,@MTC !INT ENABLE, REWIND, 6
TSTCUR !TEST CONTROLLER READY
BR IR4A-2
TST @MTC !WAIT FOR INTERRUPT
HLT !ERROR, NO INT AFTER I SUING REWIND
BR IR4A
IR4: TSTB @MTC
BMI .+4 !ERROR, INTERRUPT NOT CAUS D BY CU READY
HLT #40,@MTS
BPL .+4 !ERROR, SHOULDN'T BE AT 80 SO SOON AFTER 1ST IN
BR IR4A
HLT !ERROR, CONTROLLER DID NOT GO READY

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1369 006354 012777 006376 172432 IR4A:  MOV  #IR5,@MTV
1370 006362 104450                WAITTR
1371 006364 000412                BR   IR5A-2
1372 006366 005777 172430                TST  @MTC           ;WAIT FOR INTERRUPT
1373 006372 104400                HLT                    ;ERROR, NO INT AT END  F REWIND
1374 006374 000407                BR   IR5A
1375 006376 032777 000040 172414 IR5:  BIT  #40,@MTS
1376 006404 001001                BNE  .+4
1377 006406 104400                HLT                    ;ERROR] 2ND INTERRUPT NOT  AUSED BY REWIND COMPL
1378 006410 000401                BR   IR5A
1379 006412 104400                HLT                    ;ERROR, TAPE UNIT READ  DID NOT GO SET
1380 006414 104414                IR5A: PWRCLR
1381                                ;**** DATA TRANSFER TESTS ****
1382                                ;*****
1383                                ;WRITE RECORD, BACKSPACE, READ RECORD
1384                                ;REPEAT FOR ALL BYTE PATTERNS FROM 0 THRU ALL DATA PATTERNS
1385 006416 104402                SCOPE
1386 006420 012706 000776                MOV  #BUFF,SP        ;SET UP STACK
1387 006424 005057 177776                CLR  CC              ;SET PROCESSORPRIORITY TO 0
1388 006430 005057 000036                CLR  36              ;SET TRAP PRIORITY TO
1389 006434 012757 000340 001016                MOV  #340,MTVS      ;SET INTERRUPT VECTOR  C
1390 006442 012777 011450 172344                MOV  #MTTRP,@MTV   ;SET UP ILLEGAL INTERR PT RETURN
1391 006450 005057 001044                WBR5: CLR  TEMP      ;INITIALIZE DATA PATTERN
1392 006454 012700 014556                WBR:  MOV  #WBUF,RO
1393 006460 013720 001044                MOV  TEMP, (RO)+   ;SET UP WRITE BUFFER
1394 006464 022700 014602                CMP  #WBUF+24,RO
1395 006470 001375                BNE  WBR+4
1396 006472 012777 177754 172324                MOV  #-20,@BCIINIT BYTE COUNT
1397 006500 104434                WBUFCA
1398 006502 104404                TSTCUR              ;TEST CONTROLLER READY
1399 006504 104400                HLT                    ;ERROR, CONTROLLER DID NOT GO READY
1400 006506 104416                WRITE
1401 006510 104404                TSTCUR              ;TEST CONTROLLER READY
1402 006512 104400                HLT                    ;ERROR, CONTROLLER DID NOT GO READY
1403                                ;AFTER WRITE, CHECK WRITE BUFFER TO MAKE CERTAIN I  WASN'T MODIFIED
1404 006514 012700 014556                MOV  #WBUF,RO
1405 006520 023720 001044                WBR1: CMP  TEMP, (RO)+
1406 006524 001401                BEQ  .+4
1407 006526 104400                HLT                    ;ERROR, DATA BUFFER MODIFI D DURING WRITE
1408 006530 022700 014602                CMP  #WBUF+24,RO
1409 006534 001371                BNE  WBR1
1410                                ;BACKSPACE 1 RECORD
1411 006536 104440                MIN1BC              ;SET BYTE COUNT TO MIN S ONE
1412 006540 104430                SPACEB
1413 006542 104404                TSTCUR              ;TEST CONTROLLER READY
1414 006544 104400                HLT                    ;ERROR, CONTROLLER DID NOT GO READY
1415 006546 012700 014722                MOV  #RBUF,RO
1416 006552 005020                WBR2: CLR  (RO)+   ;CLEAR READ BUFFER
1417 006554 022700 014746                CMP  #RBUF+24,RO
1418 006560 001374                BNE  WBR2
1419                                ;READ RECORD
1420 006562 012777 177754 172234                MOV  #-20,@BCIUNIT BYTE COUNT
1421 006570 104436                RBUFCA
1422 006572 104420                READ
1423 006574 104404                TSTCUR              ;TEST CONTROLLER READY
1424 006576 104400                HLT                    ;ERROR, CONTROLLER DID NOT GO READY
1425 006600 005777 172216                TST  @MTC

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1426	006604	100001			BPL	.*+4		
1427	006606	104400			HLT		!ERROR, ERROR (BIT 15) =1 FTER READ	
1428	006610	012700	014722		MOV	#RBUF,R0		
1429	006614	023720	001044	WBR3:	CMP	TEMP,(R0)+		
1430	006620	001400			BEQ	.*+4		
1431	006622	104400			HLT		!ERROR, DATA READ NOT EQUA DATA WRITTEN	
1432	006624	022700	014746		CMP	#RBUF+24,R0		
1433	006630	001371			BNE	WBR3		
1434	006632	104402			SCOPE			
1435	006634	105237	001044		INCB	TEMP	!DONE FOR ALL DATA PATTERN ?	
1436	006640	013700	001116		MOV	TCWT,R0		
1437	006644	042700	117777		BIC	#117777,R0		
1438	006650	022700	060000		CMP	#60000,R0	!IS CORE DUMP MODE SEL CTED?	
1439	006654	001403			BEQ	.*+10	!YES	
1440	006656	142737	000300	001044	BICR	#300,TEMP	!NO	
1441	006664	105737	001044		YSTR	TEMP		
1442	006670	001405			BEQ	WBR4	!YES, EXIT	
1443	006672	113737	001044	001045	MOVB	TEMP,TEMP+1	!NO	
1444	006700	000137	006454		JMP	WBR	!REPEAT	
1445	006704	162737	020000	001116	WBR4:	SUB	#20000,TCWT	!CHANGE DENSITY OF WRI E COMMAND
1446	006712	162737	020000	001114	SUB	#20000,TCRD	!CHANGE DENSITY OF REA COMMAND	
1447	006720	032737	060000	001116	BIT	#60000,TCWT	!MASK DENSITY STATUS	
1448	006726	001230			BNE	WBR5	!REPEAT FOR ALL DENSIT S	
1449	006730	013700	001106		MOV	TCSL,R0	!RESTORE TCWT & TCRD	
1450	006734	062700	060003		ADD	#60003,R0		
1451	006740	010037	001114		MOV	R0,TCRD		
1452	006744	062700	000002		ADD	#2,R0		
1453	006750	010037	001116		MOV	R0,TCWT		
1454							!WRITE AND READ A LONG RECORD	
1455							!USES MEMORY OCCUPIED BY THE PROGRAM AS A WRITE BU FER	
1456	006754	104402			SCOPE			
1457	006756	012700	017000		MOV	#17000,R0		
1458	006762	162700	014722		SUB	#RBUF,R0	!CALCULATE SIZE OF REA BUFFER	
1459	006766	005400			NEG	R0	!GEN 2'S COMPLIMENT	
1460	006770	010037	001044		MOV	R0,TEMP		
1461	006774	013777	001044	172022	MOV	TEMP,@BC		
1462	007002	012777	002000	172016	MOV	#2000,@CA		
1463	007010	104404			TSTCUR		!TEST CONTROLLER READY	
1464	007012	104400			HLT		!ERROR, CONTROLLER DID NOT GO READY	
1465	007014	104416			WRITE			
1466	007016	104404			TSTCUR		!TEST CONTROLLER READY	
1467	007020	104400			HLT		!ERROR, CONTROLLER DID NOT GO READY	
1468	007022	104440			MIN1BC		!SET BYTE COUNT TO MIN S ONE	
1469	007024	104430			SPACEB			
1470	007026	104404			TSTCUR		!TEST CONTROLLER READY	
1471	007030	104400			HLT		!ERROR, CONTROLLER DID NOT GO READY	
1472	007032	013777	001044	171764	MOV	TEMP,@BC		
1473	007040	104436			RBUFCA			
1474	007042	104420			READ			
1475	007044	104404			TSTCUR		!TEST CONTROLLER READY	
1476	007046	104400			HLT		!ERROR, CONTROLLER DID NOT GO READY	
1477	007050	005777	171746		TST	@MTC	!CHECK FOR ERROR STATU	
1478	007054	100001			BPL	.*+4		
1479	007056	104400			HLT		!ERROR, ERROR FLAG SET IN MTC	
1480	007060	012700	002000		MOV	#2000,R0		
1481	007064	012741	014722		MOV	#RBUF,R1		
1482	007070	0220-1		WBR5:	CMP	(R0)+,(R1)+	!DO A DATA COMPARISON	

1483	007072	001401			BEQ	+.4	
1484	007074	104400			HLT		!ERROR, DATA READ NOT EQU DATA WRITTEN
1485	007076	022701	017000		CMP	#17000,R1	! CHECK THE WHOLE BUFFER
1486	007102	001372			BNE	WBR5	!NO
1487					*****		
1488					!TEST PARITY		
1489					!WRITE 3 BYTE RECORD ODD PARITY, READ EVEN PARITY		
1490					!BIT 14 OF MTRD =1 SHOULD CAUSE LPS TO BE LOADED ! DATA BUFFER AFTER RE		
1491	007104	104402			PAR:	SCOPE	
1492	007106	032737	000004	177570	BIT	#4,SR	!IS TAPE PHASE ENCODED
1493	007114	001402			BEQ	+.6	!NO
1494	007116	000137	010252		JMP	TMHT	!YES
1495	007122	012737		014556	MOV	#-1,WBUF	
1496	007130	012737		014560	MOV	#-1,WBUF+2	
1497	007136	104442			MIN3BC		!SET BYTE COUNT TO MIN S THREE
1498	007140	104434			WBUFCA		
1499	007142	104404			TSTCUR		!TEST CONTROLLER READY
1500	007144	104400			HLT		!ERROR, CONTROLLER DID NOT GO READY
1501	007146	013700	001116		MOV	TCWT,R0	
1502	007152	005300			DEC	R0	
1503	007154	010077	171642		MOV	R0,@MTC	!WRITE, 800 BPI, 9 TRA K
1504	007160	006037	177570		ROR	SR	
1505	007164	103003			BCC	+.10	
1506	007166	042777	020000	171626	BIC	#20000,@MTC	!MAKE COMMAND 7 TRACK
1507	007174	005277	171622		INC	@MTC	!60
1508	007200	104404			TSTCUR		!TEST CONTROLLER READY
1509	007202	104400			HLT		!ERROR, CONTROLLER DID NOT GO READY
1510	007204	104440			MIN3BC		!SET BYTE COUNT TO MIN S ONE
1511	007206	104430			SPACEB		
1512	007210	104404			TSTCUR		!TEST CONTROLLER READY
1513	007212	104400			HLT		!ERROR, CONTROLLER DID NOT GO READY
1514	007214	052777	040000	171610	BIS	#40000,@MTRD	
1515	007222	104442			MIN3BC		!SET BYTE COUNT TO MIN S THREE
1516	007224	104436			RBUFCA		
1517	007226	013700	001114		MOV	TCRD,R0	
1518	007232	052700	004000		BIS	#4000,R0	!MAKE EVEN PARITY
1519	007236	005300			DEC	R0	
1520	007240	010077	171556		MOV	R0,@MTC	!READ
1521	007244	006037	177570		ROR	SR	
1522	007250	103003			BCC	+.10	
1523	007252	042777	020000	171542	BIC	#20000,@MTC	!MAKE COMMAND 7 TRACK
1524	007260	005277	171536		INC	@MTC	!60
1525	007264	104404			TSTCUR		!TEST CONTROLLER READY
1526	007266	104400			HLT		!ERROR, CONTROLLER DID NOT GO READY
1527	007270	032777	010000	171522	BIT	#10000,@MTC	
1528	007276	001001			BNE	+.4	
1529	007300	104400			HLT		!ERROR, PARITY ERROR (BIT 2) NOT =1
1530	007302	017700	171522		MOV	@MTRD,R0	
1531	007306	042700	177000		BIC	#177000,R0	
1532	007312	006037	177570		ROR	SR	
1533	007316	103405			BCC	PAR1	
1534	007320	022700	000744		CMP	#744,R0	
1535	007324	001401			BEQ	+.4	
1536	007326	104400			HLT		!ERROR, LPC NOT =744 OR BI 14 OF MTRD DIDN'T CA
1537	007330	000404			BR	PAR2	
1538	007332	022700	000477		PAR1:	CMP	#477,R0
1539	007336	001401			BEQ	+.4	

1540	007340	104400		HLT		!ERROR, LPC NOT =477 (7 CH NNEL) OR LPC NOT READ
1541				!WRITE EVEN PARITY, READ ODD PARITY		
1542	007342	104442		PAR2: MIN3BC		!SET BYTE COUNT TO MIN S THREE
1543	007344	104434		WBUFCA		
1544	007346	013700	001116	MOV	TCWT,R0	
1545	007352	052700	004000	BIS	#4000,R0	!MAKE EVEN PARITY
1546	007356	005300		DEC	R0	
1547	007360	010077	171436	MOV	R0,@MTC	!WRITE, 800 BPI, 9 TRA K
1548	007364	006037	177570	ROR	SR	
1549	007370	103003		BCC	+.10	
1550	007372	042777	020000 171422	BIC	#20000,@MTC	!MAKE 7 TRACK
1551	007400	005277	171416	INC	@MTC 160	
1552	007404	104404		TSTCUR		!TEST CONTROLLER READY
1553	007406	104400		HLT		!ERROR, CONTROLLER DID NOT GO READY
1554	007410	104440		MIN1BC		!SET BYTE COUNT TO MIN S ONE
1555	007412	104430		SPACEB		
1556	007414	104404		TSTCUR		!TEST CONTROLLER READY
1557	007416	104400		HLT		!ERROR, CONTROLLER DID NOT GO READY
1558	007420	052777	040000 171404	BIS	#40000,@MTRD	
1559	007426	104442		MIN3BC		!SET BYTE COUNT TO MIN S THREE
1560	007430	104436		RBUFCA		
1561	007432	013700	001114	MOV	TCRD,R0	
1562	007436	005300		DEC	R0	
1563	007440	010077	171356	MOV	R0,@MTC	!READ, 800 BPI, 9 TRAC
1564	007444	006037	177570	ROR	SR	
1565	007450	103003		BCC	+.10	
1566	007452	042777	020000 171342	BIC	#20000,@MTC	!MAKE 7 TRACK
1567	007460	005277	171336	INC	@MTC 160	
1568	007464	104404		TSTCUR		!TEST CONTROLLER READY
1569	007466	104400		HLT		!ERROR, CONTROLLER DID NOT GO READY
1570	007470	032777	010000 171322	BIT	#10000,@MTS	
1571	007476	001001		BNE	+.4	
1572	007500	104400		HLT		!ERROR, PARITY ERROR (BIT 2) NOT #1
1573	007502	017700	171322	MOV	@MTRD,R0	
1574	007506	042700	177000	BIC	#177000,R0	
1575	007512	006037	177570	ROR	SR	
1576	007516	103411		BCS	PAR4	
1577	007520	022700	000004	CMP	#4,R0	
1578	007524	001401		BEQ	+.4	
1579	007526	104400		HLT		!ERROR, LPC NOT =004 OR LP NOT READ PROPERLY
1580	007530	000404		BR	PAR4	
1581	007532	022700	000077	PAR3: CMP	#77,R0	
1582	007536	001401		BEQ	+.4	
1583	007540	104400		HLT		!ERROR, LPC NOT =77 (7 TRA K)
1584	007542	104414		PAR4: PWRCLR		
1585	007544	032777	010000 171246	BIT	#10000,@MTS	
1586	007552	001401		BEQ	+.4	
1587	007554	104400		HLT		!ERROR, POWER CLEAR DIDN'T CLEAR PARITY ERROR (B
1588	007556	104402		SCOPE		
1589	007560	006037	177570	ROR	SR	!IS SWC=1 TO INDICATE 7 CH NNEL
1590	007564	103002		BCC	+.6	!NO
1591	007566	000137	010252	JMP	TMRT	!YES SKIP CRC TEST
1592				*****		
1593				!TEST CRC GENERATION AND LPC CHARACTER		
1594				!PROCEDURE USED IS TO WRITE A 4 BYTE RECORD AND READ IT BACK.		
1595				!THEN THE CRC WRITTEN IS COMPARED WITH CRC CALCULATED.		
1596				!THEN RECORD IS READ AGAIN AND LPC SHOULD = CRC		

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1597
1598 007572 105037 001044      ;TEST IS REPEATED FOR ALL DATA COMBINATIONS.
1599                                ;CRCTST: CLR B TEMP      ;INITIALIZE DATA
1600 007576 112737 000001 001045 ;CALCULATE PARITY OF DATA TO BE WRITTEN IN CRC YES (MAKE PARITY ODD)
1601 007604 113701 001044      CRCT1: MOVB #1,TEMP+1;INITIALIZE ODD PARITY
1602 007610 105701                                MOVB TEMP,R1
1603 007612 001001      CRCP1: TSTB R1      ;IS DATA=0
1604 007614 000410      BNE .+4      ;NO
1605 007616 106301      BR CRCT2      ;YES, NOW TEMP=1 CONTAINS PARITY BIT
1606 007620 103002      ASLB R1      ;SHIFT DATA BITS LEFT INTO C BIT
1607 007622 105137 001045      BCC .+6      ;WAS BIT=0?
1608 007626 042737 177000 001044 ;COMB TEMP+1 ;NO, COMPLEMENT PARITY
1609 007634 000705      BIC #177000,TEMP
1610 007636 013707 001044 001052 ;CRCT2: MOV CRCP1 ;DO AGAIN UNTIL DATA=0
1611 007644 013700 001044      MOV TEMP,R0      ;SAVE 1ST DATA BYTE (+ PARITY)
1612 007650 104404      ROTCMP
1613 007652 010037 001054      MOV R0,CRROT1    ;SAVE ROTATE
1614 007656 013701 001044      MOV TEMP,R1
1615 007662 104402      XCLOR
1616 007664 010137 001056      MOV R1,CRXOR2
1617 007670 013700 001056      MOV CRXOR2,R0
1618 007674 104404      ROTCMP
1619 007676 010037 001060      MOV R0,CRROT2
1620 007702 013701 001044      MOV TEMP,R1
1621 007706 104402      XCLOR
1622 007710 010137 001062      MOV R1,CRXOR3
1623 007714 013700 001062      MOV CRXOR3,R0
1624 007720 104404      ROTCMP
1625 007722 010037 001064      MOV R0,CRROT3
1626 007726 013701 001044      MOV TEMP,R1
1627 007732 104402      XCLOR
1628 007734 010137 001066      MOV R1,CRXOR4
1629 007740 013700 001066      MOV CRXOR4,R0
1630 007744 104404      ROTCMP
1631 007746 010037 001070      MOV R0,CRROT4
1632 007752 010001      MOV R0,R1      ;COMPLEMENT ALL EXCEPT 4,6
1633 007754 042701 000727      BIC #727,R1
1634 007760 005100      COM R0
1635 007762 042700 000050      BIC #50,R0
1636 007766 050100      BIS R1,R0
1637 007770 010037 001072      MOV R0,CRCWRT
1638 007774 042737 177000 001072 ;BIC #177000,CRCWRT;SAVE CRC CALCULATED
1639
1640 ;WRITE A FOUR BYTE RECORD
1641 010002 104402      ;ALL BYTES ARE = THEREFORE LPC SHOULD = CRC
1642 010004 113737 001044 014556 ;WRITE: SCOPE
1643 010012 113737 001044 014557      MOVB TEMP,WBUF
1644 010020 013737 014556 014560      MOVB TEMP,WBUF+1
1645 010026 104404      MOV WBUF,WBUF+2
1646 010030 104444      WBUFCA
1647 010032 104402      MIN4HC      ;SET BYTE COUNT TO MIN 4 FOUR
1648 010034 104404      SELECT
1649 010036 104400      TSTCUR      ;TEST CONTROLLER READY
1650 010040 104416      HLT          ;ERROR, CONTROLLER DID NOT GO READY
1651 010042 104404      WRITE
1652 010044 104400      TSTCUR      ;TEST CONTROLLER READY
1653 010046 104440      HLT          ;ERROR, CONTROLLER DID NOT GO READY
1654                                ;SET BYTE COUNT TO MIN 4 ONE
1655                                MIN1HC

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1654	010050	104440			SPACEB	
1655	010052	104444			TSTCUR	!TEST CONTROLLER READY
1656	010054	104400			HLT	!ERROR, CONTROLLER DID NOT GO READY
1657	010056	104406			RBUFCA	
1658	010060	104444			MIN4BC	!SET BYTE COUNT TO MIN S FOUR
1659	010062	104420			READ	
1660	010064	104404			TSTCUR	!TEST CONTROLLER READY
1661	010066	104400			HLT	!ERROR, CONTROLLER DID NOT GO READY
1662	010070	023737	014556	014722	CMP	WBUF,RBUF!WERE 1ST 2 BYTES WRITTEN ND READ OK?
1663	010076	001401			BEQ	+.4 !YES
1664	010100	104400			HLT	!ERROR DATA WRITTEN NOT = ATA READ
1665	010102	023737	014560	014724	CMP	WBUF+2,RBUF+2 !WERE 2ND 2 BYTES WRITTEN AND READ OK?
1666	010110	001401			BEQ	+.4 !YES
1667	010112	104400			HLT	!ERROR, DATA WRITTEN NOT = DATA READ
1668	010114	017700	170710		MOV	@MTRD,R0 !GET CRC
1669	010120	017701	170706		MOV	@MTRD,R1 !GET LPC ERROR
1670	010124	042700	177000		BIC	#177000,R0 !MASK CRC
1671	010130	042701	177000		BIC	#177000,R1 !MASK LPC ERROR
1672	010134	001401			BEQ	+.4
1673	010136	104400			HLT	!ERROR, LPC NOT = 0
1674	010140	020037	001072		CMP	R0,CRCWRT
1675	010144	001401			BEQ	+.4
1676	010146	104400			HLT	!ERROR CRC WRITTEN NOT = C C CALCULATED
1677	010150	104440			MIN1BC	!SET BYTE COUNT TO MIN S ONE
1678	010152	104400			SPACEB	
1679	010154	104404			TSTCUR	!TEST CONTROLLER READY
1680	010156	104400			HLT	!ERROR, CONTROLLER DID NOT GO READY
1681	010160	104444			MIN4BC	!SET BYTE COUNT TO MIN S FOUR
1682	010162	104406			RBUFCA	
1683	010164	052777	040000	170640	BIS	#40000,@MTRD !ENABLE LPC READ
1684	010172	104420			READ	
1685	010174	104404			TSTCUR	!TEST CONTROLLER READY
1686	010176	104400			HLT	!ERROR, CONTROLLER DID NOT GO READY
1687	010200	017700	170624		MOV	@MTRD,R0
1688	010204	042700	177000		BIC	#177000,R0
1689	010210	020037	001072		CMP	R0,CRCWRT
1690	010214	001401			BEQ	+.4
1691	010216	104400			HLT	!ERROR, LPC NOT=CRC
1692	010220	005037	001072		CLR	CRCWRT
1693	010224	005077	170602		CLR	@MTRD !ENABLE CRC READ
1694	010230	032737	040000	177570	RIT	#40000,SR !IS SW 14 SET?
1695	010236	001005			BNE	+.14
1696	010240	105237	001044		INCB	!+1 TO DATA PATTERN
1697	010244	001402			BEQ	THRT
1698	010246	000137	007576		JMP	CRCT1
1699						
1700						*****
1701	010252	104402				!TEST TIMER (BIT 15) TO BE COMPLIMENTING
1702	010254	005000			THRT:	SCOPE
1703	010256	005777	170550		CLR	R0
1704	010262	100003			TST	@MTRD
1705	010264	005200			BPL	+.10
1706	010266	001373			INC	R0 !DELAY LONG TIME
1707	010270	104400			BNE	-.10 !
1708	010272	005060			HLT	!ERROR, TIMER (BIT 15) NEVER = 0
1709	010274	005777	170532		CLR	R0
1710	010300	100403			TST	@MTRD
					BMI	+.10

1711	010302	005200			INC	R0	
1712	010304	001373			BNE	.-10	
1713	010306	104400			HLT		!ERROR, TIMER (BIT 15) NEW R #1
1714							!**** MANUAL INTERVENTION TESTS ****
1715					!*****		
1716					!		
1717	010310	104414			PWRCLR		
1718	010312	005037	001042		CLR	TMTNFL	
1719	010316	104402			SCOPE		
1720	010320	104424			REWIND		
1721	010322	104404			TSTCUR		!TEST CONTROLLER READY
1722	010324	104400			HLT		!ERROR, CONTROLLER DID NOT GO_READY
1723	010326	032737	004000	177570	BIT	#4000,SR	
1724	010334	001402			BEQ	+.6	
1725	010336	000137	011304		JMP	TSTEND	
1726	010342	012702	013144		MOV	#MSG3,R2	
1727	010346	104412			PRMSG		!PRINT MESSAGE IN R2
1728	010350	000000			HALT		!WAIT FOR OPERATOR TO CONTINUE
1729	010352	032737	004000	177570	BIT	#4000,SR	!INHIBIT TESTS?
1730	010360	001402			BEQ	+.6	!NO
1731	010362	000137	011304		JMP	TSTEND	!YES
1732					!*****		
1733					!TEST UNIT SELECT SWITCH		
1734	010366	013700	001106		MOV	TCSL,R0	
1735	010372	032700	002000		BIT	#2000,R0	!IS TESTED UNIT IN MOS SIG SELECT ADDRESSES
1736	010376	001013			BNE	USS1	!YES
1737	010400	005077	170416		CLR	@MTC	!NO
1738	010404	112737	000060	013276	MOVB	#60,MSG4+16	
1739	010412	012737	002000	001132	MOV	#2000,USLEN	
1740	010420	005037	001044		CLR	TEMP	
1741	010424	000414			BR	USS	
1742	010426	112737	000064	013276	MOVB	#64,MSG4+16	
1743	010434	012777	002000	170360	MOV	#2000,@MTC	
1744	010442	012737	004000	001132	MOV	#4000,USLEN	
1745	010450	012737	002000	001044	MOV	#2000,TEMP	
1746	010456	012702	013260		MOVB	#MSG4,R2	
1747	010462	104412			PRMSG		!PRINT MESSAGE IN R2
1748	010464	000000			HALT		
1749	010466	104402			SCOPE		
1750	010470	013777	001044	170324	MOV	TEMP,@MTC;SELECT UNIT	
1751	010476	032777	000100	170314	BIT	#100,@MTC;IS SELECT REMOTE SET	
1752	010504	001001			BNE	+.4	
1753	010506	104400			HLT		!ERROR, PROPER UNIT NOT SELECTED
1754	010510	105777	170306		TSTB	@MTC	
1755	010514	100401			BMI	+.4	
1756	010516	104400			HLT		!ERROR, CU READY NOT SET, S UNIT SELECTED?
1757	010520	032777	000040	170272	BIT	#40,@MTC	
1758	010526	001001			BNE	+.4	
1759	010530	104400			HLT		!ERROR, BOT AND TUR NOT SET, IS UNIT ON LINE & A
1760	010532	104402			SCOPE		
1761	010534	105237	013276		INCB	MSG4+16	!INCREMENT UNIT #
1762	010540	105237	001045		INCB	TEMP+1	
1763	010544	023737	001132	001044	CMP	USLEN,TEMP	!DONE ALL UNITS?
1764	010552	001341			BNE	USS	!NO
1765					!TEST ONLINE-OFFLINE SWITCH		
1766	010554	104402			SCOPE		
1767	010556	113700	001107		MOVB	TCSL+1,R0	

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1768 010562 032700 000017 BIT #17,R0
1769 010566 052700 000060 BIS #60,R0
1770 010572 010037 001044 MOV R0,TEMP
1771 010576 113737 001044 013336 MOV# TEMP,MSG5+16
1772 010604 012702 013320 MOV #MSG5,R2
1773 010610 104412 PRMSG# IPRINT MESSAGE IN R2
1774 010612 000000 HALT
1775 010614 104402 SCOPE
1776 010616 104432 SELECT
1777 010620 032777 000100 170172 BIT #100,AMTS
1778 010626 001401 BEQ .+4
1779 010630 104400 HLT IERROR, SELECT REMOTE SET, UNIT NOT OFF-LINE
1780 *****
1781 ITEST WRITE LOCK SWITCH
1782 010632 113737 001044 013472 MOV# TEMP,MSG6+100
1783 010640 012702 013372 MOV #MSG6,R2
1784 010644 104412 PRMSG# IPRINT MESSAGE IN R2
1785 010646 000000 HALT
1786 010650 104402 SCOPE
1787 010652 104432 SELECT
1788 010654 032777 000004 170136 BIT #4,AMTS IIS WRITE LOCK SET?
1789 010662 001001 BNE .+4 IYES
1790 010664 104400 HLT IERROR, WRL (BIT 2) NOT SE WITH WRITE LOCK RING
1791 *****
1792 ITEST WRITE WITH WRITE LOCK RING REMOVED TO CAUSE LLEGAL COMMAND
1793 010666 104402 SCOPE
1794 010670 005077 170130 CLR @BC
1795 010674 005077 170126 CLR @CA
1796 010700 104416 WRITE
1797 010702 104404 TSTCUR ITEST CONTROLLER READY
1798 010704 104400 HLT IERROR, CONTROLLER DID NOT GO READY
1799 010706 005777 170110 TST @MTC
1800 010712 100401 BMI .+4
1801 010714 104400 HLT IERROR (BIT 15) NOT SET AF ER WRITE WITH WRITE L
1802
1803 010716 005777 170076 TST @MTS
1804 010722 100401 BMI .+4
1805 010724 104400 HLT IERROR, ILLEGAL COMMAND (B T 15) NOT SET AFTER W
1806 *****
1807 ITEST OFFLINE FUNCTION TO SET UNIT OFFLINE AND REW ND TO BOT
1808 010726 104402 SCOPE
1809 010730 113737 001044 013700 MOV# TEMP,MSG7+153
1810 010736 012702 013525 MOV #MSG7,R2
1811 010742 104412 PRMSG# IPRINT MESSAGE IN R2
1812 010744 000000 HALT
1813 010746 104414 PWRCLR
1814 010750 104432 SELECT
1815 010752 104404 TSTCUR ITEST CONTROLLER READY
1816 010754 104400 HLT IERROR, CONTROLLER DID NOT GO READY
1817 010756 032777 000100 170034 BIT #100,AMTS
1818 010764 001001 BNE .+4
1819 010766 104400 HLT IERROR. UNIT 0 NOT ON LINE OFF BOT
1820 010770 104402 SCOPE
1821 010772 013777 001112 170022 MOV TCOL,@MTC IGO OFFLINE
1822 011000 104404 TSTCUR ITEST CONTROLLER READY
1823 011002 104400 HLT IERROR, CONTROLLER DID NOT GO READY
1824 011004 032777 000100 170006 BIT #100,AMTS

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1825 011012 001401
1826 011014 104400
1827
1828 011016 104402
1829 011020 113737 001044 014014
1830 011026 012702 013776
1831 011032 104412
1832 011034 000000
1833
1834
1835
1836 011036 012702 014057
1837 011042 104412
1838 011044 000000
1839 011046 005237 001042
1840 011052 032737 000002 177570
1841 011060 001032
1842 011062 012702 014201
1843 011066 104412
1844 011070 104402
1845 011072 104432
1846 011074 104404
1847 011076 104400
1848 011100 012777 177756 167716
1849 011106 104434
1850 011110 104416
1851 011112 005000
1852 011114 022777 014560 167704
1853 011122 003003 002403
1854 011124 005200
1855 011126 001403
1856 011130 000771
1857 011132 000000
1858 011134 000401
1859 011136 104400
1860 011140 104404
1861 011142 104400
1862 011144 032777 004000 167646
1863 011152 001001
1864 011154 104400
1865 011156 005777 167640
1866 011162 100401
1867 011164 104400
1868 011166 104414
1869 011170 032777 004000 167622
1870 011176 001401
1871 011200 104400
1872 011202 104402
1873 011204 000437
1874 011206 012702 014247
1875 011212 104412
1876 011214 104402
1877 011216 104432
1878 011220 104404
1879 011222 104400
1880 011224 012777 177756 167572
1881 011232 104434

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BEQ .+4
HLT ;ERROR, SELR (BIT 6) NOT C EARED BY OFFLINE COMM
IRE-SET UNIT
SCOPE
MOV#B TEMP,MSG8+16
MOV #MSG8,R2
PRMSG ;PRINT MESSAGE IN R2
HALT
*****
;TEST BUS GRANT LATE (BIT 11) TO=1
;HALT PROCESSOR DURING AN NPR SEQUENCE
MOV #MSG9,R2
PRMSG ;PRINT MESSAGE IN R2
HALT
INC TMTNFL
BIT #2,SR
BNE BGL1
MOV #MSG10,R2
PRMSG ;PRINT MESSAGE IN R2
SCOPE
SELECT
TSTCUR ;TEST CONTROLLER READY
HLT ;ERROR, CONTROLLER DID NOT GO READY
MOV #-18.,@BC
WBUFCA
WRITE
CLR R0
CMP #WBUF+2,@CA
BLT BGT ;WAIT FOR NPR SEQUENCE TO START
INC R0
BEQ .+10
BR .-14
HALT ;CAUSE BGL, WAIT FOR C NTINUE
BR .+4
HLT ;ERROR, CA DID NOT INC EMENT ON WRITE COMMAN
TSTCUR
HLT ;ERROR, TU DID NOT GO EADY
BIT #4000,@MTS
BNE .+4
HLT ;ERROR, BGL (BIT 11) N T=1,
TST @MTC
BMI .+4
HLT ;ERROR, BGL DID NOT SE ERROR STATUS
PWRCLR
BIT #4000,@MTS
BEQ .+4
HLT ;ERROR, POWER CLEAR DI N'T CLEAR BGL (BIT 11)
SCOPE
BR TSTEND
MOV #MSG11,R2
PRMSG ;PRINT MESSAGE IN R2
SCOPE
SELECT
TSTCUR
HLT ;TEST CONTROLLER READY
HLT ;ERROR, CONTROLLER DID NOT GO READY
MOV #-18.,@BC
WBUFCA

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1882 011234 000000          HALT
1883 011236 104416          WRITE
1884 011240 000240          NOP
1885 011242 000240          NOP
1886 011244 032777 004000 167546  BIT    #4000,@MTC
1887 011252 001001          BNE    .+4
1888 011254 104400          HLT    IERROR, BGL (BIT 11) NOT=1
1889 011256 005777 167540  TST    @MTC
1890 011262 100401          BMI    .+4
1891 011264 104400          HLT    IERROR, BGL DID NOT SE  ERROR STATUS
1892 011266 104414          PWRCLR
1893 011270 032777 004000 167522  BIT    #4000,@MTC
1894 011276 001401          BEQ    .+4
1895 011300 104400          HLT    IERROR, POWER CLEAR DIDN'T CLEAR BGL (BIT 11)
1896 011302 104402          SCOPE
1897
1898 011304 012702 014541  I:BELL ON PASS COMPLETE
1899 011310 104412  TSTEND: MOV  #MSG13,R2
1900 011312 105237 014554  PRTMSG  IPRINT MESSAGE IN R2
1901 011316 122737 000072 014554  INCB   MSG13+13
1902 011324 001025          CMPB  #72,MSG13+13
1903 011326 112737 000060 014554  BNE   BELL
1904 011334 105237 014553          MOVB  #60,MSG13+13
1905 011340 122737 000072 014553  INCB  MSG13+12
1906 011346 001014          CMPB  #72,MSG13+12
1907 011350 112737 000060 014553  BNE   BELL
1908 011356 105237 014552          MOVB  #60,MSG13+12
1909 011362 122737 000072 014552  INCB  MSG13+11
1910 011370 001003          CMPB  #72,MSG13+11
1911 011372 112737 000060 014552  BNE   BELL
1912 011400 105777 167432  BELL: MOVB  #60,MSG13+11
1913 011404 100375          TSTR  @TCSR
1914 011406 012777 000207 167420  BPL   .-4
1915 011414 005000          MOV  #207,@TDBR
1916 011416 005200          CLR  R0
1917 011420 001376          INC  R0
1918 011422 104404          BNE  .-2
1919 011424 104400          TSTCUR ITEST CONTROLLER READY
1920 011426 104424          HLT  IERROR, CONTROLLER DID NOT GO READY
1921 011430 104404          REWIND
1922 011432 104400          TSTCUR ITEST CONTROLLER READY
1923 011434 104400          HLT  IERROR, CONTROLLER DID NOT GO READY
1924 011436 000240          WAITTR
1925 011440 104400          NOP
1926 011442 104400          WAITTR
1927 011444 000137 001350  HLT
1928          JMP  BEGIN  IERROR, TAPE UNIT READ  DID NOT GO SET
1929          IGO TO START OF TEST
1930
1931          I**** SUBROUTINES ****
1932
1933 011450 013737 001044 001050  I*****
1934 011456 013737 000036 001046  IILLEGAL TAPE INTERRUPT SUBROUTINE
1935 011464 012737 000340 000036  MTRP: MOV  TEMP,TEMPS  ISAVE TEMP
1936 011472 011637 001044          MOV  36,TEMPP  ISTORE TRAP PRIORITY
1937 011476 104400          MOV  #340,36  IMAKE TRAP PRIORITY 7
1938 011500 013737 001050 001044  MOV  @SP,TEMP  ITEMP CONTAINS PC OF I LEGAL INTERRUPT
          HLT  IERROR, ILLEGAL TAPE I TERRUPT
          MOV  TEMPS,TEMP  IRESTORE TEMP

```

1939	011506	013747	001046	000036	MOV	TEMP,36	IRESTORE TRAP PRIORIT
1940	011514	000002			RTI		IRETURN FROM INTERRUPT
1941							
1942							
1943					*****		
					!TRAP HANDLER		
1944	011516	011666	000002		TRAP34:	MOV @SP,2(SP)	!PUSH RETURN ADDRESS U INTO STACK
1945	011522	162716	000002			SUB #2,@SP	!CALCULATE TRAP INSTRU TION ADDRESS
1946	011526	013646				MOV @ (SP)+,@ (SP)	!GET TRAP INSTRUCTION
1947	011530	062716	105136			ADD #TABLE-104400,@SP	!CALCULATE TABLE OINTER
1948	011534	013607				MOV @ (SP)+,PC	!POP STACK, GO TO SUBR UTINE
1949	011536	011620			TABLE:	PRINT	
1950	011540	012054				SCOPEA	
1951	011542	012120				CURTST	
1952	011544	012174				RGSTST	
1953	011546	012204				RGRTST	
1954	011550	012240				TOP	
1955	011552	012324				STCH12	
1956	011554	012334				STCWT	
1957	011556	012344				STCRD	
1958	011560	012354				STCEF	
1959	011562	012364				STCRW	
1960	011564	012374				STCSF	
1961	011566	012404				STCSB	
1962	011570	012414				STCSL	
1963	011572	012424				CAWB	
1964	011574	012434				CARB	
1965	011576	012444				BCM1	
1966	011600	012454				BCM3	
1967	011602	012464				BCM4	
1968	011604	012474				EOFTST	
1969	011606	012146				TSTRDY	
1970	011610	012504				CRCXOR	
1971	011612	012516				CRCROT	
1972	011614	012522				OCTPRT	
1973	011616	012660				OCTP	
1974							
1975							
1976							
1977							
1978	011620	012702	001134				
1979	011624	011612					
1980	011626	162722	000002				
1981	011632	017722	167162				
1982	011636	017722	167160				
1983	011642	017722	167156				
1984	011646	017722	167154				
1985	011652	017722	167152				
1986	011656	042712	177000				
1987	011662	017722	167144				
1988	011666	013722	001044				
1989	011672	013722	001072				
1990	011676	033727	177570	020000			
1991	011704	001401					
1992	011706	000207					
1993	011710	012702	013027				
1994	011714	005757	001100				
1995	011720	001402					

!ENTERED WITH SYSTEM TRAP CALL (HLT)

!PRINT PC, STATUS REGISTER, COMMAND REGISTER, BYTE COUNT, CURRENT ADDRESS

PRINT: MOV #SAVE,R2

MOV (SP), (R2)

SUB #2, (R2)+

MOV @MHS, (R2)+

MOV @MTC, (R2)+

MOV @ABC, (R2)+

MOV @CA, (R2)+

MOV @MTD, (R2)+

BIC #177000, (R2)

MOV @MTRD, (R2)+

MOV TEMP, (R2)+

MOV CRCWR, (R2)+

BIT SR, #20000: TEST FOR INHIBIT PRINT OU

BEG .+4 !BRANCH TO PRINT

RTS PC !INHIBIT, RETURN TO MAIN & REAM

MOV #MSG1, R2

TST PRINT1

BEG .+6

1996 011722 012702 013141
 1997 011726 104442
 1998 011730 005237 001100
 1999 011734 013702 001134
 2000 011740 104456
 2001 011742 013702 001136
 2002 011746 104456
 2003 011750 013702 001140
 2004 011754 104456
 2005 011756 013702 001142
 2006 011762 104456
 2007 011764 013702 001144
 2008 011770 104456
 2009 011772 013702 001146
 2010 011776 104456
 2011 012000 013702 001150
 2012 012004 104456
 2013 012006 013702 001152
 2014 012012 104456
 2015 012014 013702 001154
 2016 012020 104456
 2017 012022 005737 177570
 2018 012026 100001
 2019 012030 000000
 2020 012032 000207
 2021
 2022
 2023
 2024
 2025 012034 032737 040000 177570
 2026 012042 001003
 2027 012044 011637 001102
 2028 012050 000207
 2029 012052 022606
 2030 012054 005737 001042
 2031 012060 001415
 2032 012062 032777 002000 166730
 2033 012070 001411
 2034 012072 104424
 2035 012074 013702 001020
 2036 012100 012703 000001
 2037 012104 012704 000300
 2038 012110 104406
 2039 012112 104400
 2040 012114 000177 166762
 2041
 2042
 2043
 2044
 2045
 2046
 2047
 2048
 2049 012120 013702 001022
 2050 012124 012703 000200
 2051 012130 012704 000005
 2052 012134 104406

MOV #MSG2,R2
 PRMSG IPRINT MESSAGE IN R2
 INC PRINT1
 MOV SAVE,R2
 PRTOCT
 MOV SAVE+2,R2
 PRTOCT
 MOV SAVE+4,R2
 PRTOCT
 MOV SAVE+6,R2
 PRTOCT
 MOV SAVE+10,R2
 PRTOCT
 MOV SAVE+12,R2
 PRTOCT
 MOV SAVE+14,R2
 PRTOCT
 MOV SAVE+16,R2
 PRTOCT
 MOV SAVE+20,R2
 PRTOCT
 TST SR I CHECK SR FOR HALT SWITCH
 BPL .+4
 HALT I HALT ON ERROR UP
 RTS PC I EXIT

 I ENTERED WITH SYSTEM TRAP CALL(SCOPE)
 I SCOPE LOOP FOR EACH TEST
 SCOPEA: BIT #40000,SR I TEST SR FOR SCOPE
 BNE SCOPEB I YES SCOPE
 MOV @SP,RETURN I SAVE SCOPE RETURN POINT
 RTS PC I RETURN INLINE-NEXT TEST
 SCOPEB: CMP (SP)+,SP I REPOSITION TH STACK
 TST TMTNFL I IS PROGRAM IN TAPE MODE ION TESTS?
 BEQ SCPR1 I NO. RETURN TO BEGINNING OF TEST
 BIT #2000,@MTS I TEST EOT STATUS
 BEQ SCPR1 I RETURN IF NOT AT EOT
 REWIND
 MOV MTS,R2 I SELECT STATUS REGISTER
 MOV #1,R3 I MASK TUR BIT
 MOV #300,R4 I SET UP DELAY
 TSTRGS
 HLT I ERROR, UNIT DID NOT REWIND
 SCPR1: JMP @RETURN I SCOPE RETURN

 I ENTERED WITH SYSTEM TRAP CALL(TSTCUR)
 I TEST CONTROLLER READY SUBROUTINE
 I ARGUMENTS:
 I EXIT TO RETURN IF TIMEOUT
 I EXIT TO RETURN +2 IF NOT TIMEOUT

CURTST: MOV MTC,R2 I SELECT COMMAND REGISTER
 MOV #200,R3 I MASK CUR BIT
 MOV #5,R4 I SET UP DELAY
 TSTRGS

```

2053 012136 000207          RTS    PC          IEXIT
2054 012140 062716 000002  ADD    #2,@SP     IINCREMENT STACK POINT R
2055 012144 000207          RTS    PC          IEXIT
2056
2057
2058
2059
2060
2061
2062
2063 012146 013702 001020  TSTROY: MOV    MTS,R2    ISELECT STATUS REGISTE
2064 012152 012703 000001  MOV    #1,R3      IMASK TUR BIT
2065 012156 012704 000010  MOV    #10,R4     ISET UP DELAY
2066 012162 104406          TSTRGS
2067 012164 000207          RTS    PC          IEXIT
2068 012166 062716 000002  ADD    #2,@SP     IINCREMENT STACK POINT R
2069 012172 000207          RTS    PC          IEXIT
2070
2071
2072
2073
2074
2075
2076
2077
2078
2079
2080 012174 052737 000400 012216 R6STST: BIS    #400,TSTIN  ISETUP FOR BIT SET YES
2081 012202 000403          BR     TSTR
2082 012204 042737 000400 012216 R6RSTST: BIC    #400,TSTIN  ISETUP FOR BIT CLEAR T ST
2083 012212 005003          TSTB:  CLR    R5
2084 012214 031203          BIT    @R2,R3
2085 012216 001403          TSTIN: BEQ    TSTL      ILOOP IF TEST NEGATIVE
2086 012220 062716 000002  ADD    #2,@SP     IINCREMENT STACK POINT R
2087 012224 000207          RTS    PC          IEXIT
2088 012226 005205          TSTL:  INC    R5
2089 012230 001301          BNE   TSTB+2     IRETRY IF LOOP COUNTER NOT ZERO
2090 012232 005304          DEC    R4
2091 012234 001306          BNE   TSTB      ISTART LOOP OVER IF NO MAXIMUM TIME
2092 012236 000207          RTS    PC          IEXIT
2093
2094
2095
2096
2097
2098 012240 142717 000177 166570 TOP1:  BICH   #177,@TCSH;CLR INT FLAG
2099 012246 112237 012710  MOVB  (R2)+,EOMK  IMOVE IN EOM MARKER
2100 012252 121237 012710  TOP1:  CMPB  @R2,EOMK  ICOMPARE FOR EOM
2101 012256 001001          BNE   .+4        IND
2102 012260 000207          RTS    PC          IYES, EXIT
2103 012262 121247 000100  CMPB  @R2,#0
2104 012266 001404          BEQ   TOP2
2105 012270 112237 001076  MOVB  (R2)+,CHAR  IPRINT MESSAGE CHARACT R
2106 012274 104400          PRTOUT
2107 012276 000703          BR    TOP1       IBRANCH BACK
2108 012300 112737 000215 001076 TOP2:  MOVB  #215,CHAR  ISEND CARRIAGE RETURN
2109 012306 104400          PRTOUT

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2110 012310 112797 000212 001076      MOVB  #212,CHAR      ISEND LINE FEED
2111 012316 104460                    PRTOUT
2112 012320 005202                    INC  R2              IINCRMTN R2
2113 012322 000753                    BR   TOP1           INO EOM, SO LOOP
2114
2115
2116
2117
2118
2119 012324 012777 010000 166470      STCB12: MOV  #10000,@MTC
2120 012332 000207                    RTS  PC             IEXIT
2121 012334 013777 001116 166460      STCWT: MOV  TCWT,@MTC
2122 012342 000207                    RTS  PC             IEXIT
2123 012344 013777 001114 166450      STCRD: MOV  TCRD,@MTC
2124 012352 000207                    RTS  PC             IEXIT
2125 012354 013777 001120 166440      STCEF: MOV  TCWF,@MTC
2126 012362 000207                    RTS  PC             IEXIT
2127 012364 013777 001130 166430      STCRW: MOV  TCRW,@MTC
2128 012372 000207                    RTS  PC             IEXIT
2129 012374 013777 001122 166420      STCSF: MOV  TCSF,@MTC
2130 012402 000207                    RTS  PC             IEXIT
2131 012404 013777 001124 166410      STCSB: MOV  TCRS,@MTC
2132 012412 000207                    RTS  PC             IEXIT
2133 012414 013777 001106 166400      STCSL: MOV  TCSL,@MTC
2134 012422 000207                    RTS  PC             IEXIT
2135 012424 012777 014556 166374      CAWB:  MOV  #WBUF,@CA
2136 012432 000207                    RTS  PC             IEXIT
2137 012434 012777 014722 166364      CARB:  MOV  #RBUF,@CA
2138 012442 000207                    RTS  PC             IEXIT
2139 012444 012777 177777 166352      BCM1:  MOV  #-1,@BC
2140 012452 000207                    RTS  PC             IEXIT
2141 012454 012777 177775 166342      BCM3:  MOV  #-3,@BC
2142 012462 000207                    RTS  PC             IEXIT
2143 012464 012777 177774 166332      BCM4:  MOV  #-4,@BC
2144 012472 000207                    RTS  PC             IEXIT
2145 012474 032777 040000 166316      EOFST: BIT  #40000,@MTS
2146 012502 000207                    RTS  PC             IEXIT
2147
2148
2149
2150
2151 012504 010103                    CRCXOR: MOV  R1,R3
2152 012506 040001                    BIC  R0,R1
2153 012510 040300                    BIC  R3,R0
2154 012512 050001                    BIS  R0,R1
2155 012514 000207                    RTS  PC             IEXIT
2156
2157
2158
2159
2160 012516 042700 177000      CRCROT: BIC  #177000,R0
2161 012522 006000                    ROR  R0
2162 012524 103011                    BCC  CCR1          INO EXIT
2163 012526 052700 000400      CRCROT: BIS  #400,R0      IMAKE BIT1=1
2164 012532 010001                    MOV  R0,R1
2165 012534 042701 000074      CRCROT: BIC  #74,R1
2166 012540 005100                    COM  R0

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2167 012542 042740 000703          BIC #703,R0
2168 012546 050100          BIS R1,R0      IRECOMBINE COMPLEMENTE BITS
2169 012550 000207          CRCR1: RTS PC      IEXIT
2170
2171          I*****
2172          IENTERED WITH SYSTEM TRAP CALL(PRTOCT)
2173          IPRINT OCTAL VALUE IN REGISTER
2174 012552 012737 000060 001076 OCTPRT: MOV #0,CHAR      IINITIALIZE 2ST NUMBER AS 0
2175 012560 005702          TST R2          IIS VALUE POSITIVE
2176 012562 100005          BPL OCT1        IYES PRINT 0
2177 012564 012737 000061 001076          MOV #1,CHAR     INO PRINT 1
2178 012572 104460          OCT1: PRTOUT
2179 012574 006102          ROL R2
2180 012576 006102          ROL R2
2181 012600 012737 177773 001074          MOV #-5,OCT    ICOUNT 5 DIGITS
2182 012606 006102          OCT2: ROL R2
2183 012610 006102          ROL R2
2184 012612 006102          ROL R2
2185 012614 010237 001076          MOV R2,CHAR    ISAVE DIGIT
2186 012620 042737 177770 001076          BIC #177770,CHAR I CLEAR OTHER BITS
2187 012626 052737 000060 001076          BIS #60,CHAR   IMAKE ASCII DIGIT
2188 012634 006002          ROR R2
2189 012636 104400          PRTOUT
2190 012640 006102          ROL R2
2191 012642 005237 001074          INC OCT        I+1 TO DIGIT COUNT
2192 012646 001337          BNE OCT2       INOT DONE
2193          ITYPE 2 SPACES
2194 012650 012702 014535          MOV #MSG12,R2
2195 012654 104412          PRTMSG
2196 012656 000207          RTS PC        IPRINT MESSAGE IN R2
2197          IEXIT
2198          I*****
2199          IENTERED WITH SYSTEM TRAP CALL(PRTOCT)
2200 012660 032737 020000 177570 OCTP1: BIT #20000,SR
2201 012666 001401          BEQ .+4        IINHIBIT PRINTOUT?
2202 012670 000207          RTS PC        IYLS, EXIT
2203 012672 105777 166140          TSTB @TCR     INO, PRINT
2204 012676 100375          BPL .-4        IWAIT FOR READY
2205 012700 013777 001076 166126          MOV CHAR,@DBR IPRINT
2206 012706 000207          RTS PC        IEXIT
2207 012710 000          EOMK: .BYTE 0
2208
2209          I**** MESSAGES ****
2210
2211          I*****
2212 012711 007 100 123          MSG0: .ASCII I/ASSET SWITCH REGISTER ACCORDING TO I
      012714 105 124 040
      012717 125 127 111
      012722 124 103 110
      012725 040 122 105
      012730 107 111 123
      012733 124 105 122
      012736 040 101 103
      012741 105 117 122
      012744 104 111 116
      012747 107 040 124
      012752 117 040

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2213	012754	117	120	105		.ASCII	OPERATING INSTRUCTIONS AND	PRESS C	NTINUE	/I	
	012757	122	101	124							
	012762	111	116	107							
	012765	040	111	116							
	012770	123	124	122							
	012773	125	103	124							
	012776	111	117	116							
	013001	123	040	101							
	013004	116	104	100							
	013007	120	122	105							
	013012	123	123	040							
	013015	103	117	116							
	013020	124	111	116							
	013023	125	105	100							
	013026	057									
2214	013027	057	100	040	MSG1:	.ASCII	1/2 PC	STATUS	COMAND	BYTE CA I	
	013032	040	120	103							
	013035	040	040	040							
	013040	040	123	124							
	013043	101	124	125							
	013046	123	040	040							
	013051	103	117	115							
	013054	101	116	104							
	013057	040	040	040							
	013062	102	131	124							
	013065	103	040	040							
	013070	040	040	040							
	013073	103	101	040							
	013076	040	040	040							
2215	013101	104	101	124		.ASCII	IDATA B	READ L	TEMP	CRC CAL	/I
	013104	101	040	102							
	013107	040	040	122							
	013112	103	101	104							
	013115	040	114	040							
	013120	040	040	124							
	013123	103	115	120							
	013126	040	040	103							
	013131	122	103	040							
	013134	103	101	114							
	013137	100	057								
2216	013141	057	100	057	MSG2:	.ASCII	1/2/1				
2217	013144	057	100	123	MSG3:	.ASCII	1/2SET SW11=1	IF MANUAL	INTERVENTI	N TEST	
	013147	103	124	040							
	013152	123	127	061							
	013155	061	075	061							
	013160	040	111	106							
	013163	040	115	101							
	013166	116	125	101							
	013171	114	040	111							
	013174	116	124	105							
	013177	122	126	105							
	013202	116	124	111							
	013205	117	116	040							
	013210	124	105	123							
	013213	124									
2218	013214	100	111	123		.ASCII	IS TO BE	BYPASSED +	PRESS	CONTINU	/I
	013217	040	124	117							

	013222	040	102	105	
	013225	040	102	131	
	013230	140	101	123	
	013233	143	105	104	
	013236	040	053	040	
	013241	140	122	105	
	013244	143	123	040	
	013247	103	117	116	
	013252	124	111	116	
	013255	125	105	057	
2219	013260	057	100	123	MSG4: .ASCII 1/2SELECT UNIT 0, PRESS CONTINUE/1
	013263	105	114	105	
	013266	103	124	040	
	013271	125	116	111	
	013274	124	040	060	
	013277	054	040	120	
	013302	122	105	123	
	013305	143	040	103	
	013310	117	116	124	
	013313	111	116	125	
	013316	103	057		
2220	013320	057	100	123	MSG5: .ASCII 1/2SELECT UNIT 0, OFF-LINE, PRESS ONTINUE/1
	013323	105	114	105	
	013326	103	124	040	
	013331	125	116	111	
	013334	124	040	060	
	013337	054	040	117	
	013342	106	106	055	
	013345	114	111	116	
	013350	105	054	040	
	013353	120	122	105	
	013356	143	123	040	
	013361	103	117	116	
	013364	124	111	116	
	013367	125	105	057	
2221	013372	057	100	104	MSG6: .ASCII 1/2DISMOUNT TAPE, REMOVE WRITE LOC RING, MOUNT TAPE
	013375	111	123	115	
	013400	117	125	116	
	013403	124	040	124	
	013406	101	120	105	
	013411	054	040	122	
	013414	105	115	117	
	013417	126	105	040	
	013422	127	122	111	
	013425	124	105	040	
	013430	114	117	103	
	013433	113	040	122	
	013436	111	116	107	
	013441	054	040	115	
	013444	117	125	116	
	013447	124	040	124	
	013452	101	120	105	
2222	013455	100	123	105	.ASCII 1/2SELECT UNIT 0, ON LINE, PRESS CO TINUE/1
	013460	114	105	103	
	013463	124	040	125	
	013466	116	111	124	
	013471	040	060	054	

	013474	040	117	116	
	013477	040	114	111	
	013502	116	105	054	
	013505	040	120	122	
	013510	105	123	123	
	013513	040	103	117	
	013516	116	124	111	
	013521	116	125	105	
	013524	057			
2223	013525	057	100	104	MSG7: .ASCII 1/2DISMOUNT TAPE, REPLACE WRITE LO K RING, MOUNT TAPE1
	013530	111	123	115	
	013533	117	125	116	
	013536	124	040	124	
	013541	101	120	105	
	013544	054	040	122	
	013547	105	120	114	
	013552	101	103	105	
	013555	040	127	122	
	013560	111	124	105	
	013563	040	114	117	
	013566	105	113	040	
	013571	122	111	116	
	013574	107	054	040	
	013577	115	117	125	
	013602	116	124	040	
	013605	124	101	120	
	013610	105			
2224	013611	100	115	117	.ASCII 12MOVE TAPE SHORT DISTANCE FORWARD FROM BOT1
	013614	126	105	040	
	013617	124	101	120	
	013622	105	040	123	
	013625	110	117	122	
	013630	124	040	104	
	013633	111	123	124	
	013636	101	116	103	
	013641	105	040	106	
	013644	117	122	127	
	013647	101	122	104	
	013652	040	106	122	
	013655	117	115	040	
	013660	102	117	124	
2225	013663	100	123	105	.ASCII 12SELECT UNIT 0, ON LINE, PRESS GO TINUE1
	013666	114	105	103	
	013671	124	040	125	
	013674	116	111	124	
	013677	040	060	054	
	013702	040	117	116	
	013705	040	114	111	
	013710	116	105	054	
	013713	040	120	122	
	013716	105	123	123	
	013721	040	103	117	
	013724	116	124	111	
	013727	116	125	105	
2226	013732	100	125	116	.ASCII 12UNIT SHOULD GO OFFLINE AND REWIN 2/1
	013735	111	124	040	
	013740	123	110	117	

	013743	125	114	104	
	013746	040	107	117	
	013751	040	117	106	
	013754	106	114	111	
	013757	116	105	040	
	013762	101	116	104	
	013765	040	122	105	
	013770	127	111	116	
	013773	104	100	057	
2227	013776	057	100	123	MSG8: .ASCII 1/2SELECT UNIT 0. ON LINE. AT BOT. PRESS CONTINUE/1
	014001	103	114	105	
	014004	103	124	040	
	014007	125	116	111	
	014012	124	040	060	
	014015	054	040	117	
	014020	116	040	114	
	014023	111	116	105	
	014026	054	040	101	
	014031	124	040	102	
	014034	117	124	054	
	014037	040	120	122	
	014042	105	123	123	
	014045	040	103	117	
	014050	116	124	111	
	014053	116	125	105	
	014056	057			
2228	014057	057	100	111	MSG9: .ASCII 1/2IF PROCESSOR IS A PDP11-45, SET SW 1=1
	014062	106	040	120	
	014065	122	117	103	
	014070	105	123	123	
	014073	117	122	040	
	014076	111	123	040	
	014101	101	040	120	
	014104	104	120	061	
	014107	001	055	064	
	014112	005	054	040	
	014115	123	105	124	
	014120	040	123	127	
	014123	040	061	075	
	014126	061			
2229	014127	100	111	106	.ASCII 1/2IF ANY OTHER. SET SW 1=0. PRESS ONTINUE/1
	014132	040	101	116	
	014135	121	040	117	
	014140	124	110	105	
	014143	122	054	040	
	014146	123	105	124	
	014151	040	123	127	
	014154	040	061	075	
	014157	000	054	040	
	014162	120	122	105	
	014165	123	123	040	
	014170	103	117	116	
	014173	124	111	116	
	014176	125	105	057	
2230	014201	057	100	120	MSG10: .ASCII 1/2PROCESSOR WILL HALT. PRESS CONT NUE/1
	014204	122	117	103	
	014207	105	123	123	

	014212	117	122	040	
	014215	127	111	114	
	014220	114	040	110	
	014223	101	114	124	
	014226	054	040	120	
	014231	122	105	123	
	014234	123	040	103	
	014237	117	116	124	
	014242	111	116	125	
2231	014245	105	057		
	014247	057	100	120	MSG11; .ASCII I/O PROCESSOR WILL HALT, PUT "ENAB E-HALT" SW ON "HALT";
	014252	122	117	103	
	014255	105	123	123	
	014260	117	122	040	
	014263	040	127	111	
	014266	114	114	040	
	014271	110	101	114	
	014274	124	054	040	
	014277	120	125	124	
	014302	040	042	105	
	014305	116	101	102	
	014310	114	105	055	
	014313	110	101	114	
	014316	124	042	040	
	014321	123	127	040	
	014324	117	116	040	
	014327	042	110	101	
2232	014332	114	124	042	
	014335	100	120	125	.ASCII I/PUT "S-INST-S-BUS CYCLE" SW ON " -BUS CYCLE";
	014340	124	040	042	
	014343	123	055	111	
	014346	116	123	124	
	014351	055	123	055	
	014354	102	125	123	
	014357	040	103	131	
	014362	103	114	105	
	014365	042	040	123	
	014370	127	040	117	
	014373	116	040	042	
	014376	123	055	102	
	014401	125	123	040	
	014404	103	131	103	
	014407	114	105	042	
2233	014412	100	120	122	.ASCII I/PRESS "CONTINUE" 6 TIMES;
	014415	105	123	123	
	014420	040	042	103	
	014423	117	116	124	
	014426	111	116	125	
	014431	105	042	040	
	014434	056	040	124	
	014437	111	115	105	
	014442	123			
2234	014443	100	120	125	.ASCII I/PUT SW'S BACK TO "ENABLE" & "S- NST";
	014446	124	040	123	
	014451	127	047	123	
	014454	040	040	102	
	014457	101	103	113	

	014462	040	124	117	
	014465	040	042	105	
	014470	116	101	102	
	014473	114	105	042	
	014476	040	046	040	
	014501	042	123	055	
	014504	111	116	125	
	014507	124	042	054	
2235	014512	040	120	122	.ASCII I PRESS "CONTINUE"0/I
	014515	105	123	123	
	014520	040	042	103	
	014523	117	116	124	
	014526	111	116	125	
	014531	105	042	100	
	014534	057			
2236	014535	057	040	040	MSG12: .ASCII I/ /I
	014540	057			
2237	014541	057	100	103	MSG13: .ASCII I/0CYCLE #001/I
	014544	131	103	114	
	014547	105	040	043	
	014552	060	060	061	
	014555	057			
2238					.EVEN
2239	014556	000040	WBUF:	0	
2240		014722		.=WBUF+100.	
2241	014722	000040	RBUF:	0	
2242			*****		
2243		000041		.END	

BC	001024	BCM1	012444	BCM3	012454
BCM4	012464	BEGIN	001350	BELL	011400
BGL1	011206	BUFF	= 000776	CA	001026
CARB	012434	CAWB	012424	CC	= 177776
CHAR	001076	CINST	005414	CRCP1	007610
CRCROT	012516	CRCR1	012550	CRCTST	007572
CRCT1	007576	CRCT2	007636	CRCWRT	001072
CRXOR	012504	CRROT1	001054	CRROT2	001060
CRROT3	001064	CRROT4	001070	CRXOR1	001052
CRXOR2	001056	CRXOR3	001062	CRXOR4	001066
CURTST	012120	CWRITE	010602	EOFTST	012474
EOMK	012710	HLT	= 104400	IOBYP	004250
IDTST	001040	IR1	006040	IR2	006114
IR2A	006116	IR3	006214	IR3A	006230
IR4	006326	IR4A	006354	IR5	006376
IR5A	006414	MIN1BC=	104440	MIN3BC=	104442
MIN4BC=	104444	MSG0	012711	MSG1	013027
MSG10	014201	MSG11	014247	MSG12	014535
MSG13	014541	MSG2	013141	MSG3	013144
MSG4	013260	MSG5	013320	MSG6	013372
MSG7	013525	MSG8	013776	MSG9	014057
MTAAD	001002	MTAS	001012	MTAV	001010
MTC	001022	MTD	001030	MTNAD	001000
MINS	001006	MTNV	001004	MTP	001104
MTPM	001110	MTRD	001052	MTS	001020
MTRP	011450	MTV	001014	MTVN	001320
MTVS	001016	NOP	= 000240	NXMT	005674
OCT	001074	OCTP	012660	OCTPRT	012552
OCT1	012572	OCT2	012606	PAR	007104
PAR1	007332	PAR2	007342	PAR3	007532
PAR4	007542	PRINT	011620	PRINT1	001100
PRTMSG=	104412	PRTOCT=	104456	PRTOUT=	104460
PWRCLR=	104414	RBUF	014722	RBUFCA=	104436
READ	= 104420	RETURN	001102	REWIND=	104424
RGRTST	012204	RGSTST	012174	ROTCMP=	104454
SAVE	001134	SCOPE	= 104402	SCOPEA	012034
SCOPEB	012052	SCPRT	012114	SELECT=	104432
SPACEB=	104430	SPACEF=	104426	SR	= 177570
START	001160	STCR12	012324	STCEF	012354
STCRD	012344	STCRW	012364	STCSB	012404
STCSF	012374	STCSL	012414	STCWT	012334
TABL	011536	TAMD	001242	TBC	003076
TCOL	001112	TCRD	001114	TCRS	001124
TCRW	001130	TCSF	001122	TCSL	001106
TCSR	001036	TCWE	001126	TCWF	001120
TCWT	001116	TDB	003206	TDBR	001034
TEMP	001044	TEMPP	001046	TEMPS	001650
TMA	003142	TMKT	010252	TMTNFL	001042
TOP	012240	TOP1	012252	TOP2	012300
TRAP34	011516	TRLOF	005004	TRLE	005112
TSR	003430	TSTB	012212	TSTCUR=	104404
TSTEND	011304	TSTEOF=	104446	TSTIN	012216
TSTL	012226	TSTROY	012146	TSTRGR=	104410
TSTRGS=	104406	T7CH	003414	USLEN	001132
USS	010456	USS1	010426	WAITTR=	104450
WBR	006454	WBR5	006450	WBR1	006520
WBR2	006552	WBR3	006614	WBR4	006704

WBR5 007070 WBUF 014556 WBUFCA= 104434
 WREOF = 104422 WRITE = 104416 XCLOK = 104452

. ABS. 014724 000
 000000 001
 ERRORS DETECTED: 0
 FREE CORE: 11167. WORDS
 P466.P466/CRF<P466

CROSS REFERENCE TABLE S-1

BC	1- 307H	1- 423	1- 473	1- 691H	1- 692	1- 815	1- 879H
	1- 893	1- 904H	1- 915	1- 943	1- 971	1- 992	1-1013
	1-1046H	1-1053	1-1057H	1-1064	1-1079	1-1101H	1-1248
	1-1396H	1-1420H	1-1461H	1-1472H	1-1794H	1-1848H	1-1880H
	1-1983	1-2139H	1-2141H	1-2143H			
BCM1	1-1965	1-2139H					
BCM3	1-1966	1-2141H					
BCM4	1-1967	1-2143H					
BEGIN	1- 330		1- 376H	1-1927			
BELL	1-1902	1-1906	1-1910	1-1912H			
BGL1	1-1841	1-1874H					
BUFF	1- 285H	1- 346	1- 377	1-1291	1-1303	1-1317	1-1343
	1-1386						
CA	1- 308H	1- 430	1- 480	1- 703H	1- 704	1- 818	1- 896
	1- 918	1- 946	1- 974	1- 999	1-1010	1-1082	1-1270H
	1-1462H	1-1795H	1-1852	1-1984	1-2135H	1-2137H	
CARB	1-1964	1-2137H					
CAWB	1-1963	1-2135H					
CC	1- 283H	1- 379H	1-1292H	1-1304H	1-1318H	1-1344H	1-1387H
CHAR	1- 328H	1-2105H	1-2108H	1-2110H	1-2174H	1-2177H	1-2185H
	1-2186H	1-2187H	1-2205				
CINST	1-1194H	1-1196H	1-1199H				
CRCP1	1-1602H	1-1609					
CRCPOT	1-1971	1-2160H					
CRCR1	1-2162	1-2169H					
CRCTST	1-1590H						
CRCT1	1-1600H	1-1698					
CRCT2	1-1604	1-1610H					
CRCHWT	1- 326H	1- 384H	1-1637H	1-1638H	1-1674	1-1689	1-1692H
	1-1989						
CRXOR	1-1970	1-2151H					
CRROT1	1- 319H	1-1613H					
CRROT2	1- 321H	1-1619H					
CRROT3	1- 323H	1-1625H					
CRROT4	1- 325H	1-1631H					
CRXOR1	1- 318H	1-1610H					
CRXOR2	1- 320H	1-1616H	1-1617				
CRXOR3	1- 322H	1-1622H	1-1623				
CRXOR4	1- 324H	1-1628H	1-1629				
CURTST	1-1951	1-2049H					
CWRITE	1-1641H						
EOFTST	1-1968	1-2145H					
EOMK	1-2099H	1-2100	1-2207H				
HLT	1- 256H	1- 411	1- 418	1- 425	1- 432	1- 439	1- 446
	1- 453	1- 460	1- 468	1- 475	1- 482	1- 489	1- 496
	1- 503	1- 510	1- 518	1- 525	1- 530	1- 535	1- 540
	1- 545	1- 550	1- 555	1- 562	1- 570	1- 577	1- 582

1- 629	1- 654	1- 639	1- 647	1- 655	1- 662	1- 670
1- 676	1- 681	1- 686	1- 694	1- 706	1- 718	1- 729
1- 733	1- 740	1- 746	1- 752	1- 758	1- 766	1- 773
1- 780	1- 786	1- 796	1- 802	1- 807	1- 809	1- 811
1- 814	1- 817	1- 820	1- 824	1- 829	1- 832	1- 835
1- 838	1- 841	1- 846	1- 850	1- 853	1- 858	1- 861
1- 867	1- 870	1- 878	1- 884	1- 886	1- 889	1- 892
1- 895	1- 898	1- 902	1- 908	1- 911	1- 914	1- 917
1- 920	1- 924	1- 934	1- 942	1- 945	1- 948	1- 957
1- 960	1- 968	1- 970	1- 973	1- 976	1- 980	1- 988

CROSS REFERENCE TABLE S-2

	1- 991	1- 994	1- 997	1-1004	1-1009	1-1012	1-1015
	1-1018	1-1026	1-1029	1-1034	1-1039	1-1042	1-1045
	1-1049	1-1052	1-1055	1-1060	1-1063	1-1066	1-1072
	1-1075	1-1078	1-1081	1-1084	1-1087	1-1093	1-1096
	1-1099	1-1105	1-1108	1-1115	1-1122	1-1128	1-1135
	1-1139	1-1146	1-1149	1-1152	1-1155	1-1161	1-1166
	1-1172	1-1178	1-1181	1-1184	1-1186	1-1202	1-1205
	1-1208	1-1211	1-1214	1-1218	1-1224	1-1226	1-1230
	1-1233	1-1236	1-1246	1-1252	1-1255	1-1258	1-1261
	1-1265	1-1272	1-1276	1-1279	1-1282	1-1286	1-1298
	1-1311	1-1324	1-1331	1-1335	1-1337	1-1349	1-1352
	1-1359	1-1363	1-1366	1-1368	1-1373	1-1377	1-1379
	1-1399	1-1402	1-1407	1-1414	1-1424	1-1427	1-1431
	1-1464	1-1467	1-1471	1-1476	1-1479	1-1484	1-1500
	1-1509	1-1513	1-1526	1-1529	1-1536	1-1540	1-1553
	1-1557	1-1559	1-1572	1-1579	1-1583	1-1587	1-1649
	1-1652	1-1656	1-1661	1-1664	1-1667	1-1673	1-1676
	1-1680	1-1686	1-1691	1-1707	1-1713	1-1722	1-1753
	1-1756	1-1759	1-1779	1-1790	1-1798	1-1801	1-1805
	1-1816	1-1819	1-1823	1-1826	1-1847	1-1859	1-1861
	1-1864	1-1867	1-1871	1-1879	1-1888	1-1891	1-1895
	1-1919	1-1922	1-1926	1-1937	1-2039		
IOBYP	1- 936	1- 938	1- 943#				
IDTST	1- 313#	1- 787@	1- 937	1- 939@			
IR1	1-1294	1-1301#					
IR2	1-1307	1-1311#					
IR2A	1-1310	1-1315#					
IR3	1-1321	1-1333#					
IR3A	1-1329	1-1332	1-1336	1-1338#			
IR4	1-1346	1-1351#					
IR4A	1-1357	1-1360	1-1367	1-1369#			
IR5	1-1369	1-1375#					
IR5A	1-1371	1-1374	1-1378	1-1380#			
MIN1BC	1- 272#	1- 797	1- 930	1- 961	1-1136	1-1227	1-1269
	1-1411	1-1468	1-1510	1-1554	1-1653	1-1677	1-1677
MIN3BC	1- 273#	1- 984	1-1006	1-1030	1-1035	1-1068	1-1142
	1-1173	1-1497	1-1515	1-1542	1-1559		
MIN4BC	1- 274#	1-1131	1-1243	1-1646	1-1658	1-1681	
MSG0	1- 347	1-2212#					
MSG1	1-1993	1-2214#					
MSG10	1-1842	1-2230#					
MSG11	1-1874	1-2231#					
MSG12	1-2194	1-2236#					
MSG13	1- 351@	1- 352@	1- 353@	1-1898	1-1900@	1-1901	1-1903@
	1-1904@	1-1905	1-1907@	1-1908@	1-1909	1-1911@	1-2237#
MSG2	1-1996	1-2216#					
MSG3	1-1726	1-2217#					
MSG4	1-1738@	1-1742@	1-1746	1-1761@	1-2219#		
MSG5	1-1771@	1-1772	1-2220#				
MSG6	1-1782@	1-1783	1-2221#				
MSG7	1-1809@	1-1810	1-2223#				
MSG8	1-1829@	1-1830	1-2227#				
MSG9	1-1836	1-2228#					
MTAAD	1- 298#	1- 359					
MTAS	1- 302#	1- 368	1- 375@				
MFAV	1- 301#	1- 367	1- 374@				
MTC	1- 306#	1- 409	1- 444	1- 458	1- 494	1- 507@	1- 508
	1- 514@	1- 515@	1- 516	1- 522@	1- 523	1- 527@	1- 528

CROSS REFERENCE TABLE S-3

	1- 532a	1- 533	1- 537a	1- 538	1- 542a	1- 543	1- 547a
	1- 54a	1- 552a	1- 553	1- 559a	1- 560	1- 566a	1- 567a
	1- 56a	1- 574a	1- 575	1- 579a	1- 580	1- 584a	1- 585
	1- 591a	1- 592	1- 598a	1- 599a	1- 600	1- 606a	1- 607
	1- 611a	1- 612	1- 616a	1- 617	1- 621a	1- 622	1- 626a
	1- 627	1- 631a	1- 632	1- 636a	1- 637	1- 644a	1- 645
	1- 651a	1- 652a	1- 653	1- 659a	1- 660	1- 666a	1- 667a
	1- 66a	1- 673a	1- 674	1- 678a	1- 679	1- 683a	1- 684
	1- 800	1- 882	1- 890	1- 995	1-1016	1-1106	1-1150
	1-1182	1-1400a	1-1209a	1-1259	1-1273a	1-1274a	1-1280
	1-1295a	1-1296	1-1297a	1-1308a	1-1309	1-1327a	1-1330
	1-1333	1-1355a	1-1358	1-1361	1-1372	1-1425	1-1477
	1-1503a	1-1506a	1-1507a	1-1520a	1-1523a	1-1524a	1-1547a
	1-1550a	1-1551a	1-1563a	1-1566a	1-1567a	1-1737a	1-1743a
	1-1750a	1-1754	1-1799	1-1821a	1-1865	1-1889	1-1982
	1-2049	1-2119a	1-2121a	1-2123a	1-2125a	1-2127a	1-2129a
	1-2131a	1-2133a					
MTD	1- 309H	1- 437	1- 487	1- 715a	1- 716	1-1530	1-1573
	1-1664	1-1687	1-1985				
MTNAD	1- 297H	1- 356					
MTNS	1- 300H	1- 370a	1- 373				
MTNV	1- 299H	1- 369a	1- 372				
MTP	1- 331H	1- 389a	1-1304	1-1305	1-1306		
MTPM	1- 333H	1- 391a	1-1292	1-1293	1-1318	1-1319	1-1320
	1-1344	1-1345					
MTRD	1- 310H	1- 362	1- 451	1- 501	1- 726a	1- 727	1- 730a
	1- 731	1- 340	1-1253a	1-1514a	1-1558a	1-1669	1-1683a
	1-1693a	1-1703	1-1709	1-1987			
MTS	1- 305H	1- 355	1- 416	1- 466	1- 738	1- 744	1- 750
	1- 756	1- 764	1- 771	1- 778	1- 784	1- 803	1- 836
	1- 839a	1- 842	1- 847	1- 848	1- 851	1- 854	1- 859a
	1- 868	1- 912	1- 958	1- 964	1-1085	1-1147	1-1164
	1-1179	1-1203a	1-1206	1-1212	1-1216	1-1231	1-1234
	1-1256	1-1263	1-1277	1-1284	1-1364	1-1375	1-1527
	1-1570	1-1585	1-1751	1-1757	1-1777	1-1788	1-1803
	1-1817	1-1824	1-1862	1-1869	1-1886	1-1893	1-1981
	1-2032	1-2035	1-2063	1-2145			
MTRP	1- 254	1- 369	1- 374	1- 381	1-1390	1-1933H	
MTV	1- 303H	1- 367a	1- 372a	1- 381a	1-1294a	1-1307a	1-1321a
	1-1346a	1-1369a	1-1390a				
MTVN	1- 366	1- 372H					
MTVS	1- 304H	1- 368a	1- 373a	1- 382a	1-1293a	1-1305a	1-1319a
	1-1389a						
NOP	1- 284H						
NXMT	1-1242	1-1268H					
OCT	1- 327H	1-2181a	1-2191a				
OCTP	1-1973	1-2200H					
OCTPRT	1-1972	1-2174H					
OCT1	1-2176	1-2178H					
OCT2	1-2182H	1-2192					
PAR	1-1491H						
PAR1	1-1533	1-1538H					
PAR2	1-1537	1-1542H					
PAR3	1-1581H						
PAR4	1-1576	1-1580	1-1584H				
PC	1- 293H	1-1748a	1-1992a	1-2020a	1-2028a	1-2053a	1-2055a
	1-2067a	1-2069a	1-2087a	1-2092a	1-2102a	1-2120a	1-2122a
	1-2124a	1-2126a	1-2128a	1-2130a	1-2132a	1-2134a	1-2136a

CROSS REFERENCE TABLE S-4

	1-2138a	1-2140a	1-2142a	1-2144a	1-2146a	1-2155a	1-2169a
	1-2196a	1-2202a	1-2206a				
PRINT	1-1949	1-1788a					
PRINT1	1-329a	1-383a	1-1994	1-1998a			
PRMSG	1-261a	1-348	1-1727	1-1747	1-1773	1-1784	1-1811
	1-1831	1-1037	1-1843	1-1875	1-1899	1-1997	1-2195
PROTOCT	1-279a	1-2000	1-2002	1-2004	1-2006	1-2008	1-2010
	1-2012	1-2014	1-2016				
PRTOUT	1-280a	1-2106	1-2109	1-2111	1-2178	1-2189	
PWRCLR	1-262a	1-457	1-465	1-472	1-479	1-486	1-493
	1-500	1-621	1-862	1-871	1-899	1-921	1-949
	1-977	1-738	1-1019	1-1088	1-1125	1-1163	1-1187
	1-1215	1-1262	1-1283	1-1301	1-1315	1-1338	1-1380
RBUF	1-1584	1-1717	1-1813	1-1868	1-1892		
	1-896	1-718	1-974	1-1010	1-1100a	1-1113	1-1119a
	1-1120	1-1140a	1-1141a	1-1153	1-1158a	1-1159	1-1415
	1-1417	1-1428	1-1432	1-1458	1-1481	1-1662	1-1665
	1-2137	1-2241a					
RBUFA	1-271a	1-880	1-905	1-962	1-1005	1-1102	1-1143
	1-1421	1-1473	1-1516	1-1560	1-1657	1-1682	
READ	1-264a	1-763	1-1007	1-1103	1-1144	1-1422	1-1474
	1-1659	1-1634					
RETURN	1-330a	1-376a	1-2027a	1-2040			
REWIND	1-266a	1-843	1-865	1-876	1-922	1-955	1-978
	1-1002	1-1027	1-1043	1-1176	1-1222	1-1720	1-1920
	1-2034						
RGRST	1-1953	1-2082a					
RGRST	1-1952	1-2080a					
ROTCMP	1-278a	1-1612	1-1618	1-1624	1-1630		
RO	1-286a	1-387a	1-388a	1-389	1-390a	1-391	1-393a
	1-394a	1-395	1-396a	1-398	1-399a	1-1191a	1-1192
	1-1325a	1-1326a	1-1327	1-1333a	1-1354a	1-1355	1-1392a
	1-1393a	1-1394	1-1404a	1-1405	1-1408	1-1415a	1-1416a
	1-1417	1-1428a	1-1429	1-1432	1-1436a	1-1437a	1-1438
	1-1449a	1-1450a	1-1451	1-1452a	1-1453	1-1457a	1-1458a
	1-1459a	1-1460	1-1480a	1-1482	1-1501a	1-1502a	1-1503
	1-1517a	1-1518a	1-1519a	1-1520	1-1530a	1-1531a	1-1534
	1-1538	1-1544a	1-1545a	1-1546a	1-1547	1-1561a	1-1562a
	1-1563	1-1573a	1-1574a	1-1577	1-1581	1-1611a	1-1613
	1-1617a	1-1619	1-1623a	1-1625	1-1629a	1-1631	1-1632
	1-1634a	1-1635a	1-1636a	1-1637	1-1668a	1-1670a	1-1674
	1-1687a	1-1688a	1-1689	1-1702a	1-1705a	1-1708a	1-1711a
	1-1734a	1-1735	1-1767a	1-1768	1-1769a	1-1770	1-1851a
	1-1854a	1-1915a	1-1916a	1-2152	1-2153a	1-2154	1-2160a
	1-2161a	1-2163a	1-2164	1-2166a	1-2167a	1-2168a	
R1	1-287a	1-356a	1-359a	1-360	1-361a	1-397a	1-398a
	1-400	1-1481a	1-1482	1-1485	1-1601a	1-1602	1-1605a
	1-1614a	1-1616	1-1620a	1-1622	1-1626a	1-162a	1-1632a
	1-1633a	1-1636	1-1669a	1-1671a	1-2151	1-2152a	1-2154a
	1-2164a	1-2165a	1-2168				
R2	1-288a	1-347a	1-355a	1-350a	1-362	1-803a	1-842a
	1-847a	1-654a	1-964a	1-1248a	1-1726a	1-1746a	1-1772a
	1-1783a	1-1810a	1-1830a	1-1836a	1-1842a	1-1874a	1-1898a
	1-1978a	1-1979a	1-1980a	1-1981a	1-1982a	1-1983a	1-1984a
	1-1985a	1-1986a	1-1987a	1-1988a	1-1989a	1-1993a	1-1996a
	1-1999a	1-2001a	1-2003a	1-2005a	1-2007a	1-2009a	1-2011a
	1-2013a	1-2015a	1-2035a	1-2049a	1-2063a	1-2084	1-2099
	1-2100	1-2103	1-2105	1-2112a	1-2175	1-2179a	1-2180a

CROSS REFERENCE TABLE S-5

	1-2182a	1-2183a	1-2184a	1-2185	1-2188a	1-2190a	1-2194a
R3	1- 289H	1- 804a	1- 843a	1- 855a	1- 965a	1-1249a	1-2036a
	1-2050a	1-2064a	1-2084	1-2151a	1-2153		
R4	1- 290H	1- 005a	1- 844a	1- 856a	1- 966a	1-1250a	1-2037a
	1-2051a	1-2065a	1-2090a				
R5	1- 291H	1-2083a	1-2088a				
SAVE	1- 344H	1-1778	1-1999	1-2001	1-2003	1-2005	1-2007
	1-2009	1-2011	1-2013	1-2015			
SCOPE	1- 257H	1- 407	1- 414	1- 421	1- 428	1- 435	1- 442
	1- 449	1- 456	1- 464	1- 471	1- 478	1- 485	1- 492
	1- 499	1- 506	1- 513	1- 521	1- 526	1- 531	1- 536
	1- 541	1- 546	1- 551	1- 557	1- 565	1- 573	1- 578
	1- 583	1- 590	1- 597	1- 605	1- 610	1- 615	1- 620
	1- 625	1- 630	1- 635	1- 643	1- 650	1- 658	1- 665
	1- 672	1- 677	1- 682	1- 689	1- 701	1- 713	1- 725
	1- 736	1- 743	1- 749	1- 755	1- 763	1- 770	1- 776
	1- 783	1- 794	1- 807	1- 864	1- 875	1- 929	1- 954
	1- 983	1-1001	1-1024	1-1091	1-1126	1-1170	1-1190
	1-1221	1-1240	1-1268	1-1290	1-1302	1-1316	1-1342
	1-1385	1-1434	1-1456	1-1491	1-1588	1-1641	1-1701
	1-1719	1-1749	1-1760	1-1766	1-1775	1-1786	1-1793
	1-1808	1-1820	1-1828	1-1844	1-1872	1-1876	1-1896
SCOPEA	1-1950	1-2025H					
SCOPEB	1-2026	1-2029H					
SCPRT	1-2031	1-2033	1-2040H				
SELECT	1- 269H	1- 737		1-1322	1-1347	1-1647	1-1776
	1-1787	1-1814	1-1845	1-1877			
SP	1- 292H	1- 346a	1- 377a	1-1291a	1-1303a	1-1317a	1-1343a
	1-1386a	1-1736	1-1944a	1-1945a	1-1946a	1-1947a	1-1948
	1-1979	1-2027	1-2029	1-2054a	1-2068a	1-2086a	
SPACEB	1- 268H	1- 906	1-1070	1-1076	1-1097	1-1137	1-1228
	1-1412	1-1469	1-1511	1-1555	1-1654	1-167A	
SPACEF	1- 267H	1- 081	1-1047	1-105A			
SR	1- 282H	1- 357	1- 365	1- 387	1- 393	1- 695	1- 707
	1- 719	1- 761a	1- 935	1-1109	1-1111a	1-1117	1-1156
	1-1241	1-1432	1-1504a	1-1521a	1-1532a	1-1548a	1-1564a
	1-1575a	1-1589a	1-1694	1-1723	1-1729	1-1840	1-1990
	1-2017	1-2025	1-2200				
START	1- 295	1- 345H					
STCU12	1-1955	1-2119H					
STCEF	1-1958	1-2125H					
STCRD	1-1957	1-2123H					
STCRW	1-1959	1-2127H					
STCSB	1-1961	1-2131H					
STCSF	1-1960	1-2129H					
STCSL	1-1962	1-2133H					
STCWT	1-1956	1-2121H					
TABLE	1-1947	1-1749H					
TAMD	1- 358	1- 360H	1- 363				
TBC	1- 691H	1- 69A					
TCOL	1- 335H	1- 397	1- 400	1-1821			
TCRD	1- 336H	1-1446a	1-1451a	1-1517	1-1561	1-2123	
TCRS	1- 340H	1-2131					
TCRW	1- 342H	1-1353	1-2127				
TCSF	1- 339H	1-2129					
TCSL	1- 332H	1- 395a	1-1191	1-1197	1-1449	1-1734	1-1767
	1-2133						
TCSR	1- 312H	1-1712	1-2098a	1-2203			

CROSS REFERENCE TABLE S-6

TCWE	1- 341#						
TCWF	1- 338#	1-1525	1-2125				
TCWT	1- 337#	1-1474	1-1436	1-1445a	1-1447	1-1453a	1-1501
	1-1544	1-2121					
TDB	1- 715#	1- 722					
TDBR	1- 311#	1-1914a	1-2205a				
TEMP	1- 315#	1- 690a	1- 691	1- 692	1- 697a	1- 702a	1- 703
	1- 704	1- 709a	1- 714a	1- 715	1- 716	1- 721a	1-1197a
	1-1198a	1-1199a	1-1200	1-1391a	1-1393	1-1406	1-1429
	1-1435a	1-1440a	1-1441	1-1443a	1-1460a	1-1461	1-1472
	1-1598a	1-1600a	1-1601	1-1607a	1-1608a	1-1610	1-1611
	1-1614	1-1620	1-1626	1-1642	1-1643	1-1696a	1-1740a
	1-1745a	1-1750	1-1762a	1-1763	1-1770a	1-1771	1-1782
	1-1809	1-1829	1-1933	1-1936a	1-1938a	1-1988	
TEMPP	1- 316#	1-1734a	1-1939				
TEMPS	1- 317#	1-1753a	1-1938				
TYA	1- 703#	1- 710					
TMRT	1-1494	1-1531	1-1697	1-1701#			
TMTNFL	1- 314#	1- 378a	1- 793a	1-1718a	1-1839a	1-2030	
TOP	1-1954	1-2098#					
TOP1	1-2100#	1-2107	1-2113				
TOP2	1-2104	1-2108#					
TRAP34	1- 248	1-1744#					
TREOF	1-1112	1-1117#					
TRLE	1-1110	1-1116	1-1125#				
TSR	1- 767	1- 776#					
TSTB	1-2081	1-2093#	1-2089	1-2091			
TSTCUR	1- 258#	1- 795	1- 808	1- 828	1- 831	1- 834	1- 866
	1- 885	1- 907	1- 933	1- 969	1- 987	1-1008	1-1025
	1-1028	1-1033	1-1038	1-1041	1-1044	1-1048	1-1059
	1-1071	1-1077	1-1092	1-1095	1-1098	1-1104	1-1127
	1-1134	1-1138	1-1145	1-1171	1-1177	1-1201	1-1210
	1-1223	1-1229	1-1245	1-1271	1-1275	1-1323	1-1328
	1-1348	1-1351	1-1356	1-1398	1-1401	1-1413	1-1423
	1-1463	1-1466	1-1470	1-1475	1-1499	1-1508	1-1512
	1-1525	1-1552	1-1556	1-1568	1-1648	1-1651	1-1655
	1-1660	1-1679	1-1685	1-1721	1-1797	1-1815	1-1822
	1-1846	1-1860	1-1878	1-1918	1-1921		
TSTEND	1-1725	1-1731	1-1873	1-1898#			
TSTEOF	1- 275#	1- 412	1- 822	1- 837	1- 900	1- 909	1-1050
	1-1061	1-1073					
TSTIN	1-2080a	1-2082a	1-2085#				
TSTL	1-2085	1-2088#					
TSTROY	1-1969	1-2063#					
TSTRGR	1- 260#	1- 806	1- 845	1- 857	1- 967	1-1251	
TSTRGS	1- 259#	1-2038	1-2052	1-2066			
T7CH	1- 762	1- 770#					
USLEN	1- 343#	1-1739a	1-1744a	1-1763			
USS	1-1741	1-1746#	1-1764				
USS1	1-1736	1-1742#					
WAITTR	1- 276#	1- 410	1- 877	1- 923	1- 956	1- 979	1-1003
	1-1185	1-1225	1-1254	1-1370	1-1923	1-1925	
WBR	1-1392#	1-1395	1-1444				
WBR5	1-1391#	1-1448					
WBR1	1-1405#	1-1409					
WBR2	1-1416#	1-1418					
WBR3	1-1429#	1-1433					
WBR4	1-1442	1-1445#					

CROSS REFERENCE TABLE S-7

WBRS	1-1402#	1-1486					
WBUF	1- 818	1- 946	1- 989	1-1082	1-11290	1-11300	1-1392
	1-1394	1-1404	1-1408	1-14950	1-14960	1-16420	1-16430
	1-16440	1-1652	1-1665	1-1852	1-2135	1-2239#	1-2240
WBUFCA	1- 270#	1- 798	1- 931	1- 985	1-1031	1-1036	1-1069
	1-1132	1-1174	1-1244	1-1397	1-1498	1-1543	1-1645
	1-1049	1-1081					
WREOF	1- 265#	1- 799	1- 830	1-1040	1-1094	1-1175	1-1350
WRITE	1- 263#	1- 932	1- 986	1-1032	1-1037	1-1133	1-1247
	1-1400	1-1465	1-1650	1-1796	1-1850	1-1883	
XCLOR	1- 277#	1-1615	1-1621	1-1627			
	1- 242#	1- 246	1- 247#	1- 250#	1- 294#	1- 296#	1- 344#
	1- 401	1- 410	1- 417	1- 424	1- 431	1- 43A	1- 445
	1- 452	1- 459	1- 467	1- 474	1- 481	1- 488	1- 495
	1- 502	1- 509	1- 517	1- 524	1- 529	1- 534	1- 539
	1- 544	1- 549	1- 554	1- 561	1- 569	1- 576	1- 581
	1- 586	1- 593	1- 601	1- 608	1- 613	1- 618	1- 623
	1- 628	1- 633	1- 638	1- 646	1- 654	1- 661	1- 669
	1- 675	1- 680	1- 685	1- 693	1- 696	1- 705	1- 708
	1- 717	1- 720	1- 728	1- 752	1- 739	1- 745	1- 751
	1- 757	1- 765	1- 772	1- 779	1- 785	1- 801	1- 813
	1- 816	1- 819	1- 823	1- 837	1- 840	1- 849	1- 852
	1- 860	1- 869	1- 883	1- 888	1- 891	1- 894	1- 897
	1- 901	1- 910	1- 913	1- 916	1- 919	1- 941	1- 944
	1- 947	1- 959	1- 972	1- 975	1- 990	1- 993	1- 996
	1-1011	1-1014	1-1017	1-1051	1-1054	1-1062	1-1065
	1-1074	1-1080	1-1083	1-1086	1-1107	1-1114	1-1118
	1-1121	1-1148	1-1151	1-1154	1-1157	1-1160	1-1165
	1-1180	1-1183	1-1193	1-1195	1-1204	1-1207	1-1213
	1-1217	1-1242	1-1235	1-1257	1-1260	1-1264	1-1278
	1-1281	1-1285	1-1334	1-1352	1-1365	1-1376	1-1406
	1-1426	1-1430	1-1439	1-1478	1-1483	1-1493	1-1505
	1-1522	1-1528	1-1535	1-1539	1-1549	1-1565	1-1571
	1-1578	1-1582	1-1586	1-1590	1-1603	1-1606	1-1663
	1-1666	1-1672	1-1675	1-1690	1-1695	1-1704	1-1706
	1-1710	1-1712	1-1724	1-1730	1-1752	1-1755	1-1758
	1-1778	1-1789	1-1800	1-1804	1-1818	1-1825	1-1853
	1-1855	1-1856	1-1858	1-1863	1-1866	1-1870	1-1887
	1-1890	1-1894	1-1913	1-1917	1-1991	1-1995	1-2018
	1-2101	1-2201	1-2204	1-2240#			

CROSS REFERENCE TABLE C-1

054496
• ABS. 054496 1- 258

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1
2
3      .TITLE P468
4      .ENABL CDR
5
6      |
7      |
8      |
9      |*****
10     | * WP/PDP11 DATA RELIABILITY PROGRAM (7 AND 9 TRACK) *
11     | * PROGRAM LISTING # 708.0 *
12     |*****
13     |
14     | THE WP DATA RELIABILITY PROGRAM COLLECTS STATISTICAL
15     | INFORMATION PERTAINING TO THE DATA RELIABILITY OF THE TAPE SYSTEM
16     | WHEN RUN FOR EXTENDED PERIODS OF TIME. IT USES A NUMBER OF
17     | DIFFERENT PARAMETERS CONTROLLING DATA PATTERNS, PARITY, DENSITY
18     | RECORD LENGTHS, WRITING AND READING SEQUENCES AND STOPPING MODES
19     | (NONSTOP, START-STOP, RANDOM STALL DELAY).
20     |
21     | 12. REQUIREMENTS
22     |
23     | 12.1 EQUIPMENT
24     |
25     | PDP-11 WITH TAPE CONTROLLER AND 1 TO 8 TAPE UNITS (7 AND/OR 9 TRAC )
26     |
27     | 12.2 STORAGE
28     |
29     | 12.2.1 PROGRAM STORAGE
30     |
31     | THE ROUTINE REQUIRES 4K OF MEMORY.
32     |
33     | 12.3 PRELIMINARY PROGRAMS
34     |
35     | THE 466.X TAPE INSTRUCTION TEST DIAGNOSTIC MUST RUN
36     | PROPERLY BEFORE ATTEMPTING TO USE THIS PROGRAM.
37     |
38     | 13. LOADING PROCEDURE
39     |
40     | 13.1 METHOD
41     |
42     | PROCEDURE FOR NORMAL BINARY TAPES SHOULD BE FOLLOWED]
43     |
44     | 1. ABSOLUTE LOADER MUST BE IN MEMORY.
45     | 2. PLACE BINARY TAPE IN READER.
46     | 3. LOAD ADDRESS *7500 (* DETERMINED BY LOCATION OF LOADER)
47     | 4. PRESS "START" (PROGRAM WILL LOAD).
48     |
49     | 14. STARTING PROCEDURE
50     |
51     | 14.1 CONTROL SWITCH SETTINGS
52     |
53     | FOR INITIAL OPERATION OF PROGRAM ALL SWITCHES SHOULD BE = 0
54     | (OR DOWN).
55     |
56     | 14.2 STARTING ADDRESS
57     |
58     | 200 - BASIC TEST (AUTOMATIC PARAMETER AND UNIT SELECTION)

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|
| 204 - OPERATOR CONTROLLED PARAMETER TEST (WITH 4K MEMORY AVAILABLE)
|
| 210 - OPERATOR CONTROLLED PARAMETER TEST (WITH 8K MEMORY AVAILABLE)
|
| 4.3 PROGRAM AND/OR OPERATOR ACTION
|
| LOAD PROGRAM INTO MEMORY
| SET DESIRED TU10 TAPE UNITS ON-LINE
| LOAD STARTING ADDRESS 200 (204 OR 210 TO SELECT PARAMETERS NO
| UNITS)
| PRESS START-PROGRAM WILL BEGIN TESTING FOR LOAD ADDRESS OF 00
| OTHERWISE
| SELECT TAPE UNITS (REFERENCE 4.3.1.1)
| SELECT PARAMETERS (REFERENCE 4.3.2)
| TYPE CARRIAGE RETURN AND PROGRAM WILL BEGIN TESTING.
|
| 4.3.1 TAPE UNIT SELECTION
|
| STARTING THE PROGRAM AT 200 WILL RESULT IN AUTOMATIC SELECTION
| OF THE UNITS TO BE TESTED (REFERENCE 4.3.1.2) OTHERWISE STARTING
| AT 204 OR 210 WILL ALLOW OPERATOR TO SELECT UNITS.
|
| THE PROGRAM WILL TYPE "SELECT UNITS", ANY CONFIGURATION OF
| 1 TO 8 UNITS MAY BE SELECTED BY TYPING THE UNIT NUMBERS ON
| THE TELETYPE. ANY SEQUENCE OF NUMBERS MAY BE TYPED. AFTER
| EACH NUMBER IS TYPED A COMMA (,) WILL BE PRINTED, TYPING THE
| SAME UNIT NUMBER TWICE WILL CAUSE THAT UNIT NUMBER TO BE DELETED.
| TYPING ANY KEY OTHER THAN 0 THRU 7 WILL CAUSE A QUESTION MARK
| (?) TO BE PRINTED AND THAT KEY WILL BE IGNORED.
|
| TO TERMINATE UNIT SELECTION TYPE A CARRIAGE RETURN. WHEN
| CARRIAGE RETURN IS TYPED THE PROGRAM WILL CONTINUE TO THE
| "PARAMETER SELECTION" UNLESS NO UNITS WERE SELECTED AND IN
| THAT EVENT WILL RETURN TO THE BEGINNING OF "SELECT UNITS".
|
| 4.3.1.1 TAPE UNIT SELECTION EXAMPLES
|
| SELECT UNITS 3,4,5
| SELECT UNITS 5,3,4
|
| IN EITHER CASE, UNITS 3,4,5 ARE SELECTED.
|
| SELECT UNITS
|
| A CARRIAGE RETURN WAS TYPED WITH NO UNITS SELECTED.
|
| SELECT UNITS 1,97,1,2
|
| ONLY UNIT 2 SELECTED, UNIT 1 WAS DELETED (TYPED TWICE)
| AND THE 9 WAS IGNORED.
|
| 4.3.1.2 STARTING AT 200 WILL RESULT IN AUTOMATIC SELECTION OF UNITS TO
| BE TESTED. A UNIT WILL BE SELECTED FOR TESTING IF IT MEETS THE
| FOLLOWING CRITERIA]
| 1. IT IS ON-LINE
| 2. IT IS WRITE ENABLED

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115      |
116      | IF THE ABOVE CRITERIA ARE NOT MET BY AT LEAST ONE (1) UNIT,
117      | OPERATOR SELECTION WILL BE REQUIRED (REFERENCE 4.3.1),
118      |
119      | 4.3.2  PARAMETER SELECTION
120      |
121      | STARTING THE PROGRAM AT 200 WILL RESULT IN AN AUTOMATIC SELECTION
122      | OF TEST PARAMETERS (REFERENCE 4.3.2.10) OTHERWISE STARTING AT
123      | ADDRESS 204 OR 210 WILL ALLOW OPERATOR TO SELECT PARAMETERS,
124      | FOR 7 TRACK UNITS THERE ARE 7 PARAMETERS TO BE CONTROLLED BY CR
125      | THE OPERATOR. THEY ARE: TEST NUMBER, PATTERN, PARITY, DENSITY, CR
126      | RECORD LENGTH, WRITE MODE, AND READ MODE. FOR 9 TRACK UNITS CR
127      | THERE ARE 5 OPERATOR CONTROLLED PARAMETERS. THEY ARE ALL THE CR
128      | 7 TRACK PARAMETERS JUST REFFRENCED EXCEPT PARITY AND DENSITY. CR
129      | IN EITHER CASE, THE PROGRAM PRINTS THE FOLLOWING; CR
130      |
131      | "TST PAT PAR DEN RLS WMO RMO"
132      |
133      | TST=TEST NUMBER
134      | PAT=PATTERN
135      | PAR=PARITY
136      | DEN=DENSITY
137      | RLS=RECORD LENGTH SEQUENCE
138      | WMO=WRITE START/STOP MODE
139      | RMO=READ START/STOP MODE
140      |
141      | 4.3.2.1 TEST NUMBER
142      |
143      | THERE ARE 6 TESTS AVAILABLE FOR SELECTION (0 THRU 5),
144      |
145      | TEST          DESCRIPTION
146      |
147      | 0      WRITE 1 RECORD, REPEAT ON ALL UNITS, CONTINUE TO END
148      |        OF TAPE.
149      |
150      | 1      WRITE 256 RECORDS, REPEAT FOR ALL UNITS, CONTINUE TO END
151      |        OF TAPE.
152      |
153      | 2      WRITE 256 RECORDS, REPEAT FOR ALL UNITS, BACKSPACE 256
154      |        RECORDS, REPEAT FOR ALL UNITS, READ 256 RECORDS, REPEAT
155      |        FOR ALL UNITS, CONTINUE TO END OF TAPE.
156      |
157      | 3      WRITE 1 RECORD, REPEAT FOR ALL UNITS, BACKSPACE, REPEAT
158      |        FOR ALL UNITS, READ 1 RECORD, REPEAT FOR ALL UNITS,
159      |        CONTINUE TO END OF TAPE.
160      |
161      | 4      WRITE 1 RECORD, REPEAT FOR ALL UNITS, REPEAT FOR 256
162      |        RECORDS, BACKSPACE 256 RECORDS, REPEAT FOR ALL UNITS,
163      |        READ 1 RECORD, REPEAT FOR ALL UNITS, REPEAT FOR 256
164      |        RECORDS, CONTINUE TO END OF TAPE.
165      | NOTE: THIS TEST WILL NOT FUNCTION PROPERLY WHEN OPERATING
166      | ON A DUAL DENSITY SYSTEM (NRZ/PE) WHOSE DENSITY SELECTION
167      | IS COMPUTER CONTROLLED.
168      |
169      | 5      READ 1 RECORD, REPEAT FOR ALL UNITS, CONTINUE TO END
170      |        OF TAPE.
171      |

```

172	4.3.2.2.1 PATTERN (7 TRACK)	CR
173		
174	THERE ARE 8 DATA PATTERNS AVAILABLE FOR SELECTION (0 THRU 7) WITH ACH	
175	PARITY.	
176		
177	PATTERN DESCRIPTION	DATA
178		
179	0 (EVEN) HIGH FREQUENCY OUTSIDE SKEW	01
180		01
181		ETC
182		
183	0 (ODD) HALF FREQUENCY OUTSIDE SKEW	01
184		00
185		01
186		00
187		ETC
188		
189	1 (EVEN) SLIDING "0"	37
190		57
191		67
192		73
193		75
194		76
195		ETC
196		
197	1 (ODD) SLIDING "1"	40
198		20
199		10
200		4
201		2
202		1
203		ETC
204		
205	2 (EVEN) HIGH FREQUENCY ALTERNATING	25
206	TRACKS	25
207		ETC
208		
209	2 (ODD) HIGH FREQUENCY ALTERNATING	52
210	TRACKS	52
211		ETC
212		
213	3 (EVEN) HALF FREQUENCY OUTSIDE TRACK	77
214	HIGH FREQUENCY INSIDE TRACKS	76
215		77
216		76
217		ETC
218		
219	3 (ODD) HIGH FREQUENCY OUTSIDE TRACK	01
220	HIGH FREQUENCY INSIDE TRACKS	77
221		01
222		77
223		ETC
224		
225	PATTERN DESCRIPTION	DATA
226		
227	4 (EVEN) INCREMENTING PATTERN	01
228	(NO ALL 0'S)	02

229	:	03
230	:	:
231	:	:
232	:	77
233	:	
234	:	4 (ODD) INCREMENTING PATTERN
235	:	INCLUDING ALL 0'S)
236	:	00
237	:	01
238	:	02
239	:	:
240	:	:
241	:	77
242	:	5 (EVEN) THREE 0'S EACH TRACK EVERY
243	:	6TH WORD
244	:	37
245	:	37
246	:	37
247	:	57
248	:	57
249	:	57
250	:	67
251	:	67
252	:	67
253	:	73
254	:	73
255	:	73
256	:	75
257	:	75
258	:	75
259	:	76
260	:	76
261	:	76
262	:	ETC
263	:	5 (ODD) THREE 1'S EACH TRACK EVERY
264	:	6TH WORD
265	:	40
266	:	40
267	:	40
268	:	20
269	:	20
270	:	20
271	:	10
272	:	10
273	:	10
274	:	04
275	:	04
276	:	04
277	:	02
278	:	02
279	:	02
280	:	01
281	:	01
282	:	01
283	:	ETC
284	:	6 (ODD,EVEN) ALL 1'S
285	:	77
	:	77
	:	ETC

286		7 (EVEN) RANDOM (NO ALL 0'S)	?		
287					
288		7 (ODD) RANDOM (INCLUDING ALL 0'S)	?		
289					
290		4.3.2.2.2 PATTERN (9 TRACK)			CR
291					CR
292		THERE ARE 8 DATA PATTERNS AVAILABLE FOR SELECTION (0 THRU 7)			CR
293					CR
294		PATTERN DESCRIPTION	DATA	CHANNELS	CR
295					CR
296		4 INCREMENTING PATTERN	000	040	CR
297			001	200	CR
298			002	002	CR
299			003	202	CR
300			.	.	CR
301			.	.	CR
302			.	.	CR
303			377	777	CR
304			ETC.	ETC.	CR
305					
306		5 EACH CHANNEL 3 BITS	000	040	CR
307			000	040	CR
308			000	040	CR
309			200	004	CR
310			200	004	CR
311			200	004	CR
312			100	010	CR
313			100	010	CR
314			100	010	CR
315			040	020	CR
316			040	020	CR
317			040	020	CR
318			020	100	CR
319			020	100	CR
320			020	100	CR
321			010	001	CR
322			010	001	CR
323			010	001	CR
324			004	400	CR
325			004	400	CR
326			004	400	CR
327			002	002	CR
328			002	002	CR
329			002	002	CR
330			001	200	CR
331			001	200	CR
332			001	200	CR
333			ETC.	ETC.	CR
334					
335		6 HIGH FREQUENCY ALL CHANNELS	377	777	CR
336			377	777	CR
337			ETC.	ETC.	CR
338					
339		7 RANDOM	?	?	CR
340					
341		4.3.2.3 PARITY (7 TRACK ONLY)			CR
342					

343 | PARITY SELECTION IS EITHER EVEN OR ODD,
344 |
345 | PAR DESCRIPTION
346 |
347 | 0 EVEN PARITY,
348 |
349 | 1 ODD PARITY
350 |
351 | 4.3.2.4 DENSITY (7 TRACK ONLY) CR
352 |
353 | THERE ARE 4 TYPES OF DENSITIES FOR SELECTION (2,5,8,C)
354 |
355 | DEN DESCRIPTION
356 |
357 | 2 200 BITS PER INCH,
358 |
359 | 5 556 BITS PER INCH,
360 |
361 | 8 800 BITS PER INCH,
362 |
363 | C 800 BPI CORE DUMP,
364 |
365 | 4.3.2.5 RECORD LENGTH SEQUENCE
366 |
367 | THERE ARE 4 TYPES OF RECORD LENGTH SEQUENCES FOR SELECTION (0 THRU 3)
368 |
369 | RLS DESCRIPTION
370 |
371 | 0 MINIMUM LENGTH RECORDS (4 BYTES)
372 |
373 | 1 MAXIMUM LENGTH RECORDS (1024 BYTES)
374 |
375 | 2 VARYING LENGTH RECORDS, MINIMUM TO MAXIMUM (1ST RECORD=
376 | 4 BYTES, EACH SUCCESSIVE RECORD IS 4 BYTES LONGER
377 | UNTIL 256TH RECORD=1024 BYTES)
378 |
379 | 3 VARYING LENGTH RECORDS, MAXIMUM TO MINIMUM (1ST RECORD=
380 | 1024 BYTES, EACH SUCCESSIVE RECORD IS 4 BYTES SHORTER
381 | UNTIL 256TH RECORD=4 BYTES)
382 |
383 | 4.3.2.6 WRITE START/STOP MODE
384 |
385 | THERE ARE 3 TYPES OF WRITE MODES FOR SELECTION (0 THRU 2)
386 |
387 | WMO DESCRIPTION
388 |
389 | 0 NONSTOP = NO WAITING BETWEEN WRITE OPERATIONS, NEW
390 | COMMAND IS ISSUED WHEN CU READY SETS,
391 |
392 | 1 START/STOP - FULL STOP BETWEEN WRITE OPERATIONS, NEW
393 | COMMAND IS ISSUED WHEN TU READY SETS,
394 |
395 | 2 RANDOM - FULL STOP WITH RANDOM DELAY (1-256 MILLISECONDS)
396 |
397 | 4.3.2.7 READ START/STOP MODE
398 |
399 | THERE ARE 3 TYPES OF MODES FOR SELECTION (0 THRU 2)

400	:	
401	:	RMO DESCRIPTION
402	:	
403	:	0 NONSTOP - NO WAITING BETWEEN READ OPERATIONS, NEW
404	:	COMMAND IS ISSUED WHEN CU READY SETS,
405	:	
406	:	1 START/STOP - FULL STOP BETWEEN READ OPERATIONS, NEW
407	:	COMMAND IS ISSUED WHEN TU READY SETS,
408	:	
409	:	2 RANDOM - FULL STOP WITH RANDOM DELAY (1-256 MILLISECONDS)

410 :
 411 : 4.3.2.8 FINAL TEST SELECT APPROVAL

412 :
 413 : AFTER SELECTING RMO, IF ALL PARAMETERS SELECTED ARE LEGAL, "OK"
 414 : WILL BE PRINTED, IF THE PARAMETERS SELECTED STILL CORRESPOND
 415 : TO THE OPERATORS INTENTIONS HE MUST TYPE A CARRIAGE RETURN
 416 : TO SAVE THE PARAMETERS. TYPING ANY OTHER KEY NOW, OR IN FACT
 417 : AT ANY TIME DURING PARAMETER SELECTION TYPING AN ILLEGAL KEY
 418 : WILL CAUSE THE PRESENT PARAMETERS TO BE DELETED AND A NEW
 419 : PARAMETER SELECTION TO BE INITIATED, UP TO TEN SETS OF
 420 : PARAMETER SELECTIONS CAN BE MADE, EACH SET WILL BE EXECUTED
 421 : AFTER THE PREVIOUS SET REACHES END OF TAPE, TO TERMINATE
 422 : PARAMETER SELECTION A SECOND CARRIAGE RETURN MUST BE TYPED AFTER
 423 : SELECTING A SET OF PARAMETERS,

424 :
 425 : 4.3.2.9 TEST SELECTION EXAMPLES

426	:	
427	:	TST PAT PAR DEN RLS WMO RMO
428	:	3 2 0 2 1 0 0 OK (CR)
429	:	3 K?
430	:	0 0 1 8 2 2 2 OKX?
431	:	0 1 1 8 2 1 0 OK (CR)
432	:	(CR)

433 :
 434 : TWO PARAMETERS SETS WERE SELECTED BY THE ABOVE SEQUENCE

435 :
 436 : TEST3, PATTERN 2, EVEN PARITY, 200 BP1, MAXIMUM RECORD LENGTH,
 437 : WRITE NONSTOP, AND READ NONSTOP.
 438 : TEST 0, PATTERN 1, ODD PARITY, 800 BP1, VARYING RECORD LENGTH
 439 : (MIN TO MAX), WRITE START/STOP, READ NONSTOP,
 440 : (NOTE) EVEN THOUGH TEST 0 IS A WRITE ONLY TEST, ALL PARAMETERS
 441 : MUST BE SATISFIED.) (IN THIS CASE RMO HAS NO EFFECT)

442 :
 443 : IN THE SECOND PARAMETER SET A "K" WAS TYPED WHICH WAS ILLEGAL
 444 : AND THE SET WAS REINITIALIZED,

445 :
 446 : IN THE THIRD PARAMETER SET AN "X" WAS TYPED INSTEAD OF A CAR-
 447 : RIAGE RETURN AND THE PARAMETERS WERE IGNORED, AFTER AT LEAST
 448 : ONE GOOD SET WAS SELECTED A CARRIAGE RETURN WAS TYPED AT THE
 449 : BEGINNING OF THE PARAMETER SELECTION AND THE PROGRAM WOULD START
 450 : TESTING,

451 :
 452 : NOTE: IF NO 7 TRACK UNITS ARE AVAILABLE FOR TESTING, THE
 453 : PROGRAM WILL PRINT XXX IN THE PARITY AND DENSITY POSITIONS
 454 : SINCE THEIR SPECIFICATION IS NOT REQUIRED FOR 9 TRACK UNITS,

CR
 CR
 CR
 CR

455 :
 456 : 4.3.2.10 AUTOMATIC PARAMETER SELECTION

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STARTING AT 200 WILL CAUSE THE FOLLOWING TEST PARAMETERS
TO BE SELECTED AUTOMATICALLY)

TST	PAT	PAR	DEN	RLS	WMO	RMO
3	7	1	C	2	1	1
3	0	0	8	3	1	1
2	1	1	5	2	0	0

NOTE: PARITY AND DENSITY PARAMETERS APPLICABLE TO 7 TRACK ONLY CR

5.0 OPERATING PROCEDURE

5.1 OPERATIONAL SWITCH SETTINGS

THE OPERATIONAL SWITCH SETTINGS ARE USED TO:

- A. ALTER ERROR RECOVERY PROCEDURES
- B. DELETE ERROR PRINTOUTS
- C. CAUSE A TEST SEQUENCE TO BE REPEATED WITH A VARIATION
THE PATTERN, RECORD LENGTH SEQUENCE, WRITE MODE, OR READ MODE

5.1.1 SWITCHES TO ALTER ERROR RECOVERY

THE FUNCTION PERFORMED IS WITH THE SWITCH IN THE "1" (OR UP)
POSITION,

SW	FUNCTION	PURPOSE
4	DELETE READ RE-TRYS	USE OF THIS SWITCH WILL CAUSE DELETION OF THE NORMAL SEQUENCE OF TRYING TO RE-READ A RECORD AFTER A READ ERROR, THIS WOULD BE USEFUL FOR SCOPING READ OPERATIONS.
5	DELETE WRITE XIRG	USE OF THIS SWITCH WILL CAUSE RECORDS WITH WRITE ERRORS TO BE LEFT ON TAPE, THE READ PASS WITH DATA TIMEOUTS SELECTED WOULD BE USEFUL FOR DETERMINING WRITE ERROR ORIGINS,
6	WRITE STATISTICAL RECOVERY	USE OF THIS SWITCH WILL CAUSE A BACKSPACE 2 RECORDS, SPACE FORWARD 1 RECORD, REWRITE RECORD SEQUENCE TO BE USED INSTEAD OF WRITE XIRG SO THAT THE RECORD WILL BE REWRITTEN ON APPROXI- MATELY THE SAME AREA OF TAPE WHERE THE WRITE ERROR OCCURRED, THIS METHOD KEEPS THE INTER- RECORD GAP FROM GETTING LARGER, DATA IS WRITTEN OVER THE SAME SPOT ON TAPE TO TRY AND FIND BAD TAPE.

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5.1.2 SWITCHES TO CONTROL ERROR PRINTOUTS

THE FUNCTION PERFORMED IS WITH THE SWITCH IN THE "1" (OR UP) POSITION.

SW	FUNCTION	PURPOSE
13	SUPPRESS ERROR PRINTOUT	THE STATISTICS CONCERNING THE NUMBER AND TYPES OF ERRORS WILL BE PRINTED WHEN THE TAPE UNIT REACHES END OF TAPE, FOR LONG PERIODS OF TESTING (OVERNIGHT, ETC) IT MAY BE SUFFICIENT TO RECEIVE THIS INFORMATION AND NOT HAVE A TYPEOUT EACH TIME AN ERROR OCCURRED
8	PRINT ERROR STATISTICS	AFTER COMPLETION OF EVERY RECORD LENGTH SEQUENCE INSTEAD OF AFTER END OF TAPE AS IS NORMAL,

5.1.3 SWITCH TO ALTER TEST PATTERNS

SW	FUNCTION	PURPOSE
0	CHANGE PATTERN	AFTER COMPLETION OF A TEST SEQUENCE REPEAT WITH NEXT PATTERN, UNTIL PATTERN 7 IS COMPLETED.

THIS FEATURE IS USEFUL FOR TESTING MANY COMBINATIONS OF TEST PATTERNS WITHOUT REQUIRING THE OPERATOR TO TYPE IN A LARGE NUMBER OF PARAMETERS.

EXAMPLE: TST PAT PAR DEN RLS WMO RMO
 3 2 0 2 1 0 0
 4 6 0 2 0 0 0

WITH SW0=1
 TEST 3 WILL BE EXECUTED 6 TIMES (PATTERNS 2-7)
 AND THEN TEST 4 WILL BE EXECUTED 2 TIMES (PATTERNS 6,7)
 NOTE: XXX PRINTED FOR PARITY AND DENSITY IF ONLY 9 TRACK UNITS CR

6. ERRORS

6.1 WRITE ERRORS

THE FOLLOWING ERROR TYPEOUTS ARE POSSIBLE DURING A WRITE OPERATION.

A. WRITE STATUS ERROR

COMD	STATUS	RECORD	LENGTH	EXPECTED	ACTUAL
XXXXXX	XXXXXX				

THIS WILL OCCUR IF ERROR (BIT 15 OF COMMAND REGISTER) SETS ON A WRITE COMMAND. THE CONTENTS OF THE COMMAND AND STATUS REGISTERS IS PRINTED ALONG WITH THE RECORD NUMBER AND RECOR

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627

LENGTH:

B. XIRG WRITTEN 4 TIMES

THIS WILL OCCUR IF A WRITE STATUS ERROR CANNOT BE ELIMINATED IN 4 ATTEMPTS AT RE-WRITING THE RECORD WITH EXTENDED INTERRECORD GAP, NOT POSSIBLE DURING TEST 0 OR 1 AS THESE ARE "WRITE ONLY" TESTS AND IT IS NOT ABSOLUTELY NECESSARY FOR THE RECORDS TO BE WRITTEN PROPERLY, SETTING SWITCH 5 TO A "1" WILL DELETE "WRITE" WITH XIRG.

C. END OF TAPE

DRV	PAT	PAR	DEN	MODE	RECORD	LENGTH
0	7	0	800	SSTP	1276	MAX

WRITE ERRORS = 5
RECOVERED AT 1 = 3
RECOVERED AT 3 = 1
PERMANENT BADSPOT = 1

DRV = UNIT NUMBER
PAT = PATTERN NUMBER
PAR = PARITY (7 TRACK ONLY)
DEN = DENSITY (7 TRACK ONLY)
MODE = WRITE START/STOP MODE
RECORD = NUMBER OF RECORDS
LENGTH = LENGTH OF RECORDS

CR
CR

ON UNIT 0, USING PATTERN 7, EVEN PARITY, 800 BPI, WRITE MODE START/STOP, 1276 RECORDS OF MAXIMUM (1048 BYTES) LENGTH WERE WRITTEN, DURING THAT TIME 5 WRITE STATUS ERRORS OCCURRED, 3 WERE RECOVERED ON THE 1ST RE-WRITE, 1 RECOVERED ON THE 3RD RE-WRITE, THE REMAINING ERROR NOT RECOVERED IS CONSIDERED TO BE CAUSED BY A PERMANENT BAD SPOT ON TAPE.

NOTE: THE ABOVE EXAMPLE ILLUSTRATES OUTPUT FOR A 7 TRACK UNIT. IF THE UNIT WAS 9 TRACK, X WOULD BE PRINTED IN THE PARITY AND DENSITY POSITIONS.

CR
CR
CR
CR

6.2 READ ERRORS

THE FOLLOWING ERROR TYPEOUTS ARE POSSIBLE DURING A READ OPERATION:

A. READ STATUS ERROR

COMD	STATUS	RECORD LENGTH	EXPECTED	ACTUAL
XXXXXX	XXXXXX	47	4	

THIS WILL OCCUR WHEN ERROR (BIT 15 OF COMMAND REGISTER) SETS DURING A READ OPERATION, THE CONTENTS OF THE COMMAND AND STATUS REGISTERS IS PRINTED ALONG WITH THE RECORD NUMBER AND RECORD LENGTH.

B. READ DATA ERROR

```

628      |          COMD      STATUS      RECORD LENGTH EXPECTED ACTUAL
629      |          XXXXXX      XXXXXX      107  1024  177777  175777
630      |
631      |          THIS WILL OCCUR WHEN THE DATA READ DOES NOT AGREE WITH THE
632      |          DATA WRITTEN; THE CONTENTS OF THE COMMAND AND STATUS REGISTER
633      |          IS PRINTED, ALONG WITH THE RECORD NUMBER AND RECORD LENGTH,
634      |          ALSO PRINTED IS THE CONTENTS OF THE MEMORY ADDRESS FROM
635      |          WHICH THE DATA WAS WRITTEN (EXPECTED) AND THE CONTENTS OF THE
636      |          MEMORY ADDRESS INTO WHICH IT WAS READ (ACTUAL). THIS INDICATES
637      |          THE FIRST DATA TRANSFER ERROR FOUND FOR THE RECORD.
638      |          NO ATTEMPT IS MADE TO DETERMINE IF THERE ARE OTHER DATA ERRORS
639      |          IN THE RECORD.
640      |
641      |          C.      READ PASS
642      |
643      |          END OF TAPE
644      |
645      |          DRV PAT PAR DEN MODE RECORD LENGTH
646      |          3   4   1   CD  NSTP   1276  M-MAX
647      |
648      |          READ STATUS ERRORS = 3
649      |          DATA ERRORS = 1
650      |          NON RECOVERABLE ERRORS = 0
651      |
652      |          ON UNIT 3, USING PATTERN 4, ODD PARITY, CORE DUMP, READ MODE
653      |          NONSTOP, 1276 RECORDS OF VARYING LENGTH (4 TO 1024) WERE
654      |          READ, DURING THAT TIME 2 READ STATUS ERRORS AND 1 DATA
655      |          ERROR OCCURRED. THERE WERE 0 NON-RECOVERABLE ERRORS WHICH
656      |          INDICATES THAT THE STATUS AND DATA ERRORS WERE ELIMINATED BY
657      |          RE-READING THE RECORD UP TO THREE TIMES.
658      |
659      |          NOTE: THE SAME OUTPUT CONVENTIONS FOR PARITY AND DENSITY ARE      CR
660      |          APPLICABLE HERE AS IN SEC. 6.1.C                                     CR
661      |
662      |          6.3      ERROR RECOVERY PROCEDURES                                     CR
663      |
664      |
665      |
666      |
667      |          6.3.1      WRITE ERROR RECOVERY
668      |
669      |          THE PROCEDURE TO RECOVER FROM A WRITE ERROR IS DETERMINED BY
670      |          THE FOLLOWING:
671      |
672      |          A.      IS IT A "WRITE ONLY" TEST OR WILL THE DATA BE READ?
673      |
674      |          B.      IS "WRITE STATISTICAL RECOVERY" SELECTED (SW 6=1)?
675      |
676      |          C.      IS "DELETE WRITE WITH XIRG" SELECTED (SW 5=1)?
677      |
678      |          6.3.1.1 IF IT IS A "WRITE ONLY" TEST AND "WRITE STATISTICAL RECOVERY"
679      |          IS NOT SELECTED (SW 6=0) THE WRITE ERROR IS SIMPLY COUNTED
680      |          AND THE PROGRAM PROCEEDS TO THE NEXT RECORD.
681      |
682      |          6.3.1.2 IF IT IS A "WRITE ONLY" TEST AND "WRITE STATISTICAL
683      |          RECOVERY" IS SELECTED (SW 6=1), A WRITE ERROR IS COUNTED AND THEN
684      |          A RECOVERY SEQUENCE (BACKSPACE 2 RECORDS, SPACE FORWARD 1 RECORD,

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685 | REWRITE RECORD) IS ENTERED, THIS RECOVERY SEQUENCE WILL BE
686 | REPEATED UP TO 7 TIMES IF THE WRITE ERROR PERSISTS, IF A
687 | WRITE ERROR IS NOT ELIMINATED AFTER THE 8TH ATTEMPT IT IS
688 | COUNTED AS A PERMANENT BAD SPOT ON TAPE, STATISTICS ARE SAVED
689 | TO INDICATE HOW MANY TIMES THE REWRITE SEQUENCE HAD TO BE RE-
690 | PEATED TO RECOVER FROM EACH WRITE ERROR,
691 |
692 | 6.3.1.3 IF IT IS A "WRITE AND READ" TEST AND "WRITE STATISTICAL RECOVERY"
693 | IS SELECTED (SW 6=1) AND "WRITE WITH XIRG" IS NOT DELETED (SW 5=0)
694 | THE PROGRAM WILL FIRST ATTEMPT TO DO A "WRITE STATISTICAL RECOVERY".
695 | IF A PERMANENT BAD SPOT IS ENCOUNTERED THE PROGRAM WILL THEN
696 | ATTEMPT TO RECOVER WITH A "WRITE WITH XIRG". FAILURE TO RECOVER
697 | AT THIS POINT SHOULD RESULT IN A READ ERROR DURING THE READ PASS.
698 |
699 | 6.3.1.4 IF IT IS A "WRITE AND READ" TEST AND "WRITE STATISTICAL RECOVERY"
700 | IS NOT SELECTED (SW 6=0) AND "WRITE WITH XIRG" IS NOT DELETED
701 | (SW 5=0) THE PROGRAM WILL TRY TO RECOVER ONLY BY REWRITING THE
702 | RECORD WITH EXTENDED INTERRECORD GAP. FAILURE TO RECOVER SHOULD
703 | RESULT IN A READ ERROR DURING READ PASS.
704 |
705 | 6.3.2 READ ERROR RECOVERY
706 |
707 | A READ ERROR CAN OCCUR FOR TWO REASONS: STATUS ERROR OR DATA
708 | ERROR, A PROPER COUNT IS TAKEN FOR EACH TYPE OF ERROR, RECOVERY
709 | OF A READ ERROR WILL CONSIST OF TRYING TO RE-READ THE RECORD UP
710 | TO TWO MORE TIMES (UNLESS SW4=1 TO DELETE READ RE-TRYS FOR
711 | SCOPING PURPOSES), IF THE ERROR PERSISTS IT IS CONSIDERED "NON-
712 | RECOVERABLE" AND THE PROGRAM WILL CONTINUE WITH THE NEXT RECORD.
713 |
714 | 7. RESTRICTIONS
715 |
716 | NONE
717 |
718 | 8. MISCELLANEOUS
719 |
720 | 8.1 TAPE LENGTH
721 |
722 | SINCE EACH OF THE TESTS DEPEND ON REACHING THE "EOT" REFLECTOR
723 | FOR TERMINATING IT COULD BE ADVANTAGEOUS TO USE A "SHORT" TAPE.
724 | THIS WOULD ALLOW FOR LESS TIME TO RUN A SERIES OF TESTS WHILE
725 | VARYING THE TEST PARAMETERS (REFERENCE 5.1.3), HOWEVER, THIS
726 | IS NOT INTENDED TO IMPLY THAT CONSTANTLY CHANGING THE TEST
727 | PARAMETERS CONSTITUTES A MORE DIFFICULT TEST OF DATA RELIABILITY.
728 | THE LENGTH OF TIME UNDER TEST IS MORE LIKELY TO SUPPLY THAT,
729 | IN ANY EVENT, IF A "SHORT" TAPE IS DESIRED, JUST PLACE AN "EOT"
730 | REFLECTIVE STRIP APPROXIMATELY 50 FEET DOWN TAPE FROM THE "BOT"
731 | MARKER, SO THAT THE TAPE IS STILL USEFUL AS A "LONG" TAPE
732 | ANOTHER "BOT" MARKER COULD BE PLACED A SHORT DISTANCE (APPROX-
733 | IMATELY 10 FEET) FARTHER DOWN ON TAPE, THIS WOULD EFFECTIVELY
734 | GIVE YOU TWO TAPES, CARE MUST BE EXERCISED WHEN MOUNTING THE TAPE
735 | TO POSITION IT AT THE PROPER "BOT" MARKER.
736 |
737 | 8.2 MEMORY AVAILABLE
738 |
739 | THE PROGRAM REQUIRES 4K OF MEMORY, IF 8K IS AVAILABLE,
740 | STARTING THE PROGRAM AT ADDRESS 200 OR 210 WILL EXPAND THE WRITE
741 | AND READ BUFFERS SO THAT MINIMUM LENGTH RECORDS WILL BE

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742 | 8 BYTES AND MAXIMUM LENGTH RECORDS WILL BE 2048 BYTES.
743 |
744 | 9. PROGRAM DESCRIPTION
745 |
746 | 9.1 GENERAL DESCRIPTION
747 |
748 | THE PROGRAM IS DESIGNED AROUND TWO MAIN SUBROUTINES "WRITE" AND
749 | "READ" AND A SERIES OF MINOR SUBROUTINES FOR MANIPULATING UNIT
750 | SELECTION, HANDLING ERROR STATISTICS, AND RECORD POSITIONING,
751 | IF MORE THAN ONE UNIT IS SELECTED THE UNIT WITH THE LOWEST
752 | NUMBER IS SELECTED FIRST AND WHEN THE SEQUENCE IS COMPLETED
753 | THEN THE NEXT LOWEST UNIT NUMBER IS SELECTED UNTIL ALL UNITS HAVE
754 | BEEN SELECTED. THIS PROCESS IS REPEATED UNTIL ALL UNITS REACH
755 | END OF TAPE.
756 |
757 | 9.2 TEST 0
758 |
759 | THIS IS A "WRITE ONLY" TEST. THE PROCEDURE IS TO WRITE 1 RECORD,
760 | REPEAT FOR ALL UNITS, CONTINUE UNTIL EOT. WRITE MODE OF NONSTOP
761 | (WMO=0) WILL NOT BE AN EFFECTIVE SELECTION FOR THIS TEST BECAUSE
762 | THE WRITE ROUTINE IS EXITED AFTER EACH RECORD TO DETERMINE IF
763 | ANY OTHER UNITS ARE SELECTED. READ MODE (RMO) HAS NO EFFECT ON
764 | THIS TEST.
765 |
766 | 9.3 TEST 1
767 |
768 | THIS IS A "WRITE ONLY" TEST SIMILAR TO TEST 0 EXCEPT A SEQUENCE
769 | OF 256 RECORDS IS WRITTEN ON EACH UNIT BEFORE CHANGING TO THE
770 | NEXT UNIT. READ MODE (RMO) HAS NO EFFECT ON THIS TEST.
771 |
772 | 9.4 TEST 2
773 |
774 | THIS IS A "WRITE AND READ" TEST. THE PROCEDURE IS TO WRITE 256
775 | RECORDS ON EACH UNIT, THEN BACKSPACE 256 RECORDS ON EACH UNIT,
776 | THEN READ 256 RECORDS ON EACH UNIT, AND THEN REPEAT THE SEQUENCE
777 | UNTIL ALL UNITS ARE AT EOT.
778 |
779 | 9.5 TEST 3
780 |
781 | THIS IS A "WRITE AND READ" TEST. THE PROCEDURE IS TO WRITE 1
782 | RECORD, BACKSPACE, READ 1 RECORD AND REPEAT FOR EACH UNIT, THEN
783 | REPEAT THE SEQUENCE UNTIL ALL UNITS ARE AT EOT. WRITE MODE OR
784 | READ MODE OF NONSTOP (WMO=0 OR RMO=0) WILL NOT BE EFFECTIVE
785 | FOR THIS TEST.
786 |
787 | 9.6 TEST 4
788 |
789 | THIS IS A "WRITE AND READ" TEST. IT IS SIMILAR TO TEST 2 EXCEPT
790 | UNITS ARE CHANGED BETWEEN EACH RECORD DURING WRITE, BACKSPACE,
791 | AND READ. WRITE MODE OR READ MODE OF NONSTOP (WMO=0 OR RMO=0)
792 | WILL NOT BE EFFECTIVE FOR THIS TEST.
793 | NOTE: THIS TEST WILL NOT FUNCTION PROPERLY WHEN OPERATING
794 | ON A DUAL DENSITY SYSTEM (NRZ/PE) WHOSE DENSITY SELECTION
795 | IS COMPUTER CONTROLLED.
796 |
797 | 9.7 TEST 5
798 |

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799      | THIS IS A "READ ONLY" TEST. THE PROCEDURE IS TO READ 1 RECORD,
800      | REPEAT FOR ALL UNITS, AND CONTINUE UNTIL ALL UNITS ARE AT EOT,
801      | THE MAIN PURPOSE OF THIS TEST IS TO PROVE COMPATIBILITY AMONG
802      | TAPE UNITS. A TAPE THAT IS WRITTEN ON ONE UNIT SHOULD BE ABLE
803      | TO BE READ ON ANY OTHER UNIT. TEST PARAMETERS THAT SELECT
804      | PATTERN AND RECORD LENGTH SEQUENCE MUST BE THE SAME AS THOSE USED
805      | TO WRITE THE DATA ON TAPE, ANY OF THE OTHER TESTS (0 THRU 4)
806      | CAN BE USED TO GENERATE THE DATA.
807      |
808      | 10. LISTING
809      |
810      | STATUS AND COMMAND REGISTER BIT ASSIGNMENTS
811      |
812      | COMMAND REGISTER
813      |
814      |15 ERROR
815      |
816      |14 DEN 8 00 = 200 BPI 7 TRACK 10 = 800 BPI 7 TRACK
817      |13 DEN 5 01 = 556 BPI 7 TRACK 11 = 800 BPI 9 TRACK
818      |12 POWER CLEAR
819      |
820      |11 PARITY 0 = ODD 1 = EVEN
821      |10 UNIT SEL. BIT 2
822      |9 UNIT SEL. BIT 1
823      |
824      |8 UNIT SEL. BIT 0
825      |7 CONTROL UNIT READY
826      |6 INTERRUPT ENABLE
827      |
828      |5 ADDRESS BIT 17
829      |4 ADDRESS BIT 16
830      |3 FUNCTION BIT 2 000 = OFF LINE 100 = SPACE FORWARD
831      | 001 = READ 001 = SPACE REVERSE
832      |2 FUNCTION BIT 1 010 = WRITE 110 = WRITE XIRG
833      |1 FUNCTION BIT 0 011 = WRITE EOF 111 = REWIND
834      |0 GO
835      |
836      |
837      | STATUS REGISTER
838      |
839      |15 ILLEGAL COMMAND (ILC)
840      |
841      |14 END OF FILE (EOF)
842      |13 CYCLICAL REDUNDANCY ERROR (CRE)
843      |12 PARITY ERROR (PAE)
844      |
845      |11 BUS GRANT LATE (BGL)
846      |10 END OF TAPE (EOT)
847      |9 RECORD LENGTH ERROR (RLE)
848      |
849      |8 BAD TAPE ERROR (BTE)
850      |7 NON EXISTENT MEMORY (NMX)
851      |6 SELECT REMOTE (SELR)
852      |
853      |5 BEGINNING OF TAPE (BOT)
854      |4 7 CHANNEL (7CH)
855      |3 SETTLE DOWN (SDWN)

```



```

856      |
857      | 2      WRITE LOCK (WRL)
858      | 1      REWIND STATUS (RWS)
859      | 0      TAPE UNIT READY (TUR)
860      |
861      |
862      000000      .ENABL AMA
                   .ENABL ABS

```

```

863      |                               .NLIST TTM
864      |                               |
865      |                               |*****|
866      |                               |
867      |                               |TITLE DATUM DATA RELIABILITY - 7 AND 9 TRACK          CR
868      | 000000      R0=X0
869      | 000001      R1=X1
870      | 000002      R2=X2
871      | 000003      R3=X3
872      | 000004      R4=X4
873      | 000005      R5=X5
874      | 000006      SP=X6
875      | 000007      PC=X7
876      | 000000      .=0
877      | 000010      .=10
878      | 000005      .REPT 5
879      |
880      |                               .+2
881      |                               HALT                                |TRAPPED TO PREVIOUS A DRESS          CR
882      | 000034      .ENDR
883      | 000034      .=34
884      | 000200      TRAP34
885      | 000200      .=200
886      | 000204      000137      001152      JMP AUTOST
887      | 000210      000137      001552      JMP MEM4K
888      | 000214      172520      001556      JMP MEM8K
889      | 000216      172522      MTS: 172520
890      | 000220      172524      MTC: 172522
891      | 000222      172526      BC: 172524
892      | 000224      000000      CA: 172526
893      | 000226      000000      0
894      | 000230      177776      0
895      | 000232      177570      CC: 177776
896      | 000234      177500      SR: 177570
897      | 000236      177502      TKS: 177560
898      | 000240      177504      TKB: 177562
899      | 000242      177566      TPS: 177564
900      | 000244      002000      TPBI 177566
901      | 000246      000004      MAXLEN: 1024.      | MAX RECORD LENGTH
902      | 000250      013324      MINLEN: 4.      | MIN RECORD LENGTH
903      | 000252      015324      WBUF: BUFFER      | STARTING ADDRESS OF WRIT BUFFER
904      | 000254      000224      RBUF: BUFFER+1024. | STARTING ADDRESS OF READ BUFF
905      |                               MTV: 224
906      | 000256      000000      |TEMPORARY STORAGE AREAS
907      | 000260      000000      ATST: 0
908      | 000262      000000      0
909      | 000264      000000      0
910      | 000266      000000      DRVSEL: 0
911      | 000270      000000      STRLEN: 0
912      | 000272      000000      LENGTH: 0
                               MSBITS: 0
                               |SECONDARY INTERRUPT V CTOR LOCATION          CR

```

913 000274 000000
 914 000276 000000
 915 000300 000000
 916 000302 000000
 917 000304 000000
 918 000306 000000
 919 000310 000000
 920 000312 000000
 921 000314 000000
 922 000316 000000
 923 000320 000000
 924 000322 000000
 925 000324 000000
 926 000326 000000
 927 000330 000000
 928 000332 000000
 929 000334 000000
 930 000336 000000
 931 000340 000000
 932 000342 000000
 933 000344 000000
 934 000346 000000
 935 000350 000000
 936 000352 000000
 937 000354 000000
 938 000356 000000
 939 000360 000400
 940 000362 000514
 941 000364 000500
 942 000366 000624
 943 000370 000670
 944 000372 000704
 945 000374 001000
 946 000376 001044
 947 000400
 948 000400
 949 000450 000000
 950 000514
 951 000514 000000
 952 000500
 953 000560 000000
 954 000624 000624
 955 000624 000000
 956 000670 000670
 957 000670 000000
 958 000704
 959 000734 000000
 960 001000
 961 001000 000000
 962 001044
 963 001044 000000
 964 001110
 965 001110 000000
 966 001112 000000
 967 001114 000000
 968 001116 000000
 969 001120 000000

SVRECR: 0
 COMMAND: 0
 CORVBT: 0
 CDRIVE: 0
 RDPASS: 0
 WRPASS: 0
 BLKINC: 0
 STATRD: 0
 WRCHK: 0
 0
 0
 0
 0
 0
 0
 0
 0
 PERMBS: 0
 RECORD: 0
 WRRECR: 0
 LASRCH: 0
 RDERRS: 0
 DAERRS: 0
 NRREAD: 0
 WRTLEN: 0
 READLN: 0
 MODES: 0
 DRVADR: D0TAB
 D1TAB
 D2TAB
 D3TAB
 D4TAB
 D5TAB
 D6TAB
 D7TAB
 STACK=450
 . =450
 D0TAB: 0
 . =D0TAB+44
 D1TAB: 0
 . =D1TAB+44
 D2TAB: 0
 . =D2TAB+44
 D3TAB: 0
 . =D3TAB+44
 D4TAB: 0
 . =D4TAB+44
 D5TAB: 0
 . =D5TAB+44
 D6TAB: 0
 . =D6TAB+44
 D7TAB: 0
 . =D7TAB+44
 NUMTST: 0 ; NUMBER OF TEST
 PARAM: 0 ; TEST PARAMETERS
 TSTEX: 0 ; POINTS TO TESTS PARAMETE S TO BE EXECUTED
 TEST: 0 ; CONTAINS CURRENT TEST NU BER
 TSTTBL: 0 ; TEST TABLE

CR
CR

```

970 001122 000000 0 I UP TO 10 TESTS CAN BE SE ECTED
971 001124 000000 0 I BE RUN IN CONSECUTIVE OR ER
972 001126 000000 0
973 001130 000000 0
974 001132 000000 0
975 001134 000000 0
976 001136 000000 0
977 001140 000000 0
978 001142 000000 0
979 001144 000000 0
980 001146 000000 0
981 001150 000000 0
982 001152 012705 000450 PGMODE: 0 IPATTERN GEN. MODE - 1 7T, 2=9T CR
STFLGS: 0 17 TRACK FLAGS-BIT SET FOR EACH 7T UNIT CR
AUTOST: MOV #STACK,SP ISET STACK POINTER CR
983 001156 012737 177777 000256 MOV #-1,ATST CR
984 001164 012737 037745 001120 MOV #37745,TSTTBL CR
985 001172 012737 030265 001122 MOV #30265,TSTTBL+2
986 001200 012737 021540 001124 MOV #21540,TSTTBL+4
987 001206 012737 000003 001110 MOV #3,NUMTST
988 001214 012737 123456 007260 MOV #123456,LONUM I PRIME RANDOM NUMBER GENERATOR
989 001222 012737 176543 007262 MOV #176543,HINUM
990 I DETERMINE THE SIZE OF THE WRITE AND READ BUFFERS
991 001230 012737 001244 000004 MOV #NXMRET,%M4 I SET UP NSM VECTOR
992 001236 005737 023324 TST BUFFER+4096. I OVER 4K OF MEMORY
993 001242 000403 BR OVER4K I BR IF YES
994 001244 022626 NXMRET: CMP (SP)+,(SP)+ I POP THE STACK
995 001246 104436 SETM4K CR
996 001250 000401 BR TU,SEL I CR
997 001252 104440 OVER4K: SETM8K CR
998 I DETERMINE DRIVES TO BE TESTED
999 I A DRIVE WILL BE TESTED IF:
1000 I 1. IT CAN BE SELECTED
1001 I 2. IT IS WRITE ENABLED CR
1002 001254 012737 000006 000004 TU,SEL: MOV #6,%M4 ISET TRAP CATCHER
1003 001262 012717 010000 176726 MOV #10000,%MTC IPWR CLR
1004 001270 005037 000264 CLR DRVSEL ICLEAR DRIVE TABLE
1005 001274 005037 001150 CLR STFLGS ICLEAR 7 TRACK UNIT FL GS CR
1006 001300 005037 000272 CLR MSBITS
1007 001304 012740 000200 MOV #200,R0 IR0=DRIVE 0
1008 001310 105717 176702 TSTB %MTC
1009 001314 100035 BPL IDSELF IBR IF NO CU READY
1010 001316 013717 000264 176672 NXT,TU: MOV DRVSEL,%MTC ISELECT A DRIVE
1011 001324 012702 000024 MOV #20..R2 ISET UP R2 FOR WAIT LO P
1012 001330 032717 000100 176656 USSTST: BIT #100,%MTS IDOES DRIVE EXIST?
1013 001336 001003 BNE USS,OK IBR IF YES
1014 001340 005302 DEC R2
1015 001342 003372 RGT USSTST
1016 001344 000414 BR NO,SEL IDRIVE IS NON-EXISTENT
1017 001346 032777 000004 176640 USS,OK: BIT #4,%MTS IIS WRITE LOCK ON? CR
1018 001354 001010 BNE I YES CR
1019 001356 032717 000020 176630 BIT #20,%MTS IIS DRIVE 7 TRACK? CR
1020 001364 001402 BEQ USS10 I NO CR
1021 001366 050037 001150 BIS R0,STFLGS I YES - SET 7 TRACK DR VE BIT IN FLAGS WORD CR
1022 001372 050037 000272 USS10: BIS R0,MSBITS ISET DRIVE NO. IN TABL CR
1023 001376 105237 000265 NO,SEL: INCB DRVSEL+1 IINC. THE DRIVE NUMBER CR
1024 001402 000241 CLC
1025 001404 006000 ROR R0 IHAVE ALL DRIVES BEEN ESTED FOR EXISTENCE?
1026 001406 001343 BNE NXT,TU IBR IF NO

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1084	001652	122703	000070	SELD1:	CMPB #70,R3	IIS CHARACTER A VALID UMBER 0-77	CR
1085	001656	003403			BLE SELD2	INO,PRINT "7"	
1086	001660	122703	000060		CMPB #60,R3	IIS CHARACTER A VALID UMBER 0-77	CR
1087	001664	003404			BLE VALD	IYES	
1088	001666	012705	000077	SELD2:	MOV #*7,R5		CR
1089	001672	104404			PRC	I'PRINT '7'	CR
1090	001674	000421			BR VAL4		
1091					IHAVE VALID DRIVE NUMBER		
1092	001676	142703	000270	VALID:	BICB #270,R3	I'MASK OUT NUMBER	CR
1093	001702	105103			COMB R3		CR
1094	001704	012700	000200		MOV #200,R0	IINITIALIZE BIT POSITI N FOR DRIVE 0	
1095	001710	105203		VAL1:	INCB R3	I+1 TO DRIVE SELECT	CR
1096	001712	001402			BEQ VAL2	IHAVE DRIVE OF EQUAL T ZERO	
1097	001714	006200			ASR R0	I'MOVE BIT POSITION TO EXT DRIVE	
1098	001716	000774			BR VAL1	I'TRY AGAIN	
1099	001720	130007	000272	VAL2:	BITB R0,MSBITS	I'COMPARE DRIVE SELECT ITH PREVIOUS SELECTED	
1100	001724	001003			BNE VAL3		
1101	001726	150007	000272		BISB R0,MSBITS	I'DRIVE WASN'T PREVIOUS Y SET. SO SET IT NOW.	
1102	001732	000402			BR VAL4		
1103	001734	140007	000272	VAL3:	BICB R0,MSBITS	I'DRIVE WAS SET. CLEAR T.	
1104	001740	012705	000054	VAL4:	MOV #*.R5		CR
1105	001744	104404			PRC	I'PRINT COMMA	CR
1106	001746	000725			BR SELDRV	I'RETURN TO WAIT FOR NE T KEY	
1107					IHAVE DRIVES SELECTED-NOW GET TEST SELECTION		
1108	001750	012702	012120	SELTST:	MOV #MSG2,R2		
1109	001754	104404			TOP	I'PRINT 'SELECT TESTS'	
1110	001756	005007	001110		CLR NUMTST	I'CLEAR TEST NUMBERS SE ECTED	
1111	001762	012700	001120		MOV #TSTBL,R0	IINITIALIZE TEST TABLE POINTER	
1112	001766	104400		SELT1:	WAITKY		
1113	001770	122703	000015		CMPB #15,R3	I'WAS CHARACTER A CARRI GE RETURN?	CR
1114	001774	001005			BNE SELT2		
1115	001776	005707	001110		TST NUMTST	I'WERE ANY TESTS SELECT D?	
1116	002002	001410			BEQ SELT3	INO	
1117	002004	000107	002602		JMP EXECUT	IYES, EXECUTE TESTS	
1118	002010	122703	000066	SELT2:	CMPB #66,R3	IIS CHARACTER A VALID UMBER 0-5	CR
1119	002014	003403			BLE SELT3	INO	
1120	002016	122703	000060		CMPB #60,R3	IIS CHARACTER A VALID UMBER 0-5	CR
1121	002022	003404			BLE SELPAT	IYES	
1122	002024	012702	012072	SELT3:	MOV #MSG0,R2		
1123	002030	104404			TOP		
1124	002032	000703			BR SELT1	I'RETURN TO WAIT FOR TE T SELECT	
1125	002034	010304		SELPAT:	MOV R3,R4		CR
1126	002036	000304			SWAB R4	I'ROTATE TEST NUMBER IN 0 POSITION	
1127	002040	006104			ROL R4		
1128	002042	006104			ROL R4		
1129	002044	006104			ROL R4		
1130	002046	006104			ROL R4		
1131	002050	042704	107777		BIC #107777,R4		
1132	002054	104400			SP3	I'TYPE 3 SPACES	
1133					IHAVE VALID TEST SELECTED, NOW GET SELECTED PATER		
1134	002056	104400			WAITKY	I'WAIT FOR PATTERN SELE TION	
1135	002060	122703	000070		CMPB #70,R3	IIS CHARACTER A VALID UMBER 0-7	CR
1136	002064	003707			BLE SELT3	INO	
1137	002066	122703	000057		CMPB #57,R3	IIS CHARACTER A VALID UMBER 0-7	CR
1138	002072	002304			BGE SELT3	INO	
1139	002074	000303			SWAB R3	I'MOVE PATTERN SELECT I TO POSITION	CR
1140	002076	006103			ROL R3		CR

1141	002100	042703	170777		BIC	#170777,R3		CR
1142	002104	050304			BIS	R3,R4	ICOMBINE PATTERN WITH EST	CR
1143	002106	104400			SP3			
1144					IDETERMINE WHICH, IF ANY, DRIVES ARE 7 TRACK AND S T CORRESPONDING			CR
1145					I BITS IN THE SEVEN TRACK FLAGS WORD (STFLGS)			CR
1146	002110	005007	000264		CLR	DRVSEL	IINITIALIZE FOR 7 TRAC UNIT SEARCH	CR
1147	002114	012703	000200		MOV	#200,R3		CR
1148	002120	013777	000264	176070	DET7T:	MOV	DRVSEL,@MTC	ISELECT NEXT DRIVE
1149	002126	012702	000024		MOV	#20,R2	ISET UP WAIT LOOP	CR
1150	002132	032777	000100	176054	DET7T1:	BIT	#100,@MTC	IDOES DRIVE EXIST?
1151	002140	001003			BNE	DET7T2	I YES	CR
1152	002142	005302			DEC	R2	IWAIT A WHILE	CR
1153	002144	003372			BGT	DET7T1		CR
1154	002146	000406			BR	DET7T3	ITRY NEXT DRIVE NO.	CR
1155	002150	032777	000020	176036	DET7T2:	BIT	#20,@MTC	IIS DRIVE 7 TRACK?
1156	002156	001402			BEQ	DET7T3	I NO	CR
1157	002160	050037	001150		BIS	R0,STFLGS	ISET CORRESPONDING 7 T ACK DRIVE BIT	CR
1158	002164	105237	000265		DET7T3:	INCB	DRVSEL+1	IINCREMENT DRIVE NO.
1159	002170	000241			CLC			CR
1160	002172	006003			ROR	R3	IHAVE ALL DRIVES BEEN HECKED?	CR
1161	002174	001301			BNE	DET7T	I NO	CR
1162	002176	005737	001150		TST	STFLGS	IARE ANY DRIVES 7 TRAC ?	CR
1163	002202	001004			BNE	SELPR0	I YES - REQUEST PARITY & DENSITY	CR
1164	002204	012702	013315		MOV	MMSG31,R2	I NO - POSITION PAST P & D	CR
1165	002210	104404			TOP			CR
1166	002212	000437			BR	SELDN3		CR
1167					IWAIT FOR PARITY SELECTION (0-EVEN, 1-ODD)			
1168	002214	104400			SELPR0:	WAITKY		CR
1169	002216	122703	000060		CMPB	#60,R3	IIS CHARACTER=0	CR
1170	002222	001405			BEQ	SELPR	IYES,EVEN PARITY	
1171	002224	122703	000061		CMPB	#61,R3	IIS CHARACTER=1	CR
1172	002230	001275			BNE	SELT3	INO,HAVE ILLEGAL KEY	
1173	002232	052704	000400		BIS	#400,R4	IYES,ODD PARITY	
1174	002236	104400			SELPR1:	SP3		
1175					IWAIT FOR DENSITY SELECTION			
1176	002240	104400			WAITKY			
1177	002242	122703	000062		CMPB	#62,R3	IIS CHARACTER=2	CR
1178	002246	001401			BEQ	SELDN3	IYES, DENSITY=200 BPI	
1179	002250	122703	000065		CMPB	#65,R3	IIS CHARACTER=5	CR
1180	002254	001003			BNE	SELDN1	INO	
1181	002256	052704	000100		BIS	#100,R4	ISET DENSITY=556 BPI	
1182	002262	000413			BR	SELDN3		
1183	002264	122703	000070		SELDN1:	CMPB	#70,R3	IIS CHARACTER=8
1184	002270	001003			RNE	SELDN2		CR
1185	002272	052704	000200		BIS	#200,R4	ISET DENSITY=800 BPI	
1186	002276	000405			BR	SELDN3		
1187	002300	122703	000103		SELDN2:	CMPB	#70,R3	IIS CHARACTER=C
1188	002304	001247			BNE	SELT3	INO, HAVE ILLEGAL KEY	CR
1189	002306	052704	000300		BIS	#300,R4	ISET CORE DUMP MODE	
1190	002312	104400			SELDN3:	SP3		
1191					IWAIT FOR RECORD LENGTH SEQUENCES SELECTION			
1192	002314	104400			WAITKY			
1193	002316	122703	000060		CMPB	#60,R3	IIS CHARACTER=0	CR
1194	002322	001401			BEQ	SELH3	IYES, RLS=MIN	
1195	002324	122703	000061		CMPB	#61,R3	IIS CHARACTER=1	CR
1196	002330	001003			BNE	SELR1		
1197	002332	052704	000020		BIS	#20,R4	ISET RLS=MAX	

1198	002336	000413		BR	SELR3		
1199	002340	122703	000062	SELR1: CMPB	#62,R3	IIS CHARACTER=2	CR
1200	002344	001003		BNE	SELR2		
1201	002346	052704	000040	BIS	#40,R4	ISET RLS=MIN-MAX	
1202	002352	000405		BR	SELR3		
1203	002354	122703	000063	SELR2: CMPB	#63,R3	IIS CHARACTER=3	CR
1204	002360	001221		BNE	SELT3		
1205	002362	052704	000060	BIS	#60,R4	ISET RLS=MAX-MIN	
1206	002366	104430		SELR3: SP3			
1207				IWAIT FOR WRITE MODE SELECTION			
1208	002370	104400		WAITKY			
1209	002372	122703	000060	CMPB	#60,R3		CR
1210	002376	001415		BEQ	SELW2	ISET WMO=NONSTOP	
1211	002400	122703	000061	CMPB	#61,R3		CR
1212	002404	001003		BNE	SELW1		
1213	002406	052704	000004	BIS	#4,R4	ISET WMO=START-STOP	
1214	002412	000407		BR	SELW2		
1215	002414	122703	000062	SELW1: CMPB	#62,R3		CR
1216	002420	001402		BEQ	SELW15		CR
1217	002422	000137	002024	JMP	SELT3		CR
1218	002426	052704	000010	SELW15: BIS	#10,R4	ISET WMO=RANDOM	
1219	002432	104430		SELW2: SP3			
1220				IWAIT FOR READ MODE SELECTION			
1221	002434	104400		WAITKY			
1222	002436	122703	000060	CMPB	#60,R3		CR
1223	002442	001415		BEQ	SELRM2	ISET RMO=NONSTOP	
1224	002444	122703	000061	CMPB	#61,R3		CR
1225	002450	001003		BNE	SELRM1		
1226	002452	052704	000001	BIS	#1,R4	ISET RMO=START-STOP	
1227	002456	000407		BR	SELRM2		
1228	002460	122703	000062	SELRM1: CMPB	#62,R3		CR
1229	002464	001402		BEQ	+.6		
1230	002466	000137	002024	JMP	SELT3		
1231	002472	052704	000002	BIS	#2,R4	ISET RMO=RANDOM	
1232	002476	104430		SELRM2: SP3			
1233				IHAVE ALL PARAMETERS			
1234	002500	012702	012205	MOV	#MSG6,R2		
1235	002504	104404		TOP		IPRINT "OK"	
1236	002506	104400		WAITKY		IWAIT FOR CARRIAGE RET RN	
1237	002510	122703	000015	CMPB	#15,R3		CR
1238	002514	001402		BEQ	+.6		
1239	002516	000137	002024	JMP	SELT3		
1240	002522	105777	175512	TSTB	@TPS		
1241	002526	100315		BPL	.-4		
1242	002530	012777	000012	MOV	#12,@TPB		175504
1243	002536	105777	175476	TSTB	@TPS		
1244	002542	100375		BPL	.-4		
1245	002544	012777	000040	MOV	#40,@TPB		175470
1246	002552	010420		MOV	R4,(0)+		
1247	002554	005237	001110	INC	NUMTST	I+1 TO TEST COUNT	
1248	002560	022737	000012	CMP	#10,NUMTST	IEQUAL TO TEN YET	
1249	002566	001402		BEQ	SEL0K1	IYES	
1250	002570	000137	001766	JMP	SELT1	IINO,ACCEPT NEXT SET	
1251	002574	012702	012160	SEL0K1: MOV	#MSG5,R2		
1252	002600	104404		TOP		IPRINT 'MAX TESTS SELE TED'	
1253				IEXECUTE SELECTED TEST			
1254	002602	005037	000356	EXECUT: CLR	MODES	IINITIALIZE MODES	

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1255 002606 012737 001120 001114      MOV      #TSTBL,TSTEX
1256 002614 017737 176274 001112      EXEC1:  MOV      @TSTEX,PARAM IGET TEST PARAMS
1257 002622 013700 001112      EXEC1:  MOV      PARAM,R0
1258 002626 042700 007777      BIC      #7777,R0
1259 002632 005037 001146      CLR      PGMODE          IENABLE PATTERN GENERATION
1260 002636 010037 001116      MOV      R0,TEST
1261 002642 001460      BEQ      TEST0
1262 002644 022700 010000      CMP      #10000,R0
1263 002650 001500      BEQ      TEST1
1264 002652 022700 020000      CMP      #20000,R0
1265 002656 001501      BEQ      TEST2
1266 002660 022700 030000      CMP      #30000,R0
1267 002664 001544      BEQ      TEST3
1268 002666 022700 040000      CMP      #40000,R0
1269 002672 001402      BEQ      .+6
1270 002674 000137 003526      JMP      TEST5
1271 002700 000137 003206      JMP      TEST4
1272                                IRETURN HERE AFTER COMPLETION OF TEST
1273 002704 012702 013310      DONE:   MOV      #MSG30,R2
1274 002710 104404      TOP
1275 002712 006077 175314      ROR      @SR          IIS SW0=1 TO REPEAT TEST WITH ALL PATTERNS
1276 002716 103013      BCC      DONE1        INO
1277 002720 013700 001112      MOV      PARAM,R0
1278 002724 042700 170777      BIC      #170777,R0
1279 002730 022700 007000      CMP      #7000,R0     IREACHED PAT 7
1280 002734 001404      BEQ      DONE1        IYES
1281 002736 062737 001000 001112      ADD      #1000,PARAM  INO, +1 TO PAT
1282 002744 000726      BR       EXEC1        IREPEAT
1283 002746 005337 001110      DONE1:  DEC      NUMTST
1284 002752 001010      BNE      DOAGN
1285 002754 013702 000042      MOV      @#4,R2
1286 002760 001001      BNE      ENOADR
1287 002762 000000      HALT
1288 002764 004712      ENOADR: JSR      PC,(2)          IFINISHED ALL TESTS
1289 002766 000240      240          I*****NOP*****
1290 002770 000240      240          I*****NOP*****
1291 002772 000240      240          I*****NOP*****
1292 002774 062737 000002 001114      DOAGN:  ADD      #2,TSTEX
1293 003002 000704      BR       EXEC          IDO NEXT TEST
1294
1295                                ITEST0
1296 003004 052737 000002 000356      IWRITE ONE RECORD, CHANGE DRIVES, GO TO EOT
1297 003012 104420      TEST0:  BIS      #2,MODES  IEXIT WRITE EVERY RECORD, NO READ PASS
1298 003014 104410      TO1ENT: CLRALL          ICLEAR ERROR COUNTERS NO REWIND
1299 003016 104414      TO:     RSFDRV          IRESET DRIVE SELECTION TO LOWEST NUMBER
1300 003020 032737 000040 000356      TOA:    MVCTRS          IRESTORE DRIVE COUNTER
1301 003026 001002      BIT      #40,MODES   IIS THIS DRIVE AT EOT?
1302 003030 104402      BNE      TOB          IYES, SKIP WRITE
1303 003032 104406      WRITIT          IWRITE
1304 003034 104422      SVCTRS          ISAVE DRIVE COUNTERS
1305 003036 000767      CHGDRV          IANY MORE DRIVES SELECTED?
1306 003040 004737 004400      TOB:    BR       TOA          IYES
1307 003044 000763      JSR      PC,ALLEOT   IARE ALL DRIVES AT EOT
1308 003046 000137 002704      BR       TO          INO
1309                                JMP      DONE         IYES, EXIT
1310                                ITEST1
1311 003052 052737 000001 000356      IWRITE RECORD LENGTH SEQUENCE, GO TO NEXT DRIVE, CONTINUE TO EOT ON ALL DRIVES.
1311 003052 052737 000001 000356      TEST1:  BIS      #1,MODES  IEXIT WRITE AFTER RLS, NO READ PASS

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1312	003060	000754			BR	T01ENT		CR
1313					I TEST2			
1314					IWRITE A RECORD LENGTH SEQUENCE , CHANGE DRIVES			
1315					I BACKSPACE, CHANGE DRIVES, READ, CHANGE DRIVES, CO TINUE TO EOT ON ALL DRIVES			
1316	003062	052757	000005	000356	TEST2:	BIS #5,MODES	IEXIT WRITE AFTER RLS, DO READ PASS	
1317	003070	104420			T23ENT:	CLRALL	ICLEAR ERROR COUNTERS ND REWIND	CR
1318	003072	104410			T2:	RSFORV	ISET DRIVE SELECTION T LOWEST NUMBER	
1319	003074	104414			T2A:	MVCTRS	I RESTORE DRIVE COUNTER	
1320	003076	032757	000040	000356	BIT	#40,MODES	IIS THIS DRIVE AT EOT?	
1321	003104	001002			BNE	T2D	IYES, SKIP WRITE	
1322	003106	104402			WRITIT		IWRITE	
1323	003110	104406			SVCTRS		ISAVE DRIVE COUNTERS	
1324	003112	104422			T2B:	CHGDRV	IANYMORE DRIVES SELECT D?	
1325	003114	000757			HR	T2A	IYES	
1326	003116	104414			T2C:	MVCTRS	I RESTORE DRIVE COUNTER	
1327	003120	032757	000020	000356	BIT	#20,MODES	IIS THIS READ AT EOT?	
1328	003126	001005			BNE	T2D	IYES, SKIP BACKSPACE	
1329	003130	004757	010540		JSR	PC,60BKWD	I BACKSPACE	
1330	003134	104406			SVCTRS		ISAVE DRIVE COUNTERS	CR
1331	003136	104422			T2D:	CHGDRV	IANY MORE DRIVES SELEC ED?	CR
1332	003140	000756			BR	T2C	IYES	
1333	003142	104414			T2E:	MVCTRS	I RESTORE DRIVE COUNTER	
1334	003144	032757	000020	000356	BIT	#20,MODES	IIS THIS READ AT EOT	
1335	003152	001001			BNE	T2F	IYES, SKIP READ	
1336	003154	104424			READIT		I READ	
1337	003156	104406			T2F:	SVCTRS	ISAVE DRIVE COUNTERS	
1338	003160	104422			CHGDRV		IANYMORE DRIVES SELECT D?	
1339	003162	000757			BR	T2E	IYES	
1340	003164	004757	004400		JSR	PC,ALLEOT	IARE ALL DRIVES AT EOT	
1341	003170	000750			BR	T2	INO	
1342	003172	000157	002704		JMP	DONE	IYES EXIT	
1343					I			
1344					I			
1345					I TEST3			
1346					IWRITE ONE RECORD, CHANGE DRIVES, BACKSPACE, CHANG DRIVES, READ, CHANGE DRIV B			
1347	003176	052757	000006	000356	TEST3:	BIS #6,MODES	IEXIT WRITE EVERY RECO D, DO READ PASS	
1348	003204	000751			BR	T23ENT		CR
1349					I TEST4			
1350					IWRITE RECORD, CHANGE DRIVES, REPEAT FOR RECORD LE 6TH SEQUENCE			
1351					I READ RECORD, CHANGE DRIVES, REPEAT FOR RLS			
1352	003206	052757	000006	000356	TEST4:	BIS #6,MODES	IEXIT WRITE EVERY RECO D, DO READ PASS	
1353	003214	032777	000014	175672	BIT	#14,@STEX		
1354	003222	001006			BNE	T4		
1355	003224	042757	000007	000356	BIC	#7,MODES		
1356	003232	052757	000005	000356	BIS	#5,MODES	IEXIT WRITE AFTER RLS, DO READ PASS	
1357	003240	104420			T4:	CLRALL	ICLEAR ERROR COUNTERS ND REWIND	
1358	003242	104410			T4A:	RSFORV	ISET DRIVE SELECTION T LOWEST NUMBER	
1359	003244	104414			T4B:	MVCTRS	I RESTORE DRIVE COUNTER	
1360	003246	013757	000336	000340	MOV	RECORD,WRRECR	ISAVE RECORD	
1361	003254	104406			SVCTRS		ISAVE DRIVE COUNTERS	
1362	003256	104422			CHGDRV		IANYMORE DRIVES SELECT D?	
1363	003260	000771			BR	T4B	IYES	
1364	003262	042757	000010	000356	BIC	#10,MODES	IINDICATE RLS END	
1365	003270	104410			T4C:	RSFORV		
1366	003272	104414			T4D:	MVCTRS	I RESTORE DRIVE COUNTER	
1367	003274	032757	000040	000356	BIT	#40,MODES	IIS DRIVE AT EOT	
1368	003202	001010			BNE	T4E	IYES, SKIP WRITE	

1369	003304	013757	000340	000274	MOV	WRRECR,SVRECR	SAVE START OF RLS
1370	003312	104402			WRITIT		IWRITE
1371	003314	013757	000274	000340	MOV	SVRECR,WRRECR	RESTORE START OF RLS
1372	003322	104405			SVCTRS		ISAVE DRIVE COUNTERS
1373	003324	104422			T4E:	CHGDRV	IANYMORE DRIVES SELECT 0?
1374	003326	000761			BR	T4D	IYES
1375	003330	032757	000010	000356	BIT	#10,MODES	IARE WE AT END OF RLS
1376	003336	001007			BNE	T4G	IYES
1377	003340	104414			T4F:	MVCTRS	IRESTORE DRIVE COUNTER
1378	003342	032757	000040	000356	BIT	#40,MODES	IARE WE AT EOT?
1379	003350	001747			BEQ	T4C	INO
1380	003352	104422			CHGDRV		IANYMORE DRIVES SELECT 0?
1381	003354	000771			BR	T4F	IYES
1382	003356	104410			T4G:	RSFORV	ISET DRIVE SELECTION T LOWEST NUMBER
1383	003360	104414			T4H:	MVCTRS	IRESTORE DRIVE COUNTER
1384	003362	032757	000020	000356	BIT	#20,MODES	IIS THIS DRIVE AT EOT?
1385	003370	001002			BNE	T4J	IYES, SKIP BACKSPACE
1386	003372	004757	010540		JSR	PC,GOBKWD	IBACKSPACE
1387	003376	104406			T4J:	SVCTRS	ISAVE DRIVE COUNTERS
1388	003400	104422			CHGDRV		IANY MORE DRIVES SELEC ED?
1389	003402	000766			BR	T4H	IYES
1390	003404	104410			T4K:	RSFORV	ISET DRIVE SELECTION T, LOWEST NUMBER
1391	003406	104414			T4L:	MVCTRS	IRESTORE DRIVE COUNTER
1392	003410	032757	000020	000356	BIT	#20,MODES	IIS THIS READ AT EOT?
1393	003416	001025			BNE	T4N	IYES, SKIP READ
1394	003420	023757	000342	000356	CMF	LASRCR,RECORD	IHAVE WE READ LAST REC RD WRITTEN?
1395	003426	001421			HEQ	T4N	IYES
1396	003430	013757	000342	000274	MOV	LASRCR,SVRECR	SAVE LAST RECORD
1397	003436	032757	000003	001112	BIT	#3,PARAM	IIS READ MODE NONSTOP?
1398	003444	001465			BEQ	T4M	IYES
1399	003446	013757	000336	000342	MOV	RECORD,LASRCR	
1400	003454	005257	000342		INC	LASRCR	I+1 TO LAST RECORD WRI TEN
1401	003460	104424			T4M:	READIT	IREAD
1402	003462	013757	000274	000342	MOV	SVRECR,LASRCR	RESTORE LAST RECORD WITTEN
1403	003470	104466			SVCTRS		ISAVE DRIVE COUNTERS
1404	003472	104422			T4N:	CHGDRV	IANYMORE DRIVES SELECT 0?
1405	003474	000744			BR	T4L	IYES
1406	003476	104414			T4P:	MVCTRS	IRESTORE DRIVE COUNTER
1407	003500	023757	000342	000336	CMF	LASRCR,RECORD	IARE WE AT END OF RLS?
1408	003506	001356			BNE	T4K	INO
1409	003510	104422			CHGDRV		IANYMORE DRIVES SELECT 0?
1410	003512	000771			BR	T4P	IYES
1411	003514	004757	004400		JSR	PC,ALLEOT	IARE ALL DRIVES AT EOT
1412	003520	000650			BR	T4A	INO
1413	003522	000157	002704		JMP	DONE	IYES,EXIT
1414							
1415							
1416							
1417							
1418							
1419	003526	052757	000002	000356	TEST5:	BIS	#2,MODES
1420	003534	104420			CLRALL		ICLEAR ERROR COUNTERS NO REWIND
1421	003536	012757	177777	004004	T5:	MOV	#-1,T5FLAG
1422	003544	104402			WRITIT		IENABLE EXIT FROM WRIT ROUTINE
1423	003546	032757	000010	000356	BIT	#10,MODES	IENTER WRITE ONLY TO I INITIALIZE RECORD SEQUENCE
1424	003554	001402			BEQ	T5A	IYES
1425	003556	004757	005206		JSR	PC,TESTINC	ISEE IF RECORD LENGTH HOULD BE CHANGED

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1426 003562 013737 000336 004006 T5A:  MOV RECORD,T5INC
1427 003570 005037 000336          CLR RECORD
1428 003574 052737 000010 000356 T5B:  BIS #10,MODES      !INDICATE AT START OF LS
1429 003602 104410          RSFDRV           !SET DRIVE SELECTION T  LOWEST DRIVE NUMBER
1430 003604 104414          MVCTRS          !RESTORE DRIVE COUNTER
1431 003606 032737 000020 000356 T5C:  BIT #20,MODES      !IS THIS DRIVE AT EOT
1432 003614 001007          BNE T5D         !YES
1433 003616 013737 000336 000342 MOV RECORD,LASRCR
1434 003624 063737 004006 000342 ADD T5INC,LASRCR !CURRENT RECORD + SEQU NCE LENGTH
1435 003632 104406          SVCTRS          !SAVE DRIVE COUNTERS
1436 003634 104422          CHGDRV         !ANYMORE DRIVES?
1437 003636 000762          BR T5C         !YES
1438 003640 104410          RSFDRV           !SET DRIVE SELECTION T  LOWEST NUMBER
1439 003642 104414          MVCTRS          !RESTORE DRIVE COUNTER
1440 003644 032737 000020 000356 T5E:  BIT #20,MODES      !IS THIS DRIVE AT EOT?
1441 003652 001001          BNE T5G         !YES
1442 003654 013737 000342 000274 MOV LASRCR,SVRECR !SAVE END OF RLS RECOR S
1443 003662 032737 000003 001112 BIT #3,PARAM      !IS READ MODE NONSTOP
1444 003670 001403          BEQ T5F         !YES GO TO END RLS
1445 003672 013737 000336 000342 MOV RECORD,LASRCR !NEXT TO BE READ
1446 003700 005237 000342          INC LASRCR      !+1 EXIT READ AFTER ON RECORD
1447 003704 104424          T5F:  READIT      !READ
1448 003706 013737 000274 000342 MOV SVRECR,LASRCR !RESTORE END RECOD
1449 003714 104406          SVCTRS          !SAVE DRIVE COUNTERS
1450 003716 104422          T5G:  CHGDRV         !ANY MORE DRIVES?
1451 003720 000730          BR T5E         !YES
1452 003722 004737 004400          JSR PC,ALLEOT  !ALL AT EOT?
1453 003726 000402          BR T5H         !NO
1454 003730 000137 002704          JMP DONE       !YES EXIT
1455 003734 104410          T5H:  RSFDRV           !SET DRIVE SELECTION T  LOWEST NUMBER
1456 003736 104414          T5J:  MVCTRS          !RESTORE DRIVE COUNTER
1457 003740 023737 000336 000342 CMP RECORD,LASRCR !ARE WE AT END OF RLS?
1458 003746 001003          BNE T5K         !NO
1459 003750 042737 000010 000356 T5K:  BIC #10,MODES      !YES,
1460 003756 104422          CHGDRV         !ANYMORE DRIVES SELECT D?
1461 003760 000736          BR T5J         !YES
1462 003762 032737 000010 000356 T5L:  BIT #10,MODES      !AT END OF RLS?
1463 003770 001324          BNE T5E         !NO
1464 003772 004737 004400          JSR PC,ALLEOT  !ALL DRIVES AT EOT?
1465 003776 000637          BR T5         !NO
1466 004000 000137 002704          JMP DONE       !YLS. EXIT
1467 004004 000000          T5FLAG: 0
1468 004006 000000          T5INC: 0
1469          !SAVE DR!SAVE DRIVE RECORD AND ERROR COUNTERS
1470 004010 004737 004044          SVCTR: JSR PC,CTRDEX
1471 004014 012021          SVC1:  MOV (0)+,(1)+
1472 004016 022700 000360          CMP #DRVADR,R0
1473 004022 001374          BNE SVC1
1474 004024 000207          RTS PC
1475          !RESET DRIVE COUNTERS BACK INTO PROGRAM
1476 004026 004737 004044          MVCTR: JSR PC,CTRDEX
1477 004032 012120          MV1:  MOV (1)+,(0)+
1478 004034 022700 000360          CMP #DRVADR,R0
1479 004040 001374          BNE MV1
1480 004042 000207          RTS PC
1481          !SET UP POINTERS FOR MOVE AND SAVE COUNTERS
1482 004044 012700 000314          CTRDEX: MOV #WRCHEK,R0

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1483	004050	012701	000360		MOV	#DRVADR,R1		
1484	004054	063701	000302		ADD	CDRIVE,R1		
1485	004060	063701	000302		ADD	CDRIVE,R1		
1486	004064	011101			MOV	@R1,R1		
1487	004066	000207			RTS	PC		
1488					;CLEAR ALL DRIVE COUNTERS			
1489	004070	104410			CLR	RSFDRV		
1490	004072	004737	004342		CLR1:	JSR	PC,REWIND	
1491	004076	004737	004506		JSR	PC,CLRTBL		
1492	004102	104406			;SVCTRS			
1493	004104	104422			;CHGDRV			
1494	004106	000771			BR	CLR1		
1495	004110	052737	000010	000356	BIS	#10,MODES	;	AT END OF RLS
1496	004116	005037	004004		CLR	T5FLAG		
1497	004122	000207			RTS	PC		
1498					;RESET DRIVE SELECTION TO LOWEST NUMBER			
1499	004124	005037	000302		RSFDR:	CLR	CDRIVE	;
1500	004130	012737	000200	000300	MOV	#200,CORVBT	;	ISTART WITH DRIVE 0
1501	004136	033737	000272	000300	RSF1:	BIT	MSBITS,CDRVBT	;
1502	004144	001006			BNE	RSF2	;	IS DRIVE SELECTED?
1503	004146	005237	000302		INC	CDRIVE	;	INO + 1 TO DRIVE
1504	004152	000241			CLC			
1505	004154	006037	000300		ROR	CDRVBT	;	IRotate DRIVE BIT
1506	004160	000766			BR	RSF1	;	IREPEAT
1507	004162	013737	000302	000276	RSF2:	MOV	CDRIVE,COMAND	
1508	004170	000337	000276		SWAB	COMAND		
1509	004174	033737	001150	000300	BIT	STFLGS,CDRVBT	;	IS DRIVE 7 TRACK?
1510	004202	001013			BNE	RSF3	;	YES
1511	004204	052737	060000	000276	BIS	#60000,COMAND	;	IB00 BPI, 9 TRACK
1512	004212	032777	001000	174012	BIT	#1000,RSR	;	ITEST PARITY SELECTED
1513	004220	001403			BEQ	;	;	IODD
1514	004222	052737	004000	000276	BIS	#4000,COMAND	;	IEVEN
1515	004230	000207			RTS	PC		
1516	004232	105737	001112		RSF3:	TSTB	PARAM	;
1517	004236	100003			BPL	;	;	ISET APPROPRIATE 7 TRACK DENSITY BITS
1518	004240	052737	040000	000276	BIS	#40000,COMAND		
1519	004246	032737	000100	001112	BIT	#100,PARAM		
1520	004254	001403			BEQ	;	;	IODD
1521	004256	052737	020000	000276	BIS	#20000,COMAND		
1522	004264	032737	000400	001112	BIT	#400,PARAM	;	ITEST PARITY SELECTED
1523	004272	001003			BNE	;	;	IODD
1524	004274	052737	004000	000276	BIS	#4000,COMAND	;	IEVEN
1525	004302	000207			RTS	PC		
1526					;SELECT NEXT DRIVE IN SEQUENCE			
1527					;+1 WORD TO EXIT ADDRESS IF LAST DRIVE TESTED			
1528	004304	005237	000302		CHGDR:	INC	CDRIVE	;
1529	004310	000241			CLC			;
1530	004312	006037	000300		ROR	CDRVBT	;	IMOVE MASK BIT OVER 1 LACE
1531	004316	001004			BNE	CHG1	;	IBRANCH IF MORE DRIVES SELECTED
1532	004320	104410			RSFDRV		;	IRESET DRIVE SELECT TO LOWEST NUMBER
1533	004322	062716	000002		ADD	#2,@SP	;	;
1534	004326	000207			RTS	PC	;	;
1535	004330	033737	000300	000272	CHG1:	BIT	CDRVBT,MSBITS	
1536	004336	001762			BEQ	CHGDR		
1537	004340	000710			BR	RSF2		
1538					;REWIND DRIVE TO BOT			
1539	004342	105777	173650		REWIND:	TSTB	@MTC	

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1540 004346 100375          BPL      .-4          IWAIT FOR CONTROL UNIT
1541 004350 013777 000276 173640      MOV      COMAND,AMTC ISELECT DRIVE
1542 004356 006077 173632          ROR      AMTS
1543 004362 103375          BCC      .-4          IWAIT FOR TU READY
1544 004364 052777 000016 173624      BIS      #16,AMTC    IREWIND
1545 004372 004737 004532          JSR      PC,GOWAIT
1546 004376 000207          RTS      PC          IEXIT
1547          IARE ALL DRIVES AT END OF TAPE
1548 004400 104410      ALLEOT: RSFORV
1549 004402 104414      ALL1: MVCTRS
1550 004404 032737 000060 000356      BIT      #60,MODES IAT EOT?
1551 004412 001403          BEQ      ALLEOS     INO
1552 004414 104422          CHGDRV          IDONE ALL DRIVES?
1553 004416 000771          BR       ALL1      INO
1554 004420 000427          BR       ALL3
1555 004422 032777 000400 173602      ALLEOS: BIT      #400,ASR ITEST SWITCH 8 TO EXIT AT END OF SEQUENCE
1556 004430 001425          BEQ      ALL2      INO, GO TO EOT
1557 004432 032737 000010 000356      BIT      #10,MODES IAT END OF SEQUENCE
1558 004440 001421          BEQ      ALL2      INO, EXIT, DON'T DUMP RROR COUNTERS
1559          IDUMP ERROR COUNTERS ON ALL DRIVES
1560 004442 104410      CTRDMP: RSFORV
1561 004444 104414          MVCTRS
1562 004446 005737 004004          TST      T5FLAG
1563 004452 001006          BNE     CTRD1      IDUMP READ ONLY
1564 004454 004737 005542          JSR      PC,ENDT1
1565 004460 032737 000004 000356      BIT      #4,MODES IREAD PASS SELECTED?
1566 004466 001402          BEQ     COMFND     INO
1567 004470 004737 010110      CTRD1: JSR      PC,RNOTP1
1568 004474 104422      COMEND: CHGDRV          IDONE ALL DRIVES
1569 004476 000702          BR       CTRDMP+2 INO
1570 004500 062716 000002      ALL3: ADD     #2,(6) IINCREMENT RETURN POIN
1571 004504 000207      ALL2: RTS      PC
1572          ICLEAR READ AND WRITE TABLES
1573 004506 012700 000314      CLRTBL: MOV     #WRCHEK,RO
1574 004512 005020      CLRT1: CLR     (0)+
1575 004514 020027 000356          CMP     RO,#MODES
1576 004520 001374          BNE     CLRT1
1577 004522 042737 000070 000356      BIC     #70,MODES
1578 004530 000207          RTS      PC
1579          IINTERUPT ENABLE, GO, WAIT FOR INTERRUPT
1580 004532 012777 000200 173470      GOWAIT: MOV     #200,ACC ISET PRIORITY LEVEL 4
1581 004540 012777 004566 173506          MOV     #6W1,AMTV ISET INTERRUPT RETURN
1582 004546 052777 000101 173442          BIS     #101,AMTC IINTERUPT ENABLE, GO
1583 004554 000001          WAIT          IWAIT FOR INTERRUPT
1584 004556 012777 000340 173444          MOV     #340,ACC IRESTORE PRIORITY LEVE 7
1585 004564 000207          RTS      PC          IEXIT
1586 004566 000002      GW1: RTI          IRETURN FROM INTERRUPT
1587          IWRITE RECORD SECTION
1588 004570 005737 000336      WRIT1: TST     RECORD IIS THIS THE FIRST REC RD
1589 004574 001001          BNE     NOINCR     INO, SKIP SET UP OF RE ORD LENGTH AND BLOCK INCRE EN
1590 004576 013737 000244 000266          MOV     MAXLEN,STRLN
1591 004604 012737 177774 000310          MOV     #4,BLKINC
1592 004612 032737 000020 001112          BIT     #20,PARAM
1593 004620 001006          BNE     W1
1594 004622 013737 000246 000266          MOV     MINLEN,STRLN
1595 004630 012737 000004 000310          MOV     #4,BLKINC
1596 004636 013737 000266 000352      W1: MOV     STRLEN,WRTLEN

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1597	004644	032757	000040	001112		BIT	#40,PARAM	!DOES RECORD LENGTH CH NGE?	
1598	004652	001042				BNE	NOINCR	!YES	
1599	004654	005057	000310			CLR	BLKINC	!NO	
1600	004660	013757	000336	000340	NOINCR:	MOV	RECORD,WRRECR		
1601	004666	013777	000276	173322		MOV	COMMAND,AMTC	!SELECT UNIT	CR
1602	004674	105777	173316			TSTB	AMTC		CR
1603	004700	100375				HPL	.-4	!WAIT FOR CU READY	CR
1604	004702	104442				GENPT		!GENERATE TEST PATTERN	
1605	004704	005757	004004		W3:	TST	T5FLAG		CR
1606	004710	001401				BEQ	+.4		
1607	004712	000207				RTS	PC	!EXIT WRITE ROUTINE IF TEST 5	
1608	004714	005057	000306			CLR	WRPASS		
1609	004720	006077	173270		STRTOP:	ROR	AMTS	!WAIT FOR TU READY	CR
1610	004724	103375				BCC	.-4		
1611	004726	013777	000352	173264	NONSTP:	MOV	WRTLEN,ABC	!SET BYTE COUNT	
1612	004734	005477	173260			NEG	ABC		
1613	004740	013777	000250	173254		MOV	WBUF,ACA	!SET CURRENT ADDRESS	
1614	004746	052777	000004	173242		BIS	#4,AMTC	!WRITE	
1615	004754	004757	004532			JSR	PC,GOWAIT	!INTERRUPT ENABLE, GO, WAIT FOR DONE	
1616					!RETURN	HERE	AFTER INTERRUPT		
1617	004760	017757	173230	000312		MOV	AMTS,STATRD	!SAVE STATUS	
1618	004766	005777	173224			TST	AMTC		
1619	004772	100542				BMI	ERROR	!HAVE ERROR FLAG, CHEC FOR EOT	
1620	004774	005757	000306			TST	WRPASS	!WAS THIS A RECOVERY P SS	
1621	005000	001410				BEQ	TSTSTP	!NO	
1622	005002	013700	000306			MOV	WRPASS,R0	!YES	
1623	005006	006300				ASL	R0		
1624	005010	062700	000314			ADD	#WRCHEK,R0		
1625	005014	005210				INC	ARO	!+1 TO APPROPRIATE REC VERY PASS COUNTER	
1626	005016	005057	000306			CLR	WRPASS		
1627	005022	032757	000014	001112	TSTSTP:	BIT	#14,PARAM	!IS WRITE MODE NONSTOP	
1628	005030	001023				BNE	STOPOP	!NO	
1629	005032	005757	000306			TST	WRPASS	!YES	
1630	005036	001333				BNE	NONSTP		
1631	005040	004757	005206			JSR	PC,TESINC	!CHANGE RECORD LENGTH	
1632	005044	032757	000001	000356		BIT	#1,MODES	!EXIT AFTER RLS?	
1633	005052	001403				BEQ	W10	!NO	
1634	005054	032757	000010	000356		BIT	#10,MODES	!YES, ARE WE AT END OF RLS?	
1635	005062	001721				BEQ	NONSTP	!NO	
1636	005064	000207				RTS	PC	!YES	
1637	005066	032757	000002	000356	W10:	BIT	#2,MODES	!EXIT EVERY RECORD?	
1638	005074	001714				BEQ	NONSTP	!NO	
1639	005076	000207				RTS	PC	!YES	
1640	005100	032757	000010	001112	STOPOP:	BIT	#10,PARAM	!IS WRITE MODE RANDOM?	
1641	005106	001414				BEQ	W11	!NO	
1642									
1643									
1644					!RANDOM STALL DELAY				
1645	005110	004757	007126		RANSTP:	JSR	PC,RANGEN		
1646	005114	052757	177400	007256		BIS	#177400,RANDOM		
1647	005122	012704	177470		RAN1:	MOV	#-200.,R4	!DELAY 1 MILLISECOND	
1648	005126	005204				INC	R4		
1649	005130	001376				RNE	.-2		
1650	005132	005257	007256			INC	RANDOM		
1651	005136	001371				BNE	RAN1		
1652	005140	005757	000306		W11:	TST	WRPASS		
1653	005144	001265				RNE	STRTOP		

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1654 005146 004737 005206          JSR   PC,YESINC
1655 005152 032737 000001 000356   BIT   #1,MODES      IEXIT AFTER RLS?
1656 005160 001405          BEQ   W12           INO
1657 005162 032737 000010 000356   BIT   #10,MODES     IYES, ARE WE AT END OF RLS?
1658 005170 001603          BEQ   STRTOP       INO
1659 005172 000207          RTS   PC           IYES
1660 005174 032737 000002 000356 W12:   BIT   #2,MODES     IEXIT EVERY RECORD?
1661 005202 001646          BEQ   STRTOP       INO
1662 005204 000207          RTS   PC           IYES
1663
1664 005206 005237 000336          ISEE IF RECORD LENGTH SHOULD BE CHANGED
TESINC: INC RECORD I+1 TO RECORD COUNT
1665 005212 042737 000010 000356   BIC   #10,MODES    INOT END OF RLS UNLESS SET BELOW
1666 005220 005737 000310          TST   BLKINC
1667 005224 001416          BEQ   TSINC2
1668 005226 063737 000310 000352   ADD   BLKINC,WRTLEN
1669 005234 023737 000352 000246   CMP   WRTLEN,MINLEN IRECORD LENGTH TOO SHD T?
1670 005242 002404          BLT   RESETL      IYES,RESET
1671 005244 023737 000352 000244   CMP   WRTLEN,MAXLEN IRECORD LENGTH TOO LON ?
1672 005252 003403          BLE   TSINC2      INO
1673 005254 013737 000266 000352 RESETL: MOV STRLEN,WRTLEN IYES, RESET
1674 005262 105737 000336   TSINC2: TSTB  RECORD
1675 005266 001003          BNE   TSINC3      INO
1676 005270 052737 000010 000356   BIS   #10,MODES    IINDICATE AT END OF RL
1677 005276 000207   TSINC3: RTS   PC
1678
1679          IHAVE AN ERROR FLAG DURING WRITE OPERATION
1680          IIF ERROR IS CAUSED BY END OF TAPE FLAG, DUMP WRIT ERROR COUNTERS
1681          IFOR ALL OTHER ERRORS: PRINT COMMAND AND STATUS R GISTERS AND RECORD NUMBER
1682          IIF READ PASS IS SELECTED, TRY TO RECOVER BY WRITI G WITH XIRG,
1682 005300 032737 175600 000312 ERROR: BIT #175600,STATRD IAT EOT?
1683 005306 001510          BEQ   ENDTAP      IYES
1684 005310 005737 000306          TST   WRPASS
1685 005314 001002          BNE   ERR1       IFIRST ERROR?
1686 005316 005237 000314          INC   WRCHK      IYES, +1 TO WRITE ERRO
1687 005322 032777 020000 172702 EHR1: BIT #20000,ASR ITYPE ALL ERRORS?
1688 005330 001010          BNE   TESREC     INO
1689 005332 012702 012212          MOV   #MSG7,R2
1690 005336 104404          TOP
1691 005340 013737 000352 000270   MOV   WRTLEN,LENGTH
1692 005346 004737 010756          JSR   PC,PRTS     IPRINT STATUS, COMMAND RECORD, LENGTH
1693 005352 032777 000100 172652 TESREC: BIT #100,ASR IRECOVER STATISTICALLY SELECTED?
1694 005360 001410          BEQ   TESRC1     INO
1695 005362 005237 000306          INC   WRPASS     I+1 TO WRITE RECOVER
1696 005366 022737 000010 000306   CMP   #B,,WRPASS IHAVE WE TRIED TO WRIT RECOVER 8 TIMES?
1697 005374 001010          BNE   STREC1     INO
1698 005376 005237 000334          INC   PERMBS     IYES, +1 TO PERMANENT ADSPOT?
1699 005402 032737 000004 000356 TESRC1: BIT #4,MODES IIS READ PASS SELECTED
1700 005410 001402          BEQ   .+6        INO
1701 005412 004737 010322          JSR   PC,XRGREC
1702 005416 005037 000306          CLR   WRPASS
1703 005422 032737 002000 000312   BIT   #2000,STATRD
1704 005430 001037          BNE   ENDTAP
1705 005432 000137 005140          JMP   W11
1706 005436 004737 010032          STREC1: JSR PC,PACK1
1707 005442 004737 010032          JSR   PC,PACK1   IBACKSPACE 2 RECORDS
1708 005446 032777 000040 172540   BIT   #40,AMTS
1709 005454 001402          BEQ   .+6
1710 005456 000137 004726          JMP   STRTOP

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1711	005462	012777	177777	172530	MOV	#-1,@BC		
1712	005470	013777	000276	172520	MOV	COMAND,@MTC		
1713	005476	052777	000010	172512	BIS	#10,@MTC		
1714	005504	004737	004532		JSR	PC,GOWAIT	ISPACE FORWARD 1 RECOR	
1715	005510	042777	000016	172500	BIC	#16,@MTC		
1716	005516	052777	000004	172472	BIS	#4,@MTC	ICHANGE FROM SPACE TO RITE	
1717	005524	000137	004720		JMP	STRTOP		
1718								
1719	005530	005237	000336		IDRIVE IS AT EOT			
1720	005534	052737	000040	000356	ENDTAP: INC	RECORD		
1721	005542	012702	013142		BIS	#40,MODES	IINDICATE DRIVE AT EOT	
1722	005546	104404			ENDT1: MOV	#MSG24,R2		
1723	005550	012702	012240			TOP		
1724	005554	104404			MOV	#MSG8,R2		
1725						TOP		
1726	005556	004737	011020		IDUMP WRITE ERRORS			
1727	005562	013705	001112		WRTDMP: JSR	PC,PRTD	IPRINT DRIVE, PATTERN, PARITY, DENSITY	
1728	005566	042705	177763		MOV	PARAM,R5		CR
1729	005572	012702	012675		BIC	#177763,R5		CR
1730	005576	022705	000004		MOV	#MSG14,R2		
1731	005602	001002			CMP	#4,R5		CR
1732	005604	012702	012655		BNE	+.6		
1733	005610	022705	000010		MOV	#MSG12,R2		
1734	005614	001002			CMP	#10,R5		CR
1735	005616	012702	012665		BNE	+.6		
1736	005622	104404			MOV	#MSG13,R2		
1737	005624	013702	000336		TOP		IPRINT WRITE MODE	
1738	005630	104426			MOV	RECORD,R2		
1739	005632	013705	001112		DECPNT		IPRINT RECORD NUMBER	
1740	005636	042705	177717		MOV	PARAM,R5		CR
1741	005642	012702	012723		BIC	#177717,R5		CR
1742	005646	022705	000020		MOV	#MSG17,R2		
1743	005652	001002			CMP	#20,R5		CR
1744	005654	012702	012732		BNE	+.6		
1745	005660	022705	000040		MOV	#MSG18,R2		
1746	005664	001002			CMP	#40,R5		CR
1747	005666	012702	012705		BNE	+.6		
1748	005672	022705	000060		MOV	#MSG15,R2		
1749	005676	001002			CMP	#60,R5		CR
1750	005700	012702	012714		BNE	+.6		
1751	005704	104404			MOV	#MSG16,R2		
1752	005706	012702	012741		TOP		IPRINT RECORD LENGTH S QUENCE	
1753	005712	104404			MOV	#MSG19,R2		
1754	005714	013702	000314		TOP			
1755	005720	104426			MOV	WRCHK,R2		
1756	005722	012702	000316		DECPNT		IPRINT "WRITE ERRORS="	
1757	005726	112707	000060	013002	MOV	#WRCHK+2,R0		
1758	005734	105237	013002		MOV	#60,MSG20+17		
1759	005740	005710			WRTD1: INCB	MSG20+17	IPRINT STATISTICAL REC VERY	
1760	005742	001405			TST	@R0		
1761	005744	012702	012763		BEQ	WRTD2		
1762	005750	104404			MOV	#MSG20,R2		
1763	005752	011002			TOP			
1764	005754	104426			MOV	(0),R2		
1765	005756	005720			DECPNT		IRecovered AT X	
1766	005760	020027	000334		WRTD2: TST	(0)+	IJUST INCREMENTING	
1767	005764	001303			CMP	R0,#WRCHK+20		
					BNE	WRTD1		

1768	005766	005757	000334		TST	PERMBS	
1769	005772	001001			BNE	,+4	ISKIP PRINT IF = 0
1770	005774	000207			RTS	PC	
1771	005776	012702	013005		MOV	#MSG20A,R2	
1772	006002	104404			TOP		
1773	006004	013702	000334		MOV	PERMBS,R2	IPRINT "PERMANENT BADS OT"
1774	006010	104426			DECPRT		
1775	006012	000207			RTS	PC	
1776					IGENERATE 7 TRACK DATA PATTERN		
1777					IALL PATTERNS HAVE BITS 15,14,7,6 SET IN CASE CORE DUMP SELECTED		
1778	006014	012757	000001	001146	GENP7:	MOV	#1,PGMODE ISET 7 TRACK PATTERN G N. MODE
1779	006022	013702	000250		MOV	WBUF,R2	
1780	006026	013703	001112		MOV	PARAM,R3	
1781	006032	000303			SWAB	R3	
1782	006034	006303			ASL	R3	
1783	006036	042703	177741		RIC	#177741,R3	
1784	006042	062703	006114		ADD	#PATPST,R3	
1785	006046	012746	006054		MOV	#PATCK,-(SP)	IPUSH STACK RETURN
1786	006052	011307			MOV	#R3,PC	IGO TO PAT GEN SUBROUT NE
1787					IFINISHED PATTERN GENERATION		
1788					IF CORE DUMP NOT SELECTED CLEAR BITS 15,14,7,6 IN ALL WORDS OF WRITE DATA BU FE		
1789	006054	032757	000100	001112	PATCK:	BIT	#100,PARAM IIS CORE DUMP SET?
1790	006062	001404			BEQ	PATFN	INO
1791	006064	032757	000200	001112	BIT	#200,PARAM	IMAYBE, IS CORE DUMP S T?
1792	006072	001007			BNE	PATEN2	IYES
1793	006074	013702	000250		PATEN:	MOV	WBUF,R2 INO
1794	006100	042722	140300		PATEN1:	BIC	#140300,(2)+ ICLEAR BITS 15,14,7,6
1795	006104	023702	000252		CMP	RBUF,R2	IDONE ALL?
1796	006110	001375			BNE	PATEN1	INO
1797	006112	000207			PATEN2:	RTS	PC
1798	006114	006104			PATPST:	PATE0	
1799	006116	006102				PAT00	
1800	006120	006170				PATE1	
1801	006122	006204				PAT01	
1802	006124	006220				PATE2	
1803	006126	006226				PAT02	
1804	006130	006204				PATE3	
1805	006132	006242				PAT03	
1806	006134	006200				PATE4	
1807	006136	006700				PAT4	
1808	006140	006274				PATE5	
1809	006142	006322				PAT05	
1810	006144	006302				PAT6	
1811	006146	006302				PAT6	
1812	006150	006300				PATE7	
1813	006152	007106				PAT7	
1814					IPATTERN 0		
1815					IHIGH FREQUENCY OUTSIDE SKEW		
1816	006154	012703	140701		PATE0:	MOV	#140701,R3 1401
1817	006160	000513			BR	PFIL1	
1818					IHALF FREQUENCY OUTSIDE SKEW		
1819	006162	012703	140301		PAT00:	MOV	#140301,R3 11
1820	006166	000510			BR	PFIL1	
1821					IPATTERN 1		
1822					ISLIDING 0		
1823	006170	012703	006176		PATE1:	MOV	#PE1,R3
1824	006174	000512			BR	PFIL3	

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1825	006176	167757		PE1:	167737	127437
1826	006200	175767			175767	135467
1827	006202	177375			177375	137075
1828				;SLIDING 1		
1829	006204	012703	006212	PAT01:	MOV #P01,R3	
1830	006210	000504			BR PFIL3	
1831	006212	150340		P01:	150340	110040
1832	006214	142310			142310	12010
1833	006216	140702			140702	1402
1834				;PATTERN 2		
1835				;HIGH FREQUENCY EVERY OTHER TRACK		
1836	006220	012703	152725	PATE2:	MOV #152725,R3	112425
1837	006224	000471			BR PFIL1	
1838				;HIGH FREQUENCY EVERY OTHER TRACK		
1839	006226	012703	165352	PAT02:	MOV #165352,R3	125052
1840	006232	000466			BR PFIL1	
1841				;PATTERN 3		
1842				;HALF FREQUENCY OUTSIDE TRACK, HIGH FREQUENCY INSI E TRACKS		
1843	006234	012703	177377	PATE3:	MOV #177377,R3	137077
1844	006240	000463			BR PFIL1	
1845				;HIGH FREQUENCY OUTSIDE TRACK, HALF FREQUENCY INSI E TRACKS		
1846	006242	012703	177701	PAT03:	MOV #177701,R3	137401
1847	006246	000460			BR PFIL1	
1848				;PATTERN 4		
1849				;INCREMENTING PATTERN (NO ALL 0'S)		
1850	006250	012703	000301	PATE4:	MOV #301,R3	
1851	006254	110322			MOVB R3,(2)+	
1852	006256	023702	000252		CMP RBUF,R2	
1853	006262	001001			BNE .+4	
1854	006264	000207			RTS PC	
1855	006266	105203			INCB R3	
1856	006270	001767			BEQ PATE4	
1857	006272	000770			BR PATE4+4	
1858						
1859						
1860				;PATTERN 5		
1861				;THREE 3'S EACH TRACK EVERY 6TH WORD		
1862	006274	012703	006302	PATE5:	MOV #P05,R3	
1863	006300	000403			BR PFIL9	
1864	006302	157437		PE5:	157437	117437
1865	006304	167737			167737	127437
1866	006306	167757			167757	127457
1867	006310	173767			173767	133467
1868	006312	171767			171767	131467
1869	006314	171773			171773	131473
1870	006316	176775			176775	137075
1871	006320	177376			177376	137076
1872				;THREE 1'S EACH TRACK EVERY 6TH WORD		
1873	006322	012703	006330	PAT05:	MOV #P05,R3	
1874	006326	000402			BR PFIL9	
1875	006330	160340		P05:	160340	120040
1876	006332	150340			150340	110040
1877	006334	150320			150320	110020
1878	006336	144310			144310	14010
1879	006340	142310			142310	12010
1880	006342	142304			142304	12004
1881	006344	141302			141302	11002

1882	006346	140702			140702	1402	
1883	006350	140701			140701	1401	
1884					;PATTERN 6		
1885					;ALL 1'S ALL TRACKS		
1886	006352	012703	177777		PAT6:	MOV #1,R3	
1887	006356	000414				BR PFIL1	
1888					;PATTERN 7		
1889					;RANDOM (NONE ALL 0'S)		
1890	006360	004707	007126		PATE7:	JSR PC,RANGEN	
1891	006364	132707	000077	007256		RITB #77,RANDOM	
1892	006372	001712				BEC PATE7	
1893	006374	113722	007256			MOVB RANDOM,(2)+	
1894	006400	023702	000252			CMP RBUF,R2	
1895	006404	001365				BNE PATE7	
1896	006406	000207				RTS PC	
1897					;FILL WRITE BUFFER WITH CONSTANT PATTERN		
1898	006410	010322			PFIL1:	MOV R3,(2)+	
1899	006412	023702	000252			CMP RBUF,R2	
1900	006416	001314				BNE PFIL1	
1901	006420	000207				RTS PC	
1902					;FILL WRITE BUFFER WITH 3 WORD PATTERN		
1903	006422	010304			PFIL3:	MOV R3,R4	
1904	006424	062704	000006			ADD #6,R4	
1905	006430	012322			PFIL3A:	MOV (3)+,(2)+	
1906	006432	023702	000252			CMP RBUF,R2	
1907	006436	001001				BNE .+4	
1908	006440	000207				RTS PC	
1909	006442	020304				CMP R3,R4	
1910	006444	001002				BNE .+6	
1911	006446	162703	000006			SUB #6,R3	
1912	006452	000706				BR PFIL3A	
1913					;FILL WRITE BUFFER WITH 9 WORD PATTERN		
1914	006454	010304			PFIL9:	MOV R3,R4	
1915	006456	062704	000022			ADD #22,R4	
1916	006462	012322			PFIL9A:	MOV (3)+,(2)+	
1917	006464	023702	000252			CMP RBUF,R2	
1918	006470	001001				BNE .+4	
1919	006472	000207				RTS PC	
1920	006474	020304				CMP R3,R4	
1921	006476	001002				BNE .+6	
1922	006500	162703	000022			SUB #22,R3	
1923	006504	000706				BR PFIL9A	
1924					;GENERATE 9 TRACK DATA PATTERN		
1925	006506	012707	000002	001146	GENP9:	MOV #2,PGMODE	CR
1926	006514	013702	000250			MOV WBUF,R2	CR
1927	006520	013703	001112			MOV PARAM,R3	CR
1928	006524	000303				SWAB R3	CR
1929	006526	042703	177761			RIC #177761,R3	
1930	006532	062703	006540			ADD #PATPNT,R3	
1931	006536	011307				MOV #R3,PC	
1932	006540	006500			PATPNT:	PAT0	
1933	006542	006574				PAT1	
1934	006544	006644				PAT2	
1935	006546	006600				PAT3	
1936	006550	006700				PAT4	
1937	006552	006705				PAT5	
1938	006554	007072				PAT69	

1939	006556	007106		PAT7		
1940				{PATTERN 0		CR
1941				{HALF FREQUENCY OUTSIDE SKEW		CR
1942	006560	012722	002012	PAT0: MOV #2012,(2)+	{(010)(004)	CR
1943	006564	023702	000252	CMP RBUF,R2		CR
1944	006570	001313		BNE PAT0		CR
1945	006572	000207		RTS PC		CR
1946				{PATTERN 1		CR
1947				{SLIDING 1 BIT (ISOLATED BIT)		CR
1948	006574	012700	006622	PAT1: MOV #P1T,R0		CR
1949	006600	012022		PAT1A: MOV (0)+,(2)+		CR
1950	006602	023702	000252	CMP RBUF,R2		CR
1951	006606	001001		BNE .+4		CR
1952	006610	000207		RTS PC		CR
1953	006612	022700	006644	CMP #PAT2,R0		CR
1954	006616	001310		BNE PAT1A		CR
1955	006620	000755		BR PAT1		CR
1956	006622	100000		P1T: 100000		CR
1957	006624	020100		20100		CR
1958	006626	004020		4020		CR
1959	006630	001004		1004		CR
1960	006632	000001		1		CR
1961	006634	040200		40200		CR
1962	006636	010040		10040		CR
1963	006640	002010		2010		CR
1964	006642	000402		402		CR
1965				{PATTERN 2		CR
1966				{HIGH FREQUENCY EVERY OTHER TRACK		CR
1967	006644	012722	136274	PAT2: MOV #136274,(2)+	{(274)(274)	CR
1968	006650	023702	000252	CMP RBUF,R2		CR
1969	006654	001313		BNE PAT2		CR
1970	006656	000207		RTS PC		CR
1971				{PATTERN 3		CR
1972				{THREE 0'S, THREE 1'S, THREE 0'S:		CR
1973	006660	012700	006706	PAT3: MOV #P3T,R0		CR
1974	006664	012022		PAT3A: MOV (0)+,(2)+		CR
1975	006666	023702	000252	CMP RBUF,R2		CR
1976	006672	001001		BNE .+4		CR
1977	006674	000207		RTS PC		CR
1978	006676	022700	006730	CMP #PAT4,R0		CR
1979	006702	001310		BNE PAT3A		CR
1980	006704	000755		BR PAT3		CR
1981	006706	140037		P3T: 140037		CR
1982	006710	100476		100476		CR
1983	006712	001574		1574		CR
1984	006714	003770		3770		CR
1985	006716	017760		17760		CR
1986	006720	037300		37300		CR
1987	006722	076201		76201		CR
1988	006724	174003		174003		CR
1989	006726	170007		170007		CR
1990				{PATTERN 4		CR
1991				{INCREMENTING PATTERN (0-377)		CR
1992	006730	105027	006754	PAT4: CLRB P4A		CR
1993	006734	113722	006754	P4: MOVB P4A,(2)+		CR
1994	006740	105227	006754	INCB P4A		CR
1995	006744	023702	000252	CMP RBUF,R2		CR

1996	006750	0013/1		BNE	P4		CR
1997	006752	000207		RTS	PC		CR
1998	006754	000000		P4A1	0		CR
1999				IPATTERN	5		CR
2000				IEACH TRACK	3 BITS		CR
2001	006756	012700	007004	PAT5:	MOV	#P5T,R0	CR
2002	006762	012022		PAT5A:	MOV	(0)+(2)+	CR
2003	006764	023702	000252		CMP	RBUF,R2	CR
2004	006770	001001			BNE	,+4	CR
2005	006772	000207			RTS	PC	CR
2006	006774	022700	007072		CMP	#PAT69,R0	CR
2007	007000	001370			BNE	PAT5A	CR
2008	007002	000765			BR	PAT5	CR
2009	007004	000000		P5T:	0		CR
2010	007006	100000			100000		CR
2011	007010	100200			100200		CR
2012	007012	040100			40100		CR
2013	007014	020100			20100		CR
2014	007016	020040			20040		CR
2015	007020	010020			10020		CR
2016	007022	004020			4020		CR
2017	007024	004010			4010		CR
2018	007026	002004			2004		CR
2019	007030	001004			1004		CR
2020	007032	001002			1002		CR
2021	007034	000401			401		CR
2022	007036	000001			1		CR
2023	007040	000000			0		CR
2024	007042	100200			100200		CR
2025	007044	040200			40200		CR
2026	007046	040100			40100		CR
2027	007050	020040			20040		CR
2028	007052	010040			10040		CR
2029	007054	010020			10020		CR
2030	007056	004010			4010		CR
2031	007060	002010			2010		CR
2032	007062	002004			2004		CR
2033	007064	001002			1002		CR
2034	007066	000402			402		CR
2035	007070	000401			401		CR
2036				IPATTERN	6		CR
2037				IHIGH FREQUENCY	ALL TRACKS		
2038	007072	012722	177777	PAT69:	MOV	#-1,(2)+	CR
2039	007076	023702	000252		CMP	RBUF,R2	CR
2040	007102	001373			BNE	PAT69	CR
2041	007104	000207			RTS	PC	CR
2042				IPATTERN	7		CR
2043				IRANDOM			CR
2044	007106	004737	007126	PAT7:	JSR	PC,RANGEN	CR
2045	007112	013722	007256		MOV	RANDOM,(2)+	CR
2046	007116	023702	000252		CMP	RBUF,R2	CR
2047	007122	001371			BNE	PAT7	CR
2048	007124	000207			RTS	PC	CR
2049				IRANDOM NUMBRER	GENERATOR		
2050				IEEXIT WITH	RANDOM NUMBER IN LOCATION NAMED "RANDOM		
2051				RANGEN:	MOV	R0,-(SP) ISAVE REGISTERS	
2052	007126	010046					CR

2053	007130	010146			MOV	R1, -(SP)			CR
2054	007132	010246			MOV	R2, -(SP)			CR
2055	007134	010346			MOV	R3, -(SP)			CR
2056	007136	013700	007260		MOV	LONUM, R0		!SET UP LOW DIGIT	
2057	007142	013701	007262		MOV	HINUM, R1		!SET UP HIGH DIGIT	
2058	007146	012703	000007		MOV	#7, R3		!SET UP SHIFT COUNT	
2059	007152	005002			CLR	R2			
2060	007154	006300			RANG1: ASL	R0		!SHIFT R0 LEFT AND	
2061	007156	006101			ROL	R1		!ROTATE CARRY INTO LSB OF R1 AND	
2062	007160	006102			ROL	R2		!ROTATE CARRY OUT OF R INTO R2	
2063	007162	005303			DEC	R3		!DECREMENT R3	
2064	007164	001373			BNE	RANG1		!CONTINUE SHIFT LOOP	
2065	007166	063700	007260		ADD	LONUM, R0		!ADD NUMBER TO MAKE X1 5	
2066	007172	005501			ADC	R1		!PROPAGATE CARRY	
2067	007174	063701	007262		ADD	HINUM, R1		!ADD NUMBER TO MAKE X 29	
2068	007200	005502			ADC	R2		!PROPAGATE CARRY	
2069	007202	062700	001057		ADD	#1057, R0		!ADD LOW CONSTANT	
2070	007206	005501			ADC	R1		!PROPAGATE CARRY	
2071	007210	005502			ADC	R2		!PROPAGATE CARRY	
2072	007212	062701	047401		ADD	#47401, R1		!ADD HIGH CONSTANT	
2073	007216	005502			ADC	R2		!PROPAGATE CARRY	
2074	007220	062702	000006		ADD	#6, R2		!ADD HIGH CONSTANT	
2075	007224	060200			ADD	R2, R0		!RE-PRIME R0 WITH HIGH DIGIT	
2076	007226	005501			ADC	R1		!PROPAGATE CARRY	
2077	007230	010037	007256		MOV	R0, RANDOM		!SAVE RANDOM NUMBER	
2078	007234	010037	007260		MOV	R0, LONUM		!PUT R0 BACK IN LONUM	
2079	007240	010137	007262		MOV	R1, HINUM		!PUT R1 BACK IN HINUM	
2080	007244	012603			MOV	(SP)+, R3		!RESTORE REGISTERS	CR
2081	007246	012602			MOV	(SP)+, R2			CR
2082	007250	012601			MOV	(SP)+, R1			CR
2083	007252	012600			MOV	(SP)+, R0			CR
2084	007254	000207			RTS	PC		!EXIT	CR
2085									
2086	007256	000000			!RANDOM: 0				
2087	007260	000000			LONUM: 0				
2088	007262	000000			HINUM: 0				
2089					!READ RECORD SECTION				
2090	007264	005737	000336		READ1: TST	RECORD		!FIRST RECORD?	
2091	007270	001003			BNE	DOLLR1		!NO	
2092	007272	013737	000266	000354	MOV	STLEN, READLN		!SET INITIAL READ LENG H	
2093	007300	012737	177775	000304	DOLLR1: MOV	#-3, RDPASS		!INITIALIZE READ PASS COUNTER	
2094	007306	013777	000276	170702	RDSTPD: MOV	COMAND, @MTC			
2095	007314	105777	170676		TSTB	@MTC			
2096	007320	100375			BPL	.-4		!WAIT FOR CONTROL UNIT READY	
2097	007322	006077	170666		RUR	@MTC			
2098	007326	103375			BCC	.-4		!WAIT FOR TAPE UNIT RE DY	
2099	007330	013700	000252		READG0: MOV	RBUF, R0			
2100	007334	013701	000354		MOV	READLN, R1			
2101	007340	105020			RG1: CLR	B (0)+		!CLEAR READ BUFFER	
2102	007342	005301			DEC	R1			
2103	007344	001375			BNE	RG1			
2104	007346	013777	000354	170644	MOV	READLN, @BC		!SET BYTE COUNT	
2105	007354	005477	170640		NEG	@BC			
2106	007360	013777	000252	170634	MOV	RBUF, @CA		!SET CURRENT ADDRESS	
2107	007366	013777	000276	170622	MOV	COMAND, @MTC			
2108	007374	104442			GENPT			!GENERATE TEST PATTERN	
2109	007376	052777	000002	170612	RIS	#2, @MTC			

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2110 007404 004737 004532          JSR    PC,GOWAIT
2111
2112          IRETURN HERE AFTER INTERRUPT
2113 007410 017737 170600 000312    MOV    @MTS,STATRO
2114 007416 005777 170574          TST    @MTC          IANY STATUS ERRORS
2115 007422 100504          BMI    RDERR0       IYES
2116
2117          ICHECK FOR DATA ERRORS
2118 007424 013700 000252          MOV    RBUF,R0
2119 007430 013701 000250          MOV    WBUF,R1
2120 007434 013702 000354          MOV    READLN,R2
2121 007440 0220<1          DOLLR5: CMP    (0)+,(1)+    ICHECK FOR PROPER DATA TRANSFER
2122 007442 001045          BNE    DATERR       IHAVE DATA ERROR
2123 007444 162702 000002          SUB    #2,R2        ICHECKED ALL TRANSFERS
2124 007450 001373          BNE    DOLLR5       INO
2125 007452 032737 000003 001112    RTSSTP: BIT    #3,PARAM
2126 007460 001007          BNE    RDSTPC
2127 007462 004737 007762          JSR    PC,RDINCR    IINCREMENT FOR NEXT BL CK
2128 007466 023737 000336 000342    CMP    RECORD,LASRCR
2129 007474 001315          BNE    READGO
2130 007476 000207          RTS    PC           IEXIT READIT
2131 007500 032737 000002 001112    RDSTPC: BIT    #2,PARAM    IIS READ MODE RANDOM?
2132 007506 001414          BEQ    RDSTP        INO
2133 007510 004737 007126          RNDRDS: JSR    PC,RANGEN
2134 007514 052737 177400 007256    BIS    #177400,RANDOM
2135 007522 012704 177470          RND51: MOV    #-200.0R4    IDELAY 1 MILLISECOND
2136 007526 005204          INC    R4
2137 007530 001376          BNE    -2
2138 007532 005237 007256          INC    RANDOM
2139 007536 001371          BNE    RND51
2140 007540 004737 007762          RDSTP: JSR    PC,RDINCR
2141 007544 023737 000336 000342    CMP    RECORD,LASRCR    IDONE LAST RECORD?
2142 007552 001205          BNE    RDSTPD       INO
2143 007554 000207          RTS    PC           IYES EXIT
2144
2145 007556 032777 020000 170446    IHAVE DATA ERROR
2146 007564 001014          DATERR: BIT    #20000,@SR    ITYPE ALL READ ERRORS?
2147 007566 012702 012373          BNE    DATERR1     INO
2148 007572 104404          MOV    #MSG9A,R2
2149 007574 013737 000354 000270    TOP
2150 007602 004737 010756          MOV    READLN,LENGTH
2151 007606 014102          JSR    PC,PRTS
2152 007610 104412          MOV    -(1),R2     IPRINT 'READ DATA ERRO '
2153 007612 014002          OCTPRT
2154 007614 104412          MOV    -(0),R2
2155 007616 022737 177775 000304    OCTPRT
2156 007624 001002          CMP    #-3,RDPASS
2157 007626 005237 000346          BNE    .+6
2158 007632 000426          INC    DAERRS      I+1 TO DATA ERRORS
2159          BR    RTSR1
2160 007634 032737 175600 000312    ISTATUS INDICATES AN ERROR, CHECK FOR EOT
2161 007642 001515          RDERR0: BIT    #175600,STATRD IIS ERROR LEGITIMATE R EOT?
2162 007644 032777 020000 170360    BEQ    RNDTAP       IHAVE EOT
2163 007652 001010          BIT    #20000,@SR    ITYPE ALL READ ERRORS?
2164 007654 012702 012346          BNE    RTSREC       INO
2165 007660 104404          MOV    #MSG9,R2
2166 007662 013737 000354 000270    TOP
2166 007662 013737 000354 000270    MOV    READLN,LENGTH

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2167	007670	004757	010756			JSR	PC,PRTS		
2168						I+1 TO RDEERS IF FIRST ERROR PASS			
2169	007674	022757	177775	000304		RTSREC:	CMP	#-3,RDPASS	
2170	007702	001002					BNE	.+6	
2171	007704	005257	000344				INC	RDERRS	I+1 TO STATUS ERRORS
2172	007710	032777	000020	170314		RTSR1:	BIT	#20,@SR	DELETE READ RETRYS (S 4)?
2173	007716	001011					BNE	RPASS3	IYES
2174	007720	005257	000304				INC	RDPASS	IDONE ALL RE-READS?
2175	007724	001404					HEQ	RPASS1	IYES
2176	007726	004757	010032				JSR	PC,BACK1	INO, BACKSPACE TAPE
2177	007732	000157	007306				JMP	ROSTPD	IGO AGAIN
2178	007736	005257	000350			RPASS1:	INC	NRREAD	I+1 TO NONRECOVERABLE EAD
2179	007742	012757	177775	000304		RPASS3:	MOV	#-3,RDPASS	
2180	007750	032757	002000	000312			BIT	#2000,STATRD	IAI EOT?
2181	007756	001054					BNE	RNDTP1	IYES, TYPE "EOT"
2182	007760	000657					BR	RDSTP	
2183						ISET UP POINTERS FOR NEXT RECORD			
2184	007762	005257	000336			RDINCR:	INC	RECORD	
2185	007766	005757	000310				TST	BLKINC	
2186	007772	001416					HEQ	RESTR1	
2187						IRECORD LENGTH IS CHANGING, COUNT IT			
2188	007774	063757	000310	000354			ADD	BLKINC,READLN	
2189	010002	023757	000354	000246			CMP	READLN,MINLEN	IS LENGTH LESS THAN M NIMUM
2190	010010	002404					BLT	RESTR1	INO
2191	010012	023757	000354	000244			CMP	READLN,MAXLEN	IS LENGTH GREATER THA MAXIMUM?
2192	010020	003405					BLE	RESTR1	INO
2193	010022	013757	000266	000354		RESTR1:	MOV	STRLEN,READLN	RESET INITIAL LENGTH
2194	010030	000207				RESTR1:	RTS	PC	
2195						IBACKSPACE ONE RECORD			
2196	010032	006077	170156			BACK1:	ROR	@MTS	
2197	010036	103375					BCC	.-4	IWAIT FOR TAPE UNIT RE DY
2198	010040	012777	177777	170152			MOV	#-1,@BC	ICOUNT 1 RECORD
2199	010046	013777	000276	170142			MOV	COMAND,@MTC	ISELECT DRIVE
2200	010054	052777	000012	170134			BIS	#12,@MTC	ISSUE BACKSPACE
2201	010062	004757	004532				JSR	PC,GOWAIT	
2202	010066	042777	000016	170122			BIC	#16,@MTC	
2203	010074	000207					RTS	PC	
2204						IDRIVE HAS REACHED EOT IN READ MODE			
2205	010076	004757	007762			RNDTAP:	JSR	PC,RDINCR	
2206	010102	052757	000020	000356			BIS	#20,MODES	IINDICATE AT EOT
2207	010110	012762	013205			RNDTP1:	MOV	#MSG25,R2	
2208	010114	104404					TOP		
2209	010116	012762	012240				MOV	#MSG8,R2	
2210	010122	104404					TOP		
2211						IDUMP ERROR COUNTERS			
2212	010124	004757	011020			READMP:	JSR	PC,PRTD	IPRINT DRIVE, PATTERN, PARITY, DENSITY
2213	010130	013705	001112				MOV	PARAM,R5	
2214	010134	042705	177774				BIC	#177774,R5	
2215	010140	012762	012675				MOV	#MSG14,R2	
2216	010144	022705	000001				CMP	#1,R5	
2217	010150	001002					BNE	.+6	
2218	010152	012762	012655				MOV	#MSG12,R2	
2219	010156	022705	000002				CMP	#2,R5	
2220	010162	001002					BNE	.+6	
2221	010164	012702	012665				MOV	#MSG13,R2	
2222	010170	104404					TOP		IPRINT READ MODE
2223	010172	013702	000336				MOV	RECORD,R2	

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CR

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2224	010176	104426			DECPRT			
2225	010200	013705	001112		MOV	PARAM,R5		CR
2226	010204	042705	177717		BIC	#177717,R5		CR
2227	010210	012702	012723		MOV	#MSG17,R2		
2228	010214	022705	000020		CMP	#20,R5		CR
2229	010220	001002			BNE	+.6		
2230	010222	012702	012732		MOV	#MSG18,R2		
2231	010226	022705	000040		CMP	#40,R5		CR
2232	010232	001002			BNE	+.6		
2233	010234	012702	012705		MOV	#MSG15,R2		
2234	010240	022705	000060		CMP	#60,R5		CR
2235	010244	001002			BNE	+.6		
2236	010246	012702	012714		MOV	#MSG16,R2		
2237	010252	104404			TOP			
2238	010254	012702	013035		MOV	#MSG21,R2		
2239	010260	104404			TOP			
2240	010262	013702	000344		MOV	RDERRS,R2		
2241	010266	104426			DECPRT			
2242	010270	012702	013065		MOV	#MSG22,R2		
2243	010274	104404			TOP			
2244	010276	013702	000346		MOV	DAERRS,R2		
2245	010302	104426			DECPRT			
2246	010304	012702	013106		MOV	#MSG23,R2		
2247	010310	104404			TOP			
2248	010312	013702	000350		MOV	NRREAD,R2		
2249	010316	104426			DECPRT			
2250	010320	000207			RTS	PC		
2251								
2252								
2253								
2254								
2255	010322	012707	177774	000306	XRGRC: MOV	#-4,WRPASS	ICOUNT 4 REWRITES	
2256	010330	032777	000040	167674	XRG0: BIT	#40,@SR	IDDELETE WRITE XIRG (S 5)	
2257	010336	001036			BNE	XRGRC0	IYES	
2258	010340	004707	010032		JSR	PC,PACK1		
2259	010344	105777	167646		TSTB	@MTC		
2260	010350	100375			BPL	.-4		
2261	010352	013777	000276	167636	MOV	COMAND,@MTC		
2262	010360	052777	000014	167630	BIS	#14,@MTC	IWRITE XIRG	
2263	010366	013777	000352	167624	MOV	WRTLEN,@BC	ISET BYTE COUNT	
2264	010374	005477	167620		NEG	@BC		
2265	010400	013777	000250	167614	MOV	WBUF,@CA	ISET CURRENT ADDRESS	
2266	010406	006077	167602		ROR	@MS	IWAIT FOR TU READY	
2267	010412	103375			BCC	.-4		
2268	010414	004707	004532		JSR	PC,GOWAIT		
2269								
2270	010420	017707	167570	000312	IRETURN	HERE AFTER INTERRUPT		
2271	010426	005777	167564		MOV	@MS,STATRD	ISAVE STATUS	
2272	010432	100405			TST	@MTC		
2273	010434	005037	000306		BMI	XRG5	IHAVE ERROR FLAG, CHEC FOR EOT	
2274	010440	000207			XRGRC0: CLR	WRPASS		
2275	010442	032707	175600	000312	RTS	PC	IEXIT WRITE XIRG	
2276	010450	001771			XRG5: BIT	#175600,STATRD		
2277	010452	005207	000306		BEQ	XRGRC0	IONLY EOT, EXIT	
2278	010456	001324			INC	WRPASS	IDONE 4 XIRG	
2279					BNE	XRG0		
2280	010460	012702	012212		IPRINT	STATUS AFTER 4 XIRG ERRORS		
					MOV	#MSG7,R2		

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2281 010464 104404          TOP          IPHINT WRITE STATUS ER OR
2282 010466 013757 000352 000270  MOV        WRLEN,LENGTH
2283 010474 004757 010756  JSR        PC,PRTS      IPRINT STATUS, COMMAND RECORD, LENGTH
2284 010500 012702 012627  MOV        MSG11,R2
2285 010504 104404          TOP          IPRINT "XIRG WRITTEN 4 TIMES"
2286 010506 032757 002000 000312  BIT        #2000,STATRD
2287 010514 001702          BEQ        XRGREC
2288 010516 042777 000016 167472  BIC        #16,@MTC
2289 010524 052777 000003 167464  BIS        #3,@MTC      IWRITE AN EOF
2290 010532 004757 004532  JSR        PC,GOWAIT
2291 010536 000207          RTS        PC
2292
2293 010540 013757 000336 000342  IGO BACKWARD ON TAPE X RECORDS
2294 010546 013757 000340 000336  GOBKWD: MOV        RECORD,LASRCR
2295 010554 001003          MOV        WRREC,RECORD
2296 010556 004757 004342  BNE        GOB1        IIS NEW RECORD=0
2297 010562 000207          JSR        PC,REWIND   IYES, REWIND
2298 010564 013777 000342 167426  GOB1:  RTS        PC      IEXIT
2299 010572 163777 000340 167420  MOV        LASRCR,@BC  ISET BYTE COUNT TO DIFFERENCE
2300 010600 005477 167414  SUB        WRREC,@BC   IBETWEEN LASRCR AND WR ECK
2301          NEG        @BC
2302          I THE FOLLOWING CODE INSURES THAT BACKSPACE REQUEST IN PHASE ENCODED CR
2303          I MODE ARE PROCESSFD FIRST IN THE SITUATION WHERE RZ AND PE MODES ARE CR
2304          I BOTH SELECTED FOR TESTS ON A DUAL DENSITY UNIT CR
2304 010604 013702 000300          MOV        CDRVBT,R2   IGET CURRENT UNIT NO. CR
2305 010610 132757 000004 000277  BITB       #4,COMAND+1 IIS CURRENT UNIT NO. 4 5, 6, OR 7? CR
2306 010616 001007          BNE        GOB2        I YES CR
2307 010620 004757 010716  JSR        PC,TSTUP4   IIS UNIT NO. PLUS 4 AL O SELECTED? CR
2308 010624 000412          BR        GOB3        I NO - PROCEED WITHOUT CHANGE CR
2309 010626 152757 000004 000277  BISB       #4,COMAND+1 I YES - ADD 4 TO COMAN UNIT NO. CR
2310 010634 000405          BR        GOB3
2311 010636 004757 010730  GOB2:  JSR        PC,TSTUM4 IIS UNIT NO. MINUS 4 A SO SELECTED? CR
2312 010642 000405          BR        GOB3        I NO - PROCEED WITHOUT CHANGE CR
2313 010644 142757 000004 000277  BICB       #4,COMAND+1 I YES - SUBTRACT 4 FRO COMAND UNIT NO. CR
2314 010652 013777 000276 167336  GOB3:  MOV        COMAND,@MTC
2315 010660 105777 167332  TSTB       @MTC        IWAIT FOR CU READY
2316 010664 100375          BPL        #-4
2317 010666 006077 167322  ROR        @MTS        IWAIT FOR TU READY
2318 010672 103375          BCC        #-4
2319 010674 042777 000016 167314  BIC        #16,@MTC
2320 010702 052777 000012 167306  BIS        #12,@MTC
2321 010710 004757 004532  JSR        PC,GOWAIT
2322 010714 000207          RTS        PC
2323          I TSTUP4 & TSTUM4 TEST FOR SIMULTANEOUS SELECTION O A DUAL DENSITY CR
2324
2325
2326          I UNIT, SUCH AS UNIT NOS. 0 & 4, 1 & 5, ETC. CR
2327          I IF THIS CONDITION EXISTS, CONTROL RETURNS TO CAL LOC. + 4. CR
2328          I OTHERWISE RETURN IS TO CALL LOC. + 2. CR
2329 010716 006202  TSTUP4: ASR        R2        IUNIT NO. IN RANGE 0-3 CR
2330 010720 006202          ASR        R2 CR
2331 010722 006202          ASR        R2 CR
2332 010724 006202          ASR        R2 CR
2333 010726 000404          BR        TSTPM CR
2334 010730 006302  TSTUM4: ASL        R2        IUNIT NO. IN RANGE 4-7 CR
2335 010732 006302          ASL        R2 CR
2336 010734 006302          ASL        R2 CR
2337          ASL        R2 CR
2338          ASL        R2 CR
2339          ASL        R2 CR
2340          ASL        R2 CR
2341          ASL        R2 CR
2342          ASL        R2 CR
2343          ASL        R2 CR
2344          ASL        R2 CR
2345          ASL        R2 CR
2346          ASL        R2 CR
2347          ASL        R2 CR
2348          ASL        R2 CR
2349          ASL        R2 CR
2350          ASL        R2 CR
2351          ASL        R2 CR
2352          ASL        R2 CR
2353          ASL        R2 CR
2354          ASL        R2 CR
2355          ASL        R2 CR
2356          ASL        R2 CR
2357          ASL        R2 CR
2358          ASL        R2 CR
2359          ASL        R2 CR
2360          ASL        R2 CR
2361          ASL        R2 CR
2362          ASL        R2 CR
2363          ASL        R2 CR
2364          ASL        R2 CR
2365          ASL        R2 CR
2366          ASL        R2 CR
2367          ASL        R2 CR
2368          ASL        R2 CR
2369          ASL        R2 CR
2370          ASL        R2 CR
2371          ASL        R2 CR
2372          ASL        R2 CR
2373          ASL        R2 CR
2374          ASL        R2 CR
2375          ASL        R2 CR
2376          ASL        R2 CR
2377          ASL        R2 CR
2378          ASL        R2 CR
2379          ASL        R2 CR
2380          ASL        R2 CR
2381          ASL        R2 CR
2382          ASL        R2 CR
2383          ASL        R2 CR
2384          ASL        R2 CR
2385          ASL        R2 CR
2386          ASL        R2 CR
2387          ASL        R2 CR
2388          ASL        R2 CR
2389          ASL        R2 CR
2390          ASL        R2 CR
2391          ASL        R2 CR
2392          ASL        R2 CR
2393          ASL        R2 CR
2394          ASL        R2 CR
2395          ASL        R2 CR
2396          ASL        R2 CR
2397          ASL        R2 CR
2398          ASL        R2 CR
2399          ASL        R2 CR
2400          ASL        R2 CR

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2338	010740	030237	000272	TSTPM:	BIT	R2,MSBITS	DOES SIMULTANEOUS SEL CTION EXIST?	CR	
2339	010744	001001			BNE	SETSTK	I YES - ALTER RETURN	CR	
2340	010746	000207			RTS	PC	I NO	CR	
2341	010750	062716	000002	SETSTK:	ADD	#2,@SP		CR	
2342	010754	000207			RTS	PC		CR	
2343				I PRINT COMMAND, STATUS, RECORD NUMBER, LENGTH					
2344									
2345				I					
2346	010756	012702	012416	PRTS:	MOV	#MSG90,R2			
2347	010762	104404			TOP				
2348	010764	017702	167226		MOV	@MTC,R2			
2349	010770	104412			OCTPRT				
2350	010772	013702	000312		MOV	STATRD,R2			
2351	010776	104412			OCTPRT				
2352	011000	013702	000336		MOV	RECORD,R2			
2353	011004	005202			INC	R2			
2354	011006	104426			DECPRT				
2355	011010	013702	000270		MOV	LENGTH,R2			
2356	011014	104426			DECPRT				
2357	011016	000207			RTS	PC			
2358				I PRINT DRIVE, PATTERN, PARITY, DENSITY					
2359	011020	012705	000240	PRTD:	MOV	#240,R5		CR	
2360	011024	104404			PRC		I PRINT SPACE	CR	
2361	011026	013705	000276		MOV	COMAND,R5		CR	
2362	011032	000305			SWAB	R5		CR	
2363	011034	142705	000170		BICB	#170,R5		CR	
2364	011040	052705	000260		BIS	#260,R5		CR	
2365	011044	104404			PRC		I PRINT DRIVE NUMBER	CR	
2366	011046	104400			SP3				
2367	011050	013705	001112		MOV	PARAM,R5		CR	
2368	011054	000305			SWAB	R5		CR	
2369	011056	006005			ROR	R5		CR	
2370	011060	042705	000170		BIC	#170,R5		CR	
2371	011064	052705	000260		BIS	#260,R5		CR	
2372	011070	104404			PRC		I PRINT PATTERN NUMBER	CR	
2373	011072	104400			SP3				
2374	011074	013717	000276	167114	MOV	COMAND,@MTC	I SELECT UNIT	CR	
2375	011102	105777	167110		TSTB	@MTC		CR	
2376	011106	100375			BPL	.-4	I WAIT FOR CU READY	CR	
2377	011110	032777	000020	167076	BIT	#20,@MTS	I IS UNIT 7 TRACK?	CR	
2378	011116	001005			BNE	PRTD1	I YES	CR	
2379	011120	012702	013315		MOV	#MSG31,R2	I 9 TRACK UNIT - POSITI N PAST P & D	CR	
2380	011124	104404			TOP			CR	
2381	011126	104400			SP3			CR	
2382	011130	000207			RTS	PC		CR	
2383	011132	013705	001112	PRTD1:	MOV	PARAM,R5		CR	
2384	011136	000305			SWAB	R5		CR	
2385	011140	042705	000176		BIC	#176,R5		CR	
2386	011144	052705	000260		BIS	#260,R5		CR	
2387	011150	104404			PRC		I PRINT PARITY	CR	
2388	011152	013705	001112		MOV	PARAM,R5		CR	
2389	011156	042705	177477		BIC	#177477,R5		CR	
2390	011162	012702	013250		MOV	#MSG26,R2			
2391	011166	022705	000100		CMP	#100,R5		CR	
2392	011172	001002			BNE	.+6			
2393	011174	012702	013260		MOV	#MSG27,R2			
2394	011200	022705	000200		CMP	#200,R5		CR	

2395	011204	001002			BNE	#+6		
2396	011206	012702	013270		MOV	#MSG28,R2		
2397	011212	022705	000300		CMF	#300,R5		
2398	011216	001002			BNE	#+6		CR
2399	011220	012702	013300		MOV	#MSG29,R2		
2400	011224	1044L4			TOP			
2401	011226	000207			RTS	PC		
2402					!PRINT	OCTAL VALUE IN REGISTER 2		
2403	011230	012705	000060		OCTPR:	MOV #0,R5	!INITIALIZE 1ST NUMBER AS 0	CR
2404	011234	005702			TST	R2	!IS VALUE POSITIVE	
2405	011236	100002			BPL	OCT1	!YES PRINT 0	
2406	011240	012705	000061		MOV	#1,R5	!NO PRINT 1	CR
2407	011244	104404			OCT1:	PRC		CR
2408	011246	006102			ROL	R2		
2409	011250	006102			ROL	R2		
2410	011252	012707	177773	011320	MOV	#-5,OCT	!COUNT 5 DIGITS	
2411	011260	006102			OCT2:	ROL R2		
2412	011262	006102			ROL	R2		
2413	011264	006102			ROL	R2		
2414	011266	010205			MOV	R2,R5	!SAVE DIGIT	CR
2415	011270	042705	177770		BIC	#177770,R5	!CLEAR OTHER BITS	CR
2416	011274	052705	000060		BIS	#60,R5	!MAKE ASCII DIGIT	CR
2417	011300	006002			ROR	R2		
2418	011302	104404			PRC		!PRINT	CR
2419	011304	006102			ROL	R2		
2420	011306	005207	011320		INC	OCT	!+1 TO DIGIT COUNT	
2421	011312	001302			BNE	OCT2	!NOT DONE	
2422	011314	104400			SP3			
2423	011316	000207			KTS	PC	!EXIT	
2424	011320	000000			OCT:	0		
2425	011322	105707	166712		OCTP:	TSTB @TPS		
2426	011326	100305			BPL	.-4	!WAIT FOR READY	
2427	011330	010507	166706		MOV	R5,@TPB	!PRINT	
2428	011334	000207			RTS	PC		CR
2429					!PRINT	DECIMAL VALUE IN REGISTER 2		
2430	011336	012707	177773	011506	DECPR:	MOV #-5,DIGCNT		
2431	011344	012707		011514	MOV	#DECPNT+2,DECPNT		
2432	011352	012707	000040	011510	MOV	#40,ZERO		
2433	011360	012707	177777	011504	TYPT1:	MOV #-1,DIGIT		
2434	011366	005207	011504		TYPT2:	INC DIGIT		
2435	011372	167702	000114		SUB	@DECPNT,R2		
2436	011376	100305			RPL	TYPT2		
2437	011400	067702	000106		ADD	@DECPNT,R2		
2438	011404	004707	011432		JSR	PC,DECOUT		
2439	011410	005207	011506		INC	DIGCNT		
2440	011414	001002			BNE	TYPT3		
2441	011416	104400			SP3			
2442	011420	000207			RTS	PC		
2443	011422	062707	000002	011512	TYPT3:	ADD #2,DECPNT		
2444	011430	000703			BR	TYPT1		
2445	011432	005707	011504		DECOUT:	TST DIGIT		
2446	011436	001010			RNE	DEC1		
2447	011440	022707	177777	011506	CMF	#-1,DIGCNT		
2448	011446	001404			BEQ	DEC1		
2449	011450	013707	011510	011504	MOV	ZERO,DIGIT		
2450	011456	000406			BR	DEC2		
2451	011460	012707	000060	011510	DEC1:	MOV #60,ZERO		

2452	011466	052757	000060	011504	BIS	#60,DIGIT		
2453	011474	013705	011504	DEC2:	MOV	DIGIT,R5		CR
2454	011500	104454			PRC			CR
2455	011502	000207			RTS	PC		
2456	011504	000000			DIGIT:	0		
2457	011506	000000			DIGCNT:	0		
2458	011510	000040			ZERO:	40		
2459	011512	011514			DECPNT:	+.2		
2460	011514	023420				10000.		
2461	011516	001750				1000.		
2462	011520	000144				100.		
2463	011522	000012				10.		
2464	011524	000001				1.		
2465					!KEYBOARD INPUT			
2466	011526	105777	166502	WAITK:	TSTB	@TKS	!WAIT FOR KEY	
2467	011532	100375			BPL	.-4		
2468	011534	105777	166500		TSTB	@TPS	!WAIT FOR TELEPRINTER EADY	
2469	011540	100375			BPL	.-4		
2470	011542	117777	166470	166472	MOVW	@TKR,@TPB	!ECHO CHARACTER	
2471	011550	117703	166462		MOVW	@TKR,R3	!SAVE IT	CR
2472	011554	042703	000200		BIC	#200,R3		CR
2473	011560	000207			RTS	PC	!EXIT	
2474					!TYPE 3 SPACES			
2475	011562	012702	011572	SP3X:	MOV	#SP3A,R2		
2476	011566	104404			TOP			
2477	011570	000207			RTS	PC		
2478	011572	057	040	040	SP3A:	.ASCII 1/ /1		
2479	011575	040	057					
2480					.EVEN			
2481	011600	142777	000177	166432	!TELETYPE OUTPUT PACKAGE			
2482	011606	112257	011664		TO:	BICR	#177,@TPS	!CLEAR TELETYPE FLAGS
2483	011612	121257	011664			MOVW	(2)+,EOMK	!SAVE MESSAGE DELIMETE
2484	011616	001001			TOP1:	CMPB	@R2,EOMK	!IS CHARACTER THE SECO D MESSAGE DELIMITER?
2485	011620	000207				BNE	+.4	!NO
2486	011622	121227	000100			RTS	PC	!YES, EXIT
2487	011626	001406				CMPB	@R2,#0	!IS CHARACTER AN @ WHI H INDICATES A CARRIAGE RET
2488	011630	105777	166404			SEQ	TOP2	!YES
2489	011634	100375				TSTB	@TPS	!NO, WAIT FOR TELETYPE READY
2490	011636	112277	166400			BPL	.-4	
2491	011642	000703				MOVW	(2)+,@TPB	!PRINT CHARACTER
2492						BR	TOP1	
2493	011644	012705	000215		!CARRIAGE RETURN, LINE FEED			
2494	011650	104454			TOP2:	MOV	#215,R5	
2495	011652	012705	000212			PRC		!CR
2496	011656	104454				MOV	#212,R5	
2497	011660	105202				PRC		!LF
2498	011662	000703				INCB	R2	
2499	011664	000000				BR	TOP1	
2500	011666	012757	000004	000246	EOMK:	0		
2501	011674	012757	002000	000244	SET4K:	MOV	#4,.MINLEN	!SET RECORD LENGTHS AN
2502	011702	012757	015324	000252		MOV	#1024,.MAXLEN	!BUFFER AREAS FOR 4K
2503	011710	000207				MOV	#BUFFER+1024,.RBUF	
2504	011712	012757	000010	000246		RTS	PC	
2505	011720	012757	004000	000244	SET8K:	MOV	#8,.MINLEN	!SET RECORD LENGTHS AN
2506	011726	012757	017324	000252		MOV	#2048,.MAXLEN	!BUFFER AREAS FOR 8K
2507	011734	000207				MOV	#BUFFER+2048,.RBUF	
						RTS	PC	CR

2508											
2509	011736	005037	007260								
2510	011742	005037	007262								
2511	011746	032777	000020	166240							
2512	011754	001406									
2513	011756	022737	000001	001146							
2514	011764	001407									
2515	011766	104416									
2516	011770	000207									
2517	011772	022737	000002	001146	G1:						
2518	012000	001401									
2519	012002	104432									
2520	012004	000207									
2521											
2522	012006	011606	000002								
2523	012012	162716	000002								
2524	012016	013646									
2525	012020	062716	105426								
2526	012024	013607									
2527	012026	011506									
2528	012030	004570									
2529	012032	011600									
2530	012034	004010									
2531	012036	004124									
2532	012040	011230									
2533	012042	004026									
2534	012044	006014									
2535	012046	004070									
2536	012050	004304									
2537	012052	007204									
2538	012054	011336									
2539	012056	011502									
2540	012060	006506									
2541	012062	011302									
2542	012064	011606									
2543	012066	011712									
2544	012070	011736									
2545		104400									
2546		104402									
2547		104404									
2548		104406									
2549		104410									
2550		104412									
2551		104414									
2552		104416									
2553		104420									
2554		104422									
2555		104424									
2556		104426									
2557		104430									
2558		104432									
2559		104434									
2560		104436									
2561		104440									
2562		104442									
2563											
2564	012072	057	077	100							

!PATTERN GENERATION CONTROL

GENP: CLR LONUM !RESET RANDOM NUMBER GENERATOR

CLR HINUM

BIT #20,AMTS !IS UNIT 7 TRACK?

BEQ G1 ! NO

CMP #1,PGMODE !IS A 7 TRACK PATTERN AVAILABLE?

BEQ G2 ! YES

GENPT7 ! NO - GENERATE IT

RTS PC

G1: CMP #2,PGMODE !IS A 9 TRACK PATTERN AVAILABLE?

BEQ G2 ! YES

GENPT9 ! NO - GENERATE IT

G2: RTS PC

!TRAP HANDLER

TRAP34: MOV @SP,2(6)

SUB #2,@SP

MOV @6)+,-(6)

ADD #TABLE-104400,@SP

MOV @6)+,PC

TABLE: WAITK

WRITI

TO

SVCTR

RSFDR

OCTPR

MVCTR

GENP7

CLRAL

CHGDR

READI

DECPR

SP3X

GENP9

OCTP

SET4K

SET8K

GENP

WAITKY=104400

WRITIT=104402

TOP=104404

SVCTRS=104406

RSFDRV=104410

OCTPRT=104412

MVCTRS=104414

GENPT7=104416

CLRALL=104420

CHGDRV=104422

READIT=104424

DECPRT=104426

SP3=104430

GENPT9=104432

PRC=104434

SETM4K=104436

SETM8K=104440

GENPT=104442

!TEXT MESSAGES

MSG0: .ASCII

	012075	040	057					
2565	012077	057	100	123	MSG1:	.ASCII		/@SELECT UNITS /I
	012102	105	114	105				
	012105	103	124	040				
	012110	125	116	111				
	012113	124	123	040				
	012116	040	057					
2566	012120	057	100	124	MSG2:	.ASCII		/@TSI PAT PAR DEN RLS WMO RM00 /I
	012123	123	124	040				
	012126	129	101	124				
	012131	040	120	101				
	012134	122	040	104				
	012137	105	116	040				
	012142	122	114	123				
	012145	040	127	115				
	012150	117	040	122				
	012153	115	117	100				
	012156	040	057					
2567	012160	057	115	101	MSG5:	.ASCII		/MAX TESTS SELECTED@/
	012163	130	040	124				
	012166	105	123	124				
	012171	123	040	123				
	012174	105	114	105				
	012177	105	124	105				
	012202	104	100	057				
2568	012205	057	040	117	MSG6:	.ASCII		/ OK/I
	012210	113	057					
2569	012212	057	100	127	MSG7:	.ASCII		/@WRITE STATUS ERROR@ I
	012215	122	111	124				
	012220	105	040	123				
	012223	124	101	124				
	012226	125	123	040				
	012231	105	122	122				
	012234	117	122	100				
	012237	057						
2570	012240	057	105	116	MSG8:	.ASCII		/END OF TAPE***** @*****@I
	012243	104	040	117				
	012246	106	040	124				
	012251	101	120	105				
	012254	052	052	052				
	012257	052	052	052				
	012262	052	052	052				
	012265	052	052	052				
	012270	052	052	052				
	012273	052	052	052				
	012276	052	052	100				
2571	012301	104	122	126		.ASCII		/DRV PAT PAR DEN MODE RECORD LENGTH@/I CR
	012304	040	120	101				
	012307	124	040	120				
	012312	101	122	040				
	012315	104	105	116				
	012320	040	040	115				
	012323	117	104	105				
	012326	040	122	105				
	012331	105	117	122				
	012334	104	040	114				
	012337	105	116	107				

2578	012604	057	100	105	MSG108: .ASCII	/@EXERCISING UNITS/
	012607	130	105	122		
	012612	103	111	123		
	012615	111	116	107		
	012620	040	125	116		
	012623	111	124	123		
	012626	057				
2579	012627	057	130	111	MSG11: .ASCII	/XIRG WRITTEN 4 TIMES /
	012632	122	107	040		
	012635	127	122	111		
	012640	124	124	105		
	012643	116	040	064		
	012646	040	124	111		
	012651	115	105	123		
	012654	057				
2580	012655	057	040	123	MSG12: .ASCII	/ SSTP /
	012660	123	124	120		
	012663	040	057			
2581	012665	057	040	122	MSG13: .ASCII	/ RNDM /
	012670	116	104	115		
	012673	040	057			
2582	012675	057	040	116	MSG14: .ASCII	/ NSTP /
	012700	123	124	120		
	012703	040	057			
2583	012705	057	115	055	MSG15: .ASCII	/M-MAX/
	012710	115	101	130		
	012713	057				
2584	012714	057	115	055	MSG16: .ASCII	/M-MIN/
	012717	115	111	116		
	012722	057				
2585	012723	057	115	111	MSG17: .ASCII	/MIN /
	012726	116	040	040		
	012731	057				
2586	012732	057	115	101	MSG18: .ASCII	/MAX /
	012735	130	040	040		
	012740	057				
2587	012741	057	100	127	MSG19: .ASCII	/@WRITE ERRORS = /
	012744	122	111	124		
	012747	105	040	105		
	012752	122	122	117		
	012755	122	123	040		
	012760	075	040	057		
2588	012763	057	100	122	MSG20: .ASCII	/@RECOVERED AT 0 /
	012766	105	103	117		
	012771	126	105	122		
	012774	105	104	040		
	012777	101	124	040		
	013002	060	040	057		
2589	013005	057	100	120	MSG20A: .ASCII	/@PERMANENT BADSPOTS /
	013010	105	122	115		
	013013	101	116	105		
	013016	116	124	040		
	013021	102	101	104		
	013024	123	120	117		
	013027	124	123	040		
	013032	075	040	057		
2590	013035	057	100	122	MSG21: .ASCII	/@READ STATUS ERRORS /

	013040	105	101	104		
	013043	040	123	124		
	013046	101	124	125		
	013051	123	040	105		
	013054	122	122	117		
	013057	122	123	040		
	013062	075	040	057		
2591	013065	057	100	104	MSG22: .ASCII	I/O DATA ERRORS = /I
	013070	101	124	101		
	013073	040	105	122		
	013076	122	117	122		
	013101	123	040	075		
	013104	040	057			
2592	013106	057	100	116	MSG23: .ASCII	I/O NON RECOVERABLE ERR RS = /I
	013111	117	116	040		
	013114	122	105	103		
	013117	117	126	105		
	013122	122	101	102		
	013125	114	105	040		
	013130	105	122	122		
	013133	117	122	123		
	013136	040	075	040		
	013141	057				
2593	013142	057	100	052	MSG24: .ASCII	I/O***** WRITE PASS /I
	013145	052	052	052		
	013150	052	052	052		
	013153	052	052	052		
	013156	052	052	052		
	013161	052	052	052		
	013164	052	052	052		
	013167	052	127	122		
	013172	111	124	105		
	013175	040	120	101		
	013200	123	123	040		
	013203	040	057			
2594	013205	047	100	052	MSG25: .ASCII	I/O***** READ PASS /I
	013210	052	052	052		
	013213	052	052	052		
	013216	052	052	052		
	013221	052	052	052		
	013224	052	052	052		
	013227	052	052	052		
	013232	052	122	105		
	013235	101	104	040		
	013240	120	101	123		
	013243	123	040	040		
	013246	040	057			
2595	013250	057	040	040	MSG26: .ASCII	I/ 200/I
	013253	040	062	060		
	013256	060	057			
2596	013260	057	040	040	MSG27: .ASCII	I/ 556/I
	013263	040	065	065		
	013266	066	057			
2597	013270	057	040	040	MSG28: .ASCII	I/ 800/I
	013273	040	070	060		
	013276	060	057			
2598	013300	057	040	040	MSG29: .ASCII	I/ CD /I

	013303	040	103	104				
	013306	040	057					
2599	013310	057	100	100	MSG30:	.ASCII	1/000/1	
	013313	100	057					
2600	013315	057	130	040	MSG31:	.ASCII	1/X X/1	CR
	013320	040	040	130				
	013323	057						
2601						.EVEN		
2602	013324	013324			BUFFER:	.	WRITE BUFFER BEGINS HERE	
2603		000001.				.END		

P468
SYMBOL TABLE

ALLEOS	004422	ALLEOT	004400	ALL1	004402
ALL2	004504	ALL3	004500	ATST	000256
AUTOST	001152	BACK1	010032	BC	000220
BLKINC	000310	BUFFER	013324	CA	000222
CC	000230	CDMEND	004474	CDRIVE	000302
CDRVBT	000300	CHGOR	004304	CHGORV=	104422
CHG1	004330	CLRAL	004070	CLRALL=	104420
CLRTBL	004506	CLRT1	004512	CLR1	004072
COMAND	000276	CTRDIX	004044	CTROMP	004442
CTRD1	004470	DAERRS	000346	DATEHR	007556
DATER1	007616	DECOUT	011432	DECPNT	011512
DECPR	011336	DECPRT=	104426	DEC1	011460
DEC2	011474	DET7T	002120	DET7T1	002132
DET7T2	002150	DET7T3	002164	DIGCNT	011506
DIGIT	011504	DOAGN	002774	DOLLR1	007300
DOLLRS	007440	DONE	002704	DONE1	002746
DRVADR	000360	DRVSEL	000264	D0TAB	000450
D1TAB	000514	D2TAB	000560	D3TAB	000624
D4TAB	000670	D5TAB	000734	D6TAB	001000
D7TAB	001044	ENDADR	002764	ENDTAP	005530
ENDT1	005542	EOMK	011664	ERROR	005300
ERR1	005322	EXEC	002614	EXECUT	002602
EXEC1	002622	GENP	011736	GENPT =	104442
GENPT7=	104416	GENPT9=	104432	GENP7	006014
GENP9	006506	GOBKWD	010540	GOB1	010564
GOB2	010636	GOB3	010652	GOWALT	004532
GW1	004566	G1	011772	G2	012004
HINUM	007262	IDSELF	001410	LASRCR	000342
LENGTH	000270	LONUM	007260	LOOPER	001476
MAXLEN	000244	MEM4K	001552	MEM8K	001556
MINLEN	000246	MODES	000356	MSBITS	000272
MSG0	012072	MSG1	012077	MSG10A	012502
MSG10B	012604	MSG11	012627	MSG12	012655
MSG13	012665	MSG14	012675	MSG15	012705
MSG16	012714	MSG17	012723	MSG18	012732
MSG19	012741	MSG2	012120	MSG20	012763
MSG20A	013005	MSG21	013035	MSG22	013065
MSG23	013106	MSG24	013142	MSG25	013205
MSG26	013250	MSG27	013260	MSG28	013270
MSG29	013300	MSG30	013310	MSG31	013315
MSG5	012160	MSG6	012205	MSG7	012212
MSG8	012240	MSG9	012346	MSG9A	012373
MSG9B	012416	MTC	000216	MTS	000214
MTV	000254	MVCTR	004026	MVCTRS=	104414
MV1	004032	NOINCR	004660	NONSTP	004726
NO.SEL	001376	NRREAD	000350	NUMTST	001110
NXMHLT	001244	NXT.TU	001316	OCT	011320
OCTP	011322	OCTPR	011230	OCTPRT=	104412
OCT1	011244	OCT2	011260	OVER4K	001252
PARAM	001112	PATCK	006054	PATEN	006074
PATEN1	006100	PATEN2	006112	PATE0	006154
PATE1	006170	PATE2	006220	PATE3	006234
PATE4	006250	PATE5	006274	PATE7	006360
PAT00	006162	PAT01	006204	PAT02	006226
PAT03	006242	PAT05	006322	PATPNT	006540
PATPST	006114	PAT0	006560	PAT1	006574
PAT1A	006600	PAT2	006644	PAT3	006660

P468
SYMBOL TABLE

PAT3A	006664	PAT4	006730	PAT5	006756
PAT5A	006762	PAT6	006352	PAT69	007072
PAT7	007106	PERMBS	000334	PE1	006176
PE5	006302	PFIL1	006410	PFIL3	006422
PFIL3A	006430	PFIL9	006454	PFIL9A	006462
PGMODE	001146	P01	006212	P05	006330
PRC =	104434	PRTD	011020	PRTD1	011132
PRTS	010756	P1T	006622	P3T	006706
P4	006734	P4A	006754	P5T	007004
RANDOM	007256	RANGEN	007126	RANG1	007154
RANSTP	005110	KAN1	005122	KBUF	000252
RDERRO	007634	KDERRS	000344	RDINCR	007762
RDPASS	000304	RDSTP	007540	RDSTPC	007500
ROSTPD	007306	READGO	007330	READI	007264
READIT=	104424	READLN	000354	READMP	010124
RECORD	000336	RESETL	005254	KESTRL	010022
RESTR1	010030	REWIND	004342	RG1	007340
RNDROD	007510	RNDS1	007522	RNDTAP	010076
RNDTP1	010110	RPASS1	007736	RPASS3	007742
RSFDR	004124	RSFDRV=	104410	RSF1	004136
RSF2	004162	RSF3	004232	KTSREC	007674
RTSR1	007710	RTSSTP	007452	SELDN1	002264
SELDN2	002300	SELDN3	002312	SELDNV	001622
SEL01	001652	SEL02	001666	SELOK1	002574
SELPAT	002034	SELPR	002236	SELPH0	002214
SELRM1	002460	SELRM2	002476	SELR1	002340
SELR2	002354	SELK3	002366	SELTST	001750
SELT1	001766	SELT2	002010	SELT3	002024
SELW1	002414	SELW15	002426	SELW2	002432
SETM4K=	104436	SETM6K=	104440	SETSTK	010750
SET4K	011666	SET0K	011712	SP3 =	104430
SP3A	011572	SP3x	011562	SR	000232
STACK =	000450	START	001560	START1	001564
STATRO	000312	STFLGS	001150	STOPOP	005100
STRECI	005436	STRLEN	000266	STRTOP	004720
SVCTR	004010	SVCTNS=	104406	SVC1	004014
SVRECR	000274	TABLE	012026	TESINC	005206
TESRC1	005402	TESREC	005352	TEST	001116
TEST0	003004	TEST1	003052	TEST2	003062
TEST3	003176	TEST4	003206	TEST5	003526
TKB	000236	TKS	000234	TO	011600
TOP =	104404	TOP1	011612	TOP2	011644
TPB	000242	TPS	000240	TRAP34	012006
TSINC2	005262	TSINC3	005276	TSTEX	001114
TSTPM	010740	TSTSTP	005022	TSTBL	001120
TSTUM4	010730	TSTUP4	010716	TU.SEL	001254
TYPT1	011360	TYPT2	011366	TYPT3	011422
T0	003014	T0A	003016	T0B	003034
T01ENT	003012	T2	003072	T2A	003074
T2B	003112	T2C	003116	T2D	003136
T2E	003142	T2F	003156	T23ENT	003070
T4	003240	T4A	003242	T4B	003244
T4C	003270	T4D	003272	T4E	003324
T4F	003340	T4G	003356	T4H	003360
T4J	003376	T4K	003404	T4L	003406
T4M	003460	T4N	003472	T4P	003476
T5	003536	T5A	003562	T5B	003574

T5C	003604	T5D	003634	T5E	003642
T5F	003704	T5FLAG	004004	T5G	003716
T5H	003734	T5INC	004006	T5J	003736
T5K	003756	USSTST	001330	USS,OK	001346
USS10	001372	VALID	001676	VAL1	001710
VAL2	001720	VAL3	001734	VAL4	001740
WAITK	011526	WAITKY=	104400	WBUF	000250
WRCHK	000314	WRIT1	004570	WRITIT=	104402
JRPASS	000306	WRRECR	000340	WRTDMP	005556
WRTD1	005734	WRTD2	005756	WRTLEN	000352
W1	004636	W10	005066	W11	005140
W12	005174	W3	004704	XRGRCO	010434
XRGREC	010322	XRGO	010330	XRG5	010442
ZERO	011510	ZER000	001516		
.ABS.	013326				
	000000	000			
		001			

ERRORS DETECTED: 0
FREE CORE: 10314. WORDS
P468,P468/CRFKP468

CROSS REFERENCE TABLE S-1

ALLEOS	1-1551	1-1555#					
ALLEOT	1-1306	1-1340	1-1411	1-1452	1-1464	1-1548#	
ALL1	1-1549#	1-1553					
ALL2	1-1556	1-1558	1-1571#				
ALL3	1-1554	1-1570#					
ATST	1- 906#	1- 983#	1-1068#	1-1091			
AUTOST	1- 885	1- 982#					
BACK1	1-1706	1-1707	1-2176	1-2196#	1-2250		
BC	1- 890#	1-1011#	1-1612#	1-1711#	1-2104#	1-2105#	1-2198#
	1-2263#	1-2264#	1-2298#	1-2299#	1-2300#		
BLKINC	1- 919#	1-1531#	1-1595#	1-1599#	1-1666	1-1668	1-2185
	1-2188						
BUFFER	1- 902	1- 903	1- 992	1-1040#	1-1041	1-1059	1-2502
	1-2506	1-2602#					
CA	1- 891#	1-1613#	1-2106#	1-2265#			
CC	1- 894#	1-1580#	1-1584#				
COMEND	1-1566	1-1568#					
CORTVE	1- 916#	1-1494	1-1485	1-1499#	1-1503#	1-1507	1-1528#
CORVRT	1- 915#	1-1500#	1-1501	1-1505#	1-1509	1-1530#	1-1535
	1-2304						
CHGDR	1-1528#	1-1536	1-2536				
CHGDRV	1-1304	1-1524	1-1331	1-1338	1-1362	1-1373	1-1380
	1-1388	1-1404	1-1409	1-1436	1-1450	1-1460	1-1493
	1-1552	1-1568	1-2554#				
CHG1	1-1531	1-1535#					
CLRAL	1-1489#	1-2535					
CLRALL	1-1297	1-1317	1-1357	1-1420	1-2553#		
CLRTBL	1-1491	1-1573#					
CLRT1	1-1574#	1-1576					
CLR1	1-1490#	1-1494					
COMAND	1- 914#	1-1507#	1-1508#	1-1511#	1-1514#	1-1518#	1-1521#
	1-1524#	1-1541	1-1601	1-1712	1-2094	1-2107	1-2199
	1-2261	1-2305	1-2309#	1-2313#	1-2314	1-2361	1-2374
CTRDEX	1-1470	1-1476	1-1482#				
CTRDMP	1-1560#	1-1569					
CTRD1	1-1563	1-1567#					

DATERR	1-2122	1-2145H						
DATER1	1-2146	1-2155H						
DECOUT	1-2438	1-2445H						
DECPNT	1-2431a	1-2435	1-2437	1-2443a	1-2459H			
DECPR	1-2430H	1-2438						
DFCPRT	1-1031	1-1133	1-1738	1-1755	1-1764	1-1774	1-2224	
	1-2241	1-2245	1-2249	1-2334	1-2356	1-2556H		
DEC1	1-2446	1-2448	1-2451H					
DEC2	1-2450	1-2453H						
DET7T	1-1148H	1-1161						
DET7T1	1-1150H	1-1153						
DET7T2	1-1151	1-1155H						
DET7T3	1-1154	1-1156	1-1158H					
DIGCNT	1-2430a	1-2439a	1-2447	1-2457H				
DIGIT	1-2433a	1-2434a	1-2445	1-2449a	1-2452a	1-2453	1-2456H	
DOAGN	1-1284	1-1292H						
DOLLR1	1-2091	1-2093H						
DOLLR5	1-2121H	1-2124						
DONE	1-1273H	1-1308	1-1342	1-1413	1-1454	1-1466		
DONE1	1-1276	1-1290	1-1283H					
ORVADR	1- 939H	1-1472	1-1478	1-1483				

CROSS REFERENCE TABLE S-2

DRVSEL	1- 909#	1-1004#	1-1010	1-1023#	1-1146#	1-1148	1-1158#
00TAB	1- 939	1- 949#	1- 950				
01TAB	1- 940	1- 951#	1- 952				
02TAB	1- 941	1- 953#	1- 954				
03TAB	1- 942	1- 955#	1- 956				
04TAB	1- 943	1- 957#	1- 958				
05TAB	1- 944	1- 959#	1- 960				
06TAB	1- 945	1- 961#	1- 962				
07TAB	1- 946	1- 963#	1- 964				
ENDADR	1-1286	1-1288#					
ENDTAP	1-1683	1-1704	1-1719#				
EMDT1	1-1564	1-1721#					
EOMK	1-2482#	1-2483	1-2499#				
ERROR	1-1619	1-1682#					
ERR1	1-1685	1-1687#					
EXEC	1-1256#	1-1293					
EXECUT	1-1061	1-1083	1-1117	1-1254#			
EXEC1	1-1257#	1-1782					
GENP	1-2509#	1-2544					
GENPT	1-1604	1-2408	1-2562#				
GENPT7	1-2515	1-2552#					
GENPT9	1-2519	1-2558#					
GENP7	1-1778#	1-2534					
GENP9	1-1925#	1-2540					
GOBKWD	1-1329	1-1586	1-2293#				
GOB1	1-2295	1-2538#					
GOB2	1-2306	1-2511#					
GOB3	1-2308	1-2510	1-2312	1-2314#			
GOWAIT	1-1545	1-1580#	1-1615	1-1714	1-2110	1-2201	1-2268
	1-2290	1-2521					
GW1	1-1581	1-1586#					
G1	1-2512	1-2517#					
G2	1-2514	1-2518	1-2520#				
HINUM	1- 989#	1-1071#	1-2057	1-2067	1-2079#	1-2088#	1-2510#
IDSELF	1-1009	1-1028#					
LASRCR	1- 932#	1-1074	1-1396	1-1399#	1-1400#	1-1402#	1-1407
	1-1433#	1-1434#	1-1442	1-1445#	1-1446#	1-1448#	1-1457
	1-2128	1-2141	1-2293#	1-2298			
LENGTH	1- 911#	1-1631#	1-2149#	1-2166#	1-2282#	1-2355	
LONUM	1- 988#	1-1070#	1-2056	1-2065	1-2078#	1-2087#	1-2509#
LOOPER	1-1047#	1-1036					
MAXLEN	1- 900#	1-1032	1-1590	1-1671	1-2191	1-2501#	1-2505#
MEM4K	1- 886	1-1064#					
MEM8K	1- 887	1-1067#					
MINLEN	1- 901#	1-1030	1-1594	1-1669	1-2189	1-2500#	1-2504#
MODES	1- 938#	1-1254#	1-1296#	1-1300	1-1311#	1-1316#	1-1320
	1-1327	1-1334	1-1347#	1-1352#	1-1355#	1-1356#	1-1364#
	1-1367	1-1375	1-1378	1-1384	1-1392	1-1419#	1-1423
	1-1428#	1-1431	1-1440	1-1459#	1-1462	1-1495#	1-1550
	1-1557	1-1565	1-1575	1-1577#	1-1632	1-1634	1-1637
	1-1655	1-1657	1-1660	1-1665#	1-1676#	1-1699	1-1720#
	1-2206#						
MSBITS	1- 912#	1-1006#	1-1022#	1-1034	1-1047	1-1074#	1-1079
	1-1099	1-1101#	1-1103#	1-1501	1-1535	1-2338	
MSG0	1-1122	1-2564#					
MSG1	1-1072	1-2565#					
MSG10A	1-1028	1-2575#					
MSG10B	1-1038	1-257#					

CROSS REFERENCE TABLE S-3

MSG11	1-2284	1-2579H					
MSG12	1-1732	1-2218	1-2580H				
MSG13	1-1735	1-2221	1-2581H				
MSG14	1-1729	1-2215	1-2582H				
MSG15	1-1747	1-2233	1-2583H				
MSG16	1-1750	1-2236	1-2584H				
MSG17	1-1741	1-2227	1-2585H				
MSG18	1-1744	1-2230	1-2586H				
MSG19	1-1752	1-2287H					
MSG2	1-1108	1-2236H					
MSG20	1-1757a	1-1158a	1-1761	1-2588H			
MSG20A	1-1771	1-2289H					
MSG21	1-2238	1-2290H					
MSG22	1-2242	1-2291H					
MSG23	1-2246	1-2292H					
MSG24	1-1721	1-2293H					
MSG25	1-2207	1-2294H					
MSG26	1-2390	1-2295H					
MSG27	1-2393	1-2296H					
MSG28	1-2396	1-2297H					
MSG29	1-2399	1-2298H					
MSG30	1-1273	1-2299H					
MSG31	1-1164	1-2279	1-2600H				
MSG5	1-1251	1-2257H					
MSG6	1-1234	1-2268H					
MSG7	1-1689	1-2280	1-2569H				
MSG8	1-1723	1-2209	1-2570H				
MSG9	1-2164	1-2272H					
MSG9A	1-2147	1-2273H					
MSG9B	1-2346	1-2274H					
NTC	1- 809H	1-1003a	1-1008	1-1010a	1-1148a	1-1539	1-1541a
	1-1544a	1-1022a	1-1601a	1-1602	1-1614a	1-1618	1-1712a
	1-1713a	1-1115a	1-1716a	1-2094a	1-2095	1-2107a	1-2109a
	1-2114	1-2199a	1-2200a	1-2202a	1-2259	1-2261a	1-2262a
	1-2271	1-2286a	1-2289a	1-2314a	1-2315	1-2319a	1-2320a
	1-2348	1-2274a	1-2375				
MTS	1- 888H	1-1012	1-1017	1-1019	1-1150	1-1155	1-1542a
	1-1609a	1-1017	1-1708	1-2097a	1-2113	1-2196a	1-2266a
	1-2270	1-2217a	1-2377	1-2511			
MTV	1- 904H	1-1181a					
MVCTR	1-1476H	1-2233					
MVCTRS	1-1299	1-1219	1-1326	1-1333	1-1359	1-1366	1-1377
	1-1383	1-1231	1-1406	1-1430	1-1439	1-1456	1-1549
	1-1561	1-2231H					
MV1	1-1477H	1-1479					
NOINCR	1-1589	1-1298	1-1600H				
NONSTP	1-1611H	1-1630	1-1635	1-1638			
NO.SEL	1-1016	1-1018	1-1023H				
NRREAD	1- 935H	1-2178a	1-2248				
NUMTST	1- 965H	1- 987a	1-1110a	1-1115	1-1247a	1-1248	1-1283a
NYMRET	1- 991	1- 994H					
NXT.TU	1-1010H	1-1026					
OCT	1-2410a	1-2420a	1-2424H				
OCTP	1-2425H	1-2241					
OCTPR	1-2403H	1-2232					
OCTPRT	1-2152	1-2154	1-2349	1-2351	1-2550H		
OCT1	1-2405	1-2407H					
OCT2	1-2411H	1-2421					

CROSS REFERENCE TABLL S-4

OVER4K	1- 993	1- 997H					
PARAM	1- 966H	1-1256a	1-1257	1-1277	1-1281a	1-1397	1-1443
	1-1516	1-1519	1-1522	1-1592	1-1597	1-1627	1-1640
	1-1727	1-1739	1-1780	1-1789	1-1791	1-1927	1-2125
	1-2131	1-2213	1-2225	1-2367	1-2383	1-2388	
PATCK	1-1785	1-1789H					
PATEN	1-1790	1-1793H					
PATEN1	1-1794H	1-1796					
PATEN2	1-1792	1-1797H					
PATE0	1-1798	1-1816H					
PATE1	1-1800	1-1823H					
PATE2	1-1802	1-1836H					
PATE3	1-1804	1-1843H					
PATE4	1-1806	1-1850H	1-1856	1-1857			
PATE5	1-1808	1-1862H					
PATE7	1-1812	1-1870H	1-1892	1-1895			
PAT00	1-1799	1-1819H					
PAT01	1-1801	1-1829H					
PAT02	1-1803	1-1839H					
PAT03	1-1805	1-1846H					
PAT05	1-1809	1-1873H					
PATPNT	1-1930	1-1952H					
PATPST	1-1784	1-1798H					
PAT10	1-1932	1-1942H	1-1944				
PAT11	1-1933	1-1948H	1-1955				
PAT1A	1-1949H	1-1954					
PAT2	1-1934	1-1953	1-1967H	1-1969			
PAT3	1-1935	1-1973H	1-1980				
PAT3A	1-1974H	1-1979					
PAT4	1-1807	1-1956	1-1978	1-1992H			
PAT5	1-1937	1-2001H	1-2008				
PAT5A	1-2002H	1-2007					
PAT6	1-1810	1-1811	1-1886H				
PAT69	1-1938	1-2006	1-2038H	1-2040			
PAT7	1-1813	1-1939	1-2044H	1-2047			
PC	1- 875H	1-1488a	1-1306a	1-1329a	1-1340a	1-1386a	1-1411a
	1-1425a	1-1452a	1-1464a	1-1470a	1-1474a	1-1476a	1-1480a
	1-1487a	1-1490a	1-1491a	1-1497a	1-1515a	1-1525a	1-1534a
	1-1545a	1-1546a	1-1564a	1-1567a	1-1571a	1-1578a	1-1585a
	1-1607a	1-1615a	1-1631a	1-1636a	1-1639a	1-1645a	1-1654a
	1-1659a	1-1652a	1-1677a	1-1692a	1-1701a	1-1706a	1-1707a
	1-1714a	1-1726a	1-1770a	1-1775a	1-1786a	1-1797a	1-1854a
	1-1890a	1-1896a	1-1901a	1-1908a	1-1919a	1-1931a	1-1945a
	1-1952a	1-1970a	1-1977a	1-1997a	1-2005a	1-2041a	1-2044a
	1-2048a	1-2084a	1-2110a	1-2127a	1-2130a	1-2135a	1-2140a
	1-2143a	1-2150a	1-2167a	1-2176a	1-2194a	1-2201a	1-2203a
	1-2205a	1-2212a	1-2250a	1-2258a	1-2268a	1-2274a	1-2283a
	1-2290a	1-2291a	1-2296a	1-2297a	1-2307a	1-2311a	1-2321a
	1-2322a	1-2340a	1-2342a	1-2357a	1-2382a	1-2401a	1-2423a
	1-2428a	1-2438a	1-2442a	1-2455a	1-2473a	1-2477a	1-2485a
	1-2503a	1-2507a	1-2516a	1-2520a	1-2526a		
PERMBS	1- 929H	1-1638a	1-1768	1-1773			
PE1	1-1823	1-1825H					
PES	1-1862	1-1864H					
PFIL1	1-1817	1-1820	1-1837	1-1840	1-1844	1-1847	1-1887
	1-1898H	1-1900					
PFIL3	1-1824	1-1850	1-1903H				
PFIL3A	1-1905H	1-1912					

CROSS-REFERENCE TABLE S-5

PFIL9	1-1063	1-1070	1-1010					
PFIL9A	1-1016	1-1023						
PGMODE	1-980	1-1050	1-1770	1-1025	1-2513	1-2517		
P01	1-1029	1-1031						
P05	1-1073	1-1075						
PRC	1-1009	1-1105	1-2360	1-2365	1-2372	1-2387	1-2507	
	1-2418	1-2454	1-2494	1-2496	1-2559			
PRTD	1-1726	1-2012	1-2359					
PRTD1	1-2378	1-2083						
PRTS	1-1692	1-2150	1-2167	1-2283	1-2346			
P1T	1-1948	1-1056						
P3T	1-1973	1-1051						
P4	1-1993	1-1096						
P4A	1-1992	1-1093	1-1994	1-1998				
P5T	1-2001	1-2009						
RANDOM	1-1646	1-1000	1-1891	1-1893	1-2045	1-2077	1-2086	
	1-2134	1-2158						
RANGEN	1-1645	1-1090	1-2044	1-2052	1-2133			
RANG1	1-2060	1-2064						
RANSTP	1-1645							
RAN1	1-1647	1-1051						
RBUF	1-903	1-1095	1-1852	1-1894	1-1899	1-1906	1-1917	
	1-1943	1-1050	1-1968	1-1975	1-1995	1-2003	1-2039	
	1-2046	1-2099	1-2106	1-2118	1-2502	1-2506		
RDERR0	1-2115	1-2160						
RDERRS	1-933	1-2171	1-2240					
RDINCR	1-2127	1-2140	1-2184	1-2205				
RDPASS	1-917	1-2093	1-2155	1-2169	1-2174	1-2179		
R0STP	1-2132	1-2140	1-2182					
R0STPC	1-2126	1-2131						
R0STPD	1-2094	1-2142	1-2177					
READGO	1-2099	1-2129						
READI	1-2090	1-2037						
READIT	1-1336	1-1401	1-1447	1-2555				
READLN	1-937	1-2092	1-2100	1-2104	1-2120	1-2149	1-2166	
	1-2188	1-2189	1-2191	1-2193				
READMP	1-2212							
RECORD	1-930	1-1060	1-1394	1-1399	1-1407	1-1426	1-1427	
	1-1433	1-1445	1-1457	1-1588	1-1600	1-1664	1-1674	
	1-1719	1-1057	1-2090	1-2128	1-2141	1-2184	1-2223	
	1-2293	1-2294	1-2352					
RESETL	1-1670	1-1073						
RESTRL	1-2190	1-2193						
RESTR1	1-2186	1-2092	1-2194					
REWIND	1-1490	1-1039	1-2296					
RG1	1-2101	1-2103						
RNDROS	1-2133							
RND0S1	1-2135	1-2159						
RNDTAP	1-2161	1-2005						
RNDTP1	1-1567	1-2151	1-2207					
RPASS1	1-2175	1-2070						
RPASS3	1-2173	1-2079						
RSFDR	1-1499	1-2031						
RSFDKV	1-1298	1-1018	1-1358	1-1365	1-1382	1-1390	1-1429	
	1-1438	1-1455	1-1489	1-1532	1-1548	1-1560	1-2549	
RSF1	1-1501	1-1006						
RSF2	1-1502	1-1007	1-1537					
RSF3	1-1510	1-1016						

CROSS REFERENCE TABLE S-6

RTSREC	1-2163	1-2169#					
RTSR1	1-2158	1-2172#					
RTSSTP	1-2125#						
R0	1- 868#	1-1007#	1-1021	1-1022	1-1025#	1-1042#	1-1049
	1-1054#	1-1055	1-1094#	1-1097#	1-1099	1-1101	1-1103
	1-1111#	1-1157	1-1257#	1-1258#	1-1260	1-1262	1-1264
	1-1266	1-1268	1-1277#	1-1278#	1-1279	1-1472	1-1478
	1-1482#	1-1573#	1-1575	1-1622#	1-1623#	1-1624#	1-1625#
	1-1756#	1-1759	1-1766	1-1948#	1-1953	1-1973#	1-1978
	1-2001#	1-2006	1-2052	1-2056#	1-2060#	1-2065#	1-2069#
	1-2075#	1-2077	1-2078	1-2083#	1-2099#	1-2118#	
R1	1- 869#	1-1041#	1-1045#	1-1046#	1-1049#	1-1050#	1-1051#
	1-1057#	1-1058#	1-1483#	1-1494#	1-1465#	1-1486#	1-2053
	1-2057#	1-2061#	1-2066#	1-2067#	1-2070#	1-2072#	1-2076#
	1-2079	1-2082#	1-2100#	1-2102#	1-2119#		
R2	1- 870#	1-1011#	1-1014#	1-1028#	1-1030#	1-1032#	1-1038#
	1-1043#	1-1047	1-1053#	1-1059#	1-1072#	1-1108#	1-1122#
	1-1149#	1-1152#	1-1164#	1-1234#	1-1251#	1-1273#	1-1285#
	1-1689#	1-1721#	1-1723#	1-1729#	1-1732#	1-1735#	1-1737#
	1-1741#	1-1744#	1-1747#	1-1750#	1-1752#	1-1754#	1-1761#
	1-1763#	1-1771#	1-1773#	1-1779#	1-1793#	1-1795	1-1852
	1-1894	1-1899	1-1906	1-1917	1-1926#	1-1943	1-1950
	1-1968	1-1975	1-1995	1-2003	1-2039	1-2046	1-2054
	1-2059#	1-2062#	1-2068#	1-2071#	1-2073#	1-2074#	1-2075
	1-2081#	1-2120#	1-2123#	1-2147#	1-2151#	1-2153#	1-2164#
	1-2207#	1-2209#	1-2215#	1-2218#	1-2221#	1-2223#	1-2227#
	1-2230#	1-2233#	1-2236#	1-2238#	1-2240#	1-2242#	1-2244#
	1-2246#	1-2248#	1-2280#	1-2284#	1-2304#	1-2329#	1-2330#
	1-2331#	1-2332#	1-2334#	1-2335#	1-2336#	1-2337#	1-2338
	1-2346#	1-2348#	1-2350#	1-2352#	1-2353#	1-2355#	1-2379#
	1-2390#	1-2393#	1-2396#	1-2399#	1-2404	1-2408#	1-2409#
	1-2411#	1-2412#	1-2413#	1-2414	1-2417#	1-2419#	1-2435#
	1-2437#	1-2475#	1-2483	1-2486	1-2497#		
R3	1- 871#	1-1077	1-1084	1-1086	1-1092#	1-1093#	1-1095#
	1-1113	1-1118	1-1120	1-1125	1-1135	1-1137	1-1139#
	1-1140#	1-1141#	1-1142	1-1147#	1-1160#	1-1169	1-1171
	1-1177	1-1179	1-1183	1-1187	1-1193	1-1195	1-1199
	1-1203	1-1209	1-1211	1-1215	1-1222	1-1224	1-1228
	1-1237	1-1780#	1-1781#	1-1782#	1-1783#	1-1784#	1-1786
	1-1816#	1-1819#	1-1823#	1-1829#	1-1836#	1-1839#	1-1843#
	1-1846#	1-1850#	1-1851	1-1855#	1-1862#	1-1873#	1-1886#
	1-1898	1-1903	1-1909	1-1911#	1-1914	1-1920	1-1922#
	1-1927#	1-1928#	1-1929#	1-1930#	1-1931	1-2055	1-2058#
	1-2063#	1-2080#	1-2471#	1-2472#			
R4	1- 872#	1-1125#	1-1126#	1-1127#	1-1128#	1-1129#	1-1130#
	1-1131#	1-1142#	1-1173#	1-1181#	1-1185#	1-1189#	1-1197#
	1-1201#	1-1205#	1-1213#	1-1218#	1-1226#	1-1231#	1-1246
	1-1647#	1-1648#	1-1903#	1-1904#	1-1909	1-1914#	1-1915#
	1-1920	1-2155#	1-2136#				
R5	1- 873#	1-1088#	1-1104#	1-1727#	1-1728#	1-1730	1-1733
	1-1739#	1-1740#	1-1742	1-1745	1-1748	1-2213#	1-2214#
	1-2216	1-2419	1-2225#	1-2226#	1-2228	1-2231	1-2234
	1-2359#	1-2361#	1-2362#	1-2363#	1-2364#	1-2367#	1-2368#
	1-2369#	1-2370#	1-2371#	1-2383#	1-2384#	1-2385#	1-2386#
	1-2388#	1-2389#	1-2391	1-2394	1-2397	1-2403#	1-2406#
	1-2414#	1-2415#	1-2416#	1-2427	1-2453#	1-2493#	1-2495#
SELON1	1-1180	1-1193#					
SELON2	1-1184	1-1187#					

CROSS REFERENCE TABLE S-7

SELDN3	1-1166	1-1178	1-1182	1-1186	1-1190M			
SELDRV	1-1076M	1-1106						
SELD1	1-1078	1-1084M						
SELD2	1-1085	1-1058M						
SELOK1	1-1249	1-1-51M						
SELPAT	1-1121	1-1125M						
SELPR	1-1170	1-1174M						
SELPRO	1-1163	1-1168M						
SELRM1	1-1225	1-1-28M						
SELRM2	1-1223	1-1-27	1-1232M					
SELP1	1-1196	1-1-99M						
SELR2	1-1200	1-1-03M						
SELR3	1-1194	1-1-98	1-1202	1-1206M				
SELTST	1-1082	1-1108M						
SELT1	1-1112M	1-1124	1-1250					
SELT2	1-1114	1-1118M						
SELT3	1-1116	1-1119	1-1122M	1-1136	1-1138	1-1172	1-1188	
	1-1204	1-1-17	1-1230	1-1239				
SELW1	1-1212	1-1-15M						
SELW15	1-1216	1-1-18M						
SELW2	1-1210	1-1-14	1-1219M					
SETM4K	1- 995	1-1064	1-2560M					
SETM8K	1- 997	1-1067	1-2561M					
SETSTK	1-2339	1-2-41M						
SET4K	1-2500M	1-2-42						
SFT8K	1-2504M	1-2-43						
SP	1- 874M	1- 982M	1- 994	1-1069M	1-1533M	1-1785M	1-2052M	
	1-2053M	1-2-54M	1-2055M	1-2080	1-2081	1-2082	1-2083	
	1-2341M	1-2-22	1-2523M	1-2525M				
SP3	1-1132	1-1143	1-1174	1-1190	1-1206	1-1219	1-1232	
	1-2366	1-2-73	1-2381	1-2422	1-2441	1-2557M		
SP3A	1-2475	1-2476M						
SP3X	1-2475M	1-2-59						
SR	1- 899M	1-1-75M	1-1512	1-1555	1-1687	1-1693	1-2145	
	1-2162	1-2172	1-2256					
STACK	1- 947M	1- 982	1-1069					
START	1-1065	1-1068M						
START1	1-1036	1-1069M	1-1080					
STATRO	1- 920M	1-1617M	1-1682	1-1703	1-2113M	1-2160	1-2180	
	1-2270M	1-2-75	1-2286	1-2350				
STFLGS	1- 981M	1-1005M	1-1021M	1-1075M	1-1157M	1-1162	1-1509	
STOPOP	1-162M	1-1-40M						
STREC1	1-1697	1-1706M						
STRLEN	1- 910M	1-1390M	1-1594M	1-1596	1-1673	1-2092	1-2193	
STRTOP	1-1609M	1-1453	1-1658	1-1661	1-1710	1-1717		
SVCIR	1-1470M	1-2-30						
SVCTRS	1-1303	1-1-23	1-1330	1-1337	1-1361	1-1372	1-1387	
	1-1403	1-1435	1-1449	1-1492	1-2548M			
SVC1	1-1471M	1-1473						
SVRECR	1- 913M	1-1369M	1-1371	1-1396M	1-1402	1-1442M	1-1448	
TABLE	1-2525	1-2-27M						
TESINC	1-1425	1-1-51	1-1654	1-1664M				
TESRC1	1-1694	1-1-99M						
TESREC	1-1688	1-1-93M						
TEST	1- 968M	1-1-60M						
TEST0	1-1261	1-1-96M						
TEST1	1-1263	1-1-11M						
TEST2	1-1265	1-1-16M						

CROSS REFERENCE TABLE S-8

TEST3	1-1267	1-1047#					
TEST4	1-1271	1-1052#					
TEST5	1-1270	1-1419#					
TKB	1- 897#	1-2470	1-2471				
TKS	1- 896#	1-2466					
TO	1-2481#	1-2429					
TOP	1-1029	1-1039	1-1060	1-1073	1-1109	1-1123	1-1165
	1-1235	1-1452	1-1274	1-1690	1-1722	1-1724	1-1736
	1-1751	1-1753	1-1762	1-1772	1-2148	1-2165	1-2208
	1-2210	1-2222	1-2237	1-2239	1-2243	1-2247	1-2281
	1-2285	1-2447	1-2380	1-2400	1-2476	1-2547#	
TOP1	1-2483#	1-2491	1-2498				
TOP2	1-2487	1-2493#					
TPB	1- 899#	1-1242#	1-1245#	1-2427#	1-2470#	1-2490#	
TPS	1- 898#	1-1240	1-1243	1-2425	1-2468	1-2481#	1-2488
TRAP3#	1- 883	1-2022#					
TSINC2	1-1667	1-1472	1-1674#				
TSINC3	1-1675	1-1477#					
TSTEX	1- 967#	1-1455#	1-1256	1-1292#	1-1353		
TSTPM	1-2333	1-2038#					
TSTSTP	1-1621	1-1027#					
TSTITBL	1- 969#	1- 984#	1- 985#	1- 986#	1-1111	1-1255	
TSTUM4	1-2311	1-2034#					
TSTUP4	1-2307	1-2029#					
TU.SEL	1- 996	1-1002#					
TYPT1	1-2433#	1-2444					
TYPT2	1-2434#	1-2456					
TYPT3	1-2440	1-2443#					
TO	1-1298#	1-1307					
TOA	1-1299#	1-1305					
TOB	1-1301	1-1304#					
TO1ENT	1-1297#	1-1312					
T2	1-1318#	1-1341					
T2A	1-1319#	1-1325					
T2B	1-1321	1-1324#					
T2C	1-1326#	1-1332					
T2D	1-1328	1-1331#					
T2E	1-1333#	1-1339					
T2F	1-1335	1-1337#					
T23ENT	1-1317#	1-1348					
T4	1-1354	1-1357#					
T4A	1-1358#	1-1412					
T4B	1-1359#	1-1363					
T4C	1-1365#	1-1379					
T4D	1-1366#	1-1374					
T4E	1-1368	1-1373#					
T4F	1-1377#	1-1381					
T4G	1-1376	1-1382#					
T4H	1-1383#	1-1389					
T4J	1-1385	1-1387#					
T4K	1-1390#	1-1408					
T4L	1-1391#	1-1405					
T4M	1-1398	1-1401#					
T4N	1-1393	1-1395	1-1404#				
T4P	1-1406#	1-1410					
T5	1-1421#	1-1465					
T5A	1-1424	1-1426#					
T5B	1-1428#						

CROSS REFERENCE TABLE S-9

T5C	1-1430#	1-1437						
T5D	1-1432	1-1436#						
T5E	1-1439#	1-1451	1-1463					
T5F	1-1444	1-1447#						
T5FLA@	1-1421@	1-1467#	1-1496@	1-1562	1-1605			
T5G	1-1441	1-1450#						
T5H	1-1453	1-1455#						
T5INC	1-1426@	1-1434	1-1468#					
T5J	1-1456#	1-1461						
T5K	1-1458	1-1460#						
USSTST	1-1012#	1-1015						
USS.OK	1-1013	1-1017#						
USS10	1-1020	1-1022#						
VALID	1-1087	1-1092#						
VAL1	1-1095#	1-1098						
VAL2	1-1096	1-1099#						
VAL3	1-1100	1-1103#						
VAL4	1-1090	1-1102	1-1104#					
WAITK	1-2466#	1-2027						
WAITKY	1-1076	1-1112	1-1134	1-1168	1-1176	1-1192	1-1200	
	1-1221	1-1236	1-2545#					
WBUF	1- 902#	1-1013	1-1779	1-1793	1-1926	1-2119	1-2265	
WRCHEK	1- 921#	1-1482	1-1573	1-1624	1-1686@	1-1754	1-1756	
	1-1766							
WRITI	1-1588#	1-2028						
WRITIT	1-1302	1-1322	1-1370	1-1422	1-2546#			
WRPASS	1- 918#	1-1008@	1-1620	1-1622	1-1626@	1-1629	1-1652	
	1-1684	1-1095@	1-1696	1-1702@	1-2255@	1-2273@	1-2277@	
WRRECR	1- 931#	1-1060@	1-1369	1-1371@	1-1600@	1-2294	1-2299	
WRTDMP	1-1726#							
WRTD1	1-1758#	1-1767						
WRTD2	1-1760	1-1765#						
WRTLEN	1- 936#	1-1096@	1-1611	1-1668@	1-1669	1-1671	1-1673@	
	1-1691	1-2063	1-2282					
W1	1-1593	1-1096#						
W10	1-1633	1-1637#						
W11	1-1641	1-1052#	1-1705					
W12	1-1656	1-1660#						
W3	1-1605#							
XRGRCO	1-2257	1-2273#	1-2276					
XRGREC	1-1701	1-2055#	1-2287					
XRGO	1-2256#	1-2078						
XRG5	1-2272	1-2075#						
ZERO	1-2432@	1-2449	1-2451@	1-2458#				
ZEROOD	1-1048	1-1052#						
	1- 876#	1- 077#	1- 881	1- 882#	1- 884#	1- 948#	1- 950#	
	1- 952#	1- 054#	1- 956#	1- 958#	1- 960#	1- 962#	1- 964#	
	1-1035	1-1029	1-1238	1-1241	1-1244	1-1269	1-1513	
	1-1517	1-1020	1-1523	1-1540	1-1543	1-1603	1-1606	
	1-1610	1-1049	1-1700	1-1709	1-1731	1-1734	1-1743	
	1-1746	1-1749	1-1769	1-1853	1-1907	1-1910	1-1918	
	1-1921	1-1751	1-1976	1-2004	1-2096	1-2098	1-2137	
	1-2156	1-2170	1-2197	1-2217	1-2220	1-2229	1-2232	
	1-2235	1-2060	1-2267	1-2316	1-2318	1-2376	1-2392	
	1-2395	1-2098	1-2426	1-2459	1-2467	1-2469	1-2484	
	1-2489	1-2002						

CROSS REFERENCE TABLE C-1

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