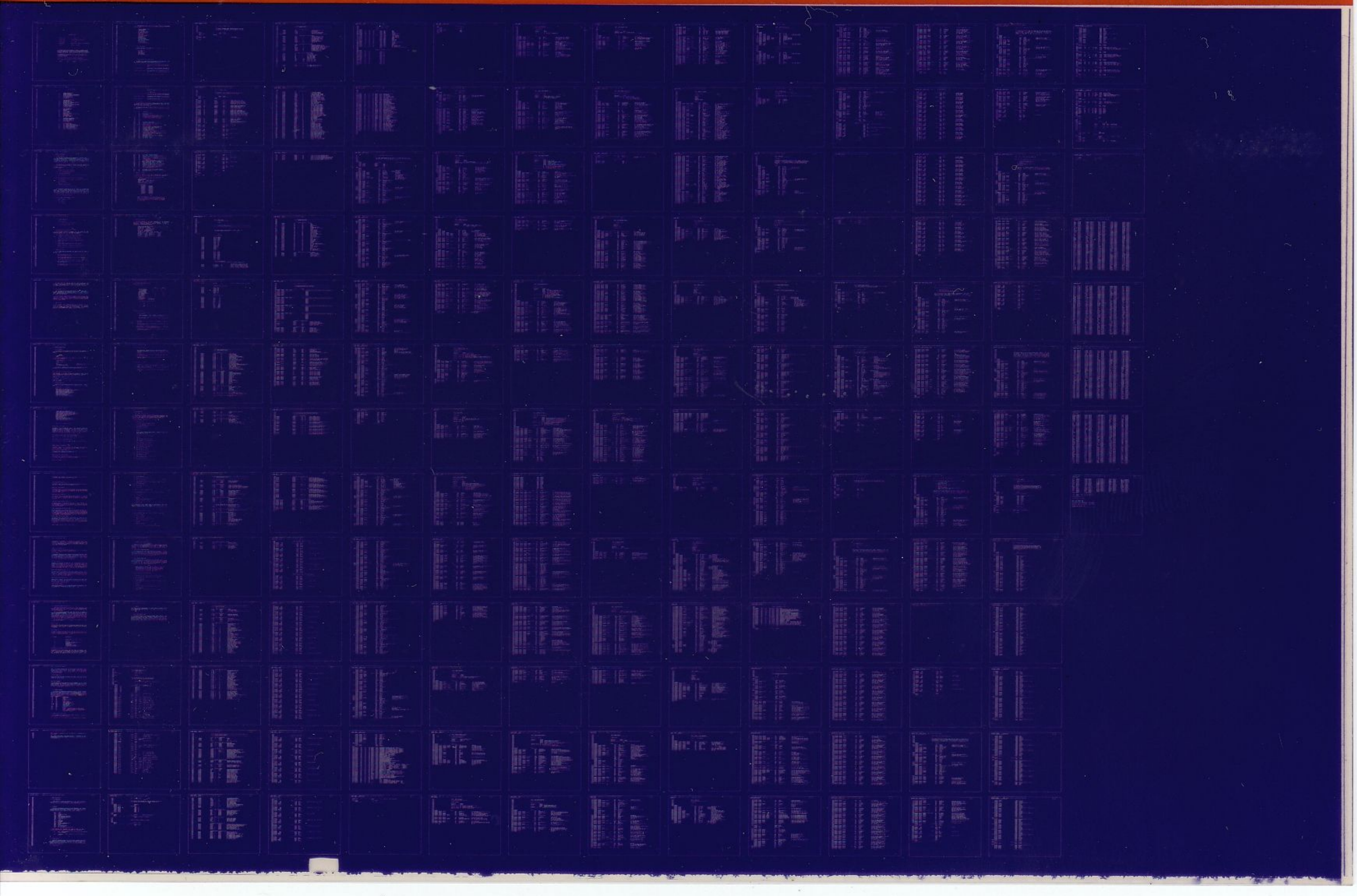
TK50

TK50 DATA RELIAB TST
CZTKBB0

AH-T774B-MC
1 OF 1 OCT 1985

digital
MADE IN USA



```
                .REM 0
```

IDENTIFICATION

PRODUCT CODE:	AC - T773B - MC
PRODUCT NAME:	CZTKBB0 TK50 DATA RELIABILITY
PRODUCT DATE:	JULY - 1985
MAINTAINER:	TAPE OPTICAL DIAGNOSTIC ENGINEERING
AUTHOR:	BRIAN T. LEBLANC

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1 GENERAL INFORMATION

1.1 Program Abstract

The TK50 PDP11 Data Reliability program will exercise the TK50 and establish the performance quality of each unit through the accumulation of statistics. Predetermined sequences of operations will permit read and write compatibility (Media Interchange testing) and data reliability testing. This program will be designed to run in a PDP11 XXDP+ environment.

The Data Reliability program will detect functional faults, but will not provide diagnostic isolation to the field replaceable unit.

The PDP11 TK50 Data Reliability program is intended for the following users:

1. Quality and user audit functions,
2. F A & T at our various facilities,
3. Field service personnel,
4. DEC customers who choose to provide their own maintenance.

Program uses include but are not limited to the following:

1. Determination of a unit's specific performance (error rate)
2. Fault detection,
3. Repair verification,
4. Installation verification,
5. Preventive maintenance software tool.

This program will exercise up to 4 TK50's in a round-robin manner. It will require 28KW of memory. One default pass will be when a tape cartridge (600') has been started at the beginning of tape (BOT) marker and has passed all available tape to the end of tape (EOT) marker over the tape head, twice. One End Of Pass (EOP) will require approximately 1 hour and 10 minutes for each unit under test.

1.2 Runtime Environment Requirements

Run time environment requirements include:

1. XXDP+ Diagnostic Supervisor
2. PDP11 family CPU,
3. 28KW of memory,

4. an XXDP Load Device,

5. Console Terminal,

6. 1 to 4 TK50 drives with controllers,

7. 1 scratch tape cartridge / TK50

1.3 Related Documents And Standards

The TK50 Data Reliability program will run under the XXDP+ operating system, and will be Supervisor compatible. The program, with the supervisor will run on all PDP11 processors.

This program will conform to the following documents:

1. EL-ENDIA-11 "PDP11 Diagnostic Design Guide",

2. PDP Diagnostic Quality Assurance Checklist,

3. Software Development Policies And Procedures Manual,

4. DEC Std 100,

5. UNIBUS/Q-bus Storage Systems Port Spec Version 2.1

6. Magnetic Tape Mass Storage Control Protocol Spec Version 1.6

7. Mass Storage Control Protocol Spec Version 1.2

1.4 Pass/Fail Criteria

A unit under test will not pass the data reliability mode of testing if any of the following error conditions have occurred during the test cycle:

1. Any irrecoverable write errors detected as documented in the TK50 product specification,

2. Any irrecoverable read errors detected as documented in the TK50 product specification,

3. Irrecoverable hardware errors have occurred,

4. CRC recoverable read errors which exceed TBD errors in 10 to the 11th bits read

5. ECC recoverable read errors which exceed TBD errors in 10 to the 11th bits read

If less than the required data has been transferred, the confidence that the unit has met the error rate is diminished. That is to say if the program is run in a quick verify mode, the unit may be accepted as error free but only with a low degree of confidence.

1.5 Data Compare Function

The time required to perform 100% software data comparisons is entirely prohibitive for streaming tape drives. This problem is further exacerbated by the asynchronous nature of command execution under TMSCP and program size limitations which dictate the allocation of a single read data buffer.

To minimize the impact of all this, tests 2 and 3 (the only tests which will perform software data compares) will do software data compares on every 4th record. To avoid the problem of performing data compares on a dynamic read buffer, 3 records will be read from tape using the Access command.

1.6 Restrictions

This program is not intended for use as an isolation tool to detect a fault to the single Field Replaceable Unit (FRU). As such, it will not contain scope loops for that purpose. The parameter selection process, discussed later in this document, is meant to be used only for functional fault detection and unit isolation.

2 OPERATING INSTRUCTIONS

2.1 User Dialogue

The following user dialogue will be provided by the diagnostic to allow the operator to establish certain operational parameters of the program.

2.2 Hardware Questions

This set of questions must be answered by operator when the program is first started.

```
CHANGE HARDWARE (L) ?  no default

NUMBER OF UNITS (D) ?

UNIT x                                   x = Number of unit the p-table is
TKIP ADDRESS (O) 774500 ?                    being built for.
T/MSCP UNIT NUMBER (O) 0 ?
```

Unit specific prompting will continue for a maximum of 4 times, depending on the users response to the "NUMBER OF UNITS" question.

2.2.1 Definition Of Hardware Questions -

CHANGE HARDWARE - If you want to change the hardware p-table to be used in the testing this question must be answered yes. This question must be answered with a yes on the initial start of the program.

NUMBER OF UNITS - Number of units to test in decimal.

TKIP ADDRESS - The base address for this unit.

T/MSCP UNIT NUMBER - The unit number of the controller board as specified by MSCP.

2.3 Software Questions

Answering of the software questions is always optional. Default values for a specific question can be obtained simply by typing a <CR>.

```
CHANGE SW (L) ?    no default

ENABLE TIME OF DAY CLOCK (L) N ?
 INPUT HOUR IN 24 HOUR FORMAT (OMIT LEADING ZERO) (D)  0 ?
 INPUT MINUTES (OMIT LEADING ZERO) (D)  0 ?
CHANGE CONTROLLER PARAMETERS (L) N ?
 ENABLE CONTROLLER ERROR CORRECTION (L) Y ?
 ENABLE CONTROLLER ERROR RECOVERY (L) Y ?
 ENABLE PAD BLOCKING (L) Y ?
CHANGE PRINTING PARAMETERS (L) N ?
 ENABLE SOFT ERROR REPORT PRINTING (L) N ?
```

```
296                          ENABLE READ SOFT ERRORS ONLY (L) Y ?
297                         CLEAR MEDIA TABLE ON EVERY PASS (L) N ?
298                         ENABLE PRINTING OF MEDIA DEFECTS TABLE (L) N ?
299                         ENABLE PROGRAM VARIABLES DUMP ON ERROR (L) N ?
300                         ENABLE CLEAR STATS ON FATAL ERROR (L) N ?
301                        CHANGE TEST PARAMETERS (L) N ?
302                         DATA PATTERN (D) 0 ?
303                         RUN TEST 3 ONLY (L) Y ?
304                         ENABLE DATA COMPARES IN TEST 5 (L) Y ?
305                         ENABLE PRINT READ BUFFER IN TEST 5 (L) N ?
306                         CHANGE COMMAND SEQUENCE (L) N ?
307
308
309
310                    2.3.1  Definition Of Software Questions -
311
312
313                    ENABLE TIME OF DAY CLOCK (L) N ?
314
315                    The default is to not enable the  clock.  This  question  allows  the
316                    operated  to  start  a  program clock to track time on a 24 hour basis
317                    during the running of the  program.  The  clock  will  remain  fairly
318                    accurate  as  long  as  the program is running.  Any time you stop the
319                    program the clock will stop running.  It  is  therefore  necessary  to
320                    reset the time whenever the program is started.
321
322
323                    INPUT HOUR IN 24 HOUR FORMAT (OMIT LEADING ZEROS) (D) 0 ?
324
325                    Input the hour in a decimal number leaving off any leading zeros.
326
327
328                    INPUT MINUTES (OMIT LEADING ZEROS) (L) 0 ?
329
330                    Input the minutes in a decimal number leaving off any leading zeros.
331
332
333
334
335                    CHANGE CONTROLLER PARAMETERS (L) N ?
336
337                    The default  answer  (no)  prohibits  the  asking  of  the  controller
338                    parameter questions.  To change the controller parameters type a Y.
339
340                    ENABLE CONTROLLER ERROR CORRECTION (L) Y ?
341
342                    If answered "yes" (default) the program will enable  the  controller's
343                    error correction algorithms for read errors.
344
345
346                    ENABLE CONTROLLER ERROR RECOVERY (L) Y ?
347
348                    If answered "yes" (default) the program will enable  the  controller's
349                    error recovery algorithms for write and read errors.
350
351
352                    ENABLE PAD BLOCKING (L) Y ?
```

If answered "yes" (default) the program will enable the controller's pad blocking algorithms to assist in streaming

CHANGE PRINTING PARAMETERS (L) N ?

The default answer (no) prohibits the asking of the printing parameter questions. To change the printing parameters type a Y.

ENABLE SOFT ERROR REPORTS (L) N ?

The default answer (no) inhibits the printing, but not the tallying of soft errors as reported by the subsystem. Answering the question "yes" will result in detailed error reports on the terminal for each recoverable data error.

ENABLE READ SOFT ERRORS ONLY (L) N ?

This question will only be asked when the above question is answered no. This question allows the operator to enable print outs on read soft errors only. The default answer is to inhibit all soft error printouts.

CLEAR MEDIA TABLE ON EVERY PASS (L) N ?

The default answer (no) allows the tallying of media defects over multiple passes. By answering the question yes, the operator can then print the table on every pass and see how the defects are affected by passing over the heads.

ENABLE PRINTING OF MEDIA DEFECTS TABLE (L) N ?

The default answer (no) inhibits the printing, but not the tallying of media defects as reported in the soft error reports by the subsystem. If the default answer is used the table may still be printed by giving the PRINT command at the supervisor prompt (DS>) after the termination of the program. Answering the question "yes" will cause the printing of the table after every pass and after a control C (C) is issued.

ENABLE CLEAR STATS ON FATAL ERROR (L) N ?

The default answer (no) allows the accumulation of statistics from pass to pass. An answer of "yes" results in the clearing of a devices statistical matrix following any error that results in the unit's being dropped from the test sequence for the rest of the current pass. This action is intended for use primarily by Springfield volume manufacturing.

ENABLE PROGRAM VARIABLES DUMP ON FATAL ERROR (L) N ?

This question is intended as a program and subsystem debug tool. Answering the question "yes" will cause the program to print out the contents of approximately 1K words of critical memory locations. This is a time consuming process and this question should be defaulted under ordinary circumstances.

CHANGE TEST PARAMETERS (L) N ?

The default answer (no) prohibits the asking of the test parameter questions. To change the test parameters type a Y.

DATA PATTERN (O) 0 ?

This question allows the user to select a data pattern from the table of patterns provided by the program. (See the Data Pattern section below.) The default answer, "0", causes the program to cycle through all the data patterns. Answering the question with a number from 1-5 will causes the program to use that pattern only. A number higher than 5 will cause the question to be repeated.

RUN TEST 3 ONLY (L) Y ?

Answering this question "Y" (default) will automatically cause the program to run test 3 only; i.e., it will no longer be necessary to use the /TES:3 switch to the start command. Please note that this question will effectively override the /TES: switch if the user wishes to run a test other than 3. That is, if the user wants to run test 4 he must specify the /TES:4 switch AND answer this question "N".

ENABLE DATA COMPARES IN TEST 5 (L) N ?

The default answer (no) disallows the data compare function during test 5. This would have to be the case when running with a truly unknown tape. The option (yes) is given to the operator so that when a tape is written in a known manner using this program the operator can then run test 5 using data compares.

ENABLE PRINT READ BUFFER IN TEST 5 (L) N ?

Answering this question "yes" will cause a printout of all data read from tape in test 5. The data will be presented on a record basis. This is a time consuming process, and this question should be defaulted except in special cases.

CHANGE COMMAND SEQUENCE (L) N ?

Answering this question "Y" will cause the program to prompt the user for a sequence of commands to be used in Test 7. (See Test 7 below.) If defaulted, this is the last software question asked.

2.4 Conversation Mode Test Questions

Answering of these question is optional. These questions will not be asked unless the operator has answered the CHANGE COMMAND SEQUENCE question with a yes. A total of seven commands may be entered by the operator.

Test 7 is intended to give the user the ability to create a specific sequence of commands. Note that Test 7 will not support the entire TMSCP command repertoire, it is limited primarily to the tape motion commands. To run Test 7, the user must issue a STA/TES:7 and must answer "Run Test 3 Only" with a N(O). The user must also answer "Change Command Sequence" with a Y (yes). Understand that the program does not check for legality of command sequences issued by the user, the onus is on the user to perform this check.

The following questions will be asked by the program to prompt the user for his input.

CMD/1 (O) 160 ?

The user enters the octal value for the desired command from the list shown below. Please note that the command values are those defined by the diagnostic, not by TMSCP. The default value for the first command is a rewind.

DATA PATTERN (O) 1 ?

The user should enter the octal value of the desired data pattern from the table of patterns shown above. If the command does not use a data pattern, any number entered here is ignored.

PATTERN #	DESCRIPTION
0	ROTATE THROUGH ALL DATA PATTERNS
1	ALL 1'S
2	ALL 0'S
3	WORST-CASE MFM PEAK SHIFT (110)
4	ALTERNATE 1'S AND 0'S
5	RANDOM DATA
6	MW PEAK SHIFT (1110)
7	COMBINATION OF PATTERN 3 AND 5 .
200	NO DATA PATTERN USED

ITEM COUNT (BYTE, RECORD, OBJECT) (D) 0 ?

The purpose of this field varies with the type of command. For example, for write and read commands, the user may specify the record size, in decimal bytes. If the command is a reposition command, the user may specify the number of records, objects or file marks. There are also two special commands provided which use this value in unique

ways. For a branch command, the user would specify the command number to which (s)he wishes to branch. For the delay command, the value entered here is the relative delay length, with larger numbers producing longer delays. User experimentation may be required to produce desired delay.

ITERATION COUNT (D) 1 ?

This field allows the user to specify how many times the command should be issued before the program issues the next command. The value is entered in decimal.

Additional Commands

This same sequence of four questions will be repeated up to 6 more times, allowing the operator to create a command table with seven unique commands. The only noticeable difference in question format is that each time the command question is asked, its relative position in the Test 7 command table is identified.

2.5 Allowable Commands

The following commands are supported by Test 7. Please remember that the octal values are defined by the program and have no numerical correlation to TMSCP command opcodes. Also note that the diagnostic does not check for legality of the value entered or for valid command sequences. Operator error in either of these cases could result in bizarre program behavior.

Octal	Command	Description
10	RD	Read forward
20	WR	Write
30	CMP	Compare host data
40	ACC	Access
50	SPC	Space records
51	SCR	Space records reverse
60	SKP	Skip tape marks
61	SKR	Skip tape marks reverse
70	SPO	Space objects
71	SPR	Space objects reverse
100	WTM	Write tape mark
160	REW	Rewind
300	BR	Branch - item count specifies destination
310	DLY	Delay - item count specifies relative delay
377	END	End of sequence - necessery if sequence has less than 7 commands

2.6 Supervisor Run Time Flags

This program will support all of the PDP11 Diagnostic Supervisor flags except for those mentioned here.

LOE - Loop on Error - This flag will not be supported by this program.

Data reliability programs do not lend themselves to implementation of error loops.

IDR - Inhibit Drop Units - This flag will not be supported by this program due to the devices sequential operation. If an error of fatal extent happens on the device there is no way to continue running in any meaningful way.

3 ERROR INFORMATION

3.1 Error Reporting

TKDR provides a variety of information in its error printouts, most of which is self-explanatory. The following information is intended to clarify certain messages and abbreviations used.

3.2 Commands

All error printouts will contain a field indicating the command on which the error was detected. Refer to the TMSCP specification for detailed descriptions of these commands. Also, please note that commands currently used by TKDR are indicated by an asterisk.

RD*	read
WRT*	write
CMP	compare host data
ACC*	access
SPC*	space records (position)
SKP*	skip tape marks (position)
SPO*	space objects (position)
WTM*	write tape mark
ERS	erase
ERG	erase gap
AVL*	available
ONL*	online
SUC	set unit characteristics
REW*	rewind (position)
ABO	abort
GCS*	get command status
GUS*	get unit status
SCC*	set controller characteristics

The following two "commands" are used by TKDR for special purposes and are not actually sent as commands to the subsystem:

NUL	null - used by program to while waiting for last responses to real commands
INT	initialize - used by program to invoke the UQ-Port init sequence

3.3 Type Of Error

Each error message includes one line of text intended to describe the type of error detected. There are three distinct sources of information used by the program to generate the text message: the status field of an end packet; an error log packet; and program detected error conditions.

3.4 Status Errors

These messages are derived from the status field of an end packet and correspond directly to the status codes as defined in the TMSCP specification.

Invalid command issued
Command aborted
Unit offline
Unit available error
Unit write protected
Data compare error
Data error
Host buffer access error
Controller error
Drive error
Formatter error
BOT encountered
Tape mark encountered
Data record truncated
Position lost
Serious exception
Logical EOT encountered

3.5 Error Log Packets

Certain messages will be generated as a result of receiving the "diagnostic mode" error log packet.

Retriable Data
Hard CRC
Data Underrun
Data Overrun
ECC Corrected
CRC Error on ECC Block

3.6 Program Detected Error Conditions

In addition to reporting errors detected by the subsystem, TKDR may generate additional error reports based on problems it detects. These error conditions are presented and defined here.

Invalid status received - the contents of the status field of an end packet is not a valid status as defined by TMSCP

Port-detected error - examination of the SA register indicated an error condition exists within the controller

Program command timeout - the program received no end packet from the subsystem within the predefined command time-out.

Response out of sequence - the program received an end packet for a

sequential command other than the oldest out-
standing command.

Port initialization failed - the port failed to make an expected step transition during the UQ-Port init sequence.

Software data compare - the program's data compare routine detected a miscomparison of read data to expected data.

Record length short - the data record read from tape was shorter than the record length expected.

3.7 Drive Errors

On occurrence of a Drive Error, status code of 13(8), the error log packet will now contain a status code which is the drive error byte as returned by the drive. This value will be placed in the DRV CODE field of the error log packet.

To understand the precise nature of the error condition it will be necessary to correlate tne value presented in the printout against the table below.

Octal	Hex	Description
1	01	Write lock violation
2	02	Drive fault
4	04	Communication exception (timeout, etc.)
6	06	Wrong track error (following a turnaround)
10	08	No cable or drive powered off
20	10	Synchronization failure - write/read
23	13	
44	22	
45	23	
47	27	
201	81	Failure to load to BOT
202	82	Failure to unload tape into cartridge
203	83	General motor or tach failure
204	84	Motor A failure
205	85	Motor B failure
206	86	Drive lost control of tape or bad tach
207	87	Excessive drag in tape transport
210	88	Failure to stop tape or remain stopped
211	89	Cartridge insert error
212	8A	Cartridge extract error
213	8B	CU attempted to move tape with drive in error
214	8C	Deceleration timeout error
215	8D	Second attempt to balance reels in init failed
220	90	8155 RAM memory failure in self-test
221	91	8155 timer failure
222	92	Read amplit (Hd 1) too low in calibrate
223	93	Read amplit (Hd 2) too low in calibrate
225	95	EOT sensed in R/W/S
226	96	BOT sensed in R/W/S
227	97	Drive block address overflow

230	98	Drive block address underflow
231	99	Servo error - excessive speed variations
231	9A	Failure in tracking - currently not used
233	9B	Command error - not recognized
234	9C	Illegal command - incompatible with drive state
235	9D	Write lock error
236	9E	Write gate at wrong time
237	9F	No write gate for calibration track write
240	A0	Error sensing cal track 1 - bad head?
241	A1	Error sensing cal track 2 - bad head?
242	A2	Detection of edges of cal trk 1 out of spec
243	A3	Detection of edges of cal trk 2 out of spec
244	A4	Offset of cal trk 2 from 1 is too great
245	A5	Search for bottom edge of tape failed
246	A6	Bottom tape edge tolerance error
247	A7	Drive is overheating
250	A8	No current in LED of BOT sensor (cable?)
251	A9	Hall switch sense lines Motor A questionable
252	AA	Tachometer failure

3.8 Hard Error Reports

Hard error reports, if not user disabled, will be generated anytime an error recovery process does not successfully complete.

Hard Error reports will typically be of the following format:

```
CZTKB HRD ERR 00014 ON UNIT 00 TST 003 SUB 000 PC: 020460
HARD DATA ERROR
COMMAND: RD     T/MSCP UNIT: 000(O)
PASS:   1(D)    DATA PAT: 01(O)
RECORD BYTE COUNT:    457(D)
OBJECT CNT : 00000026352(O)

RESPONSE PACKET
      HIGH WORD      LOW WORD
      000000(O)      026532(O)
      000000(O)      000000(O)
      000050(O)      010240(O)
      000000(O)      000733(O)
      000000(O)      000000(O)
      000000(O)      000000(O)
      000000(O)      000000(O)
      000000(O)      001413(O)
      000000(O)      000733(O)
```

NOTE

Some error reports will not include a Response Packet field. For example a Command Timeout Error, by definition, results only when no response to a command has been received prior to expiration of the programs watch dog timer.

817
818 3.9 Soft Error Reports
819
820 Soft error reports, if not user disabled, will be generated
821 anytime an error recovery process is successful. The soft error
822 report will include the number of retries necessary in order to
823 successfully complete the current operation. Soft Error reports will
824 typically be of the following format:
825
826 CZTKB SFT RD ERR 00014 ON UNIT 00 TST 003 SUB 000 PC: 020460
827 ECC RECOVERED DATA ERROR
828 COMMAND: RD T/MSCP UNIT: 000(O)
829 PASS: 1(D) DATA PAT: 01(O)
830 OBJECT CNT : 000000026352(O)
831 TAP OBJ CNT: 000000026352(O)
832 TRK NUM: 6(D) LEVEL: 0(D) RETRIES: 1(D)
833 LOG BLK NUM: 0(D) PHYS BLK NUM: 9932(D)
834 DRV CODE: 000(O) DRV FLGS: 041(O)
835 DRV STATE: 000000(O) INTERN STATUS: 002(O)
836 TAP CNT 0: 227(O) TAP CNT 1: 015(O)
837 TAP CNT 2: 035(O) RD/WR STATE: 000000(O)
838 OPER FLGS: 000000(O)
839

4 PERFORMANCE AND PROGRESS REPORTS

4.1 Statistics Matrix

	READ CH 1	READ CH 2	WRITE CH 1	WRITE CH 2
SOFT DATA ERRORS				
RETRY RECOVERED	X	X	X	X
ECC CORRECTED	X	X	N.A.	
HARD DATA ERRORS	X	X	X	X
CRC ON ECC BLOCK	X	X	N.A.	
DATA COMPARE ERRORS	X		N.A.	
DATA UNDERRUN	N.A.		X	
DATA OVERRUN	X		N.A.	
MISPOSITIONS	X		X	

OTHERS	X
TIMES DROPPED	X
BYTES WRITTEN	X,XXX,XXX,XXX
BYTES READ	X,XXX,XXX,XXX

TRK	PHY BLK	HWR	HRD	SWR	SRD
0	26	0	0	1	0
0	2474	0	0	1	0
1	126	0	0	1	0
1	10374	0	0	1	0

4.2 Read Error Definition

1. SOFT DATA ERRORS

   0 Retry Corrected - ECC disabled or repositioning was required because >1 block in ECC group was bad.

   0 ECC Corrected - CRC error occurred on data block but ECC has corrected it

2. Hard Data Errors - Maximum retries exhausted and data not recovered.

3. CRC Error on ECC Block - Data was read successfully, but CRC error occurred

4. Data Compare - No hardware detected errors, but the data compare failed. on an associated ECC block.

5. Data Overrun - The controller did not have sufficient buffer space for read data.

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4.3 Write Error Definition

1. Retry Recovered - Operational write algorithm was enabled and controller successfully recovered from a write error. (In this case, media-induced write errors will appear in this category.)

2. Hard Data Errors - Write retries exhausted and block not successfully written.

3. Underrun - Controller ran out of write data blocks prior to a record boundary.

4.4 Miscellaneous

1. Mispositions - Times the drive lost position on tape.

2. Others - This is a tally of all errors not specifically called out in the error matrix.

3. Times Dropped - Times the drive has been dropped by the program.

5 TEST DESCRIPTIONS

5.1 Test 1 Basic Function Test

This test will execute a subset of the available commands on the unit under test. It serves as a quick verify test to ascertain that the unit can move tape and write/read predictably, without error. The subset of legal commands will be issued in a coherent manner.

The testing sequence, performed once will be as follows:

1. Execute online
2. Rewind to ensure that tape is at BOT,
3. Write two tapemarks, just after BOT,
4. Backspace two tapemarks,
5. Space forward to LEOT,
6. Rewind,
7. Write, using increasing byte counts, rotating through all data patterns, using decreasing file lengths. Files to be separated by tape marks.
8. Write LEOT after previous sequence,
9. Rewind,
10. Read records of the first file,
11. Space records over the second and third files,
12. Space objects over the fourth file,
13. Read records of the fifth file,
14. Skip reverse over four tape marks,
15. Skip forward one tape mark,
16. Read the second file set,
17. Space objects over the third record set,
18. Read the fourth record set,
19. Space objects to LEOT,
20. Space objects reverse to Just after BOT,
21. Skip four tape marks,
22. Space records over the fourth record set,

23. Skip a tape mark,

24. Read the sixth record set,

25. Skip two tape marks,

26. Space objects reverse to the end of the second file set,

27. Skip a tape mark,

28. Read the third file set,

29. Rewind tape,

5.2 Test 2 Quick Verify Read/Write Test

This test rewinds the tape, then executes the following sequence:

1. Write record set,

2. Write LEOT,

3. Rewind,

4. Reposition to just written record set,

5. Read the current record set,

6. Skip to LEOT.

for 5 iterations or until fatal error is encountered. This test permits retries, fixed record length (4096 bytes decimal), fixed number of records/set (250), and predetermined data patterns. This test will execute in a round-robin manner.

5.3 Test 3 Complex Read/Write Test

This test rewinds the tape, and executes the following sequence:

1. Write N records,

2. Write a tape mark,

3. Repeat 1 and 2 until EOT is reached,

4. Write 2 tape marks (LEOT),

5. Rewind,

6. Read N records,

7. Space 1 record (should see unexpected tape mark)

8. Repeat 6 and 7 until LEOT.

Number of records (N), and record size will be randomly selected. This sequence will permit hardware retries, if enabled by the operator. This test will run until EOT, LEOT or fatal error is detected. All data patterns including random data will be used in this test.

5.4 Test 4 Write Interchange Tape

This test will rewind the tape, then write until EOT or a fatal error is encountered. This test will keep track of the number of records and files written. If a fatal error is encountered, a message will report it, the tape on the unit will be rewound, and the unit prevented from executing further write operations.

5.5 Test 5 Read Unknown Tape

This test will rewind a tape, then read until EOT, LEOT or fatal error is encountered. This test will keep track of the number of records and files read. If a fatal error is encountered, a message will report it, the tape on the unit will be rewound, and the unit prevented from executing further read operations.

NOTE

Tests 4 and 5 can be used to perform a media interchange test for multiple drives. The program will not attempt to make any determination as to whether the unit that wrote the tape or the unit reading the tape is at fault for any errors.

5.6 Test 6 Start/Stop Write/Read Test

This test rewinds the tape, then executes the following sequence:

1. Write record set, stopping between each record,
2. Write a tape mark,
3. Repeat steps one and two until two tracks have been written,
4. Write LEOT,
5. Rewind,
6. Read the record set stopping between each record,
7. Skip a tape mark,
8. Repeat steps six and seven until LEOT is detected,

9. Rewind.

Until fatal error is encountered. This test permits retries, fixed record length (8096 bytes decimal), fixed number of records/set (250), and predetermined data patterns. This test will execute in a round-robin manner.

5.7 Test 7 Conversation Test

Conversation mode will run with or without error reports. The user can select, from a list of commands, a sequence which can be used to emulate a known failure mode. Between commands, the user can specify unique delays, ranging from 10 to 250 ms. The user can follow each tape command with integer values, the first indicating the byte/record/file count and the second indicating the # of repetitions necessary for that command.
@

```
1123
1134                                    .TITLE PROGRAM HEADER AND TABLES
1135                                    .SBTTL  PROGRAM HEADER
1161
1163 000000                                     .ENABL  ABS,AMA
1164        002000                              .       =       2000
1166
1167 002000                                     BGNMOD
1168
1169                                    ;++
1170                                    ; THE PROGRAM HEADER IS THE INTERFACE BETWEEN
1171                                    ; THE DIAGNOSTIC PROGRAM AND THE SUPERVISOR.
1172                                    ;--
1173
1174 002000                                     POINTER BGNSW,BGNSFT,BGNRPT,ERRTBL,BGNDU,BGNSETUP
1175
1183
1184
1185 002000                                     HEADER  CZTKB,A,0,15000,1,0
     002000                             L$NAME::                ;DIAGNOSTIC NAME
     002000     103                             .ASCII /C/
     002001     132                             .ASCII /Z/
     002002     124                             .ASCII /T/
     002003     113                             .ASCII /K/
     002004     102                             .ASCII /B/
     002005     000                             .BYTE   0
     002006     000                             .BYTE   0
     002007     000                             .BYTE   0
     002010                             L$REV::                 ;REVISION LEVEL
     002010     101                             .ASCII  /A/
     002011                             L$DEPO::                ;0
     002011     060                             .ASCII  /0/
     002012                             L$UNIT::                ;NUMBER OF UNITS
     002012  000001                             .WORD   T$PTHV
     002014                             L$TIML::                ;LONGEST TEST TIME
     002014  015000                             .WORD   15000
     002016                             L$HPCP::                ;POINTER TO H.W. QUES.
     002016  046244                             .WORD   L$HARD
     002020                             L$SPCP::                ;POINTER TO S.W. QUES.
     002020  046332                             .WORD   L$SOFT
     002022                             L$HPTP::                ;PTR. TO DEF. H.W. PTABLE
     002022  002204                             .WORD   L$HW
     002024                             L$SPTP::                ;PTR. TO S.W. PTABLE
     002024  002212                             .WORD   L$SW
     002026                             L$LADP::                ;DIAG. END ADDRESS
     002026  115744                             .WORD   L$LAST
     002030                             L$STA::                 ;RESERVED FOR APT STATS
     002030  000000                             .WORD   0
     002032                             L$CO::
     002032  000000                             .WORD   0
     002034                             L$DTYP::                ;DIAGNOSTIC TYPE
     002034  000001                             .WORD   1
     002036                             L$APT::                 ;APT EXPANSION
     002036  000000                             .WORD   0
     002040                             L$DTP::                 ;PTR. TO DISPATCH TABLE
     002040  002124                             .WORD   L$DISPATCH
     002042                             L$PRIO::                ;DIAGNOSTIC RUN PRIORITY
```

```
002042  000000                  .WORD   0
002044                  L$ENVI::                ;FLAGS DESCRIBE HOW IT WAS SETUP
002044  000000                  .WORD   0
002046                  L$EXP1::                ;EXPANSION WORD
002046  000000                  .WORD   0
002050                  L$MREV::                ;SVC REV AND EDIT #
002050     004                  .BYTE   C$REVISION
002051     000                  .BYTE   C$EDIT
002052                  L$EF::                  ;DIAG. EVENT FLAGS
002052  000000                  .WORD   0
002054  000000                  .WORD   0
002056                  L$SPC::
002056  000000                  .WORD   0
002060                  L$DEVP::                ; POINTER TO DEVICE TYPE LIST
002060  002174                  .WORD   L$DVTYP
002062                  L$REPP::                ;PTR. TO REPORT CODE
002062  034216                  .WORD   L$RPT
002064                  L$EXP4::
002064  000000                  .WORD   0
002066                  L$EXP5::
002066  000000                  .WORD   0
002070                  L$AUT::                 ;PTR. TO ADD UNIT CODE
002070  000000                  .WORD   0
002072                  L$DUT::                 ;PTR. TO DROP UNIT CODE
002072  040706                  .WORD   L$DU
002074                  L$LUN::                 ;LUN FOR EXERCISERS TO FILL
002074  000000                  .WORD   0
002076                  L$DESP::                ;POINTER TO DIAG. DESCRIPTION
002076  002142                  .WORD   L$DESC
002100                  L$LOAD::                ;GENERATE SPECIAL AUTOLOAD EMT
002100  104035                  EMT     E$LOAD
002102                  L$ETP::                 ;POINTER TO ERRTBL
002102  013262                  .WORD   L$ERRTBL
002104                  L$ICP::                 ;PTR. TO INIT CODE
002104  037012                  .WORD   L$INIT
002106                  L$CCP::                 ;PTR. TO CLEAN-UP CODE
002106  040400                  .WORD   L$CLEAN
002110                  L$ACP::                 ;PTR. TO AUTO CODE
002110  040376                  .WORD   L$AUTO
002112                  L$PRT::                 ;PTR. TO PROTECT TABLE
002112  021036                  .WORD   L$PROT
002114                  L$TEST::                ;TEST NUMBER
002114  000000                  .WORD   0
002116                  L$DLY::                 ;DELAY COUNT
002116  000000                  .WORD   0
002120                  L$HIME::                ;PTR. TO HIGH MEM
002120  000000                  .WORD   0
```

```
                                .SBTTL  DISPATCH TABLE

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

002122                                  DISPATCH 7
002122  000007                         .WORD   7
002124                          L$DISPATCH::
002124  040722                         .WORD   T1
002126  043124                         .WORD   T2
002130  043620                         .WORD   T3
002132  044276                         .WORD   T4
002134  044656                         .WORD   T5
002136  045176                         .WORD   T6
002140  045654                         .WORD   T7

002142                                  DESCRIPT        <CZTKBA0 DATA RELIABILITY>
002142                          L$DESC::
002142  103 132 124                     .ASCIZ  /CZTKBA0 DATA RELIABILITY/
                                        .EVEN

                                ;
                                ; NAMES OF DEVICES SUPPORTED BY PROGRAM
                                ;

002174                                  DEVTYP  <TK50>
002174                          L$DVTYP::
002174  124 113 065                     .ASCIZ  %TK50%
                                        .EVEN
```

```
                                .SBTTL  DEFAULT HARDWARE P-TABLE

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

002202                                  BGNHW   DFPTBL
002202  000002                         .WORD   L10000-L$HW/2
002204                          L$HW::
002204                          DFPTBL::

002204  174500                          174500                  ;TKIP ADDRESS
002206  000000                          0                       ;T/MSCP UNIT NUMBER

002210                                  ENDHW
002210                          L10000:
```

```
                                .SBTTL  SOFTWARE P-TABLE

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

002210                                  BGNSW   SFPTBL
002210  000041                         .WORD   L10001-L$SW/2
002212                          L$SW::
002212                          SFPTBL::

002212  000             CLOCK::         .BYTE   0       ;ENABLE TIME OF DAY CLOCK
002213  000             HOURS::         .BYTE   0       ;HOURS FOR TIME OF DAY CLOCK
002214  000             MINUTE::        .BYTE   0       ;MINUTES FOR TIME OF DAY CLOCK
002215  000             SECOND::        .BYTE   0       ;SECONDS FOR TIME OF DAY CLOCK
002216  000             SUBSEC::        .BYTE   0       ;SUBSECONDS FOR TIME OF DAY CLOCK

002217  000             CONTPA::        .BYTE   0       ;CHANGE CONTROLLER PARARMETERS
002220  001             SERREC::        .BYTE   1       ;ENABLE ERROR CORRECTION FLAG
002221  001             SERCOR::        .BYTE   1       ;ENABLE ERROR RECOVERY FLAG
002222  001             PADING::        .BYTE   1       ;ENABLE PAD BLOCKING

002223  000             PRNTPA::        .BYTE   0       ;CHANGE PRINT PARAMETERS
002224  000             SOERRP::        .BYTE   0       ;ENABLE SOFT ERROR REPORT FLAG
002225  001             RDSOER::        .BYTE   1       ;ENABLE READ SOFT ERRORS ONLY
002226  000             CLRMED::        .BYTE   0       ;ENABLE CLEAR MEDIA TABLE EVERY PASS
002227  000             MEDTBL::        .BYTE   0       ;ENABLE PRINT MEDIA TABLE CONTENTS
002230  000             NOCLR::         .BYTE   0       ;ENABLE CLEAR STATS ON FATAL ERROR
002231  000             DMPFLG::        .BYTE   0       ;ENABLE PROGRAM TABLE DUMP ON ERROR

002232                  T7TBL::                         ;COMMAND TABLE TOP -6

002232  000             TESTPA::        .BYTE   0       ;CHANGE TEST PARAMETERS
002233  000             PATERN::        .BYTE   0       ;CHANGE DATA PATTERN
002234  001             T3ONLY::        .BYTE   1       ;RUN TEST 3 ONLY
002235  001             T5CMP::         .BYTE   1       ;ENABLE DATA COMPARES IN TEST 5
002236  000             DMPBUF::        .BYTE   0       ;ENABLE READ BUFFER DUMP IN TEST 5
002237  000             CHGFLG::        .BYTE   0       ;CHANGE CMD SEQ TABLE FLAG

002240  160             T7CMD1:         .BYTE   REW     ;REWIND
002241  000                             .BYTE   NULPAT
002242  000000                          .WORD   0
002244  000001                          .WORD   1

002246  020             T7CMD2:         .BYTE   WR      ;WRITE RECORDS
002247  200                             .BYTE   ALLPAT
002250  004000                          .WORD   2048.
002252  000310                          .WORD   200.

002254  100             T7CMD3:         .BYTE   WTM     ;WRITE TAPE MARK
002255  000                             .BYTE   NULPAT
002256  000000                          .WORD   0
002260  000002                          .WORD   2

002262  160             T7CMD4:         .BYTE   REW     ;REWIND
002263  000                             .BYTE   NULPAT
```

```
1275 002264  000000                        .WORD   0
1276 002266  000001                        .WORD   1
1277
1278 002270     010        T7CMD5:         .BYTE   RD      ;READ RECORDS
1279 002271     200                        .BYTE   ALLPAT
1280 002272  004000                        .WORD   2048.
1281 002274  000310                        .WORD   200.
1282
1283 002276     060        T7CMD6:         .BYTE   SKP     ;SKIP TAPE MARK
1284 002277     000                        .BYTE   NULPAT
1285 002300  000001                        .WORD   1
1286 002302  000002                        .WORD   2
1287
1288 002304     160        T7CMD7:         .BYTE   REW     ;REWIND
1289 002305     000                        .BYTE   NULPAT
1290 002306  000000                        .WORD   0
1291 002310  000001                        .WORD   1
1292
1293 002312  177777        T7END:          .WORD   -1
1294                                       .EVEN
1295
1296 002314                         ENDSW
     002314                 L10001:
1297
1298 002314                         ENDMOD
```

```
1301
1312                                    .TITLE GLOBAL AREAS
1313                                    .SBTTL  GLOBAL EQUATES SECTION
1388
1389 002314                                    BGNMOD
1390
1391
1392                                    ;/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\
1393                                    ; 1.0   SUPERVISOR DEFINED LITERALS
1394                                    ;/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\
1395
1396
1397                                    ;++
1398                                    ; THE GLOBAL EQUATES SECTION CONTAINS PROGRAM EQUATES THAT
1399                                    ; ARE USED IN MORE THAN ONE TEST.
1400                                    ;--
1401
1402 002314                                    EQUALS
                                        ;
                                        ; BIT DIFINITIONS
                                        ;
            100000                      BIT15== 100000
            040000                      BIT14== 40000
            020000                      BIT13== 20000
            010000                      BIT12== 10000
            004000                      BIT11== 4000
            002000                      BIT10== 2000
            001000                      BIT09== 1000
            000400                      BIT08== 400
            000200                      BIT07== 200
            000100                      BIT06== 100
            000040                      BIT05== 40
            000020                      BIT04== 20
            000010                      BIT03== 10
            000004                      BIT02== 4
            000002                      BIT01== 2
            000001                      BIT00== 1
                                        ;
            001000                      BIT9==  BIT09
            000400                      BIT8==  BIT08
            000200                      BIT7==  BIT07
            000100                      BIT6==  BIT06
            000040                      BIT5==  BIT05
            000020                      BIT4==  BIT04
            000010                      BIT3==  BIT03
            000004                      BIT2==  BIT02
            000002                      BIT1==  BIT01
            000001                      BIT0==  BIT00
                                        ;
                                        ; EVENT FLAG DEFINITIONS
                                        ;   EF32:EF17 RESERVED FOR SUPERVISOR TO PROGRAM COMMUNICATION
                                        ;
                                        ;                                   ;  BIT POSITION IN SECOND STATUS WORD
            000040                      EF.START==      32.                 ; (100000) START COMMAND WAS ISSUED
            000037                      EF.RESTART==    31.                 ; (040000) RESTART COMMAND WAS ISSUED
            000036                      EF.CONTINUE==   30.                 ; (020000) CONTINUE COMMAND WAS ISSUED
            000035                      EF.NEW==        29.                 ; (010000) A NEW PASS HAS BEEN STARTED
```

```
000034                  EF.PWR==        28.             ; (004000) A POWER-FAIL/POWER-UP OCCURRED
                        ;
                        ;
                        ; PRIORITY LEVEL DEFINITIONS
                        ;
000340                  PRI07== 340
000300                  PRI06== 300
000240                  PRI05== 240
000200                  PRI04== 200
000140                  PRI03== 140
000100                  PRI02== 100
000040                  PRI01== 40
000000                  PRI00== 0
                        ;
                        ;OPERATOR FLAG BITS
                        ;
000004                  EVL==       4
000010                  LOT==      10
000020                  ADR==      20
000040                  IDU==      40
000100                  ISR==     100
000200                  UAM==     200
000400                  BOE==     400
001000                  PNT==    1000
002000                  PRI==    2000
004000                  IXE==    4000
010000                  IBE==   10000
020000                  IER==   20000
040000                  LOE==   40000
100000                  HOE==  100000
1403
```

```
1405
1406
1407                            ;/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\
1408                            ; 2.0   TMSCP COMMAND LITERALS
1409                            ;/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\
1410
1411                            ; 2.1   COMMAND PACKET OPCODES
1412        000001              OP.ABO  ==      01              ;ABORT COMMAND
1413        000020              OP.ACC  ==      20              ;ACCESS COMMAND
1414        000010              OP.AVL  ==      10              ;AVAILABLE COMMAND
1415        000040              OP.CMP  ==      40              ;COMPARE HOST DATA COMMAND
1416        000013              OP.DAP  ==      13              ;DETERMINE ACCESS PATH COMMAND
1417        000022              OP.ERS  ==      22              ;ERASE COMMAND
1418        000026              OP.ERG  ==      26              ;ERASE GAP COMMAND
1419        000002              OP.GCS  ==      02              ;GET COMMAND STATUS COMMAND
1420        000003              OP.GUS  ==      03              ;GET UNIT STATUS COMMAND
1421        000011              OP.ONL  ==      11              ;ONLINE COMMAND
1422        000041              OP.RD   ==      41              ;READ COMMAND
1423        000045              OP.REP  ==      45              ;REPOSITION COMMAND
1424        000004              OP.SCC  ==      04              ;SET CONTROLLER CHARACTERISTICS COMMAND
1425        000012              OP.SUC  ==      12              ;SET UNIT CHARACTERISTICS COMMAND
1426        000042              OP.WR   ==      42              ;WRITE COMMAND
1427        000044              OP.WTM  ==      44              ;WRITE TAPE MARK COMMAND
1428        000200              OP.END  ==      200             ;END MESSAGE FLAG
1429        000100              OP.AVA  ==      100             ;AVAILABLE ATTENTION MESSAGE
1430        000102              OP.ACP  ==      102             ;ACCESS PATH ATTENTION MESSAGE
1431
1432                            ; 2.2   COMMAND MODIFIERS
1433        040000              MD.CMP  ==      040000          ;COMPARE
1434        020000              MD.CSE  ==      020000          ;CLEAR SERIOUS EXCEPTION
1435        001000              MD.SEC  ==      001000          ;SUPPRESS ERROR CORRECTION
1436        000400              MD.SER  ==      000400          ;SUPPRESS ERROR RECOVERY
1437        000200              MD.DLE  ==      000200          ;DETECT LEOT
1438        000100              MD.IMM  ==      000100          ;IMMEDIATE
1439        000040              MD.EXC  ==      000040          ;EXCLUSIVE ACCESS
1440        000020              MD.UNL  ==      000020          ;UNLOAD
1441        000010              MD.REV  ==      000010          ;REVERSE
1442        000004              MD.OBC  ==      000004          ;OBJECT COUNT
1443        000004              MD.SWP  ==      000004          ;SET WRITE PROTECT
1444        000002              MD.RWD  ==      000002          ;REWIND
1445        000002              MD.ALL  ==      000002          ;ALL CLASS DRIVERS
1446        000001              MD.SPD  ==      000001          ;SPEED
1447        000001              MD.NXU  ==      000001          ;NEXT UNIT
1448
1449                            ; 2.3   GENERIC COMMAND PACKET OFFSETS
1450        000000              P.CRF   ==       0              ;COMMAND REFERENCE NUMBER
1451        000004              P.UNIT  ==       4              ;UNIT NUMBER
1452        000010              P.OPCD  ==       10             ;OPCODE
1453        000012              P.MOD   ==       12             ;MODIFIERS
1454        000014              P.BCNT  ==       14             ;BYTE COUNT
1455        000020              P.BUFF  ==       20             ;BUFFER DESCRIPTOR
1456
1457                            ; 2.4   ABORT AND GET COMMAND STATUS OFFSETS PACKET OFFSETS
1458        000014              P.OTRF  ==       14             ;OUTSTANDING COMMAND REFERENCE NUMBER
1459
1460                            ; 2.5   ONLINE AND SET UNIT CHARACTERISTICS PACKET OFFSETS
1461        000014              P.UNFL  ==       14             ;UNIT FLAGS
```

```
1462    000034          P.DVPM  ==      34              ;DEVICE DEPENDENT PARAMETERS
1463    000040          P.FORM  ==      40              ;FORMAT
1464    000042          P.SPED  ==      42              ;SPEED
1465
1466                    ; 2.6   REPOSITION COMMAND PACKET OFFSETS
1467    000014          P.REDD  ==      14              ;RECORD/OBJECT COUNT
1468    000020          P.TMGC  ==      20              ;TAPE MARK COUNT
1469
1470                    ; 2.7   SET CONTROLLER CHARACTERISTICS  PACKET OFFSETS
1471    000014          P.VRSN  ==      14              ;MSCP VERSION
1472    000016          P.CNTF  ==      16              ;CONTROLLER FLAGS
1473    000020          P.HTMO  ==      20              ;HOST TIMEOUT
1474    000024          P.TIME  ==      24              ;QUAD-WORD TIME AND DATE
1475    000034          P.CTPM  ==      34              ;CONTROLLER DEPENDENT PARAMETERS
1476
```

```
1478                            ;/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\
1479                            ; 3.0   TMSCP END PACKET LITERALS
1480                            ;/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\
1481
1482                            ; 3.1   END PACKET FLAGS
1483        000040              EF.LOG  ==      000040          ;ERROR LOG GENERATED
1484        000020              EF.SEX  ==      000020          ;SERIOUS EXCEPTION
1485        000010              EF.EOT  ==      000010          ;EOT ENCOUNTERED
1486
1487                            ; 3.2   CONTROLLER FLAGS
1488        000200              CF.ATN  ==      000200          ;ENABLE ATTENTION INTERUPTS
1489        000100              CF.MSC  ==      000100          ;ENABLE MISCELLANEOUS ERROR LOG MESSAGES
1490        000040              CF.OTH  ==      000040          ;ENABLE OTHER HOSTS ERROR LOG MESSAGES
1491        000020              CF.THS  ==      000020          ;ENABLE THIS HOSTS ERROR LOG MESSAGES
1492
1493                            ; 3.3   UNIT FLAGS
1494        020000              UF.WPH  ==      020000          ;WRITE PROTECT (HARDWARE)
1495        020000              UF.VSU  ==      020000          ;VARIABLE SPEED UNIT
1496        010000              UF.WPS  ==      010000          ;SOFTWARE WRITE PROTECT
1497        000200              UF.RMV  ==      000200          ;REMOVABLE MEDIA
1498        000040              UF.VSS  ==      000040          ;VARIABLE SPEED MODE SUPPRESSION
1499        000002              UF.CMW  ==      000002          ;COMPARE WRITES
1500        000001              UF.CMR  ==      000001          ;COMPARE READS
1501
1502                            ; 3.4   GENERIC END MESSAGE OFFSETS
1503        000000              P.CRF   ==      0               ;COMMAND REFERENCE NUMBER
1504        000004              P.UNIT  ==      4               ;UNIT NUMBER
1505        000010              P.OPCD  ==      10              ;ENDCODE
1506        000011              P.FLGS  ==      11              ;END MESSAGE FLAGS
1507        000012              P.STS   ==      12              ;STATUS
1508        000014              P.BCNT  ==      14              ;BYTE COUNT
1509
1510                            ; 3.5   ACCESS,COMPARE HOST DATA,READ,REPOSITION,WRITE,-
1511                            ;       AND WRITE TAPE MARK END MESSAGE OFFSETS
1512        000034              P.POS   ==      34              ;POSITION (OBJECT COUNT)
1513        000040              P.TRBC  ==      40              ;TAPE RECORD BYTE COUNT
1514
1515                            ; 3.6   GET COMMAND STATUS END PACKET OFFSETS
1516        000014              P.OTRF  ==      14              ;OUTSTANDING COMMAND REFERENCE NUMBER
1517        000020              P.CMST  ==      20              ;COMMAND STATUS
1518
1519                            ; 3.7   GET UNIT STATUS END MESSAGE OFFSETS
1520        000014              P.MLUN  ==      14              ;MULTI-UNIT CODE
1521        000016              P.UNFL  ==      16              ;UNIT FLAGS
1522        000024              P.UNTI  ==      24              ;UNIT IDENTIFIER
1523        000034              P.MEDI  ==      34              ;MEDIA IDENTIFIER
1524        000040              P.FORM  ==      40              ;TAPE FORMAT
1525        000042              P.SPED  ==      42              ;SPEED
1526        000044              P.FMEM  ==      44              ;FORMAT MENU
1527        000050              P.CSVR  ==      50              ;CONTROLLER SOFTWARE VERSION
1528        000051              P.CHVR  ==      51              ;CONTROLLER HARDWARE VERSION
1529        000052              P.USVR  ==      52              ;UNIT SOFTWARE VERSION
1530        000053              P.UHVR  ==      53              ;UNIT HARDWARE VERSION
1531
1532                            ; 3.8   OP.ONL, OP.AVL AND OP.SUC MESSAGE OFFSETS
1533        000044              P.MXWR  ==      44              ;MAXIMUM WRITE RECORD SIZE
1534        000050              P.NREC  ==      50              ;NOISE RECORD
```

```
1535
1536                                    ; 3.9   REPOSITION MESSAGE OFFSETS
1537        000014                      P.RCSK  ==      14              ;RECORDS SKIPPED
1538        000020                      P.TMSK  ==      20              ;TAPE MARKS SKIPPED
1539
1540                                    ; 3.10  SET CONTROLLER CHARACTERISTICS MESSAGE OFFSETS
1541        000014                      P.VRSN  ==      14              ;MSCP VERSION
1542        000016                      P.CNTF  ==      16              ;CONTROLLER FLAGS
1543        000020                      P.HTMO  ==      20              ;HOST TIMEOUT
1544        000024                      P.TIME  ==      24              ;QUAD-WORD TIME AND DATE
```

```
1546                            ;/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\
1547                            ; 4.0   ERROR LOG LITERALS
1548                            ;/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\
1549
1550                            ; 4.1   ERROR LOG MESSAGE FORMAT CODES
1551    000000                  FM.CNT  ==      000000          ;CONTROLLER ERRORS
1552    000001                  FM.BAD  ==      000001          ;HOST MEMORY ACCESS ERRORS WITH BUS ADDRESS
1553    000005                  FM.TPE  ==      000005          ;TAPE TRANSFER ERRORS
1554
1555                            ; 4.2   ERROR LOG MESSAGE FLAGS
1556    000200                  LF.SUC  ==      000200          ;OPERATION SUCCESSFUL
1557    000100                  LF.CON  ==      000100          ;OPERATION CONTINUING
1558    000001                  LF.SNR  ==      000001          ;SEQUENCE NUMBER REQUEST
1559
1560                            ; 4.3   TAPE FORMAT FLAG VALUES
1561    000001                  TF.800  ==      000001          ;NRZI 800 BPI
1562    000002                  TF.PE   ==      000002          ;PHASE ENCODED 1600 BPI
1563    000004                  TF.GCR  ==      000004          ;GROUP CODED RECORDING 6250 BPI
1564    000010                  TF.BLK  ==      000010          ;6667 BPI
1565
1566                            ; 4.4   ERROR LOG MESSAGE OFFSETS
1567    000000                  L.CRF   ==      0               ;COMMAND REFERENCE NUMBER
1568    000004                  L.UNIT  ==      4               ;UNIT NUMBER
1569    000006                  L.SEQN  ==      6               ;SEQUENCE NUMBER
1570    000010                  L.FMT   ==      10              ;FORMAT
1571    000011                  L.FLGS  ==      11              ;ERROR LOG MESSAGE FLAGS
1572    000012                  L.EVNT  ==      12              ;EVENT CODES
1573    000014                  L.CNTI  ==      14              ;CONTROLLER ID
1574    000024                  L.CSVR  ==      24              ;CONTROLLER SOFTWARE VERSION
1575    000025                  L.CHVR  ==      25              ;CONTROLLER HARDWARE VERSION
1576    000026                  L.MLUN  ==      26              ;MULTI UNIT CODE
1577    000030                  L.UNTI  ==      30              ;UNIT ID
1578    000030                  L.BADR  ==      30              ;BUS ADDRESS
1579    000040                  L.USVR  ==      40              ;UNIT SOFTWARE VERSION
1580    000041                  L.UHVR  ==      41              ;UNIT HARDWARE VERSION
1581    000042                  L.LVL   ==      42              ;RETRY LEVEL
1582    000042                  L.FMTD  ==      42              ;FORMAT DEPENDENT
1583    000043                  L.RTRY  ==      43              ;RETRY COUNT FOR THE CURRENT LEVEL
1584    000044                  L.GPCT  ==      44              ;GAP COUNT
1585    000044                  L.VSER  ==      44              ;VOLUME SERIAL NUMBER
1586    000044                  L.PSTN  ==      44              ;TAPE OBJECT COUNT
1587    000050                  L.STI   ==      50              ;STI INFORMATION
1588    000050                  L.FHVR  ==      50              ;FORMATTER HARDWARE VERSION
1589    000051                  L.FSVR  ==      51              ;FORMATTER SOFTWARE VERSION
1590    000052                  L.STS   ==      52              ;CONTROLLER INTERNAL STATUS
1591    000053                  L.DRVC  ==      53              ;DRIVE ERROR CODE
1592    000054                  L.DFLG  ==      54              ;DRIVE STATE FLAGS
1593    000055                  L.TRK   ==      55              ;LOGICAL TRACK NUMBER
1594    000056                  L.PBLK  ==      56              ;PHYSICAL BLOCK NUMBER
1595    000060                  L.LBLK  ==      60              ;LOGICAL BLOCK NUMBER
1596    000061                  L.CNT0  ==      61              ;TAPE COUNT 0
1597    000062                  L.CNT1  ==      62              ;TAPE COUNT 1
1598    000063                  L.CNT2  ==      63              ;TAPE COUNT 2
1599    000064                  L.DRVS  ==      64              ;DRIVE STATE
1600    000066                  L.RWST  ==      66              ;READ/WRITE STATE
1601    000070                  L.OPFL  ==      70              ;OPERATION FLAGS
1602
```

```
1603                            ; 4.5   STATUS AND EVENT CODES
1604        000037              ST.MSK  ==      37              ;STATUS/EVENT CODE MASK
1605        000040              ST.SUB  ==      40              ;SUB-CODE MULTIPLIER
1606        000000              ST.SUC  ==      0               ;SUCCESS
1607        000001              ST.CMD  ==      1               ;INVALID COMMAND
1608        000002              ST.ABO  ==      2               ;COMMAND ABORTED
1609        000003              ST.OFL  ==      3               ;UNIT-OFFLINE
1610        000004              ST.AVL  ==      4               ;UNIT-AVAILABLE
1611        000005              ST.MFE  ==      5               ;MEDIA FORMAT ERROR
1612        000006              ST.WPR  ==      6               ;WRITE PROTECTED
1613        000007              ST.CMP  ==      7               ;COMPARE ERROR
1614        000010              ST.DAT  ==      10              ;DATA ERROR
1615        000011              ST.HST  ==      11              ;HOST BUFFER ACCESS ERROR
1616        000012              ST.CNT  ==      12              ;CONTROLLER ERROR
1617        000013              ST.DRV  ==      13              ;DRIVE ERROR
1618        000014              ST.FNT  ==      14              ;FORMATTER ERROR
1619        000015              ST.BOT  ==      15              ;BOT ENCOUNTERED
1620        000016              ST.TM   ==      16              ;TAPE MARK ENCOUNTERED
1621        000020              ST.RDT  ==      20              ;RECORD DATA TRUNCATED
1622        000021              ST.POL  ==      21              ;POSITION LOST
1623        000022              ST.SEX  ==      22              ;SERIOUS EXCEPTION
1624        000023              ST.LED  ==      23              ;LEOT DETECTED
1625        000037              ST.DIA  ==      37              ;INTERNAL DIAGNOSTIC MESSAGE
1626        000400              ST.ONL  ==      400             ;UNIT ALREADY ONLINE
1627
1628        000010              EV.LGP  ==      10              ;LONG GAP ENCOUNTERED
1629        000050              EV.DST  ==      50              ;DATA SYNC TIMEOUT
1630        000052              EV.CTO  ==      52              ;COMM CHANNEL TIMEOUT
1631        000053              EV.SRT  ==      53              ;DRIVE COMMAND TIMEOUT
1632        000113              EV.SRI  ==      113             ;CONTROLLER DECTECTED TRANSMISION ERROR
1633        000150              EV.COR  ==      150             ;CORRECTABLE ERROR
1634        000152              EV.IDS  ==      152             ;INTERNAL INCONSISTENCY ERROR
1635        000153              EV.SER  ==      153             ;SOFT ERROR
1636        000213              EV.HER  ==      213             ;HARD ERROR
1637        000350              EV.URE  ==      350             ;UNRECORVERABLE DATA ERROR
```

```
1639                            ;/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\
1640                            ; 5.0   PROGRAM DEFINED LITERALS
1641                            ;/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\
1642
1643                            ; 5.1   TKSA BIT DEFINITIONS
1644    100000                  ERR     ==      100000          ;ERROR
1645    004000                  S1      ==      004000          ;STEP 1
1646    000001                  GO      ==      000001          ;GO
1647    111400                  TKINIT  ==      111400          ;TK50 STEP 1 RESPONSE
1648
1649                            ; 5.2   DRIVE IN USE TABLE BIT DEFINITIONS
1650    000001                  AVB     ==      000001          ;DRIVE AVAILABLE
1651    000002                  NRDY    ==      000002          ;DRIVE NOT READY
1652    000004                  EOT     ==      000004          ;DRIVE AT EOT
1653    000010                  DROP    ==      000010          ;DRIVE DROPPED
1654    000020                  FAIL    ==      000020          ;DRIVE FAILED
1655
1656                            ; 5.3   I/O STATUS MESSAGES
1657    000000                  IONORM  ==      0               ;SUCCESSFUL COMMAND TRANSMISSION
1658    100000                  NURESP  ==      BIT15           ;NEW RESPONSE RECEIVED
1659    040000                  ERRLOG  ==      BIT14           ;ERROR LOG PACKET RECEIVED
1660    020000                  IOICRD  ==      BIT13           ;INSUFFICIENT CREDIT TO POST COMMAND
1661    000001                  CMDLST  ==      1.              ;GCS RESPONSE NEVER CAME BACK
1662    000002                  IOHUNG  ==      2.              ;CONTROLLER HUNG
1663    000003                  IOPDRE  ==      3.              ;PORT DETECTED ERROR
1664    000004                  IOTIME  ==      4.              ;CONTROLLER TIME OUT
1665    000005                  MISSEQ  ==      5.              ;COMMAND RETURNED IN WRONG SEQUENCE
1666    000006                  INTERR  ==      6.              ;ERROR DURING INITIALIZATION
1667    000007                  ILLCMD  ==      7.              ;ILLEGAL COMMAND
1668
1669                            ; 5.4   RESPONSE CONDITION CODES
1670    000001                  SUCCES  ==      000001          ;RESPONSE HANDLED SUCCESSFULLY
1671    000002                  SEREXC  ==      000002          ;SERIOUS EXCEPTION CONDITION
1672    000004                  ABORT   ==      000004          ;SYSTEM FATAL ERROR ABORT PROGRAM
1673
1674                            ; 5.5   U/Q PORT LITERALS
1675    100000                  OWN     ==      BIT15           ;DESCRIPTOR OWNERSHIP BIT
1676    040000                  FLAG    ==      BIT14           ;DESCRIPTOR INTERUPT FLAG BIT
1677    000200                  IMM     ==      BIT07           ;IMMEDIATE COMMAND FLAG
1678
1679                            ; 5.6   PROGRAM LITERALS
1680    177546                  KWCSR   ==      177546          ;LINE CLOCK REGISTER ADDRESS
1681    001233                  RS1     ==      1233            ;RANDOM GENERATOR SEED
1682    007622                  RS2     ==      7622            ;RANDOM GENERATOR SEED
1683    000000                  RS3     ==      0               ;RANDOM GENERATOR SEED
1684    000000                  NULPAT  ==      0               ;NO DATA PATTERN NEEDED
1685    000000                  RNDBYT  ==      0               ;RANDOM BYTE COUNT
1686    020000                  MAXBUF  ==      8192.           ;MAXIMUM BUFFER SIZE
1687    000024                  MINBUF  ==      20.             ;MINIMUM BUFFER SIZE
1688    000000                  RNDITR  ==      0               ;RANDOM ITERATION COUNT
1689    003720                  MAXITR  ==      2000.           ;MAXIMUM ITERATION SET
1690    000144                  MINITR  ==      100.            ;MINIMUM ITERATION SET
1691    000001                  PAT1    ==      1               ;ALL 1'S DATA PATTERN
1692    000002                  PAT2    ==      2               ;ALL 0'S DATA PATTERN
1693    000003                  PAT3    ==      3               ;WORST CASE MFM DATA PATTERN
1694    000004                  PAT4    ==      4               ;ALTERNATING 1'S AND 0'S
1695    000005                  PAT5    ==      5               ;RANDOM DATA PATTERN
```

```
1696    000006          PAT6    ==      6               ;1110 REPEATING PATTERN
1697    000007          PAT7    ==      7               ;COMBINATION PATTERN 3 AND 5
1698    000010          ENDPAT  ==      8.              ;RANDOM PATTERN VALUE
1699    000200          ALLPAT  ==      200             ;CYCLE THROUGH ALL PATTERNS
1700    000002          UNTSTP  ==      2               ;STEP THROUGH UNITS
1701    000000          HSTIMO  ==      0               ;HOST TIMEOUT VALUE
1702    000000          MSCPVR  ==      0               ;MSCP VERSION NUMBER
1703    177776          LOBYTE  ==      -2              ;LOW BYTE OFFSET FOR COMPARE DATA
1704    177777          HIBYTE  ==      -1              ;HIGH BYTE OFFSET FOR COMPARE DATA
1705    004716          T2END   ==      2510.           ;RECORDS TO FILL 2 TRACKS
1706    000004          N       ==      4               ;VALUE USED IN SUBITR
1707    000001          ONE     ==      1               ;BYTE OFFSET
1708
1709                    ; 5.7   ERROR MASKING LITERALS
1710    000001          LEDB    ==      000001          ;DETECT LOGICAL END OF TAPE
1711    000002          RDTB    ==      000002          ;RECORD DATA TRUNCATED
1712    000004          SEXB    ==      000004          ;SERIOUS EXCEPTION
1713    000010          TMB     ==      000010          ;ENCOUNTERED TAPE MARK
1714    000020          WPRB    ==      000020          ;DRIVE WRITE PROTECTED
1715    000040          AVLB    ==      000040          ;UNIT AVAILABLE
1716    000100          ONLB    ==      000100          ;UNIT ONLINE
1717
1718                    ; 5.8   ERROR TYPE LITERALS
1719    000000          SYSFAT  ==      0               ;SYSTEM FATAL ERROR
1720    000001          DEVFAT  ==      1               ;DEVICE FATAL ERROR
1721    000002          HARD    ==      2               ;HARD DEVICE ERROR
1722    000003          SOFT    ==      3               ;SOFT DEVICE ERROR
1723    000004          STATUS  ==      4               ;STATUS MESSAGE
1724
1725                    ; 5.9 BIT VALUES FOR LUN FLAG
1726    000001          INTDON  ==      000001          ;INITIALIZATION HAS BEEN DONE ON THIS UNIT
1727    000002          SEREXC  ==      000002          ;A SERIOUS EXCEPTION CONDITION EXITS
1728    000004          NOTALY  ==      000004          ;DON'T TALLY BYTES FOR THIS COMMAND
1729    000010          EOTPR   ==      000010          ;EOT PRINTED FOR THIS UNIT
1730    000020          ODDFLG  ==      000020          ;ODD BYTE COUNT FLAG
1731    000040          MTBLOV  ==      000040          ;MEDIA STATS OVERFLOW FLAG
1732    000100          ECCFLG  ==      000100          ;DON'T DECREMENT ECC COUNT FLAG
1733
1734                    ;PROGRAM CONTROL FLAG BIT VALUES
1735    000001          T7BRFL  ==      000001          ;BRANCH FLAG FOR TEST 7
1736    000002          NCLKFL  ==      000002          ;NO CLOCK PRESENT FLAG
1737    000004          TCNTFL  ==      000004          ;COUNT RECORDS AND TAPE MARKS FLAG
1738    000010          DRERFL  ==      000010          ;DRIVE ERROR FLAG
1739    000020          GCSCFL  ==      000020          ;GET COMMAND STATUS COMMAND FLAG
1740    000040          GCSRFL  ==      000040          ;GET COMMAND STATUS RESPONSE FLAG
1741    000100          NOMDTB  ==      000100          ;DON'T PRINT MEDIA DEFECTS FLAG
1742    000200          CMDONE  ==      000200          ;ALL COMMANDS ISSUED FLAG
1743    000400          DROPIT  ==      000400          ;DRIVE BEING DROPPED
```

```
                        ;/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\
                        ; 6.0   PROGRAM OFFSETS
                        ;/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\

                        ; 6.1   TEST TABLE OFFSETS
000000                  CMD     ==      0.              ;COMMAND PRIMITIVE OFFSET
000001                  DATPAT  ==      1.              ;DATA PATTERN
000002                  ITMCNT  ==      2.              ;ITEM (BYTE) COUNT OFFSET
000004                  ITRCNT  ==      4.              ;ITERATION COUNT OFFSET
000006                  TSTSTP  ==      6.              ;USED TO STEP THROUGH TEST TABLES

                        ; 6.2   PROGRAM COMMAND BUFFER OFFSETS
000000                  CMD     ==      0               ;COMMAND PRIMITIVE OFFSET
000002                  ITMOFF  ==      2.              ;ITEM (BYTE) COUNT OFFSET
000004                  OBOFFL  ==      4.              ;LOW ORDER OBJECT COUNT
000006                  OBOFFH  ==      6.              ;HIGH ORDER OBJECT COUNT
000010                  XFERST  ==      8.              ;TRANSFER STATUS
000012                  BUFOFF  ==      10.             ;COMMAND BUFFER ADDRESS
000014                  PCBSTP  ==      12.             ;STEP TO NEXT SLOT
000044                  PCB3SP  ==      36.             ;3 STEPS

                        ; 6.3   TMSCP DRIVER BUFFER OFFSETS
000002                  HIADDR  ==      2.              ;DESCRIPTOR ADDRESS OFFSET
177777                  CONID   ==      -1.             ;COMMAND/RESPONSE CONNECTION TYPE I.D.
177776                  CRD     ==      -2.             ;COMMAND/RESPONSE CREDIT LIMIT OFFSET
177774                  MSGLEN  ==      -4.             ;COMMAND/RESPONSE MESSAGE LENGTH
000104                  DRBSTP  ==      68.             ;RESPONSE PACKET SIZE (WORDS)
000050                  DCBSTP  ==      40.             ;COMMAND PACKET SIZE (WORDS)
000170                  DCB3SP  ==      120.            ;3 COMMAND PACKET SIZE
000004                  DSPSTP  ==      4.              ;PORT DESCRIPTOR SIZE

                        ; 6.4 MEDIA STATISTICS TABLE OFFSETS
000000                  TRK     ==      0       ;TRACK NUMBER
000002                  PHB     ==      2       ;PHYSICAL BLOCK NUMBER
000004                  SWR     ==      4       ;SOFT WRITE ERROR
000005                  SRD     ==      5       ;SOFT READ ERROR
000006                  HWR     ==      6       ;HARD WRITE ERROR
000007                  HRD     ==      7       ;HARD READ ERROR
005040                  U1OFF   ==      2592.   ;OFFSET FOR 1 UNIT
002420                  U2OFF   ==      1296.   ;OFFSET FOR 2 UNITS
001540                  U3OFF   ==      864.    ;OFFSET FOR 3 UNITS
001210                  U4OFF   ==      648.    ;OFFSET FOR 4 UNITS

                        ; 6.6   DRIVE STATUS CODES

000026                  ECCDC   ==      26      ;ECC CORRECTION ON DATA BLOCK
000030                  ECCTC   ==      30      ;ECC CORRECTION ON A TAPE MARK
000036                  ECCBC   ==      36      ;CRC ERROR ON ECC BLOCK
```

```
1795
1796                                    ; 6.7   LUN TABLE OFFSETS
1797    000000                          TKIP    ==      0       ;IP REGISTER ADDRESS
1798    000002                          TKSA    ==      2       ;SA REGISTER ADDRESS
1799    000004                          TKUNIT  ==      4       ;TMSCP DEVICE UNIT NUMBER
1800    000006                          CMDSEQ  ==      6       ;COMMAND REFERENCE NUMBER
1801    000010                          SLTUSE  ==      10      ;BIT MAP OF RESPONSES RECEIVED
1802    000012                          CMDSSV  ==      12      ;COMMAND DESCRIPTOR
1803    000014                          CNUSAV  ==      14      ;NEW COMMAND BUFFER POINTER
1804    000016                          COLSAV  ==      16      ;OLD COMMAND BUFFER POINTER
1805    000020                          RNUSAV  ==      20      ;NEW RESPONSE BUFFER POINTER
1806    000022                          ROLSAV  ==      22      ;OLD RESPONSE BUFFER POINTER
1807    000024                          PATSAV  ==      24      ;DATA PATTERN
1808    000026                          LUNFLG  ==      26      ;INITIALIZATION FLAG
1809    000030                          LEOTFL  ==      30      ;UNIT LOGICAL END OF TAPE FLAG
1810    000032                          UNDROP  ==      32      ;UNIT DROP COUNT
1811    000034                          OBJFDL  ==      34      ;OBJECT COUNT LOW ORDER
1812    000036                          OBJFDH  ==      36      ;OBJECT COUNT HIGH ORDER
1813    000040                          S1READ  ==      40      ;SOFT READ ERROR CHANNEL 1
1814    000042                          S2READ  ==      42      ;SOFT READ ERROR CHANNEL 2
1815    000044                          S1WRIT  ==      44      ;SOFT WRITE ERROR CHANNEL 1
1816    000046                          S2WRIT  ==      46      ;SOFT WRITE ERROR CHANNEL 2
1817    000050                          EC1COR  ==      50      ;ECC CORRECTABLE CHANNEL 1
1818    000052                          EC2COR  ==      52      ;ECC CORRECTABLE CHANNEL 2
1819    000054                          H1READ  ==      54      ;HARD READ ERROR CHANNEL 1
1820    000056                          H2READ  ==      56      ;HARD READ ERROR CHANNEL 2
1821    000060                          H1WRIT  ==      60      ;HARD WRITE ERROR CHANNEL 1
1822    000062                          H2WRIT  ==      62      ;HARD WRITE ERROR CHANNEL 2
1823    000064                          RTYEC1  ==      64      ;CRC ERROR ON ECC BLOCK CHANNEL 1
1824    000066                          RTYEC2  ==      66      ;CRC ERROR ON ECC BLOCK CHANNEL 2
1825    000070                          DTCPER  ==      70      ;DATA COMPARE ERROR
1826    000072                          UNDRUN  ==      72      ;DATA UNDERRUN
1827    000074                          OVRRUN  ==      74      ;DATA OVERRUN
1828    000076                          RMSPOS  ==      76      ;READ MISPOSITION ERROR
1829    000100                          WMSPOS  ==      100     ;WRITE MISPOSITION ERROR
1830    000102                          OTHER   ==      102     ;OTHER ERRORS
1831    000104                          DROPPD  ==      104     ;TIMES UNIT WAS DROPPED
1832    000106                          NOERR   ==      106     ;NO ERROR
1833    000110                          RDBYT1  ==      110     ;HUNDREDS BYTES READ
1834    000112                          RDBYT2  ==      112     ;THOUSANDS BYTES READ
1835    000114                          RDBYT3  ==      114     ;MILLIONS BYTES READ
1836    000116                          RDBYT4  ==      116     ;BILLIONS BYTES READ
1837    000120                          WRBYT1  ==      120     ;HUNDREDS BYTES WRITTEN
1838    000122                          WRBYT2  ==      122     ;THOUSANDS BYTES WRITTEN
1839    000124                          WRBYT3  ==      124     ;MILLIONS BYTES WRITTEN
1840    000126                          WRBYT4  ==      126     ;BILLIONS BYTES WRITTEN
1841    000130                          TBLTOP  ==      130     ;TOP OF MEDIA STATS TABLE
1842    000132                          TBLBTM  ==      132     ;BOTTOM OF MEDIA STATS TABLE
1843    000134                          LSTENT  ==      134     ;FIRST FREE SLOT IN MEDIA STATS TABLE
1844    000136                          SED1    ==      136     ;PRIME RANDOM GENERATOR SEED
1845    000140                          SED2    ==      140     ;PRIME RANDOM GENERATOR SEED
1846    000142                          SED3    ==      142     ;PRIME RANDOM GENERATOR SEED
1847    000144                          SEED1   ==      144     ;RANDOM GENERATOR SEED
1848    000146                          SEED2   ==      146     ;RANDOM GENERATOR SEED
1849    000150                          SEED3   ==      150     ;RANDOM GENERATOR SEED
1850    000152                          OLDBLK  ==      152     ;SAVE OF LAST BLOCK IN ERROR
1851    000154                          OLDTRK  ==      154     ;SAVE OF LAST TRACK IN ERROR
```

```
1853        000156                  URSPBF  ==      156     ;START OF THIS UNITS RESPONSE BUFFER
1854        000160                  URBEND  ==      160     ;END OF THIS UNITS RESPONSE BUFFER
1855        000162                  URDSRG  ==      162     ;START OF THIS UNITS RESPONSE DESCRIPTOR RING
1856        000164                  URDEND  ==      164     ;END OF THIS UNITS RESPONSE DESCRIPTOR RING
1857        000166                  UCDSRG  ==      166     ;START OF THIS UNITS COMMAND DESCRIPTOR RING
1858        000170                  UCDEND  ==      170     ;END OF THIS UNITS COMMAND DESCRIPTOR RING
1859        000172                  LUNSTP  ==      172     ;OFFSET TO NEXT LUN BLOCK
```

```
1861                            ;/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\
1862                            ; 7.0   PROGRAM PRIMITIVES
1863                            ;/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\
1864
1865                            ; 7.1   COMMAND PRIMITIVE LITERALS
1866        000000              NUL     ==      000             ;NULL
1867        000010              RD      ==      010             ;READ
1868        000011              RDR     ==      011             ;READ REVERSE
1869        000020              WR      ==      020             ;WRITE
1870        000030              CMP     ==      030             ;COMPARE HOST DATA
1871        000031              CMR     ==      031             ;COMPARE HOST DATA REVERSE
1872        000040              ACC     ==      040             ;ACCESS
1873        000041              ACR     ==      041             ;ACCESS REVERSE
1874        000050              SPC     ==      050             ;SPACE RECORDS
1875        000051              SCR     ==      051             ;SPACE RECORDS REVERSE
1876        000052              SCD     ==      052             ;SPACE TO LEOT
1877        000060              SKP     ==      060             ;SKIP TAPE MARKS
1878        000061              SKR     ==      061             ;SKIP TAPE MARKS REVERSE
1879        000062              SKD     ==      062             ;SKIP TO LEOT
1880        000070              SPO     ==      070             ;SPACE OBJECTS
1881        000071              SPR     ==      071             ;SPACE OBJECTS REVERSE
1882        000100              WTM     ==      100             ;WRITE TAPE MARKS
1883        000110              ERS     ==      110             ;ERASE
1884        000113              ERI     ==      113             ;ERASE IMMEDIATE
1885        000120              ERG     ==      120             ;ERASE GAPS
1886        000130              AVL     ==      130             ;AVAILABLE
1887        000134              AVU     ==      134             ;AVAILABLE UNLOAD
1888        000140              ONL     ==      140             ;ONLINE
1889        000150              SUC     ==      150             ;SET UNIT CHARACTERISTICS
1890        000155              SUW     ==      155             ;SET UNIT CHARA. W/WRITE PROTECT
1891        000160              REW     ==      160             ;REWIND
1892        000163              RWI     ==      163             ;REWIND IMMEDIATE
1893        000170              INT     ==      170             ;INITIALIZATION
1894        000200              ABO     ==      200             ;ABORT
1895        000210              GCS     ==      210             ;GET COMMAND STATUS
1896        000220              GUS     ==      220             ;GET UNIT STATUS
1897        000230              SCC     ==      230             ;SET CONTROLLER CHARACTERISTICS
1898
1899                            ; 7.2   COMMAND PRIMITIVE MODIFIER LITERALS
1900        000001              REVBIT  ==      1               ;REVERSE MODIFIER
1901        000002              EOTBIT  ==      2               ;DETECT LEOT MODIFIER
1902        000003              IMMBIT  ==      3               ;IMMEDIATE MODIFIER
1903        000004              UNLBIT  ==      4               ;UNLOAD MOIFIER
1904        000005              WPRBIT  ==      5               ;WRITE PROTECT MODIFIER
1905
```

```
                                .SBTTL  GLOBAL DATA SECTION

                                ;/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\
                                ; 8.0 PROGRAM AND DRIVER DATA STRUCTURES
                                ;/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\

                                ; 8.1 UNIT LUN BLOCKS
002314  000000  000000  000000  LUN0::          .WORD   0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
002404  000000  000000  000000                          0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
002472  004032                                          DRSPB0
002474  005072                                          DRBEN0
002476  010232                                          RDSRG0
002500  010272                                          RDREN0
002502  010272                                          CDSRG0
002504  010312                                          CDREN0

002506  000000  000000  000000  LUN1::          .WORD   0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
002576  000000  000000  000000                          0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
002664  005072                                          DRSPB1
002666  006132                                          DRBEN1
002670  010316                                          RDSRG1
002672  010356                                          RDREN1
002674  010356                                          CDSRG1
002676  010376                                          CDREN1

002700  000000  000000  000000  LUN2::          .WORD   0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
002770  000000  000000  000000                          0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
003056  006132                                          DRSPB2
003060  007172                                          DRBEN2
003062  010402                                          RDSRG2
003064  010442                                          RDREN2
003066  010442                                          CDSRG2
003070  010462                                          CDREN2

003072  000000  000000  000000  LUN3::          .WORD   0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
003162  000000  000000  000000                          0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
003250  007172                                          DRSPB3
003252  010232                                          DRBEN3
003254  010466                                          RDSRG3
003256  010526                                          RDREN3
003260  010526                                          CDSRG3
003262  010546                                          CDREN3

                                ; 8.2 PROGRAM COMMAND BUFFERS
003264                          PCMDBF::        .BLKW   24.     ;PROGRAM COMMAND RING
        003344                  PCBEND==.                       ;PROGRAM COMMAND RING END
003344                          DUMPKT::        .BLKW   2.      ;PROGRAM DUMMY COMMAND PACKET
003350                          DRINUS::        .BLKW   4.      ;DRIVE IN USE TABLE
003360                          UNTTBL::        .BLKW   8.      ;TEMPORY MEDIA STAT STORAGE

                                ; 8.3 PROGRAM VARIABLES
003400  000000                  CMDCNT::        .WORD   0       ;COMMAND COUNT
003402  000000                  RSPCNT::        .WORD   0       ;RESPONSE COUNT
003404  000000                  COUNT::         .WORD   0       ;COMMAND LOOP COUNTER
003406  000000                  RESPON::        .WORD   0       ;RESPONSE STATUS
003410  000000                  BRCNT::         .WORD   0       ;BRANCH COUNTER
003412  000000                  HNDLRP::        .WORD   0       ;NUMBER OF RESPONSES
```

```

003414  000000          RESP::          .WORD   0       ;DRIVER RESPONSE COUNT
003416  000000          BYTES::         .WORD   0       ;BYTE COUNT
003420  000000          ITERS::         .WORD   0       ;ITERATION COUNT
003422  000000          BUFADR::        .WORD   0       ;COMMAND BUFFER ADDRESS
003424  000000          SUBCNT::        .WORD   0       ;SUB-ITERATION COUNT FOR DATA COMPARES

003426  000000          RANWRD::        .WORD   0       ;USED BY RANGEN
003430  000000          RAN1::          .WORD   0       ;SEED WORK LOCATION
003432  000000          RAN2::          .WORD   0       ;SEED WORK LOCATION
003434  000000          RAN3::          .WORD   0       ;SEED WORK LOCATION

003436  000000          SAVDIF::        .WORD   0       ;COMMAND AND RESPONSE COUNT DIFFERENCE
003440  000000          TSTMSK::        .WORD   0       ;TEST LOAD WITH ACCEPTABLE ERROR CODES
003442  000000          WRKMSK::        .WORD   0       ;USED BY ERROR DECODE

003444  000000          CMPERR::        .WORD   0       ;NUMBER OF BYTES IN ERROR
003446                  BYTADD::        .BLKW   10.     ;SAVE TABLE FOR BYTE IN ERROR ADDRESS
        003472          TBLEND == .                     ;END OF BYTE ADDRESS TABLE
003472                  DATBL::         .BLKW   10.     ;SAVE TABLE FOR BYTE IN ERROR DATA
003516  000000          PCFLAG::        .WORD   0       ;PROGRAM CONTROL FLAGS

003520  000000          OBJECT::        .WORD   0       ;OBJECT COUNTER FOR TEST 2
003522  000000          PASCNT::        .WORD   0       ;PASS COUNTER
0C3524  000000          UDROP::         .WORD   0       ;NUMBER OF DROPPED UNITS
003526  000000          UEOT::          .WORD   0       ;COUNT OF UNITS AT EOT

003530  000000          R8::            .WORD   0       ;USED FOR TEMP STORAGE
003532  000000          R9::            .WORD   0       ;USED FOR TEMP STORAGE
003534  000000          R10::           .WORD   0       ;USED FOR TEMP STORAGE
003536  000000          R11::           .WORD   0       ;USED FOR TEMP STORAGE
003540  000000          R12::           .WORD   0       ;USED FOR TEMP STORAGE

003542  000000          SECRNS::        .WORD   0       ;SERIOUS EXCEPTION CMD REF #
003544  000000          TBLOFF::        .WORD   0       ;MEDIA ERROR TABLE OFFSET
003546  000000          RECCNT::        .WORD   0       ;NUMBER OF RECORDS
003550  000000          TMCNT::         .WORD   0       ;NUMBER OF TAPE MARKS
003552  000000          LOHEX::         .WORD   0       ;LOW ORDER HEX DIGIT

003554  000000          HIHEX::         .WORD   0       ;HIGH ORDER HEX DIGIT
003556  000000          EVENT::         .WORD   0       ;EVENT CODE STORAGE
003560  000000          R3SAVE::        .WORD   0       ;SAVE LOCATION FOR R3
003562  000000          R4SAVE::        .WORD   0       ;SAVE LOCATION FOR R4
003564     000          DAYS::          .BYTE   0       ;NUMBER OF DAYS IN RUN
                        .EVEN
```

GLOBAL DATA SECTION

```
                        ;/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\
                        ; 9.0 TMSCP CLASS AND PORT DRIVER DATA STRUCTURES
                        ;/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\

                        ; 9.1 CLASS DRIVER BUFFERS
003566                  CMDBF1::        .BLKW   2.      ;DRIVE COMMAND BUFFER 1
003572                  DCMDBF::        .BLKW   18.     ;DRIVER COMMAND BUFFER
003636                  CMDBF2::        .BLKW   20.     ;DRIVE COMMAND BUFFER 2
003706                  CMDBF3::        .BLKW   20.     ;DRIVE COMMAND BUFFER 3
003756                  CMDBF4::        .BLKW   20.     ;DRIVE COMMAND BUFFER 4

004026                  RSPBF0::        .BLKW   2.      ;TOP 4 LOCATIONS OF RESPONSE BUFFER UNIT 0
004032                  DCBEND::                        ;END OF COMMAND BUFFER
004032                  DRSPB0::        .BLKW   270.    ;DRIVER RESPONSE BUFFER UNIT 0

005066                  RSPBF1::        .BLKW   2.      ;TOP 4 LOCATIONS OF RESPONSE BUFFER UNIT 1
005072                  DRBEN0::                        ;END OF RESPONSE BUFFER UNIT 0
005072                  DRSPB1::        .BLKW   270.    ;DRIVER RESPONSE BUFFER UNIT 1

006126                  RSPBF2::        .BLKW   2.      ;TOP 4 LOCATIONS OF RESPONSE BUFFER UNIT 2
006132                  DRBEN1::                        ;END OF RESPONSE BUFFER UNIT 1
006132                  DRSPB2::        .BLKW   270.    ;DRIVER RESPONSE BUFFER UNIT 2

007166                  RSPBF3::        .BLKW   2.      ;TOP 4 LOCATIONS OF RESPONSE BUFFER UNIT 3
007172                  DRBEN2::                        ;END OF RESPONSE BUFFER UNIT 2
007172                  DRSPB3::        .BLKW   270.    ;DRIVER RESPONSE BUFFER UNIT 3
```

```
                                ; 9.2 U/Q PORT DESCRIPTOR RINGS
010226                  DSRNG0::        .BLKW   2.      ;DESCRIPTOR RING UNIT 0
010232                  DRBEN3::                        ;END OF RESPONSE BUFFER UNIT 3
010232                  RDSRG0::        .BLKW   16.     ;RESPONSE DESCRIPTOR RING UNIT 0
010272                  RDREN0::                        ;END OF RESPONCE DESCRIPTOR RING UNIT 0
010272                  CDSRG0::        .BLKW   8.      ;COMMAND DESCRIPTOR RING UNIT 0
010312                  CDREN0::                        ;END OF COMMAND DESCRIPTOR RING UNIT 0

010312                  DSRNG1::        .BLKW   2.      ;DESCRIPTOR RING UNIT 1
010316                  RDSRG1::        .BLKW   16.     ;RESPONSE DESCRIPTOR RING UNIT 1
010356                  RDREN1::                        ;END OF RESPONCE DESCRIPTOR RING UNIT 1
010356                  CDSRG1::        .BLKW   8.      ;COMMAND DESCRIPTOR RING UNIT 1
010376                  CDREN1::                        ;END OF COMMAND DESCRIPTOR RING UNIT 1

010376                  DSRNG2::        .BLKW   2.      ;DESCRIPTOR RING UNIT 2
010402                  RDSRG2::        .BLKW   16.     ;RESPONSE DESCRIPTOR RING UNIT 2
010442                  RDREN2::                        ;END OF RESPONCE DESCRIPTOR RING UNIT 2
010442                  CDSRG2::        .BLKW   8.      ;COMMAND DESCRIPTOR RING UNIT 2
010462                  CDREN2::                        ;END OF COMMAND DESCRIPTOR RING UNIT 2

010462                  DSRNG3::        .BLKW   2.      ;DESCRIPTOR RING UNIT 3
010466                  RDSRG3::        .BLKW   16.     ;RESPONSE DESCRIPTOR RING UNIT 3
010526                  RDREN3::                        ;END OF RESPONCE DESCRIPTOR RING UNIT 3
010526                  CDSRG3::        .BLKW   8.      ;COMMAND DESCRIPTOR RING UNIT 3
010546                  CDREN3::                        ;END OF COMMAND DESCRIPTOR RING UNIT 3

                                ; 9.3 CLASS AND PORT DRIVER VARIABLES
010546  000000          IOSTAT::        .WORD   0       ;I/O STATUS
010550  177777          CMSTSV::        .WORD   -1      ;COMMAND STATUS FROM GCS MODE
010552  000000          GCSREF::        .WORD   0       ;GCS COMMAND REFERENCE NUMBER
010554  000000          CNTHI::         .WORD   0       ;VALUE OF THE HIGH TIMEOUT
010556  000000          TIMER::         .WORD   0       ;TIMER VALUE
010560  000000          LOOPS::         .WORD   0       ;
010562  000120          CNTFLG::        .WORD   CF.THS!CF.MSC   ;CONTROLLER FLAGS(ENABLE THIS HOSTS
                                                        ;AND MISCELLANEOUS ERROR LOG MESSAGES)
010564  000000          PCKSIZ::        .WORD   0       ;PACKET SIZE IN BYTES
010566  000000          SAERR::         .WORD   0       ;SA REGISTER SAVE ON ERROR
010570     000          MINLIM::        .BYTE   0       ;MINIMUM REQUIRED CREDIT LIMIT
010571     004          CRDLIM::        .BYTE   4       ;DRIVER CREDIT LIMIT
                        .EVEN
```

```
2080                                    ; I/O STATUS ERROR INFORMATION TABLE
2081
2082 010572     001            IOERTB::.BYTE   DEVFAT          ; GET COMMAND STATUS FAILED
2083 010573     102                    .BYTE   OTHER
2084 010574  000001                    .WORD   1
2085 010576  012213                    .WORD   CMLSER
2086 010600  013272                    .WORD   DEVERR
2087
2088 010602     001                    .BYTE   DEVFAT          ; CONTROLLER HUNG
2089 010603     102                    .BYTE   OTHER
2090 010604  000002                    .WORD   2
2091 010606  012246                    .WORD   HUNGER
2092 010610  013272                    .WORD   DEVERR
2093
2094 010612     001                    .BYTE   DEVFAT          ; PORT DETECTED ERROR
2095 010613     102                    .BYTE   OTHER
2096 010614  000003                    .WORD   3
2097 010616  012266                    .WORD   PORTER
2098 010620  013272                    .WORD   DEVERR
2099
2100 010622     001                    .BYTE   DEVFAT          ; PROGRAM DETECTED COMMAND TIMEOUT
2101 010623     102                    .BYTE   OTHER
2102 010624  000004                    .WORD   4
2103 010626  012312                    .WORD   TIMERR
2104 010630  013272                    .WORD   DEVERR
2105
2106 010632     001                    .BYTE   DEVFAT          ; COMMAND SEQUENCE ERROR
2107 010633     102                    .BYTE   OTHER
2108 010634  000005                    .WORD   5
2109 010636  012347                    .WORD   SEQER
2110 010640  013272                    .WORD   DEVERR
2111
2112 010642     001                    .BYTE   DEVFAT          ; ERROR DETECTED DURING INIT
2113 010643     102                    .BYTE   OTHER
2114 010644  000006                    .WORD   6
2115 010646  012400                    .WORD   INITER
2116 010650  013272                    .WORD   DEVERR
2117
2118                                    ; PROGRAM DETECTED ERROR INFORMATION TABLE
2119
2120 010652     001            CMDT::  .BYTE   DEVFAT          ;INVALID COMMAND ISSUED
2121 010653     102                    .BYTE   OTHER
2122 010654  000007                    .WORD   7.
2123 010656  011502                    .WORD   CMDER
2124 010660  013272                    .WORD   DEVERR
2125
2126 010662     001            ABOT::  .BYTE   DEVFAT          ;COMMAND ABORTED
2127 010663     102                    .BYTE   OTHER
2128 010664  000010                    .WORD   8.
2129 010666  011525                    .WORD   ABOER
2130 010670  013272                    .WORD   DEVERR
2131
2132 010672     001            OFLT::  .BYTE   DEVFAT          ;UNIT OFFLINE
2133 010673     102                    .BYTE   OTHER
2134 010674  000011                    .WORD   9.
2135 010676  011541                    .WORD   OFLER
2136 010700  013272                    .WORD   DEVERR
```

GLOBAL DATA SECTION

```
2137
2138 010702     001                AVLT::  .BYTE   DEVFAT          ;UNIT AVAILABLE ERROR
2139 010703     102                        .BYTE   OTHER
2140 010704  000012                        .WORD   10.
2141 010706  011556                        .WORD   AVLER
2142 010710  013272                        .WORD   DEVERR
2143
2144 010712     001                IVST1:: .BYTE   DEVFAT          ;INVALID STATUS RETURNED
2145 010713     102                        .BYTE   OTHER
2146 010714  000013                        .WORD   11.
2147 010716  012135                        .WORD   IVSER
2148 010720  013272                        .WORD   DEVERR
2149
2150 010722     001                WPRT::  .BYTE   DEVFAT          ;UNIT WRITE PROTECTED
2151 010723     102                        .BYTE   OTHER
2152 010724  000014                        .WORD   12.
2153 010726  011603                        .WORD   WPRER
2154 010730  013272                        .WORD   DEVERR
2155
2156 010732     002                CMPT::  .BYTE   HARD            ;DATA COMPARE ERROR
2157 010733     070                        .BYTE   DTCPER
2158 010734  000015                        .WORD   13.
2159 010736  012464                        .WORD   CMPER
2160 010740  013272                        .WORD   DEVERR
2161
2162 010742     002                DATT::  .BYTE   HARD            ;DATA ERROR
2163 010743     106                        .BYTE   NOERR
2164 010744  000016                        .WORD   14.
2165 010746  011630                        .WORD   DATER
2166 010750  013272                        .WORD   DEVERR
2167
2168 010752     001                HSTT::  .BYTE   DEVFAT          ;HOST DETECTED TIMEOUT
2169 010753     102                        .BYTE   OTHER
2170 010754  000017                        .WORD   15.
2171 010756  012165                        .WORD   HSTER
2172 010760  013272                        .WORD   DEVERR
2173
2174 010762     001                CNTT::  .BYTE   DEVFAT          ;CONTROLLER ERROR
2175 010763     102                        .BYTE   OTHER
2176 010764  000020                        .WORD   16.
2177 010766  011674                        .WORD   CNTER
2178 010770  013272                        .WORD   DEVERR
2179
2180 010772     001                DRVT::  .BYTE   DEVFAT          ;DRIVE ERROR
2181 010773     102                        .BYTE   OTHER
2182 010774  000021                        .WORD   17.
2183 010776  011715                        .WORD   DRVER
2184 011000  013272                        .WORD   DEVERR
2185
2186 011002     001                FMTT::  .BYTE   DEVFAT          ;FORMATTER ERROR
2187 011003     102                        .BYTE   OTHER
2188 011004  000022                        .WORD   18.
2189 011006  011731                        .WORD   FMTER
2190 011010  013272                        .WORD   DEVERR
2191
2192 011012     001                BOTT::  .BYTE   DEVFAT          ;UNEXPECTED BOT ENCOUNTERED
2193 011013     102                        .BYTE   OTHER
```

```
2194 011014  000023                    .WORD   19.
2195 011016  011751                    .WORD   BOTER
2196 011020  013272                    .WORD   DEVERR
2197
2198 011022     001            TMT::   .BYTE   DEVFAT         ;UNEXPECTED TAPE MARK ENCOUNTERED
2199 011023     102                    .BYTE   OTHER
2200 011024  000024                    .WORD   20.
2201 011026  011771                    .WORD   TMER
2202 011030  013272                    .WORD   DEVERR
2203
2204 011032     001            IVST2:: .BYTE   DEVFAT         ;INVALID STATS RECEIVED
2205 011033     102                    .BYTE   OTHER
2206 011034  000025                    .WORD   21.
2207 011036  012135                    .WORD   IVSER
2208 011040  013272                    .WORD   DEVERR
2209
2210 011042     001            RDTT::  .BYTE   DEVFAT         ;DATA RECORD TRUNCATED
2211 011043     102                    .BYTE   OTHER
2212 011044  000026                    .WORD   22.
2213 011046  012017                    .WORD   RDTER
2214 011050  013272                    .WORD   DEVERR
2215
2216 011052     001            POLT::  .BYTE   DEVFAT         ;TAPE POSITION LOST
2217 011053     076                    .BYTE   RMSPOS
2218 011054  000027                    .WORD   23.
2219 011056  012045                    .WORD   POLER
2220 011060  013272                    .WORD   DEVERR
2221
2222 011062     001            SEXT::  .BYTE   DEVFAT         ;SERIOUS EXCEPTION
2223 011063     102                    .BYTE   OTHER
2224 011064  000030                    .WORD   24.
2225 011066  012063                    .WORD   SEXER
2226 011070  013272                    .WORD   DEVERR
2227
2228 011072     001            LEDT::  .BYTE   DEVFAT         ;LEOT ENCOUNTERED
2229 011073     102                    .BYTE   OTHER
2230 011074  000031                    .WORD   25.
2231 011076  012105                    .WORD   LEDER
2232 011100  013272                    .WORD   DEVERR
2233
2234 011102     001            IVST3:: .BYTE   DEVFAT         ;INVALID STATUS RETURNED
2235 011103     102                    .BYTE   OTHER
2236 011104  000032                    .WORD   26.
2237 011106  012135                    .WORD   IVSER
2238 011110  013272                    .WORD   DEVERR
2239
2240 011112     002            DCMPT:: .BYTE   HARD           ;DATA COMPARE ERROR
2241 011113     070                    .BYTE   DTCPER
2242 011114  000033                    .WORD   27.
2243 011116  012507                    .WORD   DCMPER
2244 011120  013272                    .WORD   DEVERR
2245
2246 011122     002            RLST::  .BYTE   HARD           ;RECORD LENGTH SHORT ERROR
2247 011123     102                    .BYTE   OTHER
2248 011124  000034                    .WORD   28.
2249 011126  012421                    .WORD   RLSER
2250 011130  013272                    .WORD   DEVERR
```

```
2251
2252                                    ;ERROR LOG ERROR TABLES
2253
2254 011132                             CNTLER:
2255 011132     002                             .BYTE   HARD            ;CONTROLLER (LAST FAIL) ERROR LOG
2256 011133     106                             .BYTE   NOERR
2257 011134  000035                             .WORD   29.
2258 011136  013172                             .WORD   CNTLEL
2259 011140  014502                             .WORD   ERLGER
2260
2261 011142                             BADERL:
2262 011142     002                             .BYTE   HARD            ;HOST MEMORY ACCSESS ERROR
2263 011143     106                             .BYTE   NOERR
2264 011144  000036                             .WORD   30.
2265 011146  013233                             .WORD   BADEL
2266 011150  014502                             .WORD   ERLGER
2267
2268 011152                             CMPERL:
2269 011152     002                             .BYTE   HARD            ;COMPARE ERROR
2270 011153     070                             .BYTE   DTCPER
2271 011154  000037                             .WORD   31.
2272 011156  013030                             .WORD   CMPEL
2273 011160  014502                             .WORD   ERLGER
2274
2275 011162                             DRVERL:
2276 011162     002                             .BYTE   HARD            ;DRIVE ERROR LOG
2277 011163     106                             .BYTE   NOERR
2278 011164  000040                             .WORD   32.
2279 011166  013125                             .WORD   DRVEL
2280 011170  014502                             .WORD   ERLGER
2281
2282 011172                             CNTERL:
2283 011172     002                             .BYTE   HARD            ;CONTROLLER ERROR
2284 011173     106                             .BYTE   NOERR
2285 011174  000041                             .WORD   33.
2286 011176  013145                             .WORD   CNTEL
2287 011200  014502                             .WORD   ERLGER
2288
2289 011202                             LGPERL:
2290 011202     002                             .BYTE   HARD            ;LONG GAP ENCOUNTERED
2291 011203     106                             .BYTE   NOERR
2292 011204  000042                             .WORD   34.
2293 011206  013057                             .WORD   LGPEL
2294 011210  014502                             .WORD   ERLGER
2295
2296 011212                             RDSTEL:
2297 011212     002                             .BYTE   HARD            ;READ DATA SYNC NOT FOUND
2298 011213     054                             .BYTE   H1READ
2299 011214  000043                             .WORD   35.
2300 011216  013103                             .WORD   DSTEL
2301 011220  014502                             .WORD   ERLGER
2302
2303 011222                             WDSTEL:
2304 011222     002                             .BYTE   HARD            ;WRITE DATA SYNC NOT FOUND
2305 011223     060                             .BYTE   H1WRIT
2306 011224  000043                             .WORD   35.
2307 011226  013103                             .WORD   DSTEL
```

```
2308 011230  014502                    .WORD   ERLGER
2309
2310 011232                        CORERL:
2311 011232     003                    .BYTE   SOFT            ;CORRECTABLE WRITE DATA ERROR
2312 011233     044                    .BYTE   S1WRIT
2313 011234  000044                    .WORD   36.
2314 011236  012627                    .WORD   COREL
2315 011240  014502                    .WORD   ERLGER
2316
2317 011242                        UWEERL:
2318 011242     002                    .BYTE   HARD            ;UNRECOVERABLE WRITE DATA ERROR
2319 011243     060                    .BYTE   H1WRIT
2320 011244  000045                    .WORD   37.
2321 011246  012760                    .WORD   UWEEL
2322 011250  014502                    .WORD   ERLGER
2323
2324 011252                        RTYERL:
2325 011252     003                    .BYTE   SOFT            ;SOFT READ ERROR
2326 011253     040                    .BYTE   S1READ
2327 011254  000052                    .WORD   42.
2328 011256  012574                    .WORD   RTYEL
2329 011260  014502                    .WORD   ERLGER
2330
2331 011262                        UREERL:
2332 011262     002                    .BYTE   HARD            ;UNRECOVERABLE READ DATA ERROR
2333 011263     054                    .BYTE   H1READ
2334 011264  000046                    .WORD   38.
2335 011266  012740                    .WORD   UREEL
2336 011270  014502                    .WORD   ERLGER
2337
2338 011272                        ECBERL:
2339 011272     003                    .BYTE   SOFT            ;CRC ERROR ON AN ECC BLOCK
2340 011273     064                    .BYTE   RTYEC1
2341 011274  000047                    .WORD   39.
2342 011276  013001                    .WORD   ECBEL
2343 011300  014502                    .WORD   ERLGER
2344
2345 011302                        ECTERL:
2346 011302     003                    .BYTE   SOFT            ;ECC CORRECTION ON A TAPE MARK
2347 011303     050                    .BYTE   EC1COR
2348 011304  000050                    .WORD   40.
2349 011306  012707                    .WORD   ECTEL
2350 011310  014502                    .WORD   ERLGER
2351
2352 011312                        ECDERL:
2353 011312     003                    .BYTE   SOFT            ;ECC CORRECTION ON A DATA BLOCK
2354 011313     050                    .BYTE   EC1COR
2355 011314  000051                    .WORD   41.
2356 011316  012663                    .WORD   ECDEL
2357 011320  014502                    .WORD   ERLGER
2358
```

```
                                .SBTTL  GLOBAL TEXT SECTION

                                ; COMMAND PRIMITIVE ASCII

011322                          CMDASC::
011322  116     125     114             .ASCIZ  ?NUL?           ;NULL
011326  122     104     040             .ASCIZ  ?RD ?           ;READ
011332  127     122     124             .ASCIZ  ?WRT?           ;WRITE
011336  103     115     120             .ASCIZ  ?CMP?           ;COMPARE HOST DATA
011342  101     103     103             .ASCIZ  ?ACC?           ;ACCESS
011346  123     120     103     SPCASC: .ASCIZ  ?SPC?           ;SPACE RECORDS
011352  123     113     120             .ASCIZ  ?SKP?           ;SKIP TAPE MARKS
011356  123     120     117             .ASCIZ  ?SPO?           ;SPACE OBJECTS
011362  127     124     115             .ASCIZ  ?WTM?           ;WRITE TAPE MARK
011366  105     122     123             .ASCIZ  ?ERS?           ;ERASE
011372  105     122     107             .ASCIZ  ?ERG?           ;ERASE GAP
011376  101     126     114             .ASCIZ  ?AVL?           ;AVAILABLE
011402  117     116     114             .ASCIZ  ?ONL?           ;ONLINE
011406  123     125     103             .ASCIZ  ?SUC?           ;SET UNIT CHARACTERISTICS
011412  122     105     127             .ASCIZ  ?REW?           ;REWIND
011416  111     116     124             .ASCIZ  ?INT?           ;INITIALIZE
011422  101     102     117             .ASCIZ  ?ABO?           ;ABORT
011426  107     103     123             .ASCIZ  ?GCS?           ;GET COMMAND STATUS
011432  107     125     123             .ASCIZ  ?GUS?           ;GET UNIT STATUS
011436  123     103     103             .ASCIZ  ?SCC?           ;SET CONTROLLER CHARACTERISTICS
                                        .EVEN

                                ;ASCII FOR HEXADECIMAL PRINTOUTS
011442                          HEXTBL::
011442  060     000                     .ASCIZ  ?0?             ;
011444  061     000                     .ASCIZ  ?1?             ;
011446  062     000                     .ASCIZ  ?2?             ;
011450  063     000                     .ASCIZ  ?3?             ;
011452  064     000                     .ASCIZ  ?4?             ;
011454  065     000                     .ASCIZ  ?5?             ;
011456  066     000                     .ASCIZ  ?6?             ;
011460  067     000                     .ASCIZ  ?7?             ;
011462  070     000                     .ASCIZ  ?8?             ;
011464  071     000                     .ASCIZ  ?9?             ;
011466  101     000                     .ASCIZ  ?A?             ;
011470  102     000                     .ASCIZ  ?B?             ;
011472  103     000                     .ASCIZ  ?C?             ;
011474  104     000                     .ASCIZ  ?D?             ;
011476  105     000                     .ASCIZ  ?E?             ;
011500  106     000                     .ASCIZ  ?F?             ;
                                .EVEN
```

```
2407                                    ;
2408                                    ; FORMAT STATEMENTS USED IN PRINT CALLS
2409                                    ;
2410
2411 011502    111     116     126  CMDER:  .ASCIZ  /INVALID CMD ISSUED/
2412 011525    103     115     104  ABOER:  .ASCIZ  /CMD ABORTED/
2413 011541    125     116     111  OFLER:  .ASCIZ  /UNIT OFFLINE/
2414 011556    125     116     111  AVLER:  .ASCIZ  /UNIT AVAILABLE ERROR/
2415 011603    125     116     111  WPRER:  .ASCIZ  /UNIT WRITE PROTECTED/
2416 011630    104     101     124  DATER:  .ASCIZ  /DATA ERROR/
2417 011643    110     117     123  BADER:  .ASCIZ  /HOST BUFFER ACCESS ERROR/
2418 011674    103     117     116  CNTER:  .ASCIZ  /CONTROLLER ERROR/
2419 011715    104     122     111  DRVER:  .ASCIZ  /DRIVE ERROR/
2420 011731    106     117     122  FMTER:  .ASCIZ  /FORMATTER ERROR/
2421 011751    102     117     124  BOTER:  .ASCIZ  /BOT ENCOUNTERED/
2422 011771    124     101     120  TMER:   .ASCIZ  /TAPE MARK ENCOUNTERED/
2423 012017    104     101     124  RDTER:  .ASCIZ  /DATA RECORD TRUNCATED/
2424 012045    120     117     123  POLER:  .ASCIZ  /POSITION LOST/
2425 012063    123     105     122  SEXER:  .ASCIZ  /SERIOUS EXCEPTION/
2426 012105    114     117     107  LEDER:  .ASCIZ  /LOGICAL EOT ENCOUNTERED/
2427 012135    111     116     126  IVSER:  .ASCIZ  /INVALID STATUS RECEIVED/
2428 012165    110     117     123  HSTER:  .ASCIZ  /HOST DETECTED TIMEOUT/
2429 012213    116     117     040  CMLSER: .ASCIZ  /NO RESPONSE TO GCS COMMAND/
2430 012246    103     117     116  HUNGER: .ASCIZ  /CONTROLLER HUNG/
2431 012266    120     117     122  PORTER: .ASCIZ  /PORT-DETECTED ERROR/
2432 012312    120     122     117  TIMERR: .ASCIZ  /PROGRAM DETECTED CMD TIMEOUT/
2433 012347    122     105     123  SEQER:: .ASCIZ  /RESPONSE OUT OF SEQUENCE/
2434 012400    120     117     122  INITER: .ASCIZ  /PORT INIT FAILED/
2435 012421    122     105     103  RLSER:  .ASCIZ  /RECORD LENGTH SHORT/
2436 012445    123     124     101  STATER: .ASCIZ  /STATUS MESSAGE/
2437 012464    104     101     124  CMPER:  .ASCIZ  /DATA COMPARE ERROR/
2438 012507    123     057     127  DCMPER: .ASCIZ  ?S/W DETECTED DATA COMPARE?
2439 012541    104     101     124  UDRNER: .ASCIZ  /DATA UNDERRUN/
2440 012557    104     101     124  OVERUN: .ASCIZ  /DATA OVERRUN/
2441 012574    122     105     124  RTYEL:  .ASCIZ  /RETRY RECOVERED READ ERROR/
2442 012627    122     105     124  COREL:  .ASCIZ  /RETRY RECOVERED WRITE ERROR/
2443 012663    105     103     103  ECDEL:  .ASCIZ  /ECC DATA CORRECTION/
2444 012707    105     103     103  ECTEL:  .ASCIZ  /ECC TAPE MARK CORRECTION/
2445 012740    110     101     122  UREEL:  .ASCIZ  /HARD READ ERROR/
2446 012760    110     101     122  UWEEL:  .ASCIZ  /HARD WRITE ERROR/
2447 013001    103     122     103  ECBEL:  .ASCIZ  /CRC ERROR ON ECC BLOCK/
2448 013030    104     101     124  CMPEL:  .ASCIZ  /DATA COMPARE ERROR LOG/
2449 013057    114     117     116  LGPEL:  .ASCIZ  /LONG GAP ENCOUNTERD/
2450 013103    104     101     124  DSTEL:  .ASCIZ  /DATA SYNC TIMEOUT/
2451 013125    104     122     111  DRVEL:  .ASCIZ  /DRIVE ERROR LOG/
2452 013145    103     117     116  CNTEL:  .ASCIZ  /CONTROLLER ERROR LOG/
2453 013172    103     117     116  CNTLEL: .ASCIZ  /CONTROLLER (LAST FAIL) ERROR LOG/
2454 013233    110     117     123  BADEL:  .ASCIZ  /HOST MEMORY ERROR LOG/
2455
2456                                    .EVEN
2463
2464
```

```
                                .SBTTL  GLOBAL ERROR REPORT SECTION

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

013262                                  ERRTBL                          ;GENERIC ERROR TABLE
013262                          L$ERRTBL::
013262  000000                  ERRTYP::        .WORD   0
013264  000000                  ERRNBR::        .WORD   0
013266  000000                  ERRMSG::        .WORD   0
013270  000000                  ERRBLK::        .WORD   0

013272                                  BGNMSG DEVERR
013272                          DEVERR::
013272                                  PUSH    <R1,R5>                 ;SAVE R1 AND R5
013272  010146                          MOV     R1,-(SP)        ;;PUSH R1 ON STACK
013274  010546                          MOV     R5,-(SP)        ;;PUSH R5 ON STACK
013276  013703  003560                  MOV     R3SAVE,R3               ;RESTORE R3
013302  013704  003562                  MOV     R4SAVE,R4               ;RESTORE R4
013306  116205  000000                  MOVB    CMD(R2),R5              ;GET THE COMMAND PRIMITIVE
013312  042705  177407                  BIC     #177407,R5              ;CLEAR MODIFIERS
013316  006205                          ASR     R5                      ;THE PRIMITIVE
013320  062705  011322                  ADD     #CMDASC,R5              ;PUT ADDRESS IN R5
013324  016237  000000  003530          MOV     CMD(R2),R8              ;GET THE PRIMITIVE AGAIN
013332  042737  177770  003530          BIC     #177770,R8              ;SAVE THE LAST 3 BITS
013340  001014                          BNE     1$                      ;BRANCH IF NOT ZERO
013342                                  PRINTB  #ERR00,R5,TKUNIT(R4)
013342  016446  000004                  MOV     TKUNIT(R4),-(SP)
013346  010546                          MOV     R5,-(SP)
013350  012746  015770                  MOV     #ERR00,-(SP)
013354  012746  000003                  MOV     #3,-(SP)
013360  010600                          MOV     SP,R0
013362  104414                          TRAP    C$PNTB
013364  062706  000010                  ADD     #10,SP
013370  000513                          BR      6$                      ;GO PRINT THE REST OF THE MESSAGE
013372  022737  000001  003530  1$:     CMP     #REVBIT,R8              ;IS IT A REVERSE ?
013400  001014                          BNE     2$                      ;BRANCH IF NOT
013402                                  PRINTB  #ERR01,R5,TKUNIT(R4)
013402  016446  000004                  MOV     TKUNIT(R4),-(SP)
013406  010546                          MOV     R5,-(SP)
013410  012746  016040                  MOV     #ERR01,-(SP)
013414  012746  000003                  MOV     #3,-(SP)
013420  010600                          MOV     SP,R0
013422  104414                          TRAP    C$PNTB
013424  062706  000010                  ADD     #10,SP
013430  000473                          BR      6$                      ;GO PRINT THE REST OF THE MESSAGE
013432  032737  000002  003530  2$:     BIT     #EOTBIT,R8              ;IS IT A DETECT EOT ?
013440  001414                          BEQ     3$                      ;BRANCH IF NOT
013442                                  PRINTB  #ERR02,R5,TKUNIT(R4)
013442  016446  000004                  MOV     TKUNIT(R4),-(SP)
013446  010546                          MOV     R5,-(SP)
013450  012746  016116                  MOV     #ERR02,-(SP)
013454  012746  000003                  MOV     #3,-(SP)
013460  010600                          MOV     SP,R0
```

GLOBAL ERROR REPORT SECTION

```
                013462  104414                          TRAP    C$PNTB
                013464  062706  000010                  ADD     #10,SP
     2503       013470  000453                          BR      6$                      ;GO PRINT THE REST OF THE MESSAGE
     2504       013472  022737  000003  003530  3$:     CMP     #IMMBIT,R8              ;IS IT A IMMEDIATE ?
     2505       013500  001014                          BNE     4$                      ;BRANCH IF NOT
     2506       013502                                  PRINTB  #ERR03,R5,TKUNIT(R4)
                013502  016446  000004                  MOV     TKUNIT(R4),-(SP)
                013506  010546                          MOV     R5,-(SP)
                013510  012746  016175                  MOV     #ERR03,-(SP)
                013514  012746  000003                  MOV     #3,-(SP)
                013520  010600                          MOV     SP,R0
                013522  104414                          TRAP    C$PNTB
                013524  062706  000010                  ADD     #10,SP
     2507       013530  000433                          BR      6$                      ;GO PRINT THE REST OF THE MESSAGE
     2508       013532  022737  000004  003530  4$:     CMP     #UNLBIT,R8              ;IS IT A UNLOAD ?
     2509       013540  001014                          BNE     5$                      ;BRANCH IF NOT
     2510       013542                                  PRINTB  #ERR04,R5,TKUNIT(R4)
                013542  016446  000004                  MOV     TKUNIT(R4),-(SP)
                013546  010546                          MOV     R5,-(SP)
                013550  012746  016253                  MOV     #ERR04,-(SP)
                013554  012746  000003                  MOV     #3,-(SP)
                013560  010600                          MOV     SP,R0
                013562  104414                          TRAP    C$PNTB
                013564  062706  000010                  ADD     #10,SP
     2511       013570  000413                          BR      6$                      ;GO PRINT THE REST OF THE MESSAGE
     2512       013572                          5$:     PRINTB  #ERR05,R5,TKUNIT(R4)
                013572  016446  000004                  MOV     TKUNIT(R4),-(SP)
                013576  010546                          MOV     R5,-(SP)
                013600  012746  016332                  MOV     #ERR05,-(SP)
                013604  012746  000003                  MOV     #3,-(SP)
                013610  010600                          MOV     SP,R0
                013612  104414                          TRAP    C$PNTB
                013614  062706  000010                  ADD     #10,SP
     2513       013620                          6$:     PRINTB  #ERR06,PASCNT,PATSAV(R4)
                013620  016446  000024                  MOV     PATSAV(R4),-(SP)
                013624  013746  003522                  MOV     PASCNT,-(SP)
                013630  012746  016411                  MOV     #ERR06,-(SP)
                013634  012746  000003                  MOV     #3,-(SP)
                013640  010600                          MOV     SP,R0
                013642  104414                          TRAP    C$PNTB
                013644  062706  000010                  ADD     #10,SP
     2514       013650  022705  011346                  CMP     #SPCASC,R5              ;IS IT A DATA TRANSFER ERROR ?
     2515       013654  101412                          BLOS    7$                      ;NO, DON'T PRINT THE BYTE COUNT
     2516       013656                                  PRINTB  #ERR07,BYTES            ;PRINT THE BYTE COUNT
                013656  013746  003416                  MOV     BYTES,-(SP)
                013662  012746  016461                  MOV     #ERR07,-(SP)
                013666  012746  000002                  MOV     #2,-(SP)
                013672  010600                          MOV     SP,R0
                013674  104414                          TRAP    C$PNTB
                013676  062706  000006                  ADD     #6,SP
     2517       013702                          7$:     PRINTB  #ERR08,OBOFFH(R2),OBOFFL(R2)
                013702  016246  000004                  MOV     OBOFFL(R2),-(SP)
                013706  016246  000006                  MOV     OBOFFH(R2),-(SP)
                013712  012746  016521                  MOV     #ERR08,-(SP)
                013716  012746  000003                  MOV     #3,-(SP)
                013722  010600                          MOV     SP,R0
                013724  104414                          TRAP    C$PNTB
```

```
                013726  062706  000010                  ADD     #10,SP
2518            013732  032737  000010  003516          BIT     #DRERFL,PCFLAG          ;WAS IT A DRIVE ERROR ?
2519            013740  001417                          BEQ     8$                      ;NO, GO PRINT TIME
2520            013742  042737  000010  003516          BIC     #DRERFL,PCFLAG          ;CLEAR THE DRIVE ERROR FLAG
2521            013750                                  PRINTB  #ERR09,HIHEX,LOHEX      ;PRINT THE DRIVE ERROR CODE
                013750  013746  003552                  MOV     LOHEX,-(SP)
                013754  013746  003554                  MOV     HIHEX,-(SP)
                013760  012746  016556                  MOV     #ERR09,-(SP)
                013764  012746  000003                  MOV     #3,-(SP)
                013770  010600                          MOV     SP,R0
                013772  104414                          TRAP    C$PNTB
                013774  062706  000010                  ADD     #10,SP
2522            014000  122737  000006  010546  8$:     CMPB    #INTERR,IOSTAT          ;IS IT A PORT INIT FAILURE ?
2523            014006  001001                          BNE     9$                      ;KEEP GOING IF IT ISN'T
2524            014010  000404                          BR      10$                     ;GO PRINT SA CONTENTS
2525            014012  122737  000003  010546  9$:     CMPB    #IOPDRE,IOSTAT          ;IS IT A PORT DETECTED FAILURE ?
2526            014020  001014                          BNE     11$                     ;KEEP GOING IF IT ISN'T
2527            014022                          10$:    PRINTB  #ERR10,SAERR            ;PRINT THE SA CONTENTS IF IT IS
                014022  013746  010566                  MOV     SAERR,-(SP)
                014026  012746  016617                  MOV     #ERR10,-(SP)
                014032  012746  000002                  MOV     #2,-(SP)
                014036  010600                          MOV     SP,R0
                014040  104414                          TRAP    C$PNTB
                014042  062706  000006                  ADD     #6,SP
2528            014046  005037  010566                  CLR     SAERR                   ;CLEAR THE ERROR OUT OF THE LOCATION
2529            014052  105737  010546          11$:    TSTB    IOSTAT                  ;WAS IT AN I/O ERROR ?
2530            014056  001150                          BNE     DEVEXT                  ;GET OUT IF IT WAS
2531            014060  005737  003444                  TST     CMPERR                  ;WAS IT A COMPARE ERROR ?
2532            014064  001051                          BNE     CMPPRI                  ;GO PRINT THE ERROR DATA
2533            014066                                  PRINTX  #ERR11
                014066  012746  016651                  MOV     #ERR11,-(SP)
                014072  012746  000001                  MOV     #1,-(SP)
                014076  010600                          MOV     SP,R0
                014100  104415                          TRAP    C$PNTX
                014102  062706  000004                  ADD     #4,SP
2534            014106                                  PRINTX  #ERR12
                014106  012746  016675                  MOV     #ERR12,-(SP)
                014112  012746  000001                  MOV     #1,-(SP)
                014116  010600                          MOV     SP,R0
                014120  104415                          TRAP    C$PNTX
                014122  062706  000004                  ADD     #4,SP
2535            014126  010305                          MOV     R3,R5                   ;GET POINTER TO RESPONSE PACKET
2536            014130  010301                          MOV     R3,R1                   ;AND A SECOND COPY
2537            014132  062701  000002                  ADD     #2,R1                   ;R1 POINT TO SECOND WORD OF PACKET
2538            014136  005763  177774          PRIPCK: TST     MSGLEN(R3)              ;CHECK THE MESSAGE LENGTH
2539            014142  100422                          BMI     CMPPRI                  ;GET OUT IF IT WENT NEGATIVE
2540            014144                                  PRINTX  #ERR13,(R1),(R5)
                014144  011546                          MOV     (R5),-(SP)
                014146  011146                          MOV     (R1),-(SP)
                014150  012746  016733                  MOV     #ERR13,-(SP)
                014154  012746  000003                  MOV     #3,-(SP)
                014160  010600                          MOV     SP,R0
                014162  104415                          TRAP    C$PNTX
                014164  062706  000010                  ADD     #10,SP
2541            014170  062701  000004                  ADD     #4,R1                   ;GET THE NEXT WORD
2542            014174  062705  000004                  ADD     #4,R5                   ;AND AGAIN
2543            014200  162763  000004  177774          SUB     #4,MSGLEN(R3)           ;ADJUST MESSAGE LENGTH DOWN 2 WORDS
```

```
2544 014206  001353
2545 014210  005737  003444          CMPPRI: TST     CMPERR          ;WAS THIS A COMPARE ERROR ?
2546 014214  001471                          BEQ     DEVEXT          ;GET OUT IF IT WASN'T
2547 014216                                  PUSH    <R2>            ;SAVE R2
2548 014220  012701  003446                  MOV     #BYTADD,R1      ;POINT R1 TO THE BYTE ADDRESS TABLE
2549 014224  012702  003472                  MOV     #DATBL,R2       ;POINT R2 TO THE WRITE DATA TABLE
2550 014230  013705  003444                  MOV     CMPERR,R5       ;LET R5 = THE NUMBER OF BYTES IN ERROR
2551 014234                                  PRINTX  #ERR14
     014234  012746  016764                  MOV     #ERR14,-(SP)
     014240  012746  000001                  MOV     #1,-(SP)
     014244  010600                          MOV     SP,R0
     014246  104415                          TRAP    C$PNTX
     014250  062706  000004                  ADD     #4,SP
2552 014254                                  PRINTX  #ERR15
     014254  012746  017012                  MOV     #ERR15,-(SP)
     014260  012746  000001                  MOV     #1,-(SP)
     014264  010600                          MOV     SP,R0
     014266  104415                          TRAP    C$PNTX
     014270  062706  000004                  ADD     #4,SP
2553 014274                          1$:     PRINTX  #ERR16,(R1),<B,ONE(R2)>,<B,(R2)>
     014274  005046                          CLR     -(SP)
     014276  151216                          BISB    (R2),(SP)
     014300  005046                          CLR     -(SP)
     014302  156216  000001                  BISB    ONE(R2),(SP)
     014306  011146                          MOV     (R1),-(SP)
     014310  012746  017062                  MOV     #ERR16,-(SP)
     014314  012746  000004                  MOV     #4,-(SP)
     014320  010600                          MOV     SP,R0
     014322  104415                          TRAP    C$PNTX
     014324  062706  000012                  ADD     #12,SP
2554 014330  005337  003444                  DEC     CMPERR          ;SUBTRACT 1 FROM NUMBER OF ERRORS
2555 014334  001405                          BEQ     CPRIEX          ;GO PRINT TOTAL NUMBER IN ERROR
2556 014336  005721                          TST     (R1)+           ;POINT R1 TO THE NEXT ADDRESS
2557 014340  005722                          TST     (R2)+           ;POINT R2 TO THE NEXT DATA
2558 014342  022701  003472                  CMP     #TBLEND,R1      ;HAVE WE PRINTED THE WHOLE TABLE ?
2559 014346  001352                          BNE     1$              ;NO CONTINUE
2560 014350                          CPRIEX: PRINTX  #ERR17,R5
     014350  010546                          MOV     R5,-(SP)
     014352  012746  017107                  MOV     #ERR17,-(SP)
     014356  012746  000002                  MOV     #2,-(SP)
     014362  010600                          MOV     SP,R0
     014364  104415                          TRAP    C$PNTX
     014366  062706  000006                  ADD     #6,SP
2561 014372  005037  003444                  CLR     CMPERR          ;CLEAR THE ERROR COUNTER
2562 014376                                  POP     <R2>
2563 014400                          DEVEXT: PRINTF  #LINE
     014400  012746  020527                  MOV     #LINE,-(SP)
     014404  012746  000001                  MOV     #1,-(SP)
     014410  010600                          MOV     SP,R0
     014412  104417                          TRAP    C$PNTF
     014414  062706  000004                  ADD     #4,SP
2564 014420  105737  002212                  TSTB    CLOCK           ;IS THE CLOCK ENABLED
2565 014424  001421                          BEQ     1$              ;NO, THEN CAN'T PRINT TIME
2566 014426                                  PRINTF  #TIME,<B,HOURS>,<B,MINUTE>,<B,SECOND>
     014426  005046                          CLR     -(SP)
     014430  153716  002215                  BISB    SECOND,(SP)
     014434  005046                          CLR     -(SP)
```

```
        014436  153716  002214                  BISB    MINUTE,(SP)
        014442  005046                          CLR     -(SP)
        014444  153716  002213                  BISB    HOURS,(SP)
        014450  012746  020044                  MOV     #TIME,-(SP)
        014454  012746  000004                  MOV     #4,-(SP)
        014460  010600                          MOV     SP,R0
        014462  104417                          TRAP    C$PNTF
        014464  062706  000012                  ADD     #12,SP
   2567 014470                          1$:     POP     <R5,R1>
   2568 014474                                  EXIT    MSG
        014474  000167                          .WORD   J$JMP
        014476  000000                          .WORD   L10002-2-.
   2569 014500                                  ENDMSG
        014500                          L10002:
        014500  104423                          TRAP    C$MSG
```

```
2571 014502                                    BGNMSG  ERLGER
     014502                              ERLGER::
2572 014502                                    PUSH    <R1,R5>                 ;SAVE R1 AND R5
     014502  010146                           MOV     R1,-(SP)        ;;PUSH R1 ON STACK
     014504  010546                           MOV     R5,-(SP)        ;;PUSH R5 ON STACK
2573 014506  013703  003560                    MOV     R3SAVE,R3               ;RESTORE R3
2574 014512  013704  003562                    MOV     R4SAVE,R4               ;RESTORE R4
2575 014516  113705  003536                    MOVB    R11,R5                  ;GET THE COMMAND PRIMITIVE
2576 014522  042705  177407                    BIC     #177407,R5              ;CLEAR MODIFIERS
2577 014526  006205                           ASR     R5                      ;THE PRIMITIVE
2578 014530  062705  011322                    ADD     #CMDASC,R5              ;PUT ADDRESS IN R5
2579 014534  013737  003536  003530           MOV     R11,R8                  ;GET THE PRIMITIVE AGAIN
2580 014542  042737  177770  003530           BIC     #177770,R8              ;SAVE THE LAST 3 BITS
2581 014550  001014                           BNE     5$                      ;BRANCH IF NOT ZERO
2582 014552                                    PRINTB  #ERR00,R5,TKUNIT(R4)
     014552  016446  000004                    MOV     TKUNIT(R4),-(SP)
     014556  010546                           MOV     R5,-(SP)
     014560  012746  015770                    MOV     #ERR00,-(SP)
     014564  012746  000003                    MOV     #3,-(SP)
     014570  010600                           MOV     SP,R0
     014572  104414                           TRAP    C$PNTB
     014574  062706  000010                    ADD     #10,SP
2583 014600  000512                           BR      30$                     ;GO PRINT THE REST OF THE MESSAGE
2584 014602  022737  000001  003530  5$:      CMP     #REVBIT,R8              ;IS IT A REVERSE ?
2585 014610  001013                           BNE     10$                     ;BRANCH IF NOT
2586 014612                                    PRINTB  #ERR01,R5,TKUNIT(R4)
     014612  016446  000004                    MOV     TKUNIT(R4),-(SP)
     014616  010546                           MOV     R5,-(SP)
     014620  012746  016040                    MOV     #ERR01,-(SP)
     014624  012746  000003                    MOV     #3,-(SP)
     014630  010600                           MOV     SP,R0
     014632  104414                           TRAP    C$PNTB
     014634  062706  000010                    ADD     #10,SP
2587 014640  032737  000002  003530  10$:      BIT     #EOTBIT,R8              ;IS IT A DETECT LEOT ?
2588 014646  001414                           BEQ     15$                     ;BRANCH IF NOT
2589 014650                                    PRINTB  #ERR02,R5,TKUNIT(R4)
     014650  016446  000004                    MOV     TKUNIT(R4),-(SP)
     014654  010546                           MOV     R5,-(SP)
     014656  012746  016116                    MOV     #ERR02,-(SP)
     014662  012746  000003                    MOV     #3,-(SP)
     014666  010600                           MOV     SP,R0
     014670  104414                           TRAP    C$PNTB
     014672  062706  000010                    ADD     #10,SP
2590 014676  000453                           BR      30$                     ;GO PRINT THE REST OF THE MESSAGE
2591 014700  022737  000003  003530  15$:      CMP     #IMMBIT,R8              ;IS IT A IMMEDIATE ?
2592 014706  001014                           BNE     20$                     ;BRANCH IF NOT
2593 014710                                    PRINTB  #ERR03,R5,TKUNIT(R4)
     014710  016446  000004                    MOV     TKUNIT(R4),-(SP)
     014714  010546                           MOV     R5,-(SP)
     014716  012746  016175                    MOV     #ERR03,-(SP)
     014722  012746  000003                    MOV     #3,-(SP)
     014726  010600                           MOV     SP,R0
     014730  104414                           TRAP    C$PNTB
     014732  062706  000010                    ADD     #10,SP
2594 014736  000433                           BR      30$                     ;GO PRINT THE REST OF THE MESSAGE
2595 014740  022737  000004  003530  20$:      CMP     #UNLBIT,R8              ;IS IT A UNLOAD ?
2596 014746  001014                           BNE     25$                     ;BRANCH IF NOT
```

```
2597 014750                                    PRINTB  #ERR04,R5,TKUNIT(R4)
     014750  016446  000004                    MOV     TKUNIT(R4),-(SP)
     014754  010546                            MOV     R5,-(SP)
     014756  012746  016253                    MOV     #ERR04,-(SP)
     014762  012746  000003                    MOV     #3,-(SP)
     014766  010600                            MOV     SP,R0
     014770  104414                            TRAP    C$PNTB
     014772  062706  000010                    ADD     #10,SP
2598 014776  000413                            BR      30$                     ;GO PRINT THE REST OF THE MESSAGE
2599 015000                            25$:    PRINTB  #ERR05,R5,TKUNIT(R4)
     015000  016446  000004                    MOV     TKUNIT(R4),-(SP)
     015004  010546                            MOV     R5,-(SP)
     015006  012746  016332                    MOV     #ERR05,-(SP)
     015012  012746  000003                    MOV     #3,-(SP)
     015016  010600                            MOV     SP,R0
     015020  104414                            TRAP    C$PNTB
     015022  062706  000010                    ADD     #10,SP
2600 015026                            30$:    PRINTB  #ERR06,PASCNT,PATSAV(R4)
     015026  016446  000024                    MOV     PATSAV(R4),-(SP)
     015032  013746  003522                    MOV     PASCNT,-(SP)
     015036  012746  016411                    MOV     #ERR06,-(SP)
     015042  012746  000003                    MOV     #3,-(SP)
     015046  010600                            MOV     SP,R0
     015050  104414                            TRAP    C$PNTB
     015052  062706  000010                    ADD     #10,SP
2601 015056  122763  000005  000010           CMPB    #FM.TPE,L.FMT(R3)       ;IS IT A TAPE TRANSFER ERROR LOG ?
2602 015064  001402                            BEQ     35$                     ;YES, GO PRINT IT
2603 015066  000137  015476                    JMP     PKPRNT                  ;NO, PRINT THE ERROR LOG PACKET
2604 015072                            35$:    PRINTB  #ERR07,BYTES            ;PRINT THE BYTE COUNT
     015072  013746  003416                    MOV     BYTES,-(SP)
     015076  012746  016461                    MOV     #ERR07,-(SP)
     015102  012746  000002                    MOV     #2,-(SP)
     015106  010600                            MOV     SP,R0
     015110  104414                            TRAP    C$PNTB
     015112  062706  000006                    ADD     #6,SP
2605 015116                                    PRINTB  #ERR08,OBOFFH(R2),OBOFFL(R2)
     015116  016246  000004                    MOV     OBOFFL(R2),-(SP)
     015122  016246  000006                    MOV     OBOFFH(R2),-(SP)
     015126  012746  016521                    MOV     #ERR08,-(SP)
     015132  012746  000003                    MOV     #3,-(SP)
     015136  010600                            MOV     SP,R0
     015140  104414                            TRAP    C$PNTB
     015142  062706  000010                    ADD     #10,SP
2606 015146                                    PRINTX  #ERL00,L.PSTN+2(R3),L.PSTN(R3)
     015146  016346  000044                    MOV     L.PSTN(R3),-(SP)
     015152  016346  000046                    MOV     L.PSTN+2(R3),-(SP)
     015156  012746  017146                    MOV     #ERL00,-(SP)
     015162  012746  000003                    MOV     #3,-(SP)
     015166  010600                            MOV     SP,R0
     015170  104415                            TRAP    C$PNTX
     015172  062706  000010                    ADD     #10,SP
2607 015176                                    PRINTX  #ERL01,<B,L.TRK(R3)>,<B,L.LVL(R3)>,<B,L.RTRY(R3)>
     015176  005046                            CLR     -(SP)
     015200  156316  000043                    BISB    L.RTRY(R3),(SP)
     015204  005046                            CLR     -(SP)
     015206  156316  000042                    BISB    L.LVL(R3),(SP)
     015212  005046                            CLR     -(SP)
```

```
        015214  156316  000055          BISB    L.TRK(R3),(SP)
        015220  012746  017203          MOV     #ERL01,-(SP)
        015224  012746  000004          MOV     #4,-(SP)
        015230  010600                  MOV     SP,R0
        015232  104415                  TRAP    C$PNTX
        015234  062706  000012          ADD     #12,SP
  2608  015240                          PRINTX  #ERL02,<B,L.LBLK(R3)>,L.PBLK(R3)
        015240  016346  000056          MOV     L.PBLK(R3),-(SP)
        015244  005046                  CLR     -(SP)
        015246  156316  000060          BISB    L.LBLK(R3),(SP)
        015252  012746  017301          MOV     #ERL02,-(SP)
        015256  012746  000003          MOV     #3,-(SP)
        015262  010600                  MOV     SP,R0
        015264  104415                  TRAP    C$PNTX
        015266  062706  000010          ADD     #10,SP
  2609  015272                          PRINTX  #ERL03,<B,L.DRVC(R3)>,<B,L.DFLG(R3)>
        015272  005046                  CLR     -(SP)
        015274  156316  000054          BISB    L.DFLG(R3),(SP)
        015300  005046                  CLR     -(SP)
        015302  156316  000053          BISB    L.DRVC(R3),(SP)
        015306  012746  017365          MOV     #ERL03,-(SP)
        015312  012746  000003          MOV     #3,-(SP)
        015316  010600                  MOV     SP,R0
        015320  104415                  TRAP    C$PNTX
        015322  062706  000010          ADD     #10,SP
  2610  015326                          PRINTX  #ERL04,L.DRVS(R3),<B,L.STS(R3)>
        015326  005046                  CLR     -(SP)
        015330  156316  000052          BISB    L.STS(R3),(SP)
        015334  016346  000064          MOV     L.DRVS(R3),-(SP)
        015340  012746  017454          MOV     #ERL04,-(SP)
        015344  012746  000003          MOV     #3,-(SP)
        015350  010600                  MOV     SP,R0
        015352  104415                  TRAP    C$PNTX
        015354  062706  000010          ADD     #10,SP
  2611  015360                          PRINTX  #ERL05,<B,L.CNT0(R3)>,<B,L.CNT1(R3)>
        015360  005046                  CLR     -(SP)
        015362  156316  000062          BISB    L.CNT1(R3),(SP)
        015366  005046                  CLR     -(SP)
        015370  156316  000061          BISB    L.CNT0(R3),(SP)
        015374  012746  017540          MOV     #ERL05,-(SP)
        015400  012746  000003          MOV     #3,-(SP)
        015404  010600                  MOV     SP,R0
        015406  104415                  TRAP    C$PNTX
        015410  062706  000010          ADD     #10,SP
  2612  015414                          PRINTX  #ERL06,<B,L.CNT2(R3)>,L.RWST(R3)
        015414  016346  000066          MOV     L.RWST(R3),-(SP)
        015420  005046                  CLR     -(SP)
        015422  156316  000063          BISB    L.CNT2(R3),(SP)
        015426  012746  017627          MOV     #ERL06,-(SP)
        015432  012746  000003          MOV     #3,-(SP)
        015436  010600                  MOV     SP,R0
        015440  104415                  TRAP    C$PNTX
        015442  062706  000010          ADD     #10,SP
  2613  015446                          PRINTX  #ERL07,L.OPFL(R3)
        015446  016346  000070          MOV     L.OPFL(R3),-(SP)
        015452  012746  017713          MOV     #ERL07,-(SP)
        015456  012746  000002          MOV     #2,-(SP)
```

```
                015462  010600                          MOV     SP,R0
                015464  104415                          TRAP    C$PNTX
                015466  062706  000006                  ADD     #6,SP
     2614       015472  000137  015670                  JMP     MSGEXT                          ;GET OUT
     2615       015476                          PKPRNT: PRINTB  #ERR08,OBOFFH(R2),OBOFFL(R2)
                015476  016246  000004                  MOV     OBOFFL(R2),-(SP)
                015502  016246  000006                  MOV     OBOFFH(R2),-(SP)
                015506  012746  016521                  MOV     #ERR08,-(SP)
                015512  012746  000003                  MOV     #3,-(SP)
                015516  010600                          MOV     SP,R0
                015520  104414                          TRAP    C$PNTB
                015522  062706  000010                  ADD     #10,SP
     2616       015526                                  PRINTX  #ERL08
                015526  012746  017743                  MOV     #ERL08,-(SP)
                015532  012746  000001                  MOV     #1,-(SP)
                015536  010600                          MOV     SP,R0
                015540  104415                          TRAP    C$PNTX
                015542  062706  000004                  ADD     #4,SP
     2617       015546                                  PRINTX  #ERR11
                015546  012746  016651                  MOV     #ERR11,-(SP)
                015552  012746  000001                  MOV     #1,-(SP)
                015556  010600                          MOV     SP,R0
                015560  104415                          TRAP    C$PNTX
                015562  062706  000004                  ADD     #4,SP
     2618       015566                                  PRINTX  #ERR12
                015566  012746  016675                  MOV     #ERR12,-(SP)
                015572  012746  000001                  MOV     #1,-(SP)
                015576  010600                          MOV     SP,R0
                015600  104415                          TRAP    C$PNTX
                015602  062706  000004                  ADD     #4,SP
     2619       015606  010305                          MOV     R3,R5                           ;GET POINTER TO RESPONSE PACKET
     2620       015610  010301                          MOV     R3,R1                           ;AND A SECOND COPY
     2621       015612  062701  000002                  ADD     #2,R1                           ;R1 POINT TO SECOND WORD OF PACKET
     2622       015616  005763  177774          1$:     TST     MSGLEN(R3)                      ;ARE WE STILL POSITIVE ?
     2623       015622  100422                          BMI     MSGEXT                          ;NO, GET OUT
     2624       015624                                  PRINTX  #ERR13,(R1),(R5)
                015624  011546                          MOV     (R5),-(SP)
                015626  011146                          MOV     (R1),-(SP)
                015630  012746  016733                  MOV     #ERR13,-(SP)
                015634  012746  000003                  MOV     #3,-(SP)
                015640  010600                          MOV     SP,R0
                015642  104415                          TRAP    C$PNTX
                015644  062706  000010                  ADD     #10,SP
     2625       015650  062701  000004                  ADD     #4,R1                           ;GET THE NEXT WORD
     2626       015654  062705  000004                  ADD     #4,R5                           ;AND AGAIN
     2627       015660  162763  000004  177774          SUB     #4,MSGLEN(R3)                   ;ADJUST MESSAGE LENGTH DOWN 2 WORDS
     2628       015666  001353                          BNE     1$                              ;KEEP PRINTING TILL ALL DONE
     2629       015670                          MSGEXT: PRINTF  #LINE
                015670  012746  020527                  MOV     #LINE,-(SP)
                015674  012746  000001                  MOV     #1,-(SP)
                015700  010600                          MOV     SP,R0
                015702  104417                          TRAP    C$PNTF
                015704  062706  000004                  ADD     #4,SP
     2630       015710  105737  002212                  TSTB    CLOCK                           ;IS THE CLOCK ENABLED
     2631       015714  001421                          BEQ     1$                              ;NO, THEN CAN'T PRINT TIME
     2632       015716                                  PRINTF  #TIME,<B,HOURS>,<B,MINUTE>,<B,SECOND>
                015716  005046                          CLR     -(SP)
```

```
        015720  153716  002215                  BISB    SECOND,(SP)
        015724  005046                          CLR     -(SP)
        015726  153716  002214                  BISB    MINUTE,(SP)
        015732  005046                          CLR     -(SP)
        015734  153716  002213                  BISB    HOURS,(SP)
        015740  012746  020044                  MOV     #TIME,-(SP)
        015744  012746  000004                  MOV     #4,-(SP)
        015750  010600                          MOV     SP,R0
        015752  104417                          TRAP    C$PNTF
        015754  062706  000012                  ADD     #12,SP
  2633  015760                          1$:     POP     <R5,R1>
  2634  015764                                  EXIT    MSG
        015764  000167                          .WORD   J$JMP
        015766  003044                          .WORD   L10003-2-.
  2635
  2636  015770    045     101     103   ERR00:: .ASCIZ  ?%N%ACOMMAND: %T%S3%AT/MSCP UNIT: %03%A(0)?
  2637  016040    045     101     103   ERR01:: .ASCIZ  ?%N%ACOMMAND: %T%A-REV%S3%AT/MSCP UNIT: %03%A(0)?
  2638  016116    045     101     103   ERR02:: .ASCIZ  ?%N%ACOMMAND: %T%A-LEOT%S3%AT/MSCP UNIT: %03%A(0)?
  2639  016175    045     101     103   ERR03:: .ASCIZ  ?%N%ACOMMAND: %T%A-IMM%S3%AT/MSCP UNIT: %03%A(0)?
  2640  016253    045     101     103   ERR04:: .ASCIZ  ?%N%ACOMMAND: %T%A-UNLD%S3%AT/MSCP UNIT: %03%A(0)?
  2641  016332    045     101     103   ERR05:: .ASCIZ  ?%N%ACOMMAND: %T%A-WRPR%S3%AT/MSCP UNIT: %03%A(0)?
  2642  016411    045     116     045   ERR06:: .ASCIZ  ?%N%APASS: %D3%A(D)   DATA PAT: %02%A(0)?
  2643  016461    045     116     045   ERR07:: .ASCIZ  ?%N%ARECORD BYTE COUNT: %D6%A(D)?
  2644  016521    045     116     045   ERR08:: .ASCIZ  ?%N%AOBJECT CNT : %06%06%A(0)?
  2645  016556    045     116     045   ERR09:: .ASCIZ  ?%N%ADRIVE ERROR CODE : %T%T%A(H)?
  2646  016617    045     116     045   ERR10:: .ASCIZ  ?%N%ASA CONTENTS: %06%A(0)?
  2647  016651    045     116     045   ERR11:: .ASCIZ  ?%N%ARESPONSE PACKET?
  2648  016675    045     116     045   ERR12:: .ASCIZ  ?%N%S5%AHIGH WORD%S6%ALOW WORD?
  2649  016733    045     116     045   ERR13:: .ASCIZ  ?%N%S5%06%A(0)%S6%06%A(0)?
  2650  016764    045     116     045   ERR14:: .ASCIZ  ?%N%S2%ABYTE%S10%ADATA?
  2651  017012    045     116     045   ERR15:: .ASCIZ  ?%N%S2%AADDR%S3%AEXPECTED%S3%ARECEIVED%N?
  2652  017062    045     123     061   ERR16:: .ASCIZ  ?%S1%06%S5%03%S8%03%N?
  2653  017107    045     101     124   ERR17:: .ASCIZ  ?%ATOTAL BYTES IN ERROR : %D4%N?
  2654  017146    045     116     045   ERL00:: .ASCIZ  ?%N%ATAP OBJ CNT: %06%06%A(0)?
  2655  017203    045     116     045   ERL01:: .ASCIZ  ?%N%ATRK NUM:  %D2%A(D)  LEVEL:  %D2%A(D)   RETRIES:  %D2%A(D)?
  2656  017301    045     116     045   ERL02:: .ASCIZ  ?%N%ALOG BLK NUM:  %D3%A(D)  PHYS BLK NUM:  %D6%A(D)?
  2657  017365    045     116     045   ERL03:: .ASCIZ  ?%N%ADRV CODE:     %03%A(0)  DRV FLGS:        %03%A(0)?
  2658  017454    045     116     045   ERL04:: .ASCIZ  ?%N%ADRV STATE: %06%A(0)  INTERN STATUS:    %03%A(0)?
  2659  017540    045     116     045   ERL05:: .ASCIZ  ?%N%ATAP CNT 0:    %03%A(0)  TAP CNT 1:       %03%A(0)?
  2660  017627    045     116     045   ERL06:: .ASCIZ  ?%N%ATAP CNT 2:    %03%A(0)  RD/WR STATE:   %06%A(0)?
  2661  017713    045     116     045   ERL07:: .ASCIZ  ?%N%AOPER FLGS: %06%A(0)?
  2662  017743    045     116     045   ERL08:: .ASCIZ  ?%N%AERROR LOG PACKET?
  2663  017770    045     116     045   NCLK::  .ASCIZ  ?%N%A*\*/*\*/* CLOCK NOT PRESENT *\*/*\*/*%N?
  2664  020044    045     116     045   TIME::  .ASCIZ  ?%N%A*\*/*\*/* TIME %Z2%A:%Z2%A:%Z2%A *\*/*\*/*%N?
  2665  020125    045     116     045   DAY::   .ASCIZ  ?%N%A*\*/*\*/* START OF DAY %02%A *\*/*\*/*%N?
  2666  020202    045     101     102   COUNTS::.ASCIZ  ?%ABYTE COUNT: %D%A(D)  FILE SIZE: %D%A(D)%N?
  2667  020256    045     116     045   UNTEOT::.ASCIZ  ?%N%AUNIT: %01%A IS AT EOT%N?
  2668  020312    045     116     045   UNTLOT::.ASCIZ  ?%N%AUNIT: %01%A IS AT LEOT%N?
  2669  020347    045     116     045   DUMP::  .ASCIZ  ?%N%AR1:%06%A R2:%06%A R3:%06%A R4:%06%A R5:%06%N?
  2670  020430    045     116     045   DUMP1:: .ASCIZ  ?%N%N%ABYTES X-FERRED: %D5%A(D)%N?
  2671  020471    045     117     066   DUMP2:: .ASCIZ  ?%06%S3%06%S3%06%S3%06%S3%06%N?
  2672  020527    045     116     000   LINE::  .ASCIZ  ?%N?
  2673  020532    045     116     045   CONTRV::        .ASCII  /%N%AUNIT: %D1/
  2674  020547    045     116     045                   .ASCII  /%N%ACONTROLLER SOFTWARE VERSION : %D3/
  2675  020614    045     116     045                   .ASCIZ  /%N%ACONTROLLER HARDWARE VERSION : %D3/
  2676  020662    045     116     045   UNITRV::        .ASCII  /%N%ADRIVE SOFTWARE VERSION :      %D3/
  2677  020727    045     116     045                   .ASCIZ  /%N%ADRIVE HARDWARE VERSION :      %D3%N%N/
```

```
 2678 021001     045     116     045 BYPASS::        .ASCIZ  /%N%A TEST %Z3%A BYPASSED%N/
 2679                                .EVEN
 2680 021034                             ENDMSG
      021034                         L10003:
      021034  104423                     TRAP    C$MSG
```

```
                                        ;PROTECTION TABLE

                                                BGNPROT
021036                                  L$PROT::
021036
021036  000000                                  .WORD   0
021040  177777                                  .WORD   -1
021042  177777                                  .WORD   -1
021044                                          ENDPROT
```

```
                                        .SBTTL  CLOCK HANDLER

                                                BGNSRV  NOCLK
                                        NOCLK::
                                                CLRB    CLOCK           ;CLEAR THE CLOCK ENABLED BIT
                                                BIS     #NCLKFL,PCFLAG  ;SET UP NO CLOCK PRESENT FLAG
                                                PRINTF  #NCLK           ;PRINT MESSAGE
021056  012746  017770                          MOV     #NCLK,-(SP)
021062  012746  000001                          MOV     #1,-(SP)
021066  010600                                  MOV     SP,R0
021070  104417                                  TRAP    C$PNTF
021072  062706  000004                          ADD     #4,SP

                                                ENDSRV
021076                                  L10005:
021076  000002                                  RTI

                                                BGNSRV  KWHDL
021100                                  KWHDL::

021100  105237  002216                          INCB    SUBSEC          ;INCREMENT THE SUB-SECOND COUNTER
021104  122737  000074  002216                  CMPB    #60.,SUBSEC     ;IS IT A SECOND YET ?
021112  001051                                  BNE     HDLEXT          ;NO, GET OUT
021114  105037  002216                          CLRB    SUBSEC          ;CLEAR THE SUBSEC COUNTER
021120  105237  002215                          INCB    SECOND          ;INCREMNET THE SECONDS COUNTER
021124  005237  010556                          INC     TIMER           ;INCREMENT THE COMMAND TIMER
021130  122737  000074  002215                  CMPB    #60.,SECOND     ;IS IT A MINUTE YET ?
021136  001037                                  BNE     HDLEXT          ;NO, GET OUT
021140  105037  002215                          CLRB    SECOND          ;CLEAR THE SECOND COUNTER
021144  105237  002214                          INCB    MINUTE          ;INCREMENT THE MINUTE COUNTER
021150  122737  000074  002214                  CMPB    #60.,MINUTE     ;IS IT AN HOUR YET ?
021156  001027                                  BNE     HDLEXT          ;NO, GET OUT
021160  105037  002214                          CLRB    MINUTE          ;CLEAR THE MINUTE COUNTER
021164  105237  002213                          INCB    HOURS           ;INCREMENT THE HOUR COUNTER
021170  122737  000030  002213                  CMPB    #24.,HOURS      ;IS IT A DAY YET ?
021176  001017                                  BNE     HDLEXT          ;NO, GET OUT
021200  105037  002213                          CLRB    HOURS           ;CLEAR THE HOURS COUNTER
021204  105237  003564                          INCB    DAYS            ;INCREMENT THE DAY COUNT
021210                                          PRINTF  #DAY,<B,DAYS>   ;PRINT END OF DAY STATMENT
021210  005046                                  CLR     -(SP)
021212  153716  003564                          BISB    DAYS,(SP)
021216  012746  020125                          MOV     #DAY,-(SP)
021222  012746  000002                          MOV     #2,-(SP)
021226  010600                                  MOV     SP,R0
021230  104417                                  TRAP    C$PNTF
021232  062706  000006                          ADD     #6,SP
021236                                  HDLEXT:
021236                                          ENDSRV
021236                                  L10006:
021236  000002                                  RTI
```

```
                                .SBTTL  SCHEDULER
                                ;*************************
                                ;
                                ; SCHEDULER
                                ;
                                ;Called by      : Test N
                                ;Calls to       : CMMDSQ
                                ;Outputs        : EOT Flag, Dropped Flag
                                ;Register Inputs: R5 (Pointer to command active in table - not used here) .
                                ;Registers Used : R4 (Pointer to LUN Block for use by called subs)
                                ;
021240                          SCHED::
021240  005001                          CLR     R1                      ;SET R1 TO FIST UNIT
021242  005037  002074                  CLR     L$LUN                   ;SET L$LUN TO FIRST UNIT
021246  012704  002314                  MOV     #LUNO,R4                ;SET R4 TO THE FIRST LUN BLOCK
021252  022737  000003  002114          CMP     #3,L$TEST               ;ARE WE IN TEST 3 ?
021260  001014                          BNE     1$                      ;YES, PRINT LINEFEED
021262  122765  000020  000000          CMPB    #WR,CMD(R5)             ;IS IT A WRITE COMMAND ?
021270  001010                          BNE     1$                      ;NO, GET OUT
021272                                  PRINTF  #LINE                   ;PRINT A LINE FEED
021272  012746  020527                  MOV     #LINE,-(SP)
021276  012746  000001                  MOV     #1,-(SP)
021302  010600                          MOV     SP,R0
021304  104417                          TRAP    C$PNTF
021306  062706  000004                  ADD     #4,SP
021312  032761  000001  003350  1$:     BIT     #AVB,DRINUS(R1)         ;SEE IF DRIVE IS PRESENT AND AVAILABLE
021320  001416                          BEQ     2$                      ;GET THE NEXT DRIVE IF IT ISN'T
021322  032761  000004  003350          BIT     #EOT,DRINUS(R1)         ;CHECK IF THE DRIVE IS AT EOT
021330  001012                          BNE     2$                      ;GET NEXT DRIVE IF IT IS
                                
021332  012764  000377  000010          MOV     #377,SLTUSE(R4)         ;SET ALL RESPONSE SLOTS TO THE PORT
021340  004737  026230                  JSR     PC,PRTCLR               ;GO DO IT
021344  112737  000004  010571          MOVB    #4,CRDLIM               ;CREDITS START AT 4 FOR NEW LUN
021352  004737  021406                  JSR     PC,CMMDSQ               ;GO DO THE TEST ON THIS DRIVE
                                
021356  022701  000006          2$:     CMP     #6.,R1                  ;HAVE WE DONE THEM ALL ?
021362  001410                          BEQ     3$                      ;GET OUT
021364  062701  000002                  ADD     #UNTSTP,R1              ;GET NEXT UNIT
021370  062704  000172                  ADD     #LUNSTP,R4              ;SET UP THE NEXT LUN BLOCK
021374  005237  002074                  INC     L$LUN                   ;GET NEXT UNIT
021400                                  BREAK
021400  104422                          TRAP    C$BRK
021402  000743                          BR      1$                      ;GO DO THE NEXT ONE
021404  000207          3$:     RTS     PC                              ;RETURN
```

```
                                .SBTTL  COMMAND SEQUENCER
                                ;**************************
                                ;
                                ;COMMAND SEQUENCER
                                ;
                                ;Called by       : SCHED
                                ;Calls to        : CMDBLD, QCMD, CLSDRV, RSPHDR, UNJAM
                                ;Register Inputs: R5 - POINTER TO COMMAND ACTIVE IN TABLE
                                ;                 R4 - POINTER TO LUN BLOCK
                                ;
                                ;
021406                          CMMDSQ::
021406                                  PUSH    <R1,R5>                 ;SAVE R1 AND R5
021406  010146                          MOV     R1,-(SP)        ;;PUSH R1 ON STACK
021410  010546                          MOV     R5,-(SP)        ;;PUSH R5 ON STACK
021412  004737  022002                  JSR     PC,CMDBLD               ;GO BUILD THE COMMAND
021416  042737  000200  003516          BIC     #CMDONE,PCFLAG          ;GET SET TO START ISSUING COMMANDS
021424  013737  003420  003400          MOV     ITERS,CMDCNT            ;GET THE COMMAND COUNT
021432  013737  003420  003402          MOV     ITERS,RSPCNT            ;GET THE RESPONSE COUNT
021440  012737  177777  010550          MOV     #-1,CMSTSV              ;RESET THE GCS PROGRESS COUNT

021446  032737  000040  003516  5$:     BIT     #GCSRFL,PCFLAG          ;STILL LOOKING FOR A GCS RESPONSE ?
021454  001023                          BNE     15$                     ;DON'T QUEUE UP THE NEXT COMMAND
021456  005737  003400                  TST     CMDCNT                  ;DO WE STILL HAVE COMMANDS TO ISSUE ?
021462  001004                          BNE     10$                     ;YES , KEEP GOING.
021464  052737  000200  003516          BIS     #CMDONE,PCFLAG          ;SET THE ALL COMMANDS ISSUED FLAG
021472  000414                          BR      15$

021474  004737  023050          10$:    JSR     PC,QCMD                 ;GO QUEUE UP THE NEXT COMMAND
021500  032737  000002  003516          BIT     #NCLKFL,PCFLAG          ;IS A CLOCK PRESENT ?
021506  001003                          BNE     13$                     ;NO CLOCK, START REGULAR TIMER
021510  005037  010556                  CLR     TIMER                   ;SET TIMER TO 0
021514  000403                          BR      15$                     ;GO ISSUE COMMAND
021516  012737  010000  010556  13$:    MOV     #10000,TIMER            ;SET UP THE TIMER

021524                          15$:    BREAK
021524  104422                          TRAP    C$BRK
021526  004737  023444                  JSR     PC,CLSDRV               ;CALL THE CLASS DRIVER
021532  032737  000002  003516          BIT     #NCLKFL,PCFLAG          ;IS A CLOCK PRESENT ?
021540  001007                          BNE     18$                     ;NO CLOCK, START REGULAR TIMER
021542  022737  000171  010556          CMP     #121.,TIMER             ;HAVE WE TIMED OUT ?
021550  101012                          BHI     20$                     ;NO, KEEP GOING
021552  005037  010556                  CLR     TIMER                   ;SET TIMER TO 0
021556  000414                          BR      25$                     ;YES,SET UP FOR TIME OUT

021560  005337  010556          18$:    DEC     TIMER                   ;DECREMENT THE TIMER
021564  001004                          BNE     20$                     ;BRANCH IF NOT 0
021566  012737  010000  010556          MOV     #10000,TIMER            ;RESET THE TIMER
021574  000405                          BR      25$                     ;SET TIME OUT ERROR

021576  022737  020000  010546  20$:    CMP     #IOICRD,IOSTAT          ;INSUFFICIENT CREDITS ?
021604  001747                          BEQ     15$                     ;YES, TRY AGAIN
021606  000425                          BR      35$                     ;YES, CHECK IT OUT

021610  032737  000040  003516  25$:    BIT     #GCSRFL,PCFLAG          ;WAITING FOR A GCS RESPONCE ?
021616  001412                          BEQ     30$                     ;NO, SET UP TO DO A GCS
021620  042737  000040  003516          BIC     #GCSRFL,PCFLAG          ;CLEAR THE GCS RESPONSE FLAG
```

```
2819 021626  012737  000004  010546        MOV     #IOTIME,IOSTAT          ;SET UP TIME OUT ERROR
2820 021634  004737  033742                JSR     PC,CORDMP               ;DO A VARIABLES DUMP
2821 021640  000240                        NOP
2822 021642  000407                        BR      35$                     ;GO REPORT ERROR AND DROP UNIT
2823
2824 021644  052737  000020  003516  30$:  BIS     #GCSCFL,PCFLAG          ;SET THE GCS COMMAND FLAG
2825 021652  052737  000040  003516        BIS     #GCSRFL,PCFLAG          ;SET THE GCS RESPONSE FLAG
2826 021660  000721                        BR      15$                     ;GO ISSUE THE GCS COMMAND
2827
2828 021662  022737  060000  010546  35$:  CMP     #ERRLOG!IOICRD,IOSTAT   ;DID WE GET ERROR LOG PACKET ONLY?
2829 021670  001406                        BEQ     40$                     ;YES - SO BRANCH AROUND NEXT INSTRUCTION
2830 021672  032737  000240  003516        BIT     #CMDONE!GCSRFL,PCFLAG   ;HAVE ALL COMMANDS BEEN ISSUED ?
2831 021700  001002                        BNE     40$                     ;YES, DON'T LET CMDCNT GO NEGATIVE
2832 021702  005337  003400                DEC     CMDCNT                  ;DECREMENT THE COMMAND COUNT
2833 021706  022737  000000  010546  40$:  CMP     #IONORM,IOSTAT          ;WAS IT A NORMAL COMPLETION ?
2834 021714  001414                        BEQ     45$                     ;YES , GET OUT
2835 021716  004737  027432                JSR     PC,RSPHDL               ;NO, LETS SEE WHAT IT WAS
2836
2837 021722  032737  020000  010546        BIT     #IOICRD,IOSTAT          ;WERE WE IN RSPHDL FOR ERROR LOG ONLY?
2838 021730  001275                        BNE     15$                     ;YES - GO TRY TO POST SAME COMMAND.
2839 021732  022737  000002  003406        CMP     #SEREXC,RESPON          ;WAS IT A SERIOUS EXCEPTION ?
2840 021740  001002                        BNE     45$                     ;NO, CONTINUE
2841 021742  004737  033250                JSR     PC,UNJAM                ;YES, GO UNJAM THE QUEUES
2842
2843 021746  032761  000001  003350  45$:  BIT     #AVB,DRINUS(R1)         ;HAS THE DRIVE BEEN DROPPED ?
2844 021754  001407                        BEQ     50$                     ;YES, EXIT
2845 021756  005737  003402                TST     RSPCNT                  ;HAVE WE GOTTEN ALL THE RESPONSE BACK ?
2846 021762  001231                        BNE     5$                      ;NO, GO BACK TO THE TOP
2847 021764  032737  000040  003516        BIT     #GCSRFL,PCFLAG          ;STILL LOOKING FOR A GCS RESPONSE ?
2848 021772  001225                        BNE     5$                      ;YES, DON'T GET OUT YET
2849
2850 021774                        50$:    POP     <R5,R1>                         ;RESTORE REGISTERS R1 AND R5
     021774  012605                        MOV     (SP)+,R5        ;;POP STACK INTO R5
     021776  012601                        MOV     (SP)+,R1        ;;POP STACK INTO R1
2851 022000  000207                        RTS     PC                      ;RETURN
```

```
                                .SBTTL  COMMAND BUILDER
                                ;******************************
                                ;
                                ;COMMAND BUILDER
                                ;
                                ;Called by      : CMMDSQ
                                ;Calls to       : BYTCNT, SELDAT, SELREC
                                ;Register Inputs: R5 - pointer to test's command table
                                ;                 R4 - pointer to LUN BLOCK
                                ;Register Output: R3 - new pointer for command ring (set to start of ring)
                                ;                 R2 - old pointer for command ring (set to start of ring)
                                ;Registers Used : R3 Pointer to dummy packet before setting to command ring
                                ;

022002                          CMDBLD::
022002  012737  000004  003424          MOV     #N,SUBCNT               ;INITIALIZE THE SUB-ITERATION COUNTER
022010  012703  003344                  MOV     #DUMPKT,R3              ;PUT THE DUMMY PACKET ADDRESS IN R3
022014  116563  000000  000000          MOVB    CMD(R5),CMD(R3)         ;MOVE THE COMMAND PRIMITIVE TO THE PACKET

022022  004737  022124                  JSR     PC,BYTCNT               ;GO GET THE BYTE COUNT
022026  013763  003416  000002          MOV     BYTES,ITMOFF(R3)        ;PUT THE BYTE COUNT IN THE DUMMY PACKET
022034  004737  022212                  JSR     PC,SELDAT               ;GO GET THE DATA
022040  004737  022644                  JSR     PC,SELREC               ;GO GET THE RECORD COUNT

022044  022737  000003  002114          CMP     #3,L$TEST               ;ARE WE IN TEST 3 ?
022052  001020                          BNE     5$                      ;YES, PRINT COUNTS
022054  122765  000020  000000          CMPB    #WR,CMD(R5)             ;IS IT A WRITE COMMAND ?
022062  001014                          BNE     5$                      ;NO, GET OUT
022064                                  PRINTF  #COUNTS,BYTES,ITERS     ;YES, PRINT BYTE AND ITERATION COUNTS
022064  013746  003420                  MOV     ITERS,-(SP)
022070  013746  003416                  MOV     BYTES,-(SP)
022074  012746  020202                  MOV     #COUNTS,-(SP)
022100  012746  000003                  MOV     #3,-(SP)
022104  010600                          MOV     SP,R0
022106  104417                          TRAP    C$PNTF
022110  062706  000010                  ADD     #10,SP

022114  012703  003264          5$:     MOV     #PCMDBF,R3              ;PUT THE PROGRAM COMMAND RING ADDRESS IN
022120  010302                          MOV     R3,R2                   ;R3 AND R2
022122  000207                          RTS     PC                      ;RETURN
```

```
                                .SBTTL  BYTE COUNT
                                ;******************************
                                ;
                                ; BYTE COUNT
                                ;
                                ;Called by      : CMDBLD
                                ;Calls to       : RANGEN
                                ;Outputs        : BYTES (contains byte or item count to be used for this iteration set)
                                ;Register Inputs: R5 - pointer to test command table
                                ;                 R4 - pointer to LUN BLOCK
                                ;Register Output: None
                                ;Registers Used : None
                                ;

022124                          BYTCNT::
022124  005037  003416                  CLR     BYTES                   ;CLEAR BYTES
022130  005765  000002                  TST     ITMCNT(R5)              ;CHECK ITMCNT FOR 0
022134  001404                          BEQ     1$                      ;CONTINUE IF IT IS 0
022136  016537  000002  003416          MOV     ITMCNT(R5),BYTES        ;PUT ITMCNT INTO BYTES
022144  000421                          BR      3$                      ;EXIT

022146  122765  000020  000000  1$:     CMPB    #WR,CMD(R5)             ;IS IT A READ OR WRITE
022154  103415                          BLO     3$                      ;GET OUT IF IT ISN'T

022156  004737  022716          2$:     JSR     PC,RANGEN               ;GO TO THE RANDOM GENERATOR
022162  023727  003426  020000          CMP     RANWRD,#MAXBUF          ;IS THE RESULT WITHIN THE LIMITS ?
022170  101372                          BHI     2$                      ;BRANCH IF TOO HIGH
022172  023727  003426  000024          CMP     RANWRD,#MINBUF          ;IS IT TOO SMALL ?
022200  103766                          BLO     2$                      ;BRANCH IF TOO SMALL
022202  013737  003426  003416          MOV     RANWRD,BYTES            ;PUT RANWRD INTO BYTES
022210  000207                  3$:     RTS     PC                      ;RETURN
```

```
                        .SBTTL  SELECT DATA PATTERN
                        ;*****************************
                        ;
                        ; SELECT DATA PATTERN
                        ;
                        ;Called by      : CMDBLD
                        ;Calls to       : RANGEN
                        ;Inputs         : Data Pattern in test command table
                        ;                 PATSAV in LUN BLOCK if rotating pattern in use
                        ;Outputs        : Write Buffer filled with appropriate data pattern
                        ;                 PATSAV in LUN BLOCK updated to next pattern
                        ;Register Inputs:  R5 - pointer to test command table
                        ;                  R4 - pointer to LUN BLOCK
                        ;Registers Used :  R3 - pointer to WRTBUF
                        ;                  R2 - pointer to data pattern
                        ;
                        ;
022212                  SELDAT::
022212                          PUSH    <R1,R5>                 ;SAVE R1 AND R5
022216  105765  000001          TSTB    DATPAT(R5)              ;TEST DATPAT FOR A TEST PATTERN
022222  001445                  BEQ     20$                     ;BRANCH IF WE DON'T NEED ONE
022224  105737  002233          TSTB    PATERN                  ;PATTERN SPECIFIED IN SOFTWARE P-TABLE ?
022230  001404                  BEQ     1$                      ;NO, KEEP GOING
022232  113764  002233  000024  MOVB    PATERN,PATSAV(R4)       ;PUT THE PATTERN IN THE SAVE LOCATION
022240  000420                  BR      10$
                        ;
022242  105765  000001  1$:     TSTB    DATPAT(R5)              ;DO WE WANT ROTATING DATA PATTERNS ?
022246  100404                  BMI     5$                      ;IF NEGATIVE GO TO 5$
022250  116564  000001  000024  MOVB    DATPAT(R5),PATSAV(R4)   ;LET PATSAV EQUAL DATPAT
022256  000411                  BR      10$                     ;BRANCH
                        ;
022260  005264  000024  5$:     INC     PATSAV(R4)              ;ADD 1 TO PATSAV
022264  026427  000024  000010  CMP     PATSAV(R4),#ENDPAT      ;ARE WE AT THE END OF THE PATTERN TABLE ?
022272  001003                  BNE     10$                     ;NO, KEEP GOING
022274  012764  000001  000024  MOV     #1.,PATSAV(R4)          ;AT THE END, LET PATSAV EQUAL 1
                        ;
022302  013705  003416  10$:     MOV     BYTES,R5                ;PUT THE BYTE COUNT IN R5
022306  032705  000001          BIT     #BIT0,R5                ;IS THE BYTE COUNT ODD ?
022312  001401                  BEQ     15$                     ;BRANCH IF NOT
022314  005205                  INC     R5                      ;MAKE BYTE COUNT EVEN FOR PATGEN
                        ;
022316  012703  070560  15$:     MOV     #WRTBUF,R3              ;POINT R3 TO THE WRITE BUFFER
022322  116401  000024          MOVB    PATSAV(R4),R1           ;SAVE PATSAV IN R1
022326  005301                  DEC     R1                      ;ADJUST FOR TABLE STEP
022330  006301                  ASL     R1                      ;MAKE IT MOD 2 OFFSET
                        ;
022332  004771  022344          JSR     PC,@PATTBL(R1)          ;GO FILL THE BUFFER
022336                  20$:     POP     <R5,R1>                 ;RESTORE R5 AND R1
022342  000207                  RTS     PC                      ;RETURN
                        ;
                        ;
022344                  PATTBL::
                                .WORD   PATGN1                  ;ALL 1'S
                                .WORD   PATGN2                  ;ALL 0'S
                                .WORD   PATGN3                  ;WORST CASE MFM
                                .WORD   PATGN4                  ;ALTERNATE 1'S AND 0'S
022354  022464                  .WORD   PATGN5                  ;RANDOM DATA
```

SELECT DATA PATTERN

```
2978 022356  022504                    .WORD   PATGN6          ;1110 REPEATING PATTERN
2979 022360  022520                    .WORD   PATGN7          ;COMBINATION PAT 3 AND 5
2980
2981 022362                     PATGN1:
2982 022362  012723  177777            MOV     #-1,(R3)+       ;PUT ALL 1'S INTO THE BUFFER
2983 022366  162705  000002            SUB     #2,R5           ;SUBTRACT TWO FROM R5
2984 022372  001373                    BNE     PATGN1          ;KEEP GOING IF WE AREN'T AT 0
2985 022374  000207                    RTS     PC              ;RETURN
2986
2987 022376                     PATGN2:
2988 022376  005023                    CLR     (R3)+           ;PUT ALL 0'S INTO THE BUFFER
2989 022400  162705  000002            SUB     #2,R5           ;SUBTRACT TWO FROM R5
2990 022404  001374                    BNE     PATGN2          ;KEEP GOING IF WE AREN'T AT 0
2991 022406  000207                    RTS     PC              ;RETURN
2992
2993 022410                     PATGN3:
2994 022410  012723  133333            MOV     #133333,(R3)+   ;PUT THE NUMBER INTO THE BUFFER
2995 022414  162705  000002            SUB     #2,R5           ;SUBTRACT TWO FROM R5
2996 022420  001412                    BEQ     1$              ;KEEP GOING IF WE AREN'T AT 0
2997 022422  012723  155555            MOV     #155555,(R3)+   ;PUT THE NUMBER INTO THE BUFFER
2998 022426  162705  000002            SUB     #2,R5           ;SUBTRACT TWO FROM R5
2999 022432  001405                    BEQ     1$              ;KEEP GOING IF WE AREN'T AT 0
3000 022434  012723  066666            MOV     #066666,(R3)+   ;PUT THE NUMBER INTO THE BUFFER
3001 022440  162705  000002            SUB     #2,R5           ;SUBTRACT TWO FROM R5
3002 022444  001361                    BNE     PATGN3          ;KEEP GOING IF WE AREN'T AT 0
3003 022446  000207             1$:    RTS     PC              ;RETURN
3004
3005 022450                     PATGN4:
3006 022450  012723  125252            MOV     #125252,(R3)+   ;PUT ALTERNATING 1 AND 0 INTO THE BUFFER
3007 022454  162705  000002            SUB     #2,R5           ;SUBTRACT TWO FROM R5
3008 022460  001373                    BNE     PATGN4          ;KEEP GOING IF WE AREN'T AT 0
3009 022462  000207                    RTS     PC              ;RETURN
3010
3011 022464                     PATGN5:
3012 022464  004737  022716            JSR     PC,RANGEN       ;GO GENERATE RANDOM PATTERN
3013 022470  013723  003426            MOV     RANWRD,(R3)+    ;PUT THE NUMBER INTO THE BUFFER
3014 022474  162705  000002            SUB     #2,R5           ;SUBTRACT TWO FROM R5
3015 022500  001371                    BNE     PATGN5          ;KEEP GOING IF WE AREN'T AT 0
3016 022502  000207                    RTS     PC              ;RETURN
3017
3018 022504                     PATGN6:
3019 022504  012723  167356            MOV     #167356,(R3)+   ;PUT 1110 REPEATING IN BUFFER
3020 022510  162705  000002            SUB     #2,R5           ;SUBTRACT TWO FROM R5
3021 022514  001373                    BNE     PATGN6          ;KEEP GOING IF WE AREN'T AT 0
3022 022516  000207                    RTS     PC              ;RETURN
3023
3024 022520                     PATGN7:
3025 022520                            PUSH    <R2>
3026 022522  012702  001000     1$:    MOV     #512.,R2
3027 022526  012723  133333     3$:    MOV     #133333,(R3)+   ;PUT THE NUMBER INTO THE BUFFER
3028 022532  162705  000002            SUB     #2,R5           ;SUBTRACT TWO FROM R5
3029 022536  001440                    BEQ     10$             ;KEEP GOING IF WE AREN'T AT 0
3030 022540  162702  000002            SUB     #2,R2           ;HAVE WE DONE A FULL BLOCK YET
3031 022544  001420                    BEQ     5$              ;YES DO NEXT BLOCK IN PATTERN 5
3032 022546  012723  155555            MOV     #155555,(R3)+   ;PUT THE NUMBER INTO THE BUFFER
3033 022552  162705  000002            SUB     #2,R5           ;SUBTRACT TWO FROM R5
3034 022556  001430                    BEQ     10$             ;KEEP GOING IF WE AREN'T AT 0
```

```
3035 022560  162702  000002              SUB     #2,R2           ;HAVE WE DONE A FULL BLOCK YET
3036 022564  001410                      BEQ     5$              ;YES DO NEXT BLOCK IN PATTERN 5
3037 022566  012723  066666              MOV     #066666,(R3)+   ;PUT THE NUMBER INTO THE BUFFER
3038 022572  162705  000002              SUB     #2,R5           ;SUBTRACT TWO FROM R5
3039 022576  001420                      BEQ     10$             ;KEEP GOING IF WE AREN'T AT 0
3040 022600  162702  000002              SUB     #2,R2           ;HAVE WE DONE A FULL BLOCK YET
3041 022604  001350                      BNE     3$              ;YES DO NEXT BLOCK IN PATTERN 5
3042 022606  012702  001000      5$:     MOV     #512.,R2
3043 022612  004737  022716      6$:     JSR     PC,RANGEN       ;GO GENERATE RANDOM PATTERN
3044 022616  013723  003426              MOV     RANWRD,(R3)+    ;PUT THE NUMBER INTO THE BUFFER
3045 022622  162705  000002              SUB     #2,R5           ;SUBTRACT TWO FROM R5
3046 022626  001404                      BEQ     10$             ;KEEP GOING IF WE AREN'T AT 0
3047 022630  162702  000002              SUB     #2,R2           ;HAVE WE DONE A FULL BLOCK YET
3048 022634  001366                      BNE     6$              ;YES DO NEXT BLOCK IN PATTERN 5
3049 022636  000731                      BR      1$
3050 022640                      10$:    POP     <R2>
3051 022642  000207                      RTS     PC              ;RETURN
3052
3053
```

```
                                .SBTTL  SELECT RECORD
                                ;*********************************
                                ;
                                ; SELECT RECORD
                                ;
                                ;Called by      : CMDBLD
                                ;Calls to       : RANGEN
                                ;Outputs        : ITERS (number of iterations for this set)
                                ;Register Inputs: R5 - pointer to test command table
                                ;                 R4 - pointer to LUN BLOCK
                                ;
                                ;

022644                          SELREC::
022644  005765  000004                  TST     ITRCNT(R5)              ;TEST THE ITERATION COUNT
022650  001016                          BNE     10$                     ;IF IT ISN'T 0 THEN BRANCH
022652  004737  022716          5$:     JSR     PC,RANGEN               ;GO TO THE RANDOM GENERATOR
022656  023727  003426  003720          CMP     RANWRD,#MAXITR          ;IS THE ITERATION COUNT TO HIGH ?
022664  101372                          BHI     5$                      ;GO TRY AGAIN
022666  023727  003426  000144          CMP     RANWRD,#MINITR          ;IS THE ITERATION SET TOO SMALL ?
022674  103766                          BLO     5$                      ;GO TRY AGAIN
022676  013737  003426  003420          MOV     RANWRD,ITERS            ;SAVE THE RANDOM NUMBER
022704  000403                          BR      15$                     ;EXIT
022706  016537  000004  003420  10$:     MOV     ITRCNT(R5),ITERS        ;SAVE THE ITERATION COUNT
022714  000207                  15$:    RTS     PC                      ;RETURN
```

```
                                .SBTTL  RANDOM NUMBER GENERATOR
                                ;*****************************
                                ;
                                ;RANDOM NUMBER GENERATOR
                                ;
                                ;Called by      : BYTCNT, SELDAT, SELREC
                                ;Inputs         : RAN1, RAN2, RAN3
                                ;Outputs        : RANWRD
                                ;Registers Used : R5
                                ;
                                RANGEN::
022716                                  PUSH    <R5>                    ;SAVE R5
022716  016437  000144  003430          MOV     SEED1(R4),RAN1          ;PUT SEED1 INTO RAN1
022726  016437  000146  003432          MOV     SEED2(R4),RAN2          ;PUT SEED2 INTO RAN2
022734  016437  000150  003434          MOV     SEED3(R4),RAN3          ;PUT SEED3 INTO RAN3
022742  013705  003430                  MOV     RAN1,R5                 ;MOVE THE FIRST SEED INTO R5
022746  000241                          CLC                             ;CLEAR THE CARRY FLAG
022750  005337  003434                  DEC     RAN3                    ;DECREMENT THE THIRD SEED
022754  006105                          ROL     R5                      ;
022756  006105                          ROL     R5                      ;
022760  063705  003432                  ADD     RAN2,R5                 ;ADD THE SECOND SEED TO R5
022764  010537  003430                  MOV     R5,RAN1                 ;PUT IT ALL IN THE FIRST SEED
022770  063705  003434                  ADD     RAN3,R5                 ;PUT THE THIRD SEED INTO R5
022774  006105                          ROL     R5                      ;
022776  006105                          ROL     R5                      ;
023000  063705  003432                  ADD     RAN2,R5                 ;ADD THE SECOND SEED TO R5
023004  006105                          ROL     R5                      ;
023006  006105                          ROL     R5                      ;
023010  010537  003432                  MOV     R5,RAN2                 ;PUT IT IN THE SECOND SEED
023014  013737  003430  003426          MOV     RAN1,RANWRD             ;PUT THE FIRST SEED INTO RANWORD
023022  013764  003430  000144          MOV     RAN1,SEED1(R4)          ;PUT RAN1 INTO SEED1
023030  013764  003432  000146          MOV     RAN2,SEED2(R4)          ;PUT RAN2 INTO SEED2
023036  013764  003434  000150          MOV     RAN3,SEED3(R4)          ;PUT RAN3 INTO SEED3
023044                                  POP     <R5>                    ;RESTORE R5
023046  000207                          RTS     PC                      ;EXIT
```

```
                                .SBTTL  QUEUE COMMANDS
                                ;**********************************
                                ;
                                ; QUEUE COMMANDS
                                ;
                                ;Called by      : CMMDSQ
                                ;Calls to       : SUBITR
                                ;Register Inputs: R3 - pointer to next slot in ring
                                ;                 R4 - pointer to LUN BLOCK
                                ;Register Output: R3 - updated to point to next available slot
                                ;Registers Used : R5 - Points to dummy packet
                                ;

023050                          QCMD::
023050  022703  003344                  CMP     #PCBEND,R3              ;IS R3 POINTING AT THE END OF THE RING ?
023054  001002                          BNE     1$                      ;NO, THEN KEEP GOING
023056  012703  003264                  MOV     #PCMDBF,R3              ;YES, SET IT TO THE RING BEGINNING
023062  012705  003344          1$:     MOV     #DUMPKT,R5              ;POINT R5 TO THE DUMMY PACKET
023066  116563  000000  000000          MOVB    CMD(R5),CMD(R3)         ;PUT THE COMMAND PRIMITIVE INTO THE RING
023074  016563  000002  000002          MOV     ITMOFF(R5),ITMOFF(R3)   ;PUT THE ITEM OFFSET INTO THE RING

023102  004737  023276                  JSR     PC,OBCTHD               ;GO GET THE OBJECT COUNT
023106  016463  000034  000004          MOV     OBJFDL(R4),OBOFFL(R3)   ;PUT THE LOW FIELD INTO THE RING
023114  016463  000036  000006          MOV     OBJFDH(R4),OBOFFH(R3)   ;PUT THE HIGH FIELD INTO THE RING

023122  004737  023142                  JSR     PC,SUBITR               ;GO TO SUB-ITERS
023126  013763  003422  000012          MOV     BUFADR,BUFOFF(R3)       ;PUT THE BUFFER ADDRESS INTO THE RING
023134  062703  000014                  ADD     #PCBSTP,R3              ;MOVE R3 TO THE NEXT SLOT IN THE RING
023140  000207                          RTS     PC                      ;RETURN
```

```
                        .SBTTL  SUB-ITERATION
                        ;******************************
                        ;
                        ; SUB-ITERATION
                        ;
                        ;Called by       : QCMD
                        ;Outputs         : BUFADR
                        ;Register Inputs: R3 - pointer to command slot
                        ;                 R4 - pointer to LUN BLOCK
                        ;
                        SUBITR::
023142  105763  000000          TSTB    CMD(R3)                 ;ARE WE ISSUING NULL COMMANDS ?
023146  001452                  BEQ     10$                     ;BRANCH IF THE NULL COMMAND
023150  122763  000020  000000  CMPB    #WR,CMD(R3)             ;IS IT GREATER THAN A WRITE
023156  103446                  BLO     10$                     ;YES, BRANCH
                        
023160  005337  003424  1$:     DEC     SUBCNT                  ;SUBTRACT 1 FROM SUBCNT
023164  001025                  BNE     5$                      ;BRANCH IF NOT 0
023166  016337  000004  070556  MOV     OBOFFL(R3),WRTBUF-2     ;PUT LOW ORDER OBJECT COUNT IN WRTBUF
023174  012737  000004  003424  MOV     #N,SUBCNT               ;REINIT SUBCNT
023202  012737  050560  003422  4$:     MOV     #RDBUF,BUFADR   ;PUT THE READ BUFFER ADDRESS IN BUFADR
023210  122763  000020  000000  CMPB    #WR,CMD(R3)             ;IS IT A WRITE COMMAND
023216  001026                  BNE     10$                     ;GET OUT IF IT'S NOT
023220  022737  000003  002114  CMP     #3,L$TEST               ;ARE WE IN TEST 3 ?
023226  001017                  BNE     7$                      ;NO, SET WRITE BUFFER IN BUFADR
023230  012737  070556  003422  MOV     #WRTBUF-2,BUFADR        ;SET MODIFIED WRITE BUFFER IN BUFADR
023236  000416                  BR      10$                     ;EXIT
                        
023240  122763  000020  000000  5$:     CMPB    #WR,CMD(R3)     ;SEE IF ITS A WRITE
023246  001407                  BEQ     7$                      ;YES, BRANCH
023250  022737  000006  002114  CMP     #6,L$TEST               ;ARE WE IN TEST 6 ?
023256  001751                  BEQ     4$                      ;YES, PUT READ BUFFER IN BUFADR
023260  112763  000040  000000  MOVB    #ACC,CMD(R3)            ;SET UP AN ACCESS DATA COMMAND
023266  012737  070560  003422  7$:     MOV     #WRTBUF,BUFADR  ;SET WRTBUF ADDRESS IN BUFADR
023274  000207          10$:     RTS     PC                      ;RETURN
```

```
                                .SBTTL  OBJET COUNT HANDLER
                                ;******************************
                                ;
                                ; OBJECT COUNT HANDLER
                                ;
                                ;Called by      : QCMD
                                ;Inputs         : Current Object Count in LUN BLOCK
                                ;Outputs        : Updated Object Count in LUN.BLOCK
                                ;Register Inputs: R3 - pointer to command slot
                                ;                 R4 - pointer to LUN BLOCK
                                ;
023276                          OBCTHD::
023276                                  PUSH    <R1>                    ;SAVE R1
023300  116301  000000                  MOVB    CMD(R3),R1              ;PUT THE COMMAND PRIMITIVE INTO R1
023304  042701  000007                  BIC     #7,R1                   ;STRIP OFF THE MODIFIERS
023310  005701                          TST     R1                      ;IS IT THE NULL COMMAND ?
023312  001452                          BEQ     6$                      ;EXIT IF IT IS
023314  022701  000160                  CMP     #REW,R1                 ;IS IT A REWIND ?
023320  001005                          BNE     1$                      ;BRANCH IF NOT
023322  005064  000034                  CLR     OBJFDL(R4)              ;CLEAR THE OBJECT
023326  005064  000036                  CLR     OBJFDH(R4)              ;COUNT FIELD AND
023332  000442                          BR      6$                      ;EXIT
                                
023334  022701  000050          1$:     CMP     #SPC,R1                 ;IS IT A NON-DATA TRANSFER COMMAND ?
023340  101007                          BHI     2$                      ;BRANCH IF IT IS
023342  022701  000100                  CMP     #WTM,R1                 ;IS IT A WRITE TAPE MARK ?
023346  001404                          BEQ     2$                      ;BRANCH IF IT IS
023350  016337  000002  003530          MOV     ITMOFF(R3),R8           ;PUT THE ITEM COUNT IN TEMP REGISTER
023356  000403                          BR      3$                      ;CONTINUE
                                
023360  012737  000001  003530  2$:     MOV     #1,R8                   ;PUT A 1 IN THE TEMP REGISTER
023366  032763  000002  000000  3$:     BIT     #EOTBIT,CMD(R3)         ;IS IT AN LEOT COMMAND ?
023374  001021                          BNE     6$                      ;GET OUT IF IT IS
023376  032763  000001  000000          BIT     #REVBIT,CMD(R3)         ;IS THE COMMAND REVERSE ?
023404  001007                          BNE     4$                      ;BRANCH IF REVERSE
023406  063764  003530  000034          ADD     R8,OBJFDL(R4)           ;ADD TEMP TO THE OBJECT COUNT
023414  103011                          BCC     6$                      ;BRANCH IF NO CARRY
023416  005264  000036                  INC     OBJFDH(R4)              ;OTHERWISE ADD 1 TO THE HIGH OBJECT COUNT
023422  000406                          BR      6$                      ;EXIT
                                
023424  163764  003530  000034  4$:     SUB     R8,OBJFDL(R4)           ;IF REVERSE, SUBTRACT TEMP FROM THE
023432  103002                          BCC     6$                      ;OBJECT COUNT AND BRANCH IF NO CARRY
023434  005364  000036                  DEC     OBJFDH(R4)              ;OTHERWISE SUBTRACT 1 FROM OBJECT COUNT HIGH
023440                          6$:     POP     <R1>                    ;RESTORE R1
023442  000207                          RTS     PC                      ;EXIT
```

```
                        .SBTTL  CLASS DRIVER TRANSMIT
                        ;*******************************
                        ;
                        ;Class Driver Transmit
                        ;
                        ;Called By      : CMMDSQ
                        ;Calls To       : CDRECV, STFPCK, PRTDRV
                        ;Inputs         : CRDLIM - Command slots open in the drive.
                        ;                 COLSAV - Old driver command pointer.
                        ;Outputs        : IOSTAT - Transfer status.
                        ;                 CMDSEQ - Number appended to each command packet.
                        ;                 GCSREF - Get Command Status reference number.
                        ;Register Inputs: R2 - Old pointer to program command ring.
                        ;                 R3 - New pointer to program command ring.
                        ;                 R4 - Lun block pointer.
                        ;Register Outputs: R5 - Old pointer to driver command ring.
                        ;
023444                  CLSDRV::
023444                          PUSH    <R3,R5>                 ;SAVE R3, R5
023450  016405  000016          MOV     COLSAV(R4),R5           ;POINT R5 TO THE OLD DRIVER COMMAND
023454  032737  000040  003516  BIT     #GCSRFL,PCFLAG          ;IS THIS A GCS COMMAND ?
023462  001010                  BNE     10$                     ;YES, GO SETUP
023464  022703  003264          CMP     #PCMDBF,R3              ;IS R3 AT THE BEGINNING OF THE PROGRAM RING ?
023470  001403                  BEQ     5$                      ;YES, BRANCH
023472  162703  000014          SUB     #PCBSTP,R3              ;NO, MOVE R3 ONE SLOT BACK
023476  000402                  BR      10$                     ;CONTINUE
                        
023500  062703  000044  5$:     ADD     #PCB3SP,R3              ;YES, ADVANCE R3 TWO SLOTS
023504  005037  010546  10$:    CLR     IOSTAT                  ;CLEAR THE I/O STATUS WORD
023510  122763  000170  000000  CMPB    #INT,CMD(R3)            ;IS THIS A INITIALIZATION COMMAND ?
023516  001003                  BNE     15$                     ;CONTINUE IF IT ISN'T
                        
023520  004737  026306          JSR     PC,PRTINT               ;CALL THE PORT INIT ROUTINE
023524  000464                  BR      55$                     ;EXIT
023526  005764  000010  15$:    TST     SLTUSE(R4)              ;DID WE HANDLE ANY RESPONSES LAST TIME ?
023532  001402                  BEQ     20$                     ;BRANCH IF NOT
023534  004737  026230          JSR     PC,PRTCLR               ;GO CLEAR THE OLD RESPONSES
                        
023540  004737  023710  20$:    JSR     PC,CDRECV               ;GO CHECK FOR ANY NEW RESPONSES
023544  105737  010546          TSTB    IOSTAT                  ;IS THE I/O STATUS O.K. ?
023550  001052                  BNE     55$                     ;EXIT IF IT ISN'T
                        
023552  032737  000020  003516  25$:    BIT     #GCSCFL,PCFLAG          ;IS THIS A GCS COMMAND ?
023560  001010                  BNE     30$                     ;YES, GO SETUP MINLIM
023562  032737  000200  003516  BIT     #CMDONE,PCFLAG          ;IS THIS A NULL COMMAND ?
023570  001042                  BNE     55$                     ;EXIT IF IT IS
023572  032763  000200  000000  BIT     #IMM,CMD(R3)            ;IS THIS AN IMMEDIATE COMMAND ?
023600  001404                  BEQ     35$                     ;NO, BRANCH
023602  112737  000001  010570  30$:    MOVB    #1,MINLIM               ;YES, SET MINIMUM LIMIT TO 1
023610  000403                  BR      40$                     ;BRANCH
                        
023612  112737  000002  010570  35$:    MOVB    #2,MINLIM               ;NO, SET MINIMUM LIMIT TO 2
023620  123737  010571  010570  40$:    CMPB    CRDLIM,MINLIM           ;DO WE HAVE ENOUGH CREDITS ?
023626  103004                  BHIS    45$                     ;YES, KEEP GOING
023630  052737  020000  010546  BIS     #IOICRD,IOSTAT          ;SET INSUFFICIENT CREDIT IN I/O STATUS
023636  000417                  BR      55$                     ;GET OUT
```

```
3288
3289 023640  005264  000006          45$:   INC   CMDSEQ(R4)            ;ADD 1 TO THE COMMAND SEQUENCE NUMBER
3290 023644  032737  000020  003516          BIT   #GCSCFL,PCFLAG         ;IS IT A GCS COMMAND ?
3291 023652  001403                          BEQ   50$                   ;NO, BRANCH
3292 023654  016437  000006  010552          MOV   CMDSEQ(R4),GCSREF     ;SAVE THE COMMAND REFERENCE NUMBER
3293
3294 023662  105337  010571          50$:   DECB  CRDLIM                ;SUBTRACT 1 FROM THE CREDIT LIMIT
3295 023666  004737  024164                  JSR   PC,STFPCK             ;GO FILL THE TMSCP PACKET
3296 023672  004737  025730                  JSR   PC,PRTDRV             ;GO SEND THE COMMAND
3297
3298 023676  010564  000016          55$:   MOV   R5,COLSAV(R4)         ;SAVE R5 IN COMMAND OLD POINTER SAVE
3299 023702                                  POP   <R5,R3>               ;RESTORE R3, AND R5
3300 023706  000207                          RTS   PC                    ;RETURN
```

```
                        .SBTTL  CLASS DRIVER RECEIVE
                        ;*******************************
                        ;
                        ;Class Driver Receive
                        ;
                        ;Called By      : CLSDVR
                        ;Calls To       : PDRECV, PRTCLR
                        ;Inputs         : RESP   - The number of RESPONSEs found.
                        ;                 GCSREF - Get Command Status reference number.
                        ;                 RNUSAV - New response buffer save
                        ;                 CMSTSV - Command progress count.
                        ;                 ELBSAV - Error log buffer pointer.
                        ;Register Inputs: R2 - Old pointer to program command ring.
                        ;                 R3 - New pointer to program command ring.
                        ;                 R4 - Lun block pointer.
                        ;                 R5 - Old pointer to driver command ring.
                        ;Registers Used : R1 - Old pointer to driver RESPONSE ring.
                        ;

023710                  CDRECV::
023710                          PUSH    <R1,R2>                 ;SAVE R1,R2
023714  016401  000020          MOV     RNUSAV(R4),R1           ;LET R1 = NEW RESPONSE BUFFER SAVE
023720  004737  026106          JSR     PC,PDRECV               ;CALL PORT DRIVER RECEIVE
023724  005737  003414          TST     RESP                    ;DID WE GET A RESPONSE ?
023730  001506                  BEQ     35$                     ;NO, GET OUT OF HERE
023732  013737  003414  003412  MOV     RESP,HNDLRP             ;SAVE A COPY FOR RSPHDL

023740  022761  000022  000012  5$:     CMP     #ST.SEX,P.STS(R1)       ;IS IT A SERIOUS EXCEPTION ?
023746  001425                  BEQ     10$                     ;YES, CONTINUE
023750  005761  000000          TST     P.CRF(R1)               ;IS IT AN UNSOLICITED ERROR LOG ?
023754  001422                  BEQ     10$                     ;YES, GO HANDLE ERROR LOG
023756  026165  000000  000000  CMP     P.CRF(R1),P.CRF(R5)     ;IS THIS THE COMMAND THAT IS EXPECTED ?
023764  001416                  BEQ     10$                     ;YES, CONTINUE
023766  023761  010552  000000  CMP     GCSREF,P.CRF(R1)        ;IS IT THE GCS END PACKET
023774  001003                  BNE     7$                      ;NO, GO DO RESPONSE OUT OF SEQUENCE
023776  004737  026534          JSR     PC,GCSHDL               ;GO TO THE GCS HANDLING ROUTINE
024002  000461                  BR      35$                     ;GET OUT

024004  112737  000005  010546  7$:     MOVB    #MISSEQ,IOSTAT          ;SET MISSING SEQUENCE IN I/O STATUS
024012  004737  033742          JSR     PC,CORDMP
024016  000240                  NOP
024020  000452                  BR      35$                     ;EXIT

024022  032761  000200  000010  10$:    BIT     #OP.END,P.OPCD(R1)      ;YES, IS IT AN END PACKET ?
024030  001427                  BEQ     20$                     ;NO, GO HANDLE ERROR LOG
024032  052737  100000  010546  BIS     #NURESP,IOSTAT          ;SET A NEW RESPONSE IN THE I/O STATUS
024040  105237  010571          INCB    CRDLIM                  ;ADD 1 TO THE CREDIT LIMIT
024044  062705  000050          ADD     #DCBSTP,R5              ;ADJUST THE OLD COMMAND POINTER
024050  022705  004032          CMP     #DCBEND,R5              ;IS IT AT THE END OF THE RING ?
024054  001002                  BNE     15$                     ;NO, BRANCH
024056  012705  003572          MOV     #DCMDBF,R5              ;YES, SET IT TO THE TOP OF THE RING

024062  016162  000012  000010  15$:    MOV     P.STS(R1),XFERST(R2)    ;PUT REPSONCE STATUS IN THE HOST PACKET
024070  062702  000014          ADD     #PCBSTP,R2              ;ADJUST R2 TO POINT AT THE NEXT SLOT
024074  022702  003344          CMP     #PCBEND,R2              ;IS IT AT THE END OF THE RING ?
024100  001006                  BNE     25$                     ;NO, BRANCH
024102  012702  003264          MOV     #PCMDBF,R2              ;YES, SET IT BACK TO TOP OF THE RING
```

```
3359 024106  000403                          BR      25$                     ;BRANCH TO THE END
3360
3361 024110  052737  040000  010546  20$:    BIS     #ERRLOG,IOSTAT          ;SET ERROR LOG IN I/O STATUS
3362 024116  005337  003414          25$:    DEC     RESP                    ;SUBTRACT 1 FROM THE RESPONSE COUNT
3363 024122  062701  000104                  ADD     #DRBSTP,R1              ;ADJUST R1
3364 024126  026401  000160                  CMP     URBEND(R4),R1           ;IS IT AT THE END OF THE RING ?
3365 024132  001002                          BNE     30$                     ;NO, KEEP GOING
3366 024134  016401  000156                  MOV     URSPBF(R4),R1           ;YES, SET IT TO BEGINNING OF THE RING
3367
3368 024140  005737  003414           30$:   TST     RESP                    ;HAVE WE DONE ALL THE RESPONSES ?
3369 024144  001275                          BNE     5$                      ;NO, DO IT AGAIN
3370
3371 024146  005037  003414          35$:    CLR     RESP                    ;CLEAR NOW IN CASE WE MADE ERROR EXIT
3372 024152  010164  000020                  MOV     R1,RNUSAV(R4)           ;SAVE THE NEW RESPONSE BUFFER POINTER
3373 024156                                  POP     <R2,R1>                 ;RESTORE R2,R1
3374 024162  000207                          RTS     PC                      ;RETURN
```

```
                                .SBTTL  COMMAND STUFFER
                                ;*******************************
                                ;
                                ; Stuff TMSCP Command Packet
                                ;
                                ;Called By      : CLSDRV
                                ;Inputs         : CNUSAV - Points to next slot in the driver command ring.
                                ;                 CMDSEQ - Number appended to each command packet.
                                ;                 GCSREF - Get Command Status reference number.
                                ;                 SEREXP - Flag set non-zero on occurrence of a serious exception.
                                ;Outputs        : PCKSIZ - Length in bytes of the command packet.
                                ;Register Inputs: R3 - New pointer to program command ring.
                                ;                 R4 - Lun block pointer.
                                ;                 R5 - Old pointer to driver command ring.
                                ;Registers Used : R1 - New pointer to driver command ring.

024164                          STFPCK::
024164                                  PUSH    <R1,R2>                 ;SAVE R1 AND R2
024170  005037  010564                  CLR     PCKSIZ                  ;CLEAR PACKET SIZE
024174  016401  000014                  MOV     CNUSAV(R4),R1           ;LET R1 EQUAL THE NEW COMMAND POINTER
024200  016461  000006  000000          MOV     CMDSEQ(R4),P.CRF(R1)    ;PUT COMMAND SEQUENCE NUMBER INTO PACKET
024206  005061  000002                  CLR     P.CRF+2(R1)             ;CLEAR THE UPPER WORD
024212  016461  000004  000004          MOV     TKUNIT(R4),P.UNIT(R1)   ;PUT THE UNIT NUMBER INTO THE PACKET
024220  005061  000006                  CLR     P.UNIT+2(R1)            ;CLEAR THE UPPER WORD
024224  005061  000012                  CLR     P.MOD(R1)               ;CLEAR MODIFIERS FIELD
024230  032737  000020  003516          BIT     #GCSCFL,PCFLAG          ;ARE WE IN GCS COMMAND MODE ?
024236  001402                          BEQ     5$                      ;NO, CONTINUE
024240  000137  025400                  JMP     GCMDST                  ;YES, GO DO A GET COMMAND STATUS
024244  016361  000002  000014  5$:     MOV     ITMOFF(R3),P.BCNT(R1)   ;PUT THE BYTE COUNT INTO THE PACKET
024252  005061  000016                  CLR     P.BCNT+2(R1)            ;CLEAR THE UPPER WORD
024256  016337  000000  003530          MOV     CMD(R3),R8              ;PUT THE PRIMITIVE IN R8
024264  042737  177770  003530          BIC     #177770,R8              ;GET JUST THE MODIFIERS
024272  022737  000001  003530          CMP     #REVBIT,R8              ;IS THE COMMAND A REVERSE ?
024300  001003                          BNE     10$                     ;NO, BRANCH
024302  052761  000010  000012          BIS     #MD.REV,P.MOD(R1)       ;YES, SET REVERSE IN THE MODIFIER FIELD
024310  032764  000002  000026  10$:    BIT     #SEREXC,LUNFLG(R4)      ;IS IT A SERIOUS EXCEPTION CONDITION ?
024316  001406                          BEQ     15$                     ;NO, BRANCH
024320  052761  020000  000012          BIS     #MD.CSE,P.MOD(R1)       ;YES, SET CLEAR SERIOUS EXCEPTION
024326  042764  000002  000026          BIC     #SEREXC,LUNFLG(R4)      ;CLEAR SERIOUS EXCEPTION FLAG
024334  116302  000000          15$:    MOVB    CMD(R3),R2              ;PUT THE COMMAND PRIMITIVE INTO R1
024340  006202                          ASR     R2                      ;
024342  006202                          ASR     R2                      ;
024344  042702  177701                  BIC     #^C76,R2                ;ADJUST FOR THE CASE STATEMENT
024350  022702  000046                  CMP     #46,R2                  ;ARE WE IN THE RANGE ?
024354  103002                          BHIS    20$                     ;YES, KEEP GOING
024356  000137  025604                  JMP     ILCMD                   ;NO, HANDLE AN ILLEGAL COMMAND
024362  000172  024366          20$:    JMP     @CMDTBL(R2)             ;SELECT

024366  024436                  CMDTBL: .WORD   NULL
024370  024442                          .WORD   READ
024372  024462                          .WORD   WRITE
024374  024502                          .WORD   CHODAT
024376  024522                          .WORD   ACCESS
024400  024542                          .WORD   SPCREC
```

```
3433 024402  024610                          .WORD   SKPTMK
3434 024404  024664                          .WORD   SPCOBJ
3435 024406  024722                          .WORD   WTAPMK
3436 024410  024750                          .WORD   ERASE
3437 024412  025006                          .WORD   ERASGP
3438 024414  025026                          .WORD   AVALAB
3439 024416  025064                          .WORD   ONLINE
3440 024420  025162                          .WORD   SUNCHR
3441 024422  025254                          .WORD   REWIND
3442 024424  025342                          .WORD   INIT
3443 024426  025346                          .WORD   ABOR
3444 024430  025400                          .WORD   GCMDST
3445 024432  025440                          .WORD   GUNSTA
3446 024434  025466                          .WORD   SCNTCH
3447
3448 024436  000137  025700          NULL:   JMP     COMEXI                  ;EXIT
3449
3450 024442  012761  000041  000010  READ:   MOV     #OP.RD,P.OPCD(R1)       ;PUT THE READ OPCODE INTO THE PACKET
3451 024450  012737  000034  010564          MOV     #34,PCKSIZ              ;PUT THE PACKET SIZE INTO THE PACKET
3452 024456  000137  025616                  JMP     BUFDSC                  ;GOTO THE BUFFER DESCRIPTOR ROUTINE
3453
3454 024462  012761  000042  000010  WRITE:  MOV     #OP.WR,P.OPCD(R1)       ;PUT THE WRITE OPCODE INTO THE PACKET
3455 024470  012737  000034  010564          MOV     #34,PCKSIZ              ;PUT THE PACKET SIZE INTO THE PACKET
3456 024476  000137  025616                  JMP     BUFDSC                  ;GOTO THE BUFFER DESCRIPTOR ROUTINE
3457
3458 024502  012761  000040  000010  CHODAT: MOV     #OP.CMP,P.OPCD(R1)      ;PUT COMPARE HOST DATA OPCODE IN PACKET
3459 024510  012737  000034  010564          MOV     #34,PCKSIZ              ;PUT THE PACKET SIZE INTO THE PACKET
3460 024516  000137  025616                  JMP     BUFDSC                  ;GOTO THE BUFFER DESCRIPTOR ROUTINE
3461
3462 024522  012761  000020  000010  ACCESS: MOV     #OP.ACC,P.OPCD(R1)      ;PUT THE ACCESS OPCODE INTO THE PACKET
3463 024530  012737  000020  010564          MOV     #20,PCKSIZ              ;PUT THE PACKET SIZE INTO THE PACKET
3464 024536  000137  025650                  JMP     SUPRES                  ;GOTO THE SUPPRESS ROUTINE
3465
3466 024542  012761  000045  000010  SPCREC: MOV     #OP.REP,P.OPCD(R1)      ;PUT REPOSITION OPCODE INTO THE PACKET
3467 024550  005061  000020                  CLR     P.TMGC(R1)              ;CLEAR THE TAPE MARK COUNT
3468 024554  005061  000022                  CLR     P.TMGC+2(R1)            ;CLEAR THE UPPER WORD
3469 024560  032737  000002  003530          BIT     #EOTBIT,R8              ;IS THE DETECT LEOT BIT SET ?
3470 024566  001403                          BEQ     70$                     ;NO,CONTINUE
3471 024570  052761  000200  000012          BIS     #MD.DLE,P.MOD(R1)       ;YES, SET DETECT LEOT IN THE MODIFIER
3472 024576  012737  000024  010564  70$:    MOV     #24,PCKSIZ              ;PUT THE PACKET SIZE INTO THE PACKET
3473 024604  000137  025650                  JMP     SUPRES                  ;GOTO THE SUPPRESS ROUTINE
3474
3475 024610  012761  000045  000010  SKPTMK: MOV     #OP.REP,P.OPCD(R1)      ;PUT THE REPOSITION OPCODE IN PACKET
3476 024616  016161  000014  000020          MOV     P.BCNT(R1),P.TMGC(R1)   ;PUT THE TAPE MARK COUNT IN PACKET
3477 024624  005061  000022                  CLR     P.TMGC+2(R1)            ;CLEAR THE TAPE MARK FIELD
3478 024630  005061  000014                  CLR     P.BCNT(R1)              ;CLEAR THE UPPER WORD
3479 024634  032737  000002  003530          BIT     #EOTBIT,R8              ;IS THE DETECT LEOT BIT SET ?
3480 024642  001403                          BEQ     100$                    ;NO,CONTINUE
3481 024644  052761  000200  000012          BIS     #MD.DLE,P.MOD(R1)       ;YES, SET DETECT LEOT IN THE MODIFIER
3482 024652  012737  000024  010564  100$:   MOV     #24,PCKSIZ              ;PUT THE PACKET SIZE INTO THE PACKET
3483 024660  000137  025650                  JMP     SUPRES                  ;GOTO THE SUPPRESS ROUTINE
3484
3485 024664  012761  000045  000010  SPCOBJ: MOV     #OP.REP,P.OPCD(R1)      ;PUT THE REPOSITION OPCODE IN PACKET
3486 024672  052761  000004  000012          BIS     #MD.OBC,P.MOD(R1)       ;SET THE OBJECT BIT IN THE MODIFIER
3487 024700  005061  000020                  CLR     P.TMGC(R1)              ;CLEAR THE TAPE MARK FIELD
3488 024704  005061  000022                  CLR     P.TMGC+2(R1)            ;CLEAR THE UPPER WORD
3489 024710  012737  000024  010564          MOV     #24,PCKSIZ              ;PUT THE PACKET SIZE INTO THE PACKET
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3490 024716  000137  025650                 JMP     SUPRES                  ;GOTO THE SUPPRESS ROUTINE
3491
3492 024722  012761  000044  000010  WTAPMK: MOV     #OP.WTM,P.OPCD(R1)      ;PUT WRITE TAPE MARK OPCODE IN PACKET
3493 024730  052761  020000  000012          BIS     #MD.CSE,P.MOD(R1)       ;YES, SET CLEAR SERIOUS EXCEPTION
3494 024736  012737  000014  010564          MOV     #14,PCKSIZ              ;PUT THE PACKET SIZE INTO THE PACKET
3495 024744  000137  025700                  JMP     COMEXI                  ;GOTO THE EXIT
3496
3497 024750  012761  000022  000010  ERASE:  MOV     #OP.ERS,P.OPCD(R1)      ;PUT THE ERASE OPCODE INTO THE PACKET
3498 024756  022737  000003  003530          CMP     #IMMBIT,R8              ;IS THE IMMEDIATE BIT SET ?
3499 024764  001403                          BEQ     20$                     ;NO,CONTINUE
3500 024766  052761  000100  000012          BIS     #MD.IMM,P.MOD(R1)       ;YES, SET IMMEDIATE IN THE MODIFIER
3501 024774  012737  000014  010564  20$:    MOV     #14,PCKSIZ              ;PUT THE PACKET SIZE INTO THE PACKET
3502 025002  000137  025700                  JMP     COMEXI                  ;GOTO THE EXIT
3503
3504 025006  012761  000026  000010  ERASGP: MOV     #OP.ERG,P.OPCD(R1)      ;PUT ERASE GAP OPCODE INTO THE PACKET
3505 025014  012737  000014  010564          MOV     #14,PCKSIZ              ;PUT THE PACKET SIZE INTO THE PACKET
3506 025022  000137  025700                  JMP     COMEXI                  ;GOTO THE EXIT
3507
3508 025026  012761  000010  000010  AVALAB: MOV     #OP.AVL,P.OPCD(R1)      ;PUT AVAILABLE OPCODE INTO THE PACKET
3509 025034  022737  000004  003530          CMP     #UNLBIT,R8              ;IS THE UNLOAD BIT SET ?
3510 025042  001403                          BEQ     10$                     ;NO,CONTINUE
3511 025044  052761  000020  000012          BIS     #MD.UNL,P.MOD(R1)       ;YES, SET UNLOAD IN THE MODIFIER FIELD
3512 025052  012737  000014  010564  10$:    MOV     #14,PCKSIZ              ;PUT THE PACKET SIZE INTO THE PACKET
3513 025060  000137  025700                  JMP     COMEXI                  ;GOTO THE EXIT
3514
3515 025064  012761  000011  000010  ONLINE: MOV     #OP.ONL,P.OPCD(R1)      ;PUT THE ONLINE OPCODE INTO THE PACKET
3516 025072  005061  000014                  CLR     P.UNFL-2(R1)            ;CLEAR THE UNIT FLAG FIELD
3517 025076  005061  000016                  CLR     P.UNFL(R1)              ;
3518 025102  005061  000020                  CLR     P.UNFL+2(R1)            ;
3519 025106  005061  000022                  CLR     P.UNFL+4(R1)            ;
3520 025112  005061  000024                  CLR     P.UNFL+6(R1)            ;
3521 025116  005061  000026                  CLR     P.UNFL+10(R1)           ;
3522 025122  005061  000030                  CLR     P.UNFL+12(R1)           ;
3523 025126  005061  000032                  CLR     P.UNFL+14(R1)           ;
3524 025132  005061  000034                  CLR     P.DVPM(R1)              ;CLEAR THE DEVICE PARAMETER FIELD
3525 025136  012761  000010  000040          MOV     #TF.BLK,P.FORM(R1)      ;PUT THE TAPE FORMAT INTO THE PACKET
3526 025144  005061  000042                  CLR     P.SPED(R1)              ;CLEAR THE SPEED FIELD
3527 025150  012737  000044  010564          MOV     #44,PCKSIZ              ;PUT THE PACKET SIZE INTO THE PACKET
3528 025156  000137  025700                  JMP     COMEXI                  ;GOTO THE EXIT
3529
3530 025162  012761  000012  000010  SUNCHR: MOV     #OP.SUC,P.OPCD(R1)      ;SET UNIT CHARA. OPCODE INTO THE PACKET
3531 025170  005061  000014                  CLR     P.UNFL-2(R1)            ;CLEAR THE UNIT FLAG FIELD
3532 025174  005061  000016                  CLR     P.UNFL(R1)              ;
3533 025200  005061  000020                  CLR     P.UNFL+2(R1)            ;
3534 025204  005061  000022                  CLR     P.UNFL+4(R1)            ;
3535 025210  005061  000024                  CLR     P.UNFL+6(R1)            ;
3536 025214  005061  000026                  CLR     P.UNFL+10(R1)           ;
3537 025220  005061  000030                  CLR     P.UNFL+12(R1)           ;
3538 025224  005061  000032                  CLR     P.UNFL+14(R1)           ;
3539 025230  005061  000034                  CLR     P.DVPM(R1)              ;CLEAR THE DEVICE PARAMETERS FIELD
3540 025234  012761  000010  000040          MOV     #TF.BLK,P.FORM(R1)      ;PUT THE TAPE FORMAT INTO THE PACKET
3541 025242  005061  000042                  CLR     P.SPED(R1)              ;CLEAR THE SPEED FIELD
3542 025246  012737  000044  010564          MOV     #44,PCKSIZ              ;PUT THE PACKET SIZE INTO THE PACKET
3543
3544 025254  012761  000045  000010  REWIND: MOV     #OP.REP,P.OPCD(R1)      ;PUT THE REPOSTITION OPCODE INTO PACKET
3545 025262  052761  020002  000012          BIS     #MD.CSE!MD.RWD,P.MOD(R1) ;SET THE REWIND MODIFIER
3546 025270  022737  000003  003530          CMP     #IMMBIT,R8              ;IS THE IMMEDIATE BIT SET
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3547 025276  001003                    BNE     60$                     ;NO,CONTINUE
3548 025300  052761  000100  000012    BIS     #MD.IMM,P.MOD(R1)       ;YES, SET THE IMMEDIATE MODIFIER
3549 025306  005061  000020      60$:  CLR     P.TMGC(R1)              ;CLEAR THE TAPE MARK
3550 025312  005061  000022            CLR     P.TMGC+2(R1)            ;COUNT FIELD
3551 025316  012737  000024  010564    MOV     #24,PCKSIZ              ;PUT THE PACKET SIZE INTO THE PACKET
3552 025324  005064  000006            CLR     CMDSEQ(R4)              ;RESET THE COMMAND SEQUENCE NUMBER
3553 025330  042764  000010  000026    BIC     #EOTPR,LUNFLG(R4)       ;CLEAT THE EOT PRINT FLAG
3554 025336  000137  025700            JMP     COMEXI                  ;GOTO THE EXIT
3555
3556 025342  000137  025722      INIT: JMP     EXIT                    ;EXIT
3557
3558 025346  012761  000001  000010 ABOR: MOV     #OP.ABO,P.OPCD(R1)      ;PUT THE ABORT OPCODE INTO THE PACKET
3559 025354  016561  000000  000014    MOV     P.CRF(R5),P.OTRF(R1)    ;PUT THE OLD CRN INTO THE PACKET
3560 025362  005061  000016            CLR     P.OTRF+2(R1)            ;CLEAR THE UPPER WORD
3561 025366  012737  000020  010564    MOV     #20,PCKSIZ              ;PUT THE PACKET SIZE INTO THE PACKET
3562 025374  000137  025700            JMP     COMEXI                  ;GOTO THE EXIT
3563
3564 025400  012761  000002  000010 GCMDST: MOV     #OP.GCS,P.OPCD(R1)      ;PUT GCS OPCODE INTO THE PACKET
3565 025406  016561  000000  000014    MOV     P.CRF(R5),P.OTRF(R1)    ;PUT THE OLD CRN INTO THE PACKET
3566 025414  005061  000016            CLR     P.OTRF+2(R1)            ;CLEAR THE UPPER WORD
3567 025420  012737  000020  010564    MOV     #20,PCKSIZ              ;PUT THE PACKET SIZE INTO THE PACKET
3568 025426  042737  000020  003516    BIC     #GCSCFL,PCFLAG          ;CLEAR GCS COMMAND MODE ?
3569 025434  000137  025700            JMP     COMEXI                  ;GOTO THE EXIT
3570
3571 025440  012761  000003  000010 GUNSTA: MOV     #OP.GUS,P.OPCD(R1)      ;PUT THE GUS OPCODE INTO THE PACKET
3572 025446  042761  020000  000012    BIC     #MD.CSE,P.MOD(R1)       ;CLEAR CLEAR SERIOUS EXCEPTION MODIFIER
3573 025454  012737  000014  010564    MOV     #14,PCKSIZ              ;PUT THE PACKET SIZE INTO THE PACKET
3574 025462  000137  025700            JMP     COMEXI                  ;GOTO THE EXIT
3575
3576 025466  012761  000004  000010 SCNTCH: MOV     #OP.SCC,P.OPCD(R1)      ;PUT THE SCC OPCODE INTO THE PACKET
3577 025474  005061  000004            CLR     P.UNIT(R1)              ;CLEAR THE UNIT NUMBER
3578 025500  012761  000000  000014    MOV     #MSCPVR,P.VRSN(R1)      ;PUT THE MSCP VERSION INTO THE PACKET
3579 025506  013761  010562  000016    MOV     CNTFLG,P.CNTF(R1)       ;PUT CONTROLLER FLAGS INTO THE PACKET
3580 025514  012761  000000  000020    MOV     #HSTIMO,P.HTMO(R1)      ;PUT THE HOST TIMEOUT INTO THE PACKET
3581 025522  005061  000022            CLR     P.HTMO+2(R1)            ;CLEAR THE TIME FIELD
3582 025526  005061  000024            CLR     P.TIME(R1)              ;
3583 025532  005061  000026            CLR     P.TIME+2(R1)            ;
3584 025536  005061  000030            CLR     P.TIME+4(R1)            ;
3585 025542  005061  000032            CLR     P.TIME+6(R1)            ;
3586 025546  005061  000034            CLR     P.CTPM(R1)              ;CLEAR THE FIRDT WORD
3587 025552  005061  000036            CLR     P.CTPM+2(R1)            ;CLEAR THE SECOND WORD
3588 025556  105737  002222            TSTB    PADING                  ;ARE WE ALLOWING WRITE PADDING ?
3589 025562  001003                    BNE     5$                      ;YES, DON'T SET THE BIT
3590 025564  052761  000001  000034    BIS     #BIT0,P.CTPM(R1)        ;SET CNTRL PARAM TO DISABLE PADDING
3591 025572  012737  000040  010564 5$:  MOV     #40,PCKSIZ              ;PUT THE PACKET SIZE INTO THE PACKET
3592 025600  000137  025700            JMP     COMEXI                  ;GOTO THE EXIT
3593
3594 025604  052737  000007  010546 ILCMD: BIS     #ILLCMD,IOSTAT          ;SET ILLCMD IN THE I/O STATUS
3595 025612  000137  025722            JMP     EXIT                    ;GOTO THE ERROR EXIT
3596
3597 025616  016361  000012  000020 BUFDSC: MOV     BUFOFF(R3),P.BUFF(R1)   ;PUT THE BUFFER ADDRESS INTO THE PACKET
3598 025624  005061  000022            CLR     P.BUFF+2(R1)            ;CLEAR THE REST OF THE BUFFER FIELD
3599 025630  005061  000024            CLR     P.BUFF+4(R1)            ;
3600 025634  005061  000026            CLR     P.BUFF+6(R1)            ;
3601 025640  005061  000030            CLR     P.BUFF+10(R1)           ;
3602 025644  005061  000032            CLR     P.BUFF+12(R1)           ;
3603
```

```
3604 025650  105737  002220          SUPRES: TSTB    SERREC              ;IS SUPPRESS ERROR CORRECTION ENABLED ?
3605 025654  001003                          BNE     105$                ;NO
3606 025656  052761  001000  000012          BIS     #MD.SEC,P.MOD(R1)   ;YES, SET SEC MODIFIER
3607 025664  105737  002221          105$:   TSTB    SERCOR              ;IS SUPPRESS ERROR RECOVERY ENABLED ?
3608 025670  001003                          BNE     COMEXI              ;NO
3609 025672  052761  000400  000012          BIS     #MD.SER,P.MOD(R1)   ;YES, SET THE SER MODIFIER
3610
3611 025700  062701  000050          COMEXI: ADD     #DCBSTP,R1          ;SET THE POINTER TO THE NEXT SLOT
3612 025704  022701  004032                  CMP     #DCBEND,R1          ;ARE WE AT THE END OF THE RING ?
3613 025710  001002                          BNE     110$                ;NO, EXIT
3614 025712  012701  003572                  MOV     #DCMDBF,R1          ;YES, SET THE POINTER TO START OF RING
3615 025716  010164  000014          110$:   MOV     R1,CNUSAV(R4)       ;SAVE THE POINTER
3616
3617 025722                          EXIT:   POP     <R2,R1>             ;RESTORE R1
3618 025726  000207                          RTS     PC                  ;RETURN
```

```
                                .SBTTL  PORT DRIVER TRANSMIT
                                ;******************************
                                ;
                                ;Port Driver Transmit
                                ;
                                ;Called By      : CLSDVR
                                ;Inputs         : CMDSSV - Command descriptor ring pointer.
                                ;                 DCDSAV - Driver command ring pointer.
                                ;                 CRDLIM - Number of open slots in the driver command ring.
                                ;                 PCKSIZ - Length in bytes of the command packet.
                                ;Register Inputs: R4 - Lun block pointer.
                                ;Registers Used : R2 - Pointer to driver command ring.
                                ;                 R1 - Pointer to driver command descriptor ring.
                                ;

025730                          PRTDRV::
025730                                  PUSH    <R3,R2,R1>              ;SAVE R3, R2 AND R1
025736  016402  000014                  MOV     CNUSAV(R4),R2           ;POINT R2 AT NEW COMMAND BUFFER SLOT
025742  016401  000012                  MOV     CMDSSV(R4),R1           ;LET R1 POINT TO THE COMMAND DESCRIPTOR
025746  022702  003572                  CMP     #DCMDBF,R2              ;IS R2 AT TOP OF DRIVER COMMAND Ring
025752  001403                          BEQ     1$                      ;YES, BRANCH
025754  162702  000050                  SUB     #DCBSTP,R2              ;NO, SUBTRACT DCBSTP FROM R2
025760  000402                          BR      5$                      ;

025762  062702  000170          1$:     ADD     #DCB3SP,R2              ;YES, ADD DCB3SP TO R2
025766  113762  010571  177776  5$:     MOVB    CRDLIM,CRD(R2)          ;PUT THE CREDIT LIMIT INTO THE PACKET
025774  112762  000001  177777          MOVB    #1,CONID(R2)            ;PUT THE CONNECTION TYPE INTO THE PACKET
026002  013762  010564  177774          MOV     PCKSIZ,MSGLEN(R2)       ;PUT THE PACKET SIZE INTO THE PACKET
026010  010211                          MOV     R2,(R1)                 ;PUT THE PACKET ADDRESS INTO THE DESCRIPTOR
026012  052761  100000  000002          BIS     #OWN,HIADDR(R1)         ;SET THE OWNERSHIP BIT OF THE DESCRIPTOR
026020  042761  040000  000002          BIC     #FLAG,HIADDR(R1)        ;CLEAR TO DESCRIPTOR FLAG BIT
026026  005774  000000                  TST     @TKIP(R4)               ;READ THE IP REGISTER
026032  017437  000002  010566          MOV     @TKSA(R4),SAERR         ;SAVE THE SA FOR THE ERROR PRINTOUT
026040  005737  010566                  TST     SAERR                   ;READ THE SA REGISTER
026044  100003                          BPL     10$                     ;BRANCH IF NO ERRORS
026046  052737  000003  010546          BIS     #IOPDRE,IOSTAT          ;SET PORT DETECTED ERROR IN I/O STATUS

026054  062701  000004          10$:    ADD     #DSPSTP,R1              ;ADVANCE THE DESCRIPTOR POINTER
026060  026401  000170                  CMP     UCDEND(R4),R1           ;ARE WE AT END OF THE DESCRIPTOR RING
026064  001002                          BNE     15$                     ;NO, BRANCH
026066  016401  000166                  MOV     UCDSRG(R4),R1           ;YES, SET POINTER TO START OF THE RING

026072  010164  000012          15$:    MOV     R1,CMDSSV(R4)           ;SAVE THE POINTER
026076                                  POP     <R1,R2,R3>              ;RESTORE R1, R2 AND R3
026104  000207                          RTS     PC                      ;RETURN
```

```
                        .SBTTL  PORT DRIVER RECEIVE
                        ;*******************************
                        ;
                        ;Port Driver Receive
                        ;
                        ;Called By      : CDRECV
                        ;Inputs         : URDSRG - RESPONSE descriptor ring.
                        ;                 UCDSRG - Command descriptor ring.
                        ;Outputs        : RESP   - Number of new RESPONSEs.
                        ;Registers Used : R1 - RESPONSE descriptor ring pointer.
                        ;

026106                  PDRECV::
026106                          PUSH    <R1>                    ;SAVE R1
026110  016401  000162          MOV     URDSRG(R4),R1           ;SET R1 TO THE RESPONSE DESCRIPTOR
026114  017437  000002  010566  MOV     @TKSA(R4),SAERR         ;SAVE THE SA FOR THE ERROR PRINTOUT
026122  005737  010566          TST     SAERR                   ;READ THE SA REGISTER
026126  100003                  BPL     1$                      ;BRANCH IF NO ERRORS
026130  052737  000003  010546  BIS     #IOPDRE,IOSTAT          ;SET PORT DETECTED ERROR IN I/O STATUS

026136  006364  000010  1$:     ASL     SLTUSE(R4)              ;SHIFT BITMAP
026142  032737  000040  003516  BIT     #GCSRFL,PCFLAG          ;ARE WE IN GCS MODE ?
026150  001403                  BEQ     2$                      ;NO, DO ALL RESPONSES
026152  005737  003414          TST     RESP                    ;HAVE WE GOTTEN A RESPONSE ?
026156  001012                  BNE     5$                      ;YES, GCS MODE ALLOW ONLY 1 RESPONSE

026160  032761  100000  000002  2$:     BIT     #OWN,HIADDR(R1)         ;IS THE SLOT SET TO US ?
026166  001006                  BNE     5$                      ;NO , BRANCH
026170  005237  003414          INC     RESP                    ;ADD 1 TO THE RESPONSE COUNT
026174  052764  000001  000010  BIS     #BIT0,SLTUSE(R4)        ;SET SLOT-IN-USE
026202  000403                  BR      10$

026204  042764  000001  000010  5$:     BIC     #BIT0,SLTUSE(R4)        ;ELSE CLEAR THIS SLOT-IN-USE
026212  062701  000004          10$:    ADD     #DSPSTP,R1              ;SET THE POINTER TO THE NEXT SLOT
026216  026401  000164          CMP     URDEND(R4),R1           ;ARE WE AT THE END OF THE RING ?
026222  001345                  BNE     1$                      ;NO, KEEP GOING TILL WE GET THEM ALL
026224                          POP     <R1>                    ;RESTORE R1
026226  000207                  RTS     PC                      ;RETURN
```

```
                                .SBTTL  PORT DRIVER CLEAR
                                ;*******************************
                                ;
                                ;Port Driver Clear
                                ;
                                ;Called By      : CDRECV
                                ;Register Inputs: R4 - Lun block pointer.
                                ;Registers Used : R1 - Current location in the RESPONSE descriptor ring.
                                ;

026230                          PRTCLR::
026230                                  PUSH    <R1,R2>                 ;SAVE R1 AND R2
026234  016401  000164                  MOV     URDEND(R4),R1           ;R1 = END OF RESPONSE DESCRIPTOR RING
026240  016402  000162                  MOV     URDSRG(R4),R2           ;R2 = RESPONSE DESCRIPTOR RING
026244  162702  000004                  SUB     #4,R2                   ;BACK UP POINTER BY A LONGWORD

026250  162701  000004          1$:     SUB     #4,R1                   ;BACK UP POINTER BY A LONGWORD
026254  020201                          CMP     R2,R1                   ;BACKED UP PAST START OF RING?
026256  001410                          BEQ     20$                     ;YES - SO GET OUT
026260  000241                          CLC                             ;CLEAR THE CARRY
026262  006064  000010                  ROR     SLTUSE(R4)              ;MOVE BITO TO CARY BIT
026266  103003                          BCC     5$                      ;BRANCH IF SLOT NOT USED
026270  012761  100000  000002          MOV     #OWN,HIADDR(R1)         ;GIVE SLOT BACK TO PORT

026276  000764                  5$:     BR      1$                      ;LOOK FOR MORE
026300                          20$:    POP     <R2,R1>                 ;RESTORE R2 AND R1
026304  000207                          RTS     PC                      ;RETURN
```

```
                                        .SBTTL  PORT DRIVER INITIALIZATION
                                        ;**********************************
                                        ;
                                        ;Port Driver Initialization
                                        ;
                                        ;Called By      : CLSDRV
                                        ;Register Inputs: R4 - Lun block pointer.
                                        ;Registers Used : R1 - Current init step in process
                                        ;                 R2 - Used by the watchdog timer
                                        ;                 R3 - Initialization data table pointer
                                        ;

026306                                   PRTINT::
026306                                          PUSH    <R1,R2,R3,R5>           ;SAVE R1, R2, R3 AND R5
026316  010174  000000                          MOV     R1,@TKIP(R4)            ;INITIALIZE THE DRIVE
026322  016437  000162  026526                  MOV     URDSRG(R4),INTTBL+2     ;PUT RESP DESCRIPTOR ADDRESS IN TABLE
026330  012703  026524                          MOV     #INTTBL,R3              ;PUT THE TABLE ADDRESS INTO R3
026334  012701  104000                          MOV     #S1!ERR,R1              ;SET UP TO BEGIN AT STEP 1

026340  012737  000050  010554  LOOP:   MOV     #40.,CNTHI              ;SET UP THE TIME OUT COUNTER
026346  005002                          CLR     R2                      ;CLEAR R2

026350  005202                  ILOOP:  INC     R2                      ;INCREMENT HI TIME OUT VALUE ?
026352  001003                          BNE     2$                      ;IF NOT, BRANCH
026354  005337  010554                  DEC     CNTHI                   ;ELSE, INCREMENT HI TIMEOUT
026360  001447                          BEQ     TKERR                   ;GET OUT, WE'VE TIMED OUT

026362  037401  000002          2$:     BIT     @TKSA(R4),R1            ;TEST FOR STEP BIT FROM DRIVE
026366  001770                          BEQ     ILOOP                   ;LOOP UNTIL SOMETHING SETS
026370  017437  000002  010566          MOV     @TKSA(R4),SAERR         ;SAVE THE SA FOR THE ERROR PRINTOUT
026376  005737  010566                  TST     SAERR                   ;CHECK FOR ERROR
026402  100436                          BMI     TKERR                   ;GET OUT ON ERROR
026404  012374  000002          3$:     MOV     (R3)+,@TKSA(R4)         ;WRITE WORD FROM TABLE TO CONTROLLER
026410  006301                          ASL     R1                      ;SHIFT TO NEXT STEP
026412  100403                          BMI     4$                      ;GET OUT AFTER THE FOURTH STEP
026414  052701  100000                  BIS     #ERR,R1                 ;ALSO CHECK FOR ERROR BIT
026420  000747                          BR      LOOP                    ;IF NOT AT LAST STEP LOOP

026422  016402  000162          4$:     MOV     URDSRG(R4),R2           ;PUT THE RESPONSE DESCRIPTOR ADD IN R2
026426  016403  000156                  MOV     URSPBF(R4),R3           ;PUT THE RESPONSE BUFFER ADDRESS IN R3
026432  010322                  5$:     MOV     R3,(R2)+                ;PUT THE BUFF ADD IN THE DESCRIPTOR
026434  005022                          CLR     (R2)+                   ;CLEAR THE NEXT WORD
026436  062703  000104                  ADD     #DRBSTP,R3              ;STEP TO THE NEXT BUFFER SLOT
026442  026403  000160                  CMP     URBEND(R4),R3           ;ARE WE AT THE END OF THE BUFFER ?
026446  001371                          BNE     5$                      ;NO, KEEP GOING

026450  016402  000166                  MOV     UCDSRG(R4),R2           ;PUT THE CMD DESCRIPTOR ADDRESS IN R2
026454  012703  003572                  MOV     #DCMDBF,R3              ;PUT THE CMD BUFFER ADDRESS IN R3
026460  010322                  10$:    MOV     R3,(R2)+                ;PUT THE BUFF ADD IN THE DESCRIPTOR
026462  005022                          CLR     (R2)+                   ;CLEAR THE NEXT WORD
026464  062703  000050                  ADD     #DCBSTP,R3              ;STEP TO THE NEXT BUFFER SLOT
026470  022703  004032                  CMP     #DCBEND,R3              ;ARE WE AT THE END OF THE BUFFER ?
026474  001371                          BNE     10$                     ;NO, KEEP GOING
026476  000403                          BR      IDONE                   ;ALL DONE

026500  012737  000006  010546  TKERR:  MOV     #INTERR,IOSTAT          ;SET UP FOR A FATAL ERROR
```

```
3791 026506  005337  003402          IDONE:  DEC     RSPCNT
3792 026512                                 POP     <R5,R3,R2,R1>           ;RESTORE THE REGISTERS
3793 026522  000207                         RTS     PC                      ;RETURN
3794
3795                                ;INIT DATA TABLE
3796
3797 026524  111400                INTTBL:         .WORD   TKINIT  .
3798 026526  000000                                .WORD   0
3799 026530  000000                                .WORD   0
3800 026532  000001                                .WORD   GO
```

```
3802                                    .SBTTL  GCS RESPONSE HANDLER
3803                                    ;******************************
3804                                    ;
3805                                    ;GCS RESPONSE HANDLER
3806                                    ;
3807                                    ;Called By       :
3808                                    ;Calls To        :
3809                                    ;Register Inputs :
3810                                    ;                :
3811                                    ;Register Inputs :
3812                                    ;
3813
3814 026534                            GCSHDL::
3815 026534  023761  010550  000020             CMP     CMSTSV,P.CMST(R1)       ;ANY PROGRESS ?
3816 026542  101017                            BHI     5$                      ;YES, CLKEAN UP THE MESS
3817 026544  042737  000040  003516             BIC     #GCSRFL,PCFLAG          ;CLEAR THE GCS MODE FLAG
3818 026552  005037  003414                    CLR     RESP                    ;TAKE OFF THE RESPONSE
3819 026556  005037  003412                    CLR     HNDLRP                  ;TAKE OFF THE RESPONSE
3820 026562  112737  000002  010546             MOVB    #IOHUNG,IOSTAT          ;SET HUNG CONTROLLER BIT
3821 026570  004737  033742                    JSR     PC,CORDMP
3822 026574  000240                            NOP
3823 026576  000137  027320                    JMP     GCSEXT                  ;GET OUT
3824
3825 026602                            5$:     PUSH    <R1,R2>                 ;
3826 026606  016401  000016                    MOV     COLSAV(R4),R1           ;PUT THE OLD POINTER IN R1
3827 026612  162701  000004                    SUB     #4,R1                   ;ADJUST TO INCLUDE DESCRIPTOR WORDS
3828 026616  016402  000014                    MOV     CNUSAV(R4),R2           ;PUT THE NEW POINTER IN R2
3829 026622  162702  000004                    SUB     #4,R2                   ;ADJUST TO INCLUDE DESCRIPTOR WORDS
3830 026626  022701  003566                    CMP     #CMDBF1,R1              ;OLD POINTER AT BF1 ?
3831 026632  001407                            BEQ     OLD1                    ;YES, GO HANDLE IT
3832 026634  022701  003636                    CMP     #CMDBF2,R1              ;OLD POINTER AT BF2 ?
3833 026640  001434                            BEQ     OLD2                    ;YES, GO HANDLE IT
3834 026642  022701  003706                    CMP     #CMDBF3,R1              ;OLD POINTER AT BF3 ?
3835 026646  001461                            BEQ     OLD3                    ;YES, GO HANDLE IT
3836 026650  000510                            BR      OLD4                    ;NO, GO HANDLE BF4
3837
3838 026652  022702  003706            OLD1:   CMP     #CMDBF3,R2              ;NEW POINTER AT BF3 ?
3839 026656  001004                            BNE     5$                      ;NO, TRY AGAIN
3840 026660  004737  027322                    JSR     PC,EXC1A2               ;GO MOVE COMMAND 1 TO 2
3841 026664  000137  027146                    JMP     ADJUST                  ;GO ADJUST THE OLD POINTER
3842 026670  022702  003756            5$:     CMP     #CMDBF4,R2              ;NEW POINTER AT BF4 ?
3843 026674  001006                            BNE     10$                     ;NO, TRY AGAIN
3844 026676  004737  027344                    JSR     PC,EXC2A3               ;GO MOVE COMMAND 2 TO 3
3845 026702  004737  027322                    JSR     PC,EXC1A2               ;GO MOVE COMMAND 1 TO 2
3846 026706  000137  027146                    JMP     ADJUST                  ;GO ADJUST THE OLD POINTER
3847 026712  004737  027366            10$:    JSR     PC,EXC3A4               ;GO MOVE COMMAND 3 TO 4
3848 026716  004737  027344                    JSR     PC,EXC2A3               ;GO MOVE COMMAND 2 TO 3
3849 026722  004737  027322                    JSR     PC,EXC1A2               ;GO MOVE COMMAND 1 TO 2
3850 026726  000137  027146                    JMP     ADJUST                  ;GO ADJUST THE OLD POINTER
3851
3852 026732  022702  003756            OLD2:   CMP     #CMDBF4,R2              ;NEW POINTER AT BF4 ?
3853 026736  001004                            BNE     5$                      ;NO, TRY AGAIN
3854 026740  004737  027344                    JSR     PC,EXC2A3               ;GO MOVE COMMAND 2 TO 3
3855 026744  000137  027146                    JMP     ADJUST                  ;GO ADJUST THE OLD POINTER
3856 026750  022702  003566            5$:     CMP     #CMDBF1,R2              ;NEW POINTER AT BF1 ?
3857 026754  001006                            BNE     10$                     ;NO, TRY AGAIN
3858 026756  004737  027366                    JSR     PC,EXC3A4               ;GO MOVE COMMAND 3 TO 4
```

```
3859 026762  004737  027344            JSR     PC,EXC2A3       ;GO MOVE COMMAND 2 TO 3
3860 026766  000137  027146            JMP     ADJUST          ;GO ADJUST THE OLD POINTER
3861 026772  004737  027410      10$:  JSR     PC,EXC4A1       ;GO MOVE COMMAND 4 TO 1
3862 026776  004737  027366            JSR     PC,EXC3A4       ;GO MOVE COMMAND 3 TO 4
3863 027002  004737  027344            JSR     PC,EXC2A3       ;GO MOVE COMMAND 2 TO 3
3864 027006  000137  027146            JMP     ADJUST          ;GO ADJUST THE OLD POINTER
3865
3866 027012  022702  003566      OLD3: CMP     #CMDBF1,R2      ;NEW POINTER AT BF1 ?
3867 027016  001004                    BNE     5$              ;NO, TRY AGAIN
3868 027020  004737  027366            JSR     PC,EXC3A4       ;GO MOVE COMMAND 3 TO 4
3869 027024  000137  027146            JMP     ADJUST          ;GO ADJUST THE OLD POINTER
3870 027030  022702  003636      5$:   CMP     #CMDBF2,R2      ;NEW POINTER AT BF2 ?
3871 027034  001006                    BNE     10$             ;NO, TRY AGAIN
3872 027036  004737  027410            JSR     PC,EXC4A1       ;GO MOVE COMMAND 4 TO 1
3873 027042  004737  027366            JSR     PC,EXC3A4       ;GO MOVE COMMAND 3 TO 4
3874 027046  000137  027146            JMP     ADJUST          ;GO ADJUST THE OLD POINTER
3875 027052  004737  027322      10$:  JSR     PC,EXC1A2       ;GO MOVE COMMAND 1 TO 2
3876 027056  004737  027410            JSR     PC,EXC4A1       ;GO MOVE COMMAND 4 TO 1
3877 027062  004737  027366            JSR     PC,EXC3A4       ;GO MOVE COMMAND 3 TO 4
3878 027066  000137  027146            JMP     ADJUST          ;GO ADJUST THE OLD POINTER
3879
3880 027072  022702  003636      OLD4: CMP     #CMDBF2,R2      ;NEW POINTER AT BF2 ?
3881 027076  001004                    BNE     5$              ;NO, TRY AGAIN
3882 027100  004737  027410            JSR     PC,EXC4A1       ;GO MOVE COMMAND 4 TO 1
3883 027104  000137  027146            JMP     ADJUST          ;GO ADJUST THE OLD POINTER
3884 027110  022702  003706      5$:   CMP     #CMDBF3,R2      ;NEW POINTER AT BF3 ?
3885 027114  001006                    BNE     10$             ;NO, TRY AGAIN
3886 027116  004737  027322            JSR     PC,EXC1A2       ;GO MOVE COMMAND 1 TO 2
3887 027122  004737  027410            JSR     PC,EXC4A1       ;GO MOVE COMMAND 4 TO 1
3888 027126  000137  027146            JMP     ADJUST          ;GO ADJUST THE OLD POINTER
3889 027132  004737  027344      10$:  JSR     PC,EXC2A3       ;GO MOVE COMMAND 2 TO 3
3890 027136  004737  027322            JSR     PC,EXC1A2       ;GO MOVE COMMAND 1 TO 2
3891 027142  004737  027410            JSR     PC,EXC4A1       ;GO MOVE COMMAND 4 TO 1
3892
3893 027146                      ADJUST: POP     <R2,R1>         ;
3894 027152  042737  000040  003516      BIC     #GCSRFL,PCFLAG  ;CLEAR THE GCS MODE FLAG
3895 027160  016137  000020  010550      MOV     P.CMST(R1),CMSTSV ;PUT THE CMD STATUS INTO THE SAVE LOC
3896 027166  005037  003414            CLR     RESP            ;TAKE OFF THE RESPONSE
3897 027172  005037  003412            CLR     HNDLRP          ;TAKE OFF THE RESPONSE
3898 027176  005364  000006            DEC     CMDSEQ(R4)      ;ADJUST THE CMDSEQ NUMBER BACK 1
3899 027202  042737  100000  010546      BIC     #NURESP,IOSTAT  ;CLEAR THE NEW RESPONSE FLAG IN IOSTAT
3900 027210  105237  010571            INCB    CRDLIM          ;ADD 1 TO THE CREDIT LIMIT
3901
3902 027214  062764  000050  000016      ADD     #DCBSTP,COLSAV(R4) ;ADJUST THE OLD COMMAND POINTER
3903 027222  022764  004032  000016      CMP     #DCBEND,COLSAV(R4) ;IS IT AT THE END OF THE RING ?
3904 027230  001003                    BNE     5$              ;NO, BRANCH
3905 027232  012764  003572  000016      MOV     #DCMDBF,COLSAV(R4) ;YES, SET IT TO THE TOP OF THE RING
3906
3907 027240  062705  000050            5$:   ADD     #DCBSTP,R5      ;ADJUST THE OLD COMMAND POINTER
3908 027244  022705  004032                  CMP     #DCBEND,R5      ;IS IT AT THE END OF THE RING ?
3909 027250  001002                          BNE     10$             ;NO, BRANCH
3910 027252  012705  003572                  MOV     #DCMDBF,R5      ;YES, SET IT TO THE TOP OF THE RING
3911
3912 027256  062764  000104  000022  10$:  ADD     #DRBSTP,ROLSAV(R4) ;ADJUST THE OLD RESPONSE POINTER
3913 027264  026464  000160  000022        CMP     URBEND(R4),ROLSAV(R4) ;IS IT AT THE END OF THE BUFFER ?
3914 027272  001003                        BNE     15$             ;NO, KEEP GOING
3915 027274  016464  000156  000022        MOV     URSPBF(R4),ROLSAV(R4) ;YES, SET IT TO BEGINNING OF THE BUFFER
```

```
3916
3917 027302  062701  000104          15$:    ADD     #DRBSTP,R1              ;ADJUST R1
3918 027306  026401  000160                  CMP     URBEND(R4),R1           ;IS IT AT THE END OF THE BUFFER ?
3919 027312  001002                          BNE     GCSEXT                  ;NO, GET OUT
3920 027314  016401  000156                  MOV     URSPBF(R4),R1           ;YES, SET IT TO BEGINNING OF THE BUFFER
3921
3922 027320                          GCSEXT:
3923 027320  000207                          RTS     PC                      ;RETURN
3924
3925
3926 027322  012701  003566          EXC1A2: MOV     #CMDBF1,R1              ;SET R1 TO BF1
3927 027326  012702  003636                  MOV     #CMDBF2,R2              ;SET R2 TO BF2
3928 027332  012122                  5$:     MOV     (R1)+,(R2)+             ;MOV BF1 CONTENTS TO BF2
3929 027334  022701  003636                  CMP     #CMDBF2,R1              ;HAVE WE MOVED THEM ALL
3930 027340  001374                          BNE     5$                      ;NO, KEEP MOVING IT
3931 027342  000207                          RTS     PC                      ;YES, GET OUT
3932
3933 027344  012701  003636          EXC2A3: MOV     #CMDBF2,R1              ;SET R1 TO BF2
3934 027350  012702  003706                  MOV     #CMDBF3,R2              ;SET R2 TO BF3
3935 027354  012122                  5$:     MOV     (R1)+,(R2)+             ;MOV BF2 CONTENTS TO BF3
3936 027356  022701  003706                  CMP     #CMDBF3,R1              ;HAVE WE MOVED THEM ALL
3937 027362  001374                          BNE     5$                      ;NO, KEEP MOVING IT
3938 027364  000207                          RTS     PC                      ;YES, GET OUT
3939
3940 027366  012701  003706          EXC3A4: MOV     #CMDBF3,R1              ;SET R1 TO BF3
3941 027372  012702  003756                  MOV     #CMDBF4,R2              ;SET R2 TO BF4
3942 027376  012122                  5$:     MOV     (R1)+,(R2)+             ;MOV BF3 CONTENTS TO BF4
3943 027400  022701  003756                  CMP     #CMDBF4,R1              ;HAVE WE MOVED THEM ALL
3944 027404  001374                          BNE     5$                      ;NO, KEEP MOVING IT
3945 027406  000207                          RTS     PC                      ;YES, GET OUT
3946
3947 027410  012701  003756          EXC4A1: MOV     #CMDBF4,R1              ;SET R1 TO BF4
3948 027414  012702  003566                  MOV     #CMDBF1,R2              ;SET R2 TO BF1
3949 027420  012122                  5$:     MOV     (R1)+,(R2)+             ;MOV BF4 CONTENTS TO BF1
3950 027422  022702  003636                  CMP     #CMDBF2,R2              ;HAVE WE MOVED THEM ALL
3951 027426  001374                          BNE     5$                      ;NO, KEEP MOVING IT
3952 027430  000207                          RTS     PC                      ;YES, GET OUT
```

```
                                .SBTTL  RESPONSE HANDLER
                                ;*****************************
                                ;
                                ;RESPONSE HANDLER
                                ;
                                ;Called By       : CMDSEQ
                                ;Calls To        : ERRDEI, ERRDEL, ERRDEC, CMPDAT, DQCMD
                                ;Register Inputs : R1 - UNIT NUMBER
                                ;                : R4 - LUN BLOCK POINTER
                                ;Register Inputs : R3 - POINTER TO CURRENT RESPONSE PACKET
                                ;

027432                          RSPHDL::
027432                                  PUSH    <R3>
027434  005037  003406                  CLR     RESPON                  ;0 HERE TELLS CMDSEQ ALL'S OKAY
027440  105737  010546                  TSTB    IOSTAT                  ;DID WE HAVE I/O TYPE FAILURE?
027444  001403                          BEQ     5$                      ;BRANCH AROUND IF NOT
027446  004737  031006                  JSR     PC,ERRDEI               ;ELSE DECODE AND PRINT IT
027452  000504                          BR      60$                     ;GET OUT NOW

027454  016403  000022          5$:     MOV     ROLSAV(R4),R3           ;GET OLD RESPONSE BUFFER POINTER
027460  005737  003412                  TST     HNDLRP                  ;DID WE HAVE ANY RESPONSES ?
027464  001477                          BEQ     60$                     ;NO, GET OUT OF HERE
027466  032763  000200  000010  10$:    BIT     #OP.END,P.OPCD(R3)      ;IS IT AN END PACKET?
027474  001003                          BNE     15$                     ;YES, BRANCH
027476  004737  031250                  JSR     PC,ERRDEL               ;GO HANDLE ERROR LOG PACKET
027502  000456                          BR      50$                     ;SEE IF THERE'S MORE RESPONSES

027504  005763  000012          15$:    TST     P.STS(R3)               ;WAS STATUS "NORMAL"?
027510  001413                          BEQ     25$                     ;YES - BRANCH
027512  022763  000022  000012          CMP     #ST.SEX,P.STS(R3)       ;IS IT SERIOUS EXCEPTION STATUS?
027520  001004                          BNE     20$                     ;NO - GO HANDLE THE ERROR
027522  052764  000004  000026          BIS     #NOTALY,LUNFLG(R4)      ;SET THE NO-TALLY FLAG
027530  000441                          BR      45$                     ;YES, GO DE-QUE THE COMMANDS
027532  004737  030316          20$:    JSR     PC,ERRDEC               ;GO HANDLE ERROR STATUS
027536  000403                          BR      30$
027540  000241                  25$:    CLC                             ;CLEAR THE CARRY BIT
027542  006164  000030                  ROL     LEOTFL(R4)              ;ROTATE THE CARRY INTO THE LEOT FLAG

027546  032761  000001  003350  30$:    BIT     #AVB,DRINUS(R1)         ;HAVE WE DROPPED THE UNIT ?
027554  001443                          BEQ     60$                     ;YES - GET OUT
027556  022763  000241  000010          CMP     #OP.END!OP.RD,P.OPCD(R3) ;DID WE READ THIS TIME ?
027564  001023                          BNE     45$                     ;NO - SKIP DATA COMPARE
027566  022737  000005  002114          CMP     #5,L$TEST               ;ARE WE IN TEST 5 ?
027574  001003                          BNE     35$                     ;NO - DO DATA COMPARE
027576  105737  002235                  TSTB    T5CMP                   ;DO DATA COMPARES IN TEST 5 ?
027602  001406                          BEQ     40$                     ;NO, SKIP DATA COMPARE
027604  004737  032564          35$:    JSR     PC,CMPDAT               ;DO COMPARE DATA
027610  022737  000005  002114          CMP     #5,L$TEST               ;ARE WE IN TEST 5 ?
027616  001006                          BNE     45$                     ;NO - DON'T DUMP BUFFER
027620  132737  000001  002236  40$:    BITB    #BIT0,DMPBUF            ;SHOULD WE DUMP RDBUF ?
027626  001402                          BEQ     45$                     ;NO - BRANCH
027630  004737  034074                  JSR     PC,BUFDMP

027634  004737  027674          45$:    JSR     PC,DQCMD                ;DEQUEUE THE COMMAND
027640  062703  000104          50$:    ADD     #DRBSTP,R3              ;ADJUST POINTER TO NEXT PACKET
027644  026403  000160                  CMP     URBEND(R4),R3           ;END OF RESPONSE BUFFER?
```

```
 4011 027650  001002                        BNE     55$                 ;NO - BRANCH AROUND
 4012 027652  016403  000156                MOV     URSPBF(R4),R3       ;PUT POINTER AT BEGINNING OF BUFFER
 4013
 4014 027656  005337  003412        55$:    DEC     HNDLRP              ;DECREMENT RESPONSE COUNTER
 4015 027662  001301                        BNE     10$                 ;GO HANDLE ANOTHER ONE
 4016
 4017 027664  010364  000022        60$:    MOV     R3,ROLSAV(R4)       ;SAVE OLD RESPONSE BUFFER POINTER
 4018 027670                                POP     <R3>
 4019 027672  000207                        RTS     PC
```

```
                                .SBTTL  DE-QUEUE COMMAND
                                ;**********************************
                                ;
                                ; DE-QUEUE COMMAND
                                ;
                                ;Called By       : RSPHDL
                                ;Calls To        : LGSTAT
                                ;Register Inputs : R2 - OLD POINTER TO PROGRAM COMMAND RING
                                ;Register Outputs: R2 - UPDATED
                                ;

027674                          DQCMD::
027674  004737  027732                JSR     PC,LGSTAT               ;CALL LOG STATS
027700  062702  000014                ADD     #PCBSTP,R2              ;ADJUST THE OLD COMMAND POINTER
027704  022702  003344                CMP     #PCBEND,R2              ;ARE WE AT THE END OF THE BUFFER ?
027710  001002                        BNE     5$                      ;NO, KEEP GOING
027712  012702  003264                MOV     #PCMDBF,R2              ;YES, SET IT BACK TO THE TOP

027716  005337  003402          5$:   DEC     RSPCNT                  ;DECREMENT THE RESPONSE COUNTER
027722  012737  177777  010550        MOV     #-1,CMSTSV              ;RESET THE GCS PROGRESS COUNT
027730  000207                        RTS     PC                      ;RETURN
```

```
                                .SBTTL  LOG STATISTICS
                                ;**********************************
                                ;
                                ; LOG STATISTICS
                                ;
                                ;Called By       : DQCMD
                                ;Register Inputs : R2 - OLD PROGRAM COMMAND POINTER
                                ;                  R4 - LUN BLOCK POINTER
                                ;
                                LGSTAT::
027732                                  BIT     #NOTALY,LUNFLG(R4)      ;IS THIS NOT TO BE TALLIED ?
027732  032764  000004  000026          BNE     10$                     ;YES, GET OUT
027740  001162                          CMPB    #ACC,CMD(R2)            ;SEE IF COMMAND A READ OR WRITE
027742  122762  000040  000000          BLO     10$                     ;NO, EXIT SUBROUTINE
027750  103556                          TSTB    CMD(R2)                 ;IS IT A NULL ?
027752  105762  000000                  BEQ     10$                     ;YES, EXIT SUBROUTINE
027756  001553                          CMPB    #WR,CMD(R2)             ;IS IT A WRITE ?
027760  122762  000020  000000          BNE     5$                      ;NO, HANDLE READ
027766  001056                          ADD     ITMOFF(R2),WRBYT1(R4)   ;YES, ADD THE BYTES WRITTEN TO TOTAL
027770  066264  000002  000120  1$:     CMP     WRBYT1(R4),#999.        ;IS IT HIGER THAN 999. ?
027776  026427  000120  001747          BLE     2$                      ;BRANCH IF IT'S NOT
030004  003406                          SUB     #1000.,WRBYT1(R4)       ;SUBTRACT 1000. FROM THE LOWER ORDER WORD
030006  162764  001750  000120          INC     WRBYT2(R4)              ;INCREMENT THE SECOND WORD
030014  005264  000122                  BR      1$
030020  000766                  2$:     CMP     WRBYT2(R4),#999.        ;IS IT HIGER THAN 999. ?
030022  026427  000122  001747          BLE     3$                      ;BRANCH IF IT'S NOT
030030  003406                          SUB     #1000.,WRBYT2(R4)       ;SUBTRACT 1000. FROM THE LOWER ORDER WORD
030032  162764  001750  000122          INC     WRBYT3(R4)              ;INCREMENT THE SECOND WORD
030040  005264  000124                  BR      2$
030044  000766                  3$:     CMP     WRBYT3(R4),#999.        ;IS IT HIGER THAN 999. ?
030046  026427  000124  001747          BLE     4$                      ;BRANCH IF IT'S NOT
030054  003406                          SUB     #1000.,WRBYT3(R4)       ;SUBTRACT 1000. FROM THE LOWER ORDER WORD
030056  162764  001750  000124          INC     WRBYT4(R4)              ;INCREMENT THE SECOND WORD
030064  005264  000126                  BR      3$
030070  000766                  4$:     CMP     WRBYT4(R4),#999.        ;IS IT HIGER THAN 999. ?
030072  026427  000126  001747          BLE     10$                     ;BRANCH IF IT'S NOT
030100  003502                          CLR     WRBYT1(R4)              ;
030102  005064  000120                  CLR     WRBYT2(R4)              ;
030106  005064  000122                  CLR     WRBYT3(R4)              ;
030112  005064  000124                  CLR     WRBYT4(R4)              ;
030116  005064  000126                  BR      10$                     ;EXIT
030122  000471
030124  022763  000016  000012  5$:     CMP     #ST.TM,P.STS(R3)        ;WAS THIS A TAPE MARK DURING READ
030132  001465                          BEQ     10$                     ;YES, GET OUT
030134  022763  000010  000012          CMP     #10,P.STS(R3)           ;WAS THIS A DATA ERROR DURING READ
030142  001461                          BEQ     10$                     ;YES, GET OUT
030144  022763  000350  000012          CMP     #350,P.STS(R3)          ;WAS THIS A DATA ERROR DURING READ
030152  001455                          BEQ     10$                     ;YES, GET OUT
030154  066364  000040  000110          ADD     P.TRBC(R3),RDBYT1(R4)   ;YES, ADD THE BYTES WRITTEN TO TOTAL
030162  026427  000110  001747  6$:     CMP     RDBYT1(R4),#999.        ;IS IT HIGER THAN 999. ?
030170  003406                          BLE     7$                      ;BRANCH IF IT'S NOT
030172  162764  001750  000110          SUB     #1000.,RDBYT1(R4)       ;SUBTRACT 1000. FROM THE LOWER ORDER WORD
030200  005264  000112                  INC     RDBYT2(R4)              ;INCREMENT THE SECOND WORD
030204  000766                          BR      6$
030206  026427  000112  001747  7$:     CMP     RDBYT2(R4),#999.        ;IS IT HIGER THAN 999. ?
030214  003406                          BLE     8$                      ;BRANCH IF IT'S NOT
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 4101 030216  162764  001750  000112          SUB     #1000.,RDBYT2(R4)       ;SUBTRACT 1000. FROM THE LOWER ORDER WORD
 4102 030224  005264  000114                  INC     RDBYT3(R4)              ;INCREMENT THE SECOND WORD
 4103 030230  000766                          BR      7$
 4104 030232  026427  000114  001747  8$:     CMP     RDBYT3(R4),#999.        ;IS IT HIGER THAN 999. ?
 4105 030240  003406                          BLE     9$                      ;BRANCH IF IT'S NOT
 4106 030242  162764  001750  000114          SUB     #1000.,RDBYT3(R4)       ;SUBTRACT 1000. FROM THE LOWER ORDER WORD
 4107 030250  005264  000116                  INC     RDBYT4(R4)              ;INCREMENT THE SECOND WORD
 4108 030254  000766                          BR      8$
 4109 030256  026427  000116  001747  9$:     CMP     RDBYT4(R4),#999.        ;IS IT HIGER THAN 999. ?
 4110 030264  003410                          BLE     10$                     ;BRANCH IF IT'S NOT
 4111 030266  005064  000110                  CLR     RDBYT1(R4)              ;
 4112 030272  005064  000112                  CLR     RDBYT2(R4)              ;
 4113 030276  005064  000114                  CLR     RDBYT3(R4)              ;
 4114 030302  005064  000116                  CLR     RDBYT4(R4)              ;
 4115 030306  042764  000004  000026  10$:    BIC     #NOTALY,LUNFLG(R4)      ;CLEAR THE NO-TALLY FLAG BEFORE EXITING
 4116 030314  000207                          RTS     PC                      ;RETURN
```

```
4118                                    .SBTTL ERROR DECODE
4119                                    ;**********************************
4120                                    ;
4121                                    ; ERROR DECODE
4122                                    ;
4123                                    ;Called By       : RSPHDL
4124                                    ;Calls To        : ERRTLY, PRIERR
4125                                    ;Register Inputs : R2 - OLD PROGRAM COMMAND BUFFER POINTER
4126                                    ;
4127
4128 030316                            ERRDEC::
4129 030316                                    PUSH    <R5>                    ;SAVE R5
4130 030320  016205  000010                    MOV     XFERST(R2),R5           ;PUT THE COMMAND STATUS IN R5
4131 030324  022705  000400                    CMP     #ST.ONL,R5              ;IS IT A UNIT ONLINE ERROR ?
4132 030330  001005                            BNE     997$                    ;BRANCH IF IT ISN'T
4133 030332  012737  000100  003442            MOV     #ONLB,WRKMSK            ;SET THE ERROR BIT IN THE MASK
4134 030340  000137  030774                    JMP     MSKTST                  ;GO TEST IF IT'S O.K.
4135 030344  042705  177740            997$:   BIC     #177740,R5              ;CLEAR THE UNWANTED BITS
4136 030350  022762  002000  000010            CMP     #2000,XFERST(R2)        ;IS EOT SET IN TRANSFER STATUS ?
4137 030356  001037                            BNE     1$                      ;BRANCH IF IT ISN'T
4138 030360  052761  000004  003350            BIS     #EOT,DRINUS(R1)         ;SET THE DRIVE TO EOT
4139 030366  005237  003526                    INC     UEOT                    ;INC THE EOT FLAG
4140 030372  163737  003400  003402            SUB     CMDCNT,RSPCNT           ;SET RESPONSE COUNT TO NUMBER OUT
4141 030400  005037  003400                    CLR     CMDCNT                  ;ISSUE NO MORE COMMANDS
4142 030404  032764  000010  000026            BIT     #EOTPR,LUNFLG(R4)       ;HAS EOT BEEN PRINTED FOR THIS DRIVE ?
4143 030412  001017                            BNE     999$                    ;DON'T PRINT IT AGAIN
4144 030414                                    PUSH    <R1>                    ;SAVE R1
4145 030416  006001                            ROR     R1                      ;DIVIDE R1 BY 2
4146 030420                                    PRINTF  #UNTEOT,R1              ;PRINT UNIT AT EOT MESSAGE
     030420  010146                            MOV     R1,-(SP)
     030422  012746  020256                    MOV     #UNTEOT,-(SP)
     030426  012746  000002                    MOV     #2,-(SP)
     030432  010600                            MOV     SP,R0
     030434  104417                            TRAP    C$PNTF
     030436  062706  000006                    ADD     #6,SP
4147 030442                                    POP     <R1>                    ;RESTORE R1
4148 030444  052764  000010  000026            BIS     #EOTPR,LUNFLG(R4)       ;EOT BEEN PRINTED FOR THIS DRIVE
4149 030452  000137  031244            999$:   JMP     EDCEXT                  ;GET OUT
4150
4151 030456  012737  010652  003530    1$:     MOV     #CMDT,R8                ;PUT THE ERROR TABLE ADDRESS IN R8
4152 030464  022705  000013                    CMP     #13,R5                  ;IS IT A DRIVE ERROR ?
4153 030470  001005                            BNE     4$                      ;NO, CONTINUE
4154 030472  052737  000010  003516            BIS     #DRERFL,PCFLAG          ;SET THE DRIVE ERROR FLAG
4155 030500  004737  033376                    JSR     PC,OCTHEX               ;GO DECODE THE STATUS
4156 030504  022705  000023            4$:     CMP     #23,R5                  ;IS IT A VALID STATUS ?
4157 030510  103003                            BHIS    5$                      ;IT'S VALID, BRANCH
4158 030512  012705  000024                    MOV     #24,R5                  ;MAKE SURE ITS NOT MORE THAN 24
4159 030516  000543                            BR      ERREXT                  ;TAKE THE ERROR EXIT
4160
4161 030520  012737  000002  003406    5$:     MOV     #SEREXC,RESPON          ;SET SERIOUS EXCEPTION
4162 030526  016337  000000  003542            MOV     P.CRF(R3),SECRNS        ;SAVE THE CURRENT COMMAND REF #
4163 030534  022705  000006                    CMP     #ST.WPR,R5              ;IS IT A WRITE PROTECT ERROR ?
4164 030540  001004                            BNE     10$                     ;BRANCH IF IT ISN'T
4165 030542  012737  000020  003442            MOV     #WPRB,WRKMSK            ;SET THE ERROR BIT IN THE MASK
4166 030550  000511                            BR      MSKTST                  ;GO TEST IF IT'S O.K.
4167
4168 030552  022705  000016            10$:    CMP     #ST.TM,R5               ;IS IT A TAPE MARK ERROR ?
```

```
4169 030556  001061                        BNE     15$                     ;BRANCH IF IT ISN'T
4170 030560  052764  000002  000026        BIS     #SEREXC,LUNFLG(R4)      ;SET SERIOUS EXCEPTION
4171 030566  000261                        SEC                             ;
4172 030570  006164  000030                ROL     LEOTFL(R4)              ;
4173 030574  042764  177774  000030        BIC     #177774,LEOTFL(R4)      ;
4174 030602  022764  000003  000030        CMP     #3,LEOTFL(R4)           ;
4175 030610  001032                        BNE     13$                     ;
4176 030612  052761  000004  003350        BIS     #EOT,DRINUS(R1)         ;
4177 030620  005237  003526                INC     UEOT                    ;INC THE EOT FLAG
4178 030624                                PUSH    <R1>                    ;SAVE R1
4179 030626  006001                        ROR     R1                      ;DIVIDE R1 BY 2
4180 030630                                PRINTF  #UNTLOT,R1              ;PRINT UNIT AT EOT MESSAGE
     030630  010146                        MOV     R1,-(SP)
     030632  012746  020312                MOV     #UNTLOT,-(SP)
     030636  012746  000002                MOV     #2,-(SP)
     030642  010600                        MOV     SP,R0
     030644  104417                        TRAP    C$PNTF
     030646  062706  000006                ADD     #6,SP
4181 030652                                POP     <R1>                    ;RESTORE R1
4182 030654  163737  003400  003402        SUB     CMDCNT,RSPCNT           ;SET RESPONSE COUNT TO NUMBER OUT
4183 030662  005037  003400                CLR     CMDCNT                  ;ISSUE NO MORE COMMANDS
4184 030666  005037  003406                CLR     RESPON                  ;MAKE SURE WE
4185 030672  000137  031244                JMP     EDCEXT                  ;GET OUT
4186
4187 030676  132763  000010  000011  13$:  BITB    #EF.EOT,P.FLGS(R3)      ;IS THE TAPE MARK AT EOT ?
4188 030704  001402                        BEQ     14$                     ;NO, KEEP ON GOING
4189 030706  000137  031244                JMP     EDCEXT                  ;YES, GET OUT
4190 030712  012737  000010  003442  14$:  MOV     #TMB,WRKMSK             ;SET THE ERROR BIT IN THE MASK
4191 030720  000425                        BR      MSKTST                  ;GO TEST IF IT'S O.K.
4192
4193 030722  022705  000020        15$:    CMP     #ST.RDT,R5              ;IS IT A RECORD DATA TRUNCATED ERROR ?
4194 030726  001007                        BNE     20$                     ;BRANCH IF IT ISN'T
4195 030730  000241                        CLC                             ;CLEAR THE CARRY BIT
4196 030732  006164  000030                ROL     LEOTFL(R4)              ;ROTATE THE CARRY INTO THE LEOT FLAG
4197 030736  012737  000002  003442        MOV     #RDTB,WRKMSK            ;SET THE ERROR BIT IN THE MASK
4198 030744  000413                        BR      MSKTST                  ;GO TEST IF IT'S O.K.
4199
4200 030746  022705  000023        20$:    CMP     #ST.LED,R5              ;IS IT A LOGICAL END OF TAPE ERROR ?
4201 030752  001002                        BNE     25$                     ;BRANCH IF IT ISN'T
4202 030754  000137  031244                JMP     EDCEXT                  ;GET OUT IF LEOT DETECTED
4203
4204 030760  022705  000004        25$:    CMP     #ST.AVL,R5              ;IS IT A UNIT AVAILABLE ERROR ?
4205 030764  001020                        BNE     ERREXT                  ;BRANCH IF IT ISN'T
4206 030766  012737  000040  003442        MOV     #AVLB,WRKMSK            ;SET THE ERROR BIT IN THE MASK
4207
4208 030774  033737  003442  003440  MSKTST: BIT   WRKMSK,TSTMSK           ;IS IT AN ACCEPTABLE ERROR ?
4209 031002  001120                        BNE     EDCEXT                  ;GET OUT IF IT IS
4210 031004  000410                        BR      ERREXT                  ;OTHERWISE PRINT THE ERROR
4211
4212 031006                        ERRDEI::
4213 031006                                PUSH    <R5>                    ;SAVE R5
4214 031010  113705  010546                MOVB    IOSTAT,R5               ;PUT THE I/O ERROR CODE INTO R5
4215 031014  012737  010572  003530        MOV     #IOERTB,R8              ;SET THE ERROR TABLE ADDRESS IN R8
4216 031022  042705  177770                BIC     #177770,R5              ;CLEAR OFF ALL UNWANTED BITS
4217
4218 031026  005305                ERREXT: DEC     R5                      ;SUBTRACT 1 FROM R5
4219 031030  006305                        ASL     R5                      ;MULTIPLY R5 BY 10(8)
```

```
4220 031032  006305                        ASL     R5                      ;
4221 031034  006305                        ASL     R5                      ;
4222 031036  063705  003530                ADD     R8,R5                   ;ADD THE TABLE ADDRESS TO R5
4223 031042                                PUSH    <R3>
4224 031044  012703  013262                MOV     #L$ERRTBL,R3            ;SET R3 TO THE GENERIC ERROR TABLE
4225 031050  012523                        MOV     (R5)+,(R3)+             ;MOVE ERROR TABLE CONTENTS
4226 031052  012523                        MOV     (R5)+,(R3)+             ;MOVE ERROR TABLE CONTENTS
4227 031054  012523                        MOV     (R5)+,(R3)+             ;MOVE ERROR TABLE CONTENTS
4228 031056  011513                        MOV     (R5),(R3)               ;MOVE ERROR TABLE CONTENTS
4229 031060                                POP     <R3>
4230
4231 031062  022762  000010  000010        CMP     #EV.LGP,XFERST(R2)      ;IS IS A LONG GAP ENCOUNTERED ?
4232 031070  001031                        BNE     ERTLY                   ;NO, KEEP GOING
4233 031072  112737  000001  013262        MOVB    #DEVFAT,ERRTYP          ;YES, DROP THE UNIT
4234 031100  004737  033742                JSR     PC,CORDMP               ;;;;GO DO IT
4235 031104  000240                        NOP                             ;;;;
4236 031106  122762  000020  000000        CMPB    #WR,CMD(R2)             ;IS IT A WRITE ?
4237 031114  001004                        BNE     1$                      ;NO TRY AGAIN
4238 031116  112737  000060  013263        MOVB    #H1WRIT,ERRTYP+1        ;AND TALLY THE HARD WRITE ERROR
4239 031124  000413                        BR      ERTLY                   ;GO TALLY THE ERROR
4240 031126  122762  000100  000000  1$:   CMPB    #WTM,CMD(R2)            ;IS IT A WRITE TAPE MARK ?
4241 031134  001004                        BNE     5$                      ;NO, MUST BE A READ
4242 031136  112737  000060  013263        MOVB    #H1WRIT,ERRTYP+1        ;AND TALLY THE HARD WRITE ERROR
4243 031144  000403                        BR      ERTLY                   ;TALLY THE ERROR
4244 031146  112737  000054  013263  5$:   MOVB    #H1READ,ERRTYP+1        ;TALLY THE HARD READ ERROR
4245 031154  004737  032050        ERTLY:  JSR     PC,ERRTLY               ;TALLY THE ERROR
4246 031160  105037  013263                CLRB    ERRTYP+1                ;CLEAR UPPER BYTE
4247 031164  105737  002224                TSTB    SOERRP                  ;ARE SOFT ERRORS ENABLED ?
4248 031170  001004                        BNE     6$                      ;YES, GO PRINT THE ERROR
4249 031172  122737  000003  013262        CMPB    #SOFT,L$ERRTBL          ;IS IT A SOFT ERROR ?
4250 031200  001402                        BEQ     8$                      ;YES, DON'T PRINT IT
4251 031202  004737  032550        6$:     JSR     PC,PRIERR               ;GO PRINT THE ERROR
4252
4253 031206  132737  000001  002231  8$:   BITB    #BIT0,DMPFLG            ;SHOULD WE DUMP PROGRAM TABLES?
4254 031214  001403                        BEQ     10$                     ;NO - BRANCH
4255 031216  004737  033742                JSR     PC,CORDMP               ;GO DO IT
4256 031222  000240                        NOP
4257 031224  022737  000001  013262  10$:   CMP     #DEVFAT,ERRTYP          ;IS IT A FATAL ERROR ?
4258 031232  001004                        BNE     EDCEXT                  ;NO EXIT
4259 031234  010100                        MOV     R1,R0                   ;MOVE UNIT # * 2 TO R0
4260 031236  006000                        ROR     R0                      ;DIVIDE BY 2
4261 031240  004737  040450                JSR     PC,DROPUN               ;DROP DRIVE FROM TESTING
4262 031244                        EDCEXT: POP     <R5>                    ;RESTORE REGISTERS
4263 031246  000207                        RTS     PC                      ;RETURN
4264
```

```
                                .SBTTL ERROR LOG DECODE
                                ;**********************************
                                ;
                                ; ERROR LOG DECODE
                                ;
                                ;Called By       :
                                ;Calls To        :
                                ;Inputs          :
                                ;Outputs         :
                                ;Register Inputs :
                                ;Register Outputs:

031250                          ERRDEL::
031250                                  PUSH    <R3,R5>
031254  116237  000000  003536          MOVB    CMD(R2),R11         ;GET THE COMMAND PRIMITIVE FOR LATER USE
031262  042737  177407  003536          BIC     #177407,R11         ;GET JUST THE ROOT PRIMATIVE
031270                                  PUSH    <R1>                ;SAVE R1
031272  122763  000005  000010          CMPB    #FM.TPE,L.FMT(R3)   ;TAPE TRANSFER ERROR LOG?
031300  001420                          BEQ     5$                  ;YES, DECODE IT
031302  122763  000000  000010          CMPB    #FM.CNT,L.FMT(R3)   ;CONTROLLER ERROR LOG?
031310  001004                          BNE     1$                  ;NO, SEE WHAT IT IS
031312  012705  011132                  MOV     #CNTLER,R5          ;PRINT PACKET
031316  000137  031736                  JMP     PRTEXT              ;GET OUT
031322  122763  000001  000010  1$:     CMPB    #FM.BAD,L.FMT(R3)   ;HOST MEMORY ACCESS ERROR LOG?
031330  001004                          BNE     5$                  ;NO, GET OUT
031332  012705  011142                  MOV     #BADERL,R5          ;SET UP TO PRINT HOST MEM ACC ERL
031336  000137  031736                  JMP     PRTEXT              ;GO PRINT IT
031342  016337  000012  003556  5$:     MOV     L.EVNT(R3),EVENT    ;GET A COPY OF THE EVENT CODE
031350  042737  177740  003556          BIC     #177740,EVENT       ;GET RID OF THE SUBCODES
031356  022737  000007  003556          CMP     #ST.CMP,EVENT       ;IS IT A COMPARE ERROR ?
031364  001004                          BNE     10$                 ;NO, KEEP GOING
031366  012705  011152                  MOV     #CMPERL,R5          ;SET UP TO PRINT ERROR
031372  000137  031736                  JMP     PRTEXT              ;GO PRINT THE ERROR
031376  022737  000013  003556  10$:    CMP     #ST.DRV,EVENT       ;IS IT A DRIVE ERROR ?
031404  001004                          BNE     15$                 ;NO, KEEP GOING
031406  012705  011162                  MOV     #DRVERL,R5          ;SET UP TO PRINT ERROR
031412  000137  031736                  JMP     PRTEXT              ;GO PRINT THE ERROR
031416  022737  000012  003556  15$:    CMP     #ST.CNT,EVENT       ;IS IT A CONTROLLER ERROR ?
031424  001004                          BNE     DATAEL              ;NO, MUST BE A DATA ERROR
031426  012705  011172                  MOV     #CNTERL,R5          ;SET UP TO PRINT ERROR
031432  000137  031736                  JMP     PRTEXT              ;GO PRINT THE ERROR
031436  022763  000010  000012  DATAEL: CMP     #EV.LGP,L.EVNT(R3)  ;IS IT A LONG GAP ENCOUNTERED ?
031444  001004                          BNE     1$                  ;NO, KEEP TRYING
031446  012705  011202                  MOV     #LGPERL,R5          ;SET UP TO PRINT LGE ERROR
031452  000137  031736                  JMP     PRTEXT              ;GO PRINT IT
031456  012701  003360          1$:     MOV     #UNTTBL,R1          ;PUT THE TEMP TABLE ADDRESS IN R1
031462  116361  000055  000000          MOVB    L.TRK(R3),TRK(R1)   ;PUT THE TRACK NUMBER IN TEMP
031470  016361  000056  000002          MOV     L.PBLK(R3),PHB(R1)  ;PHYSICAL BLOCK NUMBER TO TEMP
031476  022737  000020  003536          CMP     #WR,R11             ;WAS IT A WRITE COMMAND ?
031504  001404                          BEQ     WRERL               ;GO HANDLE WRITE ERROR
031506  022737  000100  003536          CMP     #WTM,R11            ;IS IT A WRITE TAPE MARK COMMAND ?
031514  001026                          BNE     RDERL               ;GO HANDLE READ ERROR LOG
031516  022763  000150  000012  WRERL:  CMP     #EV.COR,L.EVNT(R3)  ;IS IT A SOFT ERROR ?
031524  001005                          BNE     1$                  ;NO, INCREMENT HARD ERROR
031526  105261  000004                  INCB    SWR(R1)             ;YES, INCREMENT SOFT WRITE ERROR
031532  012705  011232                  MOV     #CORERL,R5          ;SET UP TO PRINT ERROR
031536  000413                          BR      10$                 ;KEEP GOING
```

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4323 031540  105261  000006          1$:     INCB    HWR(R1)                 ;INCREMENT HARD WRITE ERROR
4324 031544  022763  000050  000012          CMP     #EV.DST,L.EVNT(R3)      ;IS IT A DATA SYNC TIMEOUT ?
4325 031552  001003                          BNE     5$                      ;NO, KEEP TRYING
4326 031554  012705  011222                  MOV     #WDSTEL,R5              ;SET UP TO PRINT DST ERROR
4327 031560  000402                          BR      10$                     ;GO PRINT IT
4328 031562  012705  011242          5$:     MOV     #UWEERL,R5              ;SET UP TO PRINT ERROR
4329 031566  000137  031732          10$:    JMP     SRTBL                   ;GO SORT THE ERROR AND PRINT
4330 031572  022763  000350  000012  RDERL:  CMP     #EV.URE,L.EVNT(R3)      ;IS IT A HARD READ ERROR ?
4331 031600  001006                          BNE     1$                      ;NO, HANDLE SOFT READ
4332 031602  105261  000007                  INCB    HRD(R1)                 ;INC THE HARD READ ERROR
4333 031606  012705  011262                  MOV     #UREERL,R5              ;SET UP TO PRINT ERROR
4334 031612  000137  031732                  JMP     SRTBL                   ;GO SORT AND PRINT IT
4335 031616  022763  000050  000012  1$:     CMP     #EV.DST,L.EVNT(R3)      ;IS IT A DATA SYNC TIMEOUT ?
4336 031624  001006                          BNE     5$                      ;NO, KEEP TRYING
4337 031626  105261  000007                  INCB    HRD(R1)                 ;INC THE HARD READ ERROR
4338 031632  012705  011212                  MOV     #RDSTEL,R5              ;SET UP TO PRINT DST ERROR
4339 031636  000137  031732                  JMP     SRTBL                   ;GO SORT AND PRINT IT
4340 031642  105261  000005          5$:     INCB    SRD(R1)                 ;INC THE SOFT READ ERROR
4341 031646  105763  000042                  TSTB    L.LVL(R3)               ;WAS IT RECOVERED BY ECC ?
4342 031652  001025                          BNE     20$                     ;NO, KEEP TRYING
4343 031654  122763  000036  000052          CMPB    #ECCBC,L.STS(R3)        ;WAS THE ERROR ON AN ECC BLOCK ?
4344 031662  001003                          BNE     10$                     ;NO TRY AGAIN
4345 031664  012705  011272                  MOV     #ECBERL,R5              ;SET UP TO PRINT ERROR
4346 031670  000420                          BR      SRTBL                   ;GO SORT AND PRINT ERROR
4347 031672  122763  000030  000052  10$:    CMPB    #ECCTC,L.STS(R3)        ;WAS ERROR ON A TAPE MARK ?
4348 031700  001003                          BNE     15$                     ;TRY AGAIN
4349 031702  012705  011302                  MOV     #ECTERL,R5              ;SET UP TO PRINT ERROR
4350 031706  000411                          BR      SRTBL                   ;GO SORT AND PRINT ERROR
4351 031710  122763  000026  000052  15$:    CMPB    #ECCDC,L.STS(R3)        ;WAS ERROR ON DATA BLOCK ?
4352 031716  001003                          BNE     20$                     ;NO, TRY AGAIN
4353 031720  012705  011312                  MOV     #ECDERL,R5              ;SET UP TO PRINT ERROR
4354 031724  000402                          BR      SRTBL                   ;GO SORT AND PRINT ERROR
4355 031726  012705  011252          20$:    MOV     #RTYERL,R5              ;SET UP RETRY RECOVERED
4356 031732  004737  032174          SRTBL:  JSR     PC,TBLSRT               ;GO TALLY ERROR IN MEDIA TABLE
4357 031736  116237  000000  003536  PRTEXT: MOVB    CMD(R2),R11             ;GET THE COMMAND PRIMITIVE FOR LATER USE
4358 031744  012701  013262                  MOV     #L$ERRTBL,R1            ;R1 = SUPERVISORS ERROR TABLE
4359 031750  012521                          MOV     (R5)+,(R1)+             ;COPY PROGRAM'S ERROR TABLE
4360 031752  012521                          MOV     (R5)+,(R1)+             ;  TO SUPERVISOR'S
4361 031754  012521                          MOV     (R5)+,(R1)+             ;     ERROR
4362 031756  011511                          MOV     (R5),(R1)               ;       TABLE
4363 031760                                  POP     <R1>                    ;RESTORE R1
4364 031762  004737  032132                  JSR     PC,ETLLY                ;TALLY ERROR FIRST
4365 031766  105037  013263                  CLRB    ERRTYP+1                ;DISCARD INFO USED BY ERRTLLY
4366 031772  105737  002224                  TSTB    SOERRP                  ;ARE SOFT ERRORS ENABLED ?
4367 031776  001017                          BNE     1$                      ;YES, GO PRINT THE ERROR
4368 032000  122737  000003  013262          CMPB    #SOFT,L$ERRTBL          ;IS IT A SOFT ERROR ?
4369 032006  001013                          BNE     1$                      ;NO, PRINT IT
4370 032010  022737  000020  003536          CMP     #WR,R11                 ;IS IT A WRITE ?
4371 032016  001411                          BEQ     EDLEXT                  ;DON'T PRINT IT
4372 032020  022737  000100  003536          CMP     #WTM,R11                ;IS IT A WRITE TAPE MARK ?
4373 032026  001405                          BEQ     EDLEXT                  ;DON'T PRINT IT
4374 032030  105737  002225                  TSTB    RDSOER                  ;ARE WE PRINTING SOFT READ ERRORS ?
4375 032034  001402                          BEQ     EDLEXT                  ;NO, DON'T PRINT IT
4376 032036  004737  032550          1$:     JSR     PC,PRIERR               ;GO PRINT IT
4377 032042                          EDLEXT: POP     <R5,R3>
4378 032046  000207                          RTS     PC
```

```
 4380                                   .SBTTL  ERROR TALLY
 4381                                   ;**********************************
 4382                                   ;
 4383                                   ; ERROR TALLY
 4384                                   ;
 4385                                   ;Called By       : ERRDEC, ERRDEI, ERRDEL
 4386                                   ;
 4387
 4388 032050                            ERRTLY::
 4389 032050                                    PUSH    <R1>                    ;SAVE R1
 4390 032052  122737  000106  013263            CMPB    #NOERR,ERRTYP+1         ;IS IT A STATUS ERROR ?
 4391 032060  001422                            BEQ     15$                     ;YES, GET OUT
 4392 032062  113701  013263                    MOVB    ERRTYP+1,R1             ;PUT THE ERROR TYPE IN R1
 4393 032066  122737  000076  013263            CMPB    #RMSPOS,ERRTYP+1        ;IS IT A MISPOSITION ERROR
 4394 032074  001012                            BNE     10$                     ;NO KEEP GOING
 4395 032076  122762  000020  000000            CMPB    #WR,CMD(R2)             ;IS IT A WRITE ?
 4396 032104  001404                            BEQ     5$                      ;NO TRY AGAIN
 4397 032106  122762  000100  000000            CMPB    #WTM,CMD(R2)            ;IS IT A WRITE TAPE MARK ?
 4398 032114  001002                            BNE     10$                     ;NO, MUST BE A READ
 4399 032116  112701  000100          5$:       MOVB    #WMSPOS,R1              ;SET IT TO A WRITE MISPOSITON
 4400 032122  060401                  10$:      ADD     R4,R1                   ;ADD THE OFFSET TO THE LUN POINTER
 4401 032124  005211                            INC     (R1)                    ;INC THE ERROR COUNT
 4402 032126                          15$:      POP     <R1>                    ;RESTORE R1 AND R4
 4403 032130  000207                            RTS     PC                      ;EXIT
 4404
```

```
 4406                                   .SBTTL  ERROR LOG TALLY
 4407                                   ;**********************************
 4408                                   ;
 4409                                   ; ERROR LOG TALLY
 4410                                   ;
 4411                                   ;Called By       :
 4412                                   ;Calls To        :
 4413                                   ;Inputs          :
 4414                                   ;Outputs         :
 4415                                   ;Register Inputs :
 4416                                   ;Register Outputs:
 4417
 4418 032132                           ETLLY::
 4419 032132                                   PUSH    <R1>                    ;SAVE R1
 4420 032134  122737  000106  013263           CMPB    #NOERR,ERRTYP+1         ;IS IT A STATUS ERROR ?
 4421 032142  001412                           BEQ     ELTEXT                  ;YES, GET OUT
 4422 032144  113701  013263                   MOVB    ERRTYP+1,R1             ;LET R1 = THE ERROR TYPE
 4423 032150  060401                           ADD     R4,R1                   ;ADD THE LUN BLOCK POINTER TO R1
 4424 032152  132763  000001  000055           BITB    #BIT0,L.TRK(R3)         ;IS IT AN ODD TRACK NUMBER ?
 4425 032160  001402                           BEQ     1$                      ;YES, GO TALLY THE ERROR
 4426 032162  062701  000002                   ADD     #2,R1                   ;NO, TALLY THE EVEN TRACK
 4427 032166  005211                   1$:     INC     (R1)                    ;INC THE ERROR COUNT
 4428 032170                           ELTEXT: POP     <R1>                    ;RESTORE R1
 4429 032172  000207                           RTS     PC                      ;RETURN
```

```
                                .SBTTL  TABLE SORTER
                                ;**********************************
                                ;
                                ; TABLE SORTER
                                ;
                                ;Called By       : ERRDEL
                                ;Register Inputs :
                                ;Register Outputs:

032174                          TBLSRT::PUSH    <R1,R2,R3,R5>           ;SAVE R1,R2,R3,R5 ON STACK
032204  012701  003360                  MOV     #UNTTBL,R1              ;INITIALIZE R1,R2,R3,R5
032210  016402  000130                  MOV     TBLTOP(R4),R2           ;FOR LOCAL USAGE
032214  016403  000134                  MOV     LSTENT(R4),R3
032220  010205                          MOV     R2,R5
032222  020203                          CMP     R2,R3                   ;FIRST ENTRY?
032224  001524                          BEQ     30$                     ;YES, PUT IT IN THE TABLE

032226  126162  000000  000000  1$:     CMPB    TRK(R1),TRK(R2)         ;GET TO THE RIGHT TRACK
032234  101405                          BLOS    5$
032236  062702  000010                  ADD     #8.,R2
032242  020203                          CMP     R2,R3                   ;NEXT UNUSED SLOT ?
032244  001514                          BEQ     30$                     ;YES, PUT IT IN THE TABLE
032246  000767                          BR      1$

032250  126162  000000  000000  5$:     CMPB    TRK(R1),TRK(R2)         ;MAKE SURE ITS THE SAME TRACK
032256  001024                          BNE     15$
032260  026162  000002  000002          CMP     PHB(R1),PHB(R2)         ;IF OUR OBJ CNT HIGHER
032266  101405                          BLOS    10$
032270  062702  000010                  ADD     #8.,R2                  ;GO TO NEXT TABLE LOCATION
032274  020203                          CMP     R2,R3                   ;NEXT UNUSED SLOT ?
032276  001477                          BEQ     30$                     ;YES, PUT IT IN THE TABLE
032300  000763                          BR      5$

032302  026162  000002  000002  10$:    CMP     PHB(R1),PHB(R2)         ;IF THE ENTRY ALREADY EXIST
032310  001007                          BNE     15$
032312  066162  000004  000004          ADD     SWR(R1),SWR(R2)         ;THEN ADD THE ERROR COUNT
032320  066162  000006  000006          ADD     HWR(R1),HWR(R2)
032326  000477                          BR      EXTSRT

032330  026464  000134  000132  15$:    CMP     LSTENT(R4),TBLBTM(R4)   ;IF THE TABLES FULL, GET OUT
032336  001022                          BNE     20$
032340  032764  000040  000026  17$:    BIT     #MTBLOV,LUNFLG(R4)
032346  001067                          BNE     EXTSRT
032350  052764  000040  000026          BIS     #MTBLOV,LUNFLG(R4)
032356                                  PRINTF  #TBLFUL,L$LUN
032356  013746  002074                  MOV     L$LUN,-(SP)
032362  012746  036724                  MOV     #TBLFUL,-(SP)
032366  012746  000002                  MOV     #2,-(SP)
032372  010600                          MOV     SP,R0
032374  104417                          TRAP    C$PNTF
032376  062706  000006                  ADD     #6,SP
032402  000451                          BR      EXTSRT

032404  016405  000134          20$:    MOV     LSTENT(R4),R5           ;MOVE THE TABLE CONTENTS
032410  010503                          MOV     R5,R3                   ;DOWN TO PUT IN THE ENTRY
032412  162703  000010                  SUB     #8.,R3
```

```
 4482 032416  116365  000000  000000  25$:    MOVB    TRK(R3),TRK(R5)
 4483 032424  016365  000002  000002          MOV     PHB(R3),PHB(R5)
 4484 032432  116365  000004  000004          MOVB    SWR(R3),SWR(R5)
 4485 032440  116365  000005  000005          MOVB    SRD(R3),SRD(R5)
 4486 032446  116365  000006  000006          MOVB    HWR(R3),HWR(R5)
 4487 032454  116365  000007  000007          MOVB    HRD(R3),HRD(R5)
 4488 032462  162703  000010                  SUB     #8.,R3
 4489 032466  162705  000010                  SUB     #8.,R5
 4490 032472  020502                          CMP     R5,R2                   ;KEEP GOING TILL THE RIGHT SLOT
 4491 032474  101350                          BHI     25$                     ;IS OPEN
 4492
 4493 032476  026464  000134  000132  30$:    CMP     LSTENT(R4),TBLBTM(R4)   ;IF THE TABLES FULL, GET OUT
 4494 032504  001715                          BEQ     17$
 4495 032506  020301                          CMP     R3,R1
 4496 032510  103403                          BLO     35$
 4497 032512  010103                          MOV     R1,R3
 4498 032514  010205                          MOV     R2,R5
 4499 032516  000737                          BR      25$
 4500 032520  062764  000010  000134  35$:    ADD     #8.,LSTENT(R4)          ;ADJUST THE LAST ENTRY POINTER
 4501 032526  005061  000004          EXTSRT: CLR     SWR(R1)                 ;CLEAR SOFT ERROR COUNTERS
 4502 032532  005061  000006                  CLR     HWR(R1)                 ;CLEAR HARD ERROR COUNTERS
 4503 032536                                  POP     <R5,R3,R2,R1>           ;RESTORE REGISTERS
 4504 032546  000207                          RTS     PC
```

```
                                .SBTTL  PRINT ERROR
                                ;**********************************
                                ;
                                ; PRINT ERROR
                                ;
                                ;Called By       : ERRDEC, ERRDEI, ERRDEL
                                ;Calls To        : ERROR
                                ;Register Inputs :
                                ;Register Outputs:

032550                          PRIERR::
032550  010337  003560                  MOV     R3,R3SAVE               ;SAVE R3
032554  010437  003562                  MOV     R4,R4SAVE               ;SAVE R4
032560                                  ERROR                           ;ERROR MACRO
032560  104460                          TRAP    C$ERROR
032562  000207                          RTS     PC                      ;RETURN
```

```
                                .SBTTL  COMPARE DATA
                                ;**********************************
                                ;
                                ; COMPARE DATA
                                ;
                                ;Called By       :
                                ;Calls To        :
                                ;Inputs          :
                                ;Outputs         :
                                ;Register Inputs :
                                ;Register Outputs:
                                ;
032564                          CMPDAT::
032564                                  PUSH    <R1,R2,R3,R5>           ;SAVE R1,R2,R3,R5
032564  010146                          MOV     R1,-(SP)        ;;PUSH R1 ON STACK
032566  010246                          MOV     R2,-(SP)        ;;PUSH R2 ON STACK
032570  010346                          MOV     R3,-(SP)        ;;PUSH R3 ON STACK
032572  010546                          MOV     R5,-(SP)        ;;PUSH R5 ON STACK
032574  026363  000040  000014          CMP     P.TRBC(R3),P.BCNT(R3)   ;AS MANY BYTES READ AS WRITTEN ?
032602  001424                          BEQ     5$                      ;BRANCH IF YES
032604  012705  011122                  MOV     #RLST,R5                ;PUT THE RLS TABLE ADDRESS IN R5
032610  012702  013262                  MOV     #L$ERRTBL,R2            ;PUT THE ERROR TABLE ADDRES IN R2
032614  012522                          MOV     (R5)+,(R2)+             ;MOV THE RLS TABLE TO THE ERROR TABLE
032616  012522                          MOV     (R5)+,(R2)+             ;
032620  012522                          MOV     (R5)+,(R2)+             ;
032622  011512                          MOV     (R5),(R2)               ;
032624                                  POP     <R5,R3,R2,R1>           ;RESTORE REGISTERS
032624  012605                          MOV     (SP)+,R5        ;;POP STACK INTO R5
032626  012603                          MOV     (SP)+,R3        ;;POP STACK INTO R3
032630  012602                          MOV     (SP)+,R2        ;;POP STACK INTO R2
032632  012601                          MOV     (SP)+,R1        ;;POP STACK INTO R1
032634  004737  032050                  JSR     PC,ERRTLY               ;GO TALLY THE ERROR
032640  105037  013263                  CLRB    ERRTYP+1                ;CLEAR THE LUN POINTER
032644  004737  032550                  JSR     PC,PRIERR               ;GO PRINT THE ERROR
032650  000137  033246                  JMP     45$                     ;GET OUT IF THERE WAS AN ERROR
032654  005037  003444          5$:     CLR     CMPERR                  ;CLEAR LOCATION CMPERR
032660  042764  000020  000026          BIC     #ODDFLG,LUNFLG(R4)      ;CLEAR THE ODD BYTE COUNT FLAG
032666  016337  000014  003530          MOV     P.BCNT(R3),R8           ;PUT THE TAPE RECORD BYTE COUNT IN R8
032674  005037  003532                  CLR     R9                      ;CLEAR THE BYTE ADDRESS COUNTER
032700  032737  000001  003530          BIT     #BIT0,R8                ;IS THE BYTE COUNT ODD
032706  001406                          BEQ     10$                     ;BRANCH IF NOT
032710  042737  000001  003530          BIC     #BIT0,R8                ;MAKE THE COUNT EVEN
032716  052764  000020  000026          BIS     #ODDFLG,LUNFLG(R4)      ;SET THE ODD BYTE FLAG
032724  012701  003446          10$:    MOV     #BYTADD,R1              ;LET R1 POINT TO THE ADDRESS TABLE
032730  022737  000003  002114          CMP     #3,L$TEST               ;ARE WE IN TEST 3 ?
032736  001003                          BNE     11$                     ;NO, SO JUST SET RDBUF IN BUFADR
032740  012702  070556                  MOV     #WRTBUF-2,R2            ;LET R2 POINT TO THE WRITE BUFFER
032744  000402                          BR      12$
032746  012702  070560          11$:    MOV     #WRTBUF,R2              ;LET R2 POINT TO THE WRITE BUFFER
032752  012703  050560          12$:    MOV     #RDBUF,R3               ;LET R3 POINT TO THE READ BUFFER
032756  012705  003472                  MOV     #DATBL,R5               ;LET R5 POINT TO THE ERROR DATA TABLE
032762  022322                  14$:    CMP     (R3)+,(R2)+             ;COMPARE THE FIRST WORD OF DATA
032764  001447                          BEQ     25$                     ;BRANCH IF THEY ARE EQUAL
032766  126362  177776  177776          CMPB    LOBYTE(R3),LOBYTE(R2)   ;COMPARE THE LOW BYTE
032774  001415                          BEQ     15$                     ;BRANCH IF EQUAL
032776  005237  003444                  INC     CMPERR                  ;ADD 1 TO THE ERROR COUNT
```

```
4572 033002  022701  003472              CMP     #TBLEND,R1              ;IS THERE ROOM TO SAVE THIS DATA ?
4573 033006  001410                      BEQ     15$                     ;BRANCH IF NOT
4574 033010  116315  177776              MOVB    LOBYTE(R3),(R5)         ;LOW READ BYTE IN SAVE BYTE
4575 033014  116265  177776  000001      MOVB    LOBYTE(R2),ONE(R5)      ;LOW WRITE BYTE IN SAVE BYTE
4576 033022  013721  003532              MOV     R9,(R1)+                ;SAVE THE ADDRESS FOR PRINTING
4577 033026  005725                      TST     (R5)+                   ;POINT R5 TO NEXT TABLE LOCATION
4578 033030  005237  003532          17$:INC     R9                      ;ADD 1 TO THE BYTE COUNT
4579 033034  126362  177777  177777      CMPB    HIBYTE(R3),HIBYTE(R2)   ;COMPARE THE HIGH BYTE
4580 033042  001415                      BEQ     20$                     ;BRANCH IF THEY ARE THE SAME
4581 033044  005237  003444              INC     CMPERR                  ;ADD 1 TO THE ERROR COUNT
4582 033050  022701  003472              CMP     #TBLEND,R1              ;ROOM TO SAVE THIS DATA ?
4583 033054  001410                      BEQ     20$                     ;BRANCH IF NOT
4584 033056  116315  177777              MOVB    HIBYTE(R3),(R5)         ;HI READ BYTE TO LOW SAVE BYTE
4585 033062  116265  177777  000001      MOVB    HIBYTE(R2),ONE(R5)      ;HIGH WRITE BYTE TO HIGH SAVE BYTE
4586 033070  013721  003532              MOV     R9,(R1)+                ;SAVE THE ADDRESS TO PRINT
4587 033074  005725                      TST     (R5)+                   ;POINT R5 TO THE NEXT TABLE LOCATION
4588 033076  005237  003532          20$:INC     R9                      ;ADD 1 TO THE BYTE COUNTER
4589 033102  000403                      BR      30$                     ;BRANCH
4590 033104  062737  000002  003532  25$:ADD     #2,R9                   ;ADD 2 TO THE BYTE COUNT
4591 033112  023737  003532  003530  30$:CMP     R9,R8                   ;HAVE WE COMPARED THEM ALL ?
4592 033120  001320                      BNE     14$                     ;NO, GO DO SOME MORE
4593 033122  032764  000020  000026      BIT     #ODDFLG,LUNFLG(R4)      ;WAS IT AN ODD BYTE COUNT ?
4594 033130  001414                      BEQ     35$                     ;BRANCH IF NOT
4595 033132  121312                      CMPB    (R3),(R2)               ;COMPARE THE LOW BYTES
4596 033134  001412                      BEQ     35$                     ;BRANCH IF THEY MATCH
4597 033136  005237  003444              INC     CMPERR                  ;ADD 1 TO THE ERROR COUNT
4598 033142  022701  003472              CMP     #TBLEND,R1              ;IS THERE ROOM FOR THIS DATA ?
4599 033146  001405                      BEQ     35$                     ;BRANCH IF NOT
4600 033150  111315                      MOVB    (R3),(R5)               ;LOW READ BYTE IN THE LOW SAVE BYTE
4601 033152  111265  000001              MOVB    (R2),ONE(R5)            ;LOW WRITE BYTE TO HIGH SAVE BYTE
4602 033156  013721  003532              MOV     R9,(R1)+                ;SAVE THE ADDRESS TO PRINT
4603 033162  005737  003444  35$:       TST     CMPERR                  ;DID WE HAVE ANY ERRORS ?
4604 033166  001423                      BEQ     40$                     ;BRANCH TO EXIT IF NOT
4605 033170  012705  011112              MOV     #DCMPT,R5               ;POINT R5 TO THE DATA COMPARE ERROR TABLE
4606 033174  012702  013262              MOV     #L$ERRTBL,R2            ;POINT R2 TO THE ERROR TABLE
4607 033200  012522                      MOV     (R5)+,(R2)+             ;MOVE THE DATA COMPARE COMPARE TABLE
4608 033202  012522                      MOV     (R5)+,(R2)+             ;TO THE ERROR TABLE
4609 033204  012522                      MOV     (R5)+,(R2)+             ;
4610 033206  011512                      MOV     (R5),(R2)               ;
4611 033210                              POP     <R5,R3,R2,R1>           ;RESTORE THE REGISTERS
     033210  012605                      MOV     (SP)+,R5        ;;POP STACK INTO R5
     033212  012603                      MOV     (SP)+,R3        ;;POP STACK INTO R3
     033214  012602                      MOV     (SP)+,R2        ;;POP STACK INTO R2
     033216  012601                      MOV     (SP)+,R1        ;;POP STACK INTO R1
4612 033220  004737  032050              JSR     PC,ERRTLY               ;GO TALLY THE ERROR
4613 033224  105037  013263              CLRB    ERRTYP+1                ;CLEAR THE UPPER BYTE OF ERROR TYPE
4614 033230  004737  032550              JSR     PC,PRIERR               ;GO PRINT THE ERROR
4615 033234  000404                      BR      45$                     ;EXIT
4616 033236                          40$:POP     <R5,R3,R2,R1>           ;RESTORE THE REGISTERS
     033236  012605                      MOV     (SP)+,R5        ;;POP STACK INTO R5
     033240  012603                      MOV     (SP)+,R3        ;;POP STACK INTO R3
     033242  012602                      MOV     (SP)+,R2        ;;POP STACK INTO R2
     033244  012601                      MOV     (SP)+,R1        ;;POP STACK INTO R1
4617 033246  000207                  45$:RTS     PC                      ;RETURN
```

```
                                .SBTTL  UNJAM
                                ;**********************************
                                ;
                                ; UNJAM
                                ;
                                ;Called By       :
                                ;Calls To        :
                                ;Inputs          :
                                ;Outputs         :
                                ;Register Inputs :
                                ;Register Outputs:
                                ;
033250                          UNJAM::
033250  005737  003344                  TST     DUMPKT                  ;ARE WE ISSUEING NULL COMMANDS
033254  001444                          BEQ     15$                     ;YES , THEN EXIT
033256  023764  003542  000006          CMP     SECRNS,CMDSEQ(R4)       ;IS IT THE ONLY COMMAND OUT ?
033264  001440                          BEQ     15$                     ;YES , THEN EXIT
033266  016437  000006  003436          MOV     CMDSEQ(R4),SAVDIF       ;SET UP TO UNJAM THE QUEUES
033274  163737  003542  003436          SUB     SECRNS,SAVDIF           ;SUBTRACT CURRENT FROM THE HIGHEST
033302  063737  003436  003400          ADD     SAVDIF,CMDCNT           ;ADJUST THE COMMAND COUNT
033310  063737  003436  003402          ADD     SAVDIF,RSPCNT           ;ADJUST THE RESPONSE COUNT
033316  042737  000200  003516          BIC     #CMDONE,PCFLAG          ;CLEAR THE ALL COMMANDS ISSUED FLAG
033324  163764  003436  000034          SUB     SAVDIF,OBJFDL(R4)       ;ADUST THE OBJECT COUNT
033332  103002                          BCC     5$                      ;GET OUT IF NO CARRY
033334  005364  000036                  DEC     OBJFDH(R4)              ;OTHERWISE, ADJUST THE HIGH WORD
033340  022737  000004  003424  5$:     CMP     #N,SUBCNT
033346  001002                          BNE     10$
033350  005037  003424                  CLR     SUBCNT
033354  005237  003424          10$:    INC     SUBCNT
033360  005337  003436                  DEC     SAVDIF
033364  001365                          BNE     5$
033366  052764  000002  000026  15$:    BIS     #SEREXC,LUNFLG(R4)      ;SET THE SERIOUS EXCEPTION FLAG
033374  000207                          RTS     PC                      ;RETURN
033376                                  ENDMOD
```

```
                                .SBTTL  OCTAL -> HEX CONVERTER
                                ;**********************************
                                ;
                                ; OCTAL -> HEX CONVERTER
                                ;
033376                          OCTHEX::
033376  116337  000013  003552          MOVB    P.STS+1(R3),LOHEX       ;GET THE UPPER STATUS BYTE
033404  013737  003552  003554          MOV     LOHEX,HIHEX             ;GET A SECOND COPY
033412  042737  177760  003552          BIC     #177760,LOHEX           ;CLEAR THE UNWANTED BITS
033420  042737  177417  003554          BIC     #177417,HIHEX           ;CLEAR THE UNWANTED BITS
033426  006037  003554                  ROR     HIHEX                   ;SHIFT THE
033432  006037  003554                  ROR     HIHEX                   ;       UPPER NIBBLE
033436  006037  003554                  ROR     HIHEX                   ;                OVER 3 PLACES
033442  006137  003552                  ROL     LOHEX                   ;SHIFT THE LOWER NIBBLE OVER 1
033446  062737  011442  003552          ADD     #HEXTBL,LOHEX           ;ADD ASCII TABLE BASE ADDRESS
033454  062737  011442  003554          ADD     #HEXTBL,HIHEX           ;ADD ASCII TABLE BASE ADDRESS
033462  000207                          RTS     PC                      ;RETURN
```

```
                                .SBTTL  CLEAR EOT
                                ;**********************************
                                ;
                                ; CLEAR EOT
                                ;

033464                          CLREOT::
033464                                  PUSH    <R1,R2,R4>              ;SAVE R1, R2, AND R4
033464  010146                         MOV     R1,-(SP)        ;;PUSH R1 ON STACK
033466  010246                         MOV     R2,-(SP)        ;;PUSH R2 ON STACK
033470  010446                         MOV     R4,-(SP)        ;;PUSH R4 ON STACK
033472  005002                         CLR     R2                      ;CLEAR OUT R2
033474  012701  177776                 MOV     #-2.,R1                 ;SET R1 TO THE FIRST UNIT
033500  012704  002314                 MOV     #LUNO,R4                ;LET R4 EQUAL THE FIRDT LUN
033504  062701  000002         5$:     ADD     #2.,R1                  ;ADD 2 TO THE UNIT POINTER
033510  062702  000001                 ADD     #1.,R2                  ;ADD 1 TO R2
033514  112764  177777  000154         MOVB    #-1,OLDTRK(R4)          ;INITIALIZE OLD TRACK
033522  012764  177777  000152         MOV     #-1,OLDBLK(R4)          ;INITIALIZE OLD BLOCK
033530  062704  000172                 ADD     #LUNSTP,R4              ;SET R4 TO THE NEXT LUN
033534  042761  000004  003350         BIC     #EOT,DRINUS(R1)         ;CLEAR THE EOT BIT IN DRINUS
033542  005037  003526                 CLR     UEOT                    ;CLEAR THE EOT FLAG
033546  023702  002012         10$:    CMP     L$UNIT,R2               ;HAVE WE DONE THEM ALL
033552  001354                         BNE     5$                      ;NO, KEEP GOING TILL ALL DONE
033554                                  POP     <R4,R2,R1>              ;RESTORE R4, R2, AND R1
033554  012604                         MOV     (SP)+,R4        ;;POP STACK INTO R4
033556  012602                         MOV     (SP)+,R2        ;;POP STACK INTO R2
033560  012601                         MOV     (SP)+,R1        ;;POP STACK INTO R1
033562  000207                         RTS     PC                      ;RETURN
```

```
                                .SBTTL  SEED SETUP AND SAVE
                                ;*************************************
                                ;
                                ; SEED SETUP
                                ;

033564                          SDSTUP::
033564                                  PUSH    <R1,R4>                 ;
033564  010146                          MOV     R1,-(SP)        ;;PUSH R1 ON STACK
033566  010446                          MOV     R4,-(SP)        ;;PUSH R4 ON STACK
033570  013701  002012                  MOV     L$UNIT,R1               ;
033574  012704  002314                  MOV     #LUNO,R4                ;
033600  016464  000136  000144  5$:     MOV     SED1(R4),SEED1(R4)      ;
033606  016464  000140  000146          MOV     SED2(R4),SEED2(R4)      ;
033614  016464  000142  000150          MOV     SED3(R4),SEED3(R4)      ;
033622  062704  000172                  ADD     #LUNSTP,R4              ;
033626  005301                          DEC     R1                      ;
033630  001363                          BNE     5$                      ;
033632                                  POP     <R4,R1>                 ;
033632  012604                          MOV     (SP)+,R4        ;;POP STACK INTO R4
033634  012601                          MOV     (SP)+,R1        ;;POP STACK INTO R1
033636  000207                          RTS     PC                      ;

                                ;*************************************
                                ;
                                ; SEED SAVE
                                ;

033640                          SDSAVE::
033640                                  PUSH    <R1,R4>                 ;
033640  010146                          MOV     R1,-(SP)        ;;PUSH R1 ON STACK
033642  010446                          MOV     R4,-(SP)        ;;PUSH R4 ON STACK
033644  013701  002012                  MOV     L$UNIT,R1               ;
033650  012704  002314                  MOV     #LUNO,R4                ;
033654  016464  000144  000136  5$:     MOV     SEED1(R4),SED1(R4)      ;
033662  016464  000146  000140          MOV     SEED2(R4),SED2(R4)      ;
033670  016464  000150  000142          MOV     SEED3(R4),SED3(R4)      ;
033676  062704  000172                  ADD     #LUNSTP,R4              ;
033702  005301                          DEC     R1                      ;
033704  001363                          BNE     5$                      ;
033706                                  POP     <R4,R1>                 ;
033706  012604                          MOV     (SP)+,R4        ;;POP STACK INTO R4
033710  012601                          MOV     (SP)+,R1        ;;POP STACK INTO R1
033712  000207                          RTS     PC                      ;
```

```
 4736                                   .SBTTL  PATTERN CLEAR
 4737                                   ;**********************************
 4738                                   ;
 4739                                   ; PATTERN CLEAR
 4740                                   ;
 4741                                   ;THIS ROUTINE DOES NOT SAVE R4 AND THEREFORE SHOULD NOT BE CALLED FROM ANY
 4742                                   ;PLACE OTHER THAN A TEST.
 4743
 4744 033714                           PATCLR:
 4745 033714  012704  002314                      MOV     #LUNO,R4                ;
 4746 033720  005064  000024           1$:        CLR     PATSAV(R4)              ;
 4747 033724  022704  003072                      CMP     #LUN3,R4                ;
 4748 033730  001403                              BEQ     2$                      ;
 4749 033732  062704  000172                      ADD     #LUNSTP,R4              ;
 4750 033736  000770                              BR      1$                      ;
 4751 033740  000207                   2$:        RTS     PC                      ;
 4752
 4753
 4754
```

```
                                .SBTTL  CORE DUMP
                                ;**********************************
                                ;
                                ; CORE DUMP
                                ;
                                ;THIS ROUTINE IS DESIGNED TO DUMP ALL CRITICAL MEMORY LOCATIONS ON
                                ;OCCURRENCE OF ERRORS, WHEN ENEABLED BY THE OPERATOR VIA THE SOFTWARE
                                ;QUESTIONS.  IT IS INTENDED PRIMARILY AS AN AID TO DEBUGGING THE
                                ;PROGRAM, BUT MAY PROVE USEFUL IN ANALYZING CERTAIN DEVICE ERRORS
                                ;AS WELL.

 033742                         CORDMP:
 033742                                 PUSH    <R1,R2>
 033742 010146                          MOV     R1,-(SP)        ;;PUSH R1 ON STACK
 033744 010246                          MOV     R2,-(SP)        ;;PUSH R2 ON STACK
 033746                                 PRINTF  #DUMP,R1,R2,R3,R4,R5
 033746 010546                          MOV     R5,-(SP)
 033750 010446                          MOV     R4,-(SP)
 033752 010346                          MOV     R3,-(SP)
 033754 010246                          MOV     R2,-(SP)
 033756 010146                          MOV     R1,-(SP)
 033760 012746  020347                  MOV     #DUMP,-(SP)
 033764 012746  000006                  MOV     #6,-(SP)
 033770 010600                          MOV     SP,R0
 033772 104417                          TRAP    C$PNTF
 033774 062706  000016                  ADD     #16,SP
 034000 012701  002314                  MOV     #LUNO,R1                ;PUT STARING ADDRESS IN R1
 034004 012702  002314                  MOV     #LUNO,R2                ;AND ANOTHER COPY IN R2
 034010                         1$:     PRINTF  #DUMP2,R1,(R2),2(R2),4(R2),6(R2)
 034010 016246  000006                  MOV     6(R2),-(SP)
 034014 016246  000004                  MOV     4(R2),-(SP)
 034020 016246  000002                  MOV     2(R2),-(SP)
 034024 011246                          MOV     (R2),-(SP)
 034026 010146                          MOV     R1,-(SP)
 034030 012746  020471                  MOV     #DUMP2,-(SP)
 034034 012746  000006                  MOV     #6,-(SP)
 034040 010600                          MOV     SP,R0
 034042 104417                          TRAP    C$PNTF
 034044 062706  000016                  ADD     #16,SP

 034050 062701  000010          ADD     #10,R1                  ;UPDATE R1
 034054 062702  000010          ADD     #10,R2                  ;UPDATE R2
 034060 022701  010572          CMP     #IOERTB,R1              ;ARE WE AT THE END OF DUMP AREA
 034064 101351                  BHI     1$                      ;KEEP GOING IF NOT
 034066                         POP     <R2,R1>
 034072 000207                  RTS     PC
```

```
                                .SBTTL BUFFER DUMP
                                ;**********************************
                                ;
                                ; BUFFER DUMP
                                ;
                                ;THIS ROUTINE WILL PRINT THE READ BUFFER FOR EVERY RECORD READ IN
                                ;TEST 5.
                                ;
034074                          BUFDMP:
034074                                  PUSH    <R1,R2>
034100  016301  000014                  MOV     P.BCNT(R3),R1           ;GET NUMBER OF BYTES X-FERRED
034104  012702  050560                  MOV     #RDBUF,R2               ;GET BUFFER ADDRESS
034110                                  PRINTF  #DUMP1,R1               ;PRINT NUMBER OF BYTES
034110  010146                          MOV     R1,-(SP)
034112  012746  020430                  MOV     #DUMP1,-(SP)
034116  012746  000002                  MOV     #2,-(SP)
034122  010600                          MOV     SP,R0
034124  104417                          TRAP    C$PNTF
034126  062706  000006                  ADD     #6,SP
                                ;
034132                          1$:     PRINTF  #DUMP2,(R2),2(R2),4(R2),6(R2),10(R2)
034132  016246  000010                  MOV     10(R2),-(SP)
034136  016246  000006                  MOV     6(R2),-(SP)
034142  016246  000004                  MOV     4(R2),-(SP)
034146  016246  000002                  MOV     2(R2),-(SP)
034152  011246                          MOV     (R2),-(SP)
034154  012746  020471                  MOV     #DUMP2,-(SP)
034160  012746  000006                  MOV     #6,-(SP)
034164  010600                          MOV     SP,R0
034166  104417                          TRAP    C$PNTF
034170  062706  000016                  ADD     #16,SP
034174  062702  000012                  ADD     #12,R2                  ;ADJUST BUFFER POINTER
034200  162701  000012                  SUB     #12,R1                  ;ADJUST BYTE COUNT
034204  001401                          BEQ     5$                      ;IF ZERO GET OUT
034206  100351                          BPL     1$                      ;KEEP GOING IF POSITIVE
                                ;
034210                          5$:     POP     <R2,R1>
034214  000207                          RTS     PC
                                ;
```

```
                                .TITLE MISCELLANEOUS SECTIONS
                                .SBTTL  REPORT CODING SECTION

                                        BGNMOD

                                ;++
                                ; THE REPORT CODING SECTION CONTAINS THE
                                ; "PRINTS" CALLS THAT GENERATE STATISTICAL REPORTS.
                                ;--

                                        BGNRPT
                                L$RPT::

                                        PUSH    <R1,R4,R5>
                                        MOV     R1,-(SP)        ;;PUSH R1 ON STACK
                                        MOV     R4,-(SP)        ;;PUSH R4 ON STACK
                                        MOV     R5,-(SP)        ;;PUSH R5 ON STACK
                                        BIT     #DROPIT,PCFLAG          ;ARE WE DROPPING A UNIT
                                        BNE     5$                      ;YES, ONLY PRINT STATS FOR THIS UNIT
                                        CLR     R1                      ;SET R1 TO FIRST UNIT
                                        CLR     L$LUN                   ;START WITH UNIT 0
                                        MOV     #LUNO,R4                ;START WITH LUN BLOCK FOR UNIT 0
                                        MOV     L$UNIT,R5               ;INIT UNIT COUNTER
                                1$:     BIT     #DROP,DRINUS(R1)        ;HAS THE DRIVE BEEN DROPPED ?
                                        BEQ     5$                      ;NO, PRINT ITS STATS
                                        JMP     15$                     ;OTHERWISE GET THE NEXT DRIVE

                                5$:     PRINTS  #STAT0
                                        MOV     #STAT0,-(SP)
                                        MOV     #1,-(SP)
                                        MOV     SP,R0
                                        TRAP    C$PNTS
                                        ADD     #4,SP

                                        PRINTS  #STAT1,L$LUN
                                        MOV     L$LUN,-(SP)
                                        MOV     #STAT1,-(SP)
                                        MOV     #2,-(SP)
                                        MOV     SP,R0
                                        TRAP    C$PNTS
                                        ADD     #6,SP

                                        PRINTS  #STAT2
                                        MOV     #STAT2,-(SP)
                                        MOV     #1,-(SP)
                                        MOV     SP,R0
                                        TRAP    C$PNTS
                                        ADD     #4,SP

                                        PRINTS  #STAT3
                                        MOV     #STAT3,-(SP)
                                        MOV     #1,-(SP)
                                        MOV     SP,R0
                                        TRAP    C$PNTS
                                        ADD     #4,SP

                                        PRINTS  #STAT4
```

```
                034372  012746  035666          MOV     #STAT4,-(SP)
                034376  012746  000001          MOV     #1,-(SP)
                034402  010600                  MOV     SP,R0
                034404  104416                  TRAP    C$PNTS
                034406  062706  000004          ADD     #4,SP
        4880
        4881 034412                             PRINTS  #STAT5,S1READ(R4),S2READ(R4),S1WRIT(R4),S2WRIT(R4)
                034412  016446  000046          MOV     S2WRIT(R4),-(SP)
                034416  016446  000044          MOV     S1WRIT(R4),-(SP)
                034422  016446  000042          MOV     S2READ(R4),-(SP)
                034426  016446  000040          MOV     S1READ(R4),-(SP)
                034432  012746  035713          MOV     #STAT5,-(SP)
                034436  012746  000005          MOV     #5,-(SP)
                034442  010600                  MOV     SP,R0
                034444  104416                  TRAP    C$PNTS
                034446  062706  000014          ADD     #14,SP
        4882
        4883 034452                             PRINTS  #STAT6,EC1COR(R4),EC2COR(R4)
                034452  016446  000052          MOV     EC2COR(R4),-(SP)
                034456  016446  000050          MOV     EC1COR(R4),-(SP)
                034462  012746  035760          MOV     #STAT6,-(SP)
                034466  012746  000003          MOV     #3,-(SP)
                034472  010600                  MOV     SP,R0
                034474  104416                  TRAP    C$PNTS
                034476  062706  000010          ADD     #10,SP
        4884
        4885 034502                             PRINTS  #STAT7,H1READ(R4),H2READ(R4),H1WRIT(R4),H2WRIT(R4)
                034502  016446  000062          MOV     H2WRIT(R4),-(SP)
                034506  016446  000060          MOV     H1WRIT(R4),-(SP)
                034512  016446  000056          MOV     H2READ(R4),-(SP)
                034516  016446  000054          MOV     H1READ(R4),-(SP)
                034522  012746  036032          MOV     #STAT7,-(SP)
                034526  012746  000005          MOV     #5,-(SP)
                034532  010600                  MOV     SP,R0
                034534  104416                  TRAP    C$PNTS
                034536  062706  000014          ADD     #14,SP
        4886
        4887 034542                             PRINTS  #STAT8,RTYEC1(R4),RTYEC2(R4)
                034542  016446  000066          MOV     RTYEC2(R4),-(SP)
                034546  016446  000064          MOV     RTYEC1(R4),-(SP)
                034552  012746  036077          MOV     #STAT8,-(SP)
                034556  012746  000003          MOV     #3,-(SP)
                034562  010600                  MOV     SP,R0
                034564  104416                  TRAP    C$PNTS
                034566  062706  000010          ADD     #10,SP
        4888
        4889 034572                             PRINTS  #STAT9,DTCPER(R4)
                034572  016446  000070          MOV     DTCPER(R4),-(SP)
                034576  012746  036151          MOV     #STAT9,-(SP)
                034602  012746  000002          MOV     #2,-(SP)
                034606  010600                  MOV     SP,R0
                034610  104416                  TRAP    C$PNTS
                034612  062706  000006          ADD     #6,SP
        4890
        4891 034616                             PRINTS  #STAT10,UNDRUN(R4)
                034616  016446  000072          MOV     UNDRUN(R4),-(SP)
                034622  012746  036230          MOV     #STAT10,-(SP)
```

```
        034626  012746  000002                  MOV     #2,-(SP)
        034632  010600                          MOV     SP,R0
        034634  104416                          TRAP    C$PNTS
        034636  062706  000006                  ADD     #6,SP
 4892
 4893 034642                                    PRINTS  #STAT11,OVRRUN(R4)
        034642  016446  000074                  MOV     OVRRUN(R4),-(SP)
        034646  012746  036300                  MOV     #STAT11,-(SP)
        034652  012746  000002                  MOV     #2,-(SP)
        034656  010600                          MOV     SP,R0
        034660  104416                          TRAP    C$PNTS
        034662  062706  000006                  ADD     #6,SP
 4894
 4895 034666                                    PRINTS  #STAT12,RMSPOS(R4),WMSPOS(R4)
        034666  016446  000100                  MOV     WMSPOS(R4),-(SP)
        034672  016446  000076                  MOV     RMSPOS(R4),-(SP)
        034676  012746  036352                  MOV     #STAT12,-(SP)
        034702  012746  000003                  MOV     #3,-(SP)
        034706  010600                          MOV     SP,R0
        034710  104416                          TRAP    C$PNTS
        034712  062706  000010                  ADD     #10,SP
 4896
 4897 034716                                    PRINTS  #STAT13,OTHER(R4)
        034716  016446  000102                  MOV     OTHER(R4),-(SP)
        034722  012746  036413                  MOV     #STAT13,-(SP)
        034726  012746  000002                  MOV     #2,-(SP)
        034732  010600                          MOV     SP,R0
        034734  104416                          TRAP    C$PNTS
        034736  062706  000006                  ADD     #6,SP
 4898
 4899 034742                                    PRINTS  #STAT14,DROPPD(R4)
        034742  016446  000104                  MOV     DROPPD(R4),-(SP)
        034746  012746  036436                  MOV     #STAT14,-(SP)
        034752  012746  000002                  MOV     #2,-(SP)
        034756  010600                          MOV     SP,R0
        034760  104416                          TRAP    C$PNTS
        034762  062706  000006                  ADD     #6,SP
 4900
 4901 034766                                    PRINTS  #STAT15,WRBYT4(R4),WRBYT3(R4),WRBYT2(R4),WRBYT1(R4)
        034766  016446  000120                  MOV     WRBYT1(R4),-(SP)
        034772  016446  000122                  MOV     WRBYT2(R4),-(SP)
        034776  016446  000124                  MOV     WRBYT3(R4),-(SP)
        035002  016446  000126                  MOV     WRBYT4(R4),-(SP)
        035006  012746  036461                  MOV     #STAT15,-(SP)
        035012  012746  000005                  MOV     #5,-(SP)
        035016  010600                          MOV     SP,R0
        035020  104416                          TRAP    C$PNTS
        035022  062706  000014                  ADD     #14,SP
 4902
 4903 035026                                    PRINTS  #STAT16,RDBYT4(R4),RDBYT3(R4),RDBYT2(R4),RDBYT1(R4)
        035026  016446  000110                  MOV     RDBYT1(R4),-(SP)
        035032  016446  000112                  MOV     RDBYT2(R4),-(SP)
        035036  016446  000114                  MOV     RDBYT3(R4),-(SP)
        035042  016446  000116                  MOV     RDBYT4(R4),-(SP)
        035046  012746  036533                  MOV     #STAT16,-(SP)
        035052  012746  000005                  MOV     #5,-(SP)
        035056  010600                          MOV     SP,R0
```

```
        035060  104416                          TRAP    C$PNTS
        035062  062706  000014                  ADD     #14,SP
  4904
  4905  035066                                  PRINTS  #STAT0
        035066  012746  035472                  MOV     #STAT0,-(SP)
        035072  012746  000001                  MOV     #1,-(SP)
        035076  010600                          MOV     SP,R0
        035100  104416                          TRAP    C$PNTS
        035102  062706  000004                  ADD     #4,SP
  4906
  4907  035106  032737  000100  003516          BIT     #NOMDTB,PCFLAG          ;IS THE TABLE TO BE PRINTED
  4908  035114  001117                          BNE     15$                     ;NO, GET OUT
  4909  035116                                  PUSH    <R1,R2,R3>
  4910  035124  016401  000130                  MOV     TBLTOP(R4),R1           ;POINT R1 TO THE TOP OF THE TABLE
  4911  035130  016402  000134                  MOV     LSTENT(R4),R2           ;POINT R2 TO THE LAST ENTRY IN TABLE
  4912
  4913  035134                                  PRINTS  #STAT17,L$LUN
        035134  013746  002074                  MOV     L$LUN,-(SP)
        035140  012746  036605                  MOV     #STAT17,-(SP)
        035144  012746  000002                  MOV     #2,-(SP)
        035150  010600                          MOV     SP,R0
        035152  104416                          TRAP    C$PNTS
        035154  062706  000006                  ADD     #6,SP
  4914
  4915  035160  016103  000000          10$:    MOV     TRK(R1),R3              ;MOV THE TRACK # TO TEMP STORAGE
  4916  035164  020102                          CMP     R1,R2                   ;HAVE WE PRINTED ALL ENTRIES ?
  4917  035166  001451                          BEQ     12$                     ;YES, GET OUT
  4918  035170  026103  000000                  CMP     TRK(R1),R3              ;ARE WE STILL ON THE SAME TRACK ?
  4919  035174  001412                          BEQ     11$                     ;YES, KEEP GOING
  4920  035176  016103  000000                  MOV     TRK(R1),R3              ;MOV THE TRACK # TO TEMP STORAGE
  4921
  4922  035202                                  PRINTS  #STAT0
        035202  012746  035472                  MOV     #STAT0,-(SP)
        035206  012746  000001                  MOV     #1,-(SP)
        035212  010600                          MOV     SP,R0
        035214  104416                          TRAP    C$PNTS
        035216  062706  000004                  ADD     #4,SP
  4923
  4924  035222                          11$:    PRINTS  #STAT18,<B,TRK(R1)>,PHB(R1),<B,HWR(R1)>,<B,HRD(R1)>,<B,SWR(R1)>,<B,SRD(R1)>
        035222  005046                          CLR     -(SP)
        035224  156116  000005                  BISB    SRD(R1),(SP)
        035230  005046                          CLR     -(SP)
        035232  156116  000004                  BISB    SWR(R1),(SP)
        035236  005046                          CLR     -(SP)
        035240  156116  000007                  BISB    HRD(R1),(SP)
        035244  005046                          CLR     -(SP)
        035246  156116  000006                  BISB    HWR(R1),(SP)
        035252  016146  000002                  MOV     PHB(R1),-(SP)
        035256  005046                          CLR     -(SP)
        035260  156116  000000                  BISB    TRK(R1),(SP)
        035264  012746  036655                  MOV     #STAT18,-(SP)
        035270  012746  000007                  MOV     #7,-(SP)
        035274  010600                          MOV     SP,R0
        035276  104416                          TRAP    C$PNTS
        035300  062706  000020                  ADD     #20,SP
  4925
  4926  035304  062701  000010                  ADD     #8.,R1                  ;STEP R1 TO THE NEXT TABLE LOCATION
```

```
 4927 035310  000725                        BR      10$                     ;NO, KEEP PRINTING
 4928 035312                          12$:   POP     <R3,R2,R1>
 4929 035320  032764  000040  000026        BIT     #MTBLOV,LUNFLG(R4)      ;IS THE TABLE FULL ?
 4930 035326  001412                        BEQ     15$                     ;NO, GET NEXT DRIVE
 4931 035330                                PRINTF  #TBLFUL,L$LUN           ;PRINT TABLE FULL MESSAGE
      035330  013746  002074                MOV     L$LUN,-(SP)
      035334  012746  036724                MOV     #TBLFUL,-(SP)
      035340  012746  000002                MOV     #2,-(SP)
      035344  010600                        MOV     SP,R0
      035346  104417                        TRAP    C$PNTF
      035350  062706  000006                ADD     #6,SP
 4932
 4933 035354  032737  000400  003516  15$:   BIT     #DROPIT,PCFLAG          ;ARE WE DROPPING A UNIT
 4934 035362  001036                        BNE     25$                     ;YES, ONLY PRINT STATS FOR THIS UNIT
 4935 035364  062704  000172                ADD     #LUNSTP,R4              ;R4 POINTS TO NEXT LUN BLOCK
 4936 035370  062701  000002                ADD     #2,R1                   ;POINT R1 TO THE NEXT UNIT
 4937 035374  005237  002074                INC     L$LUN                   ;POINTS TO NEXT UNIT NUMBER
 4938 035400  005305                        DEC     R5                      ;ANY UNITS LEFT TO REPORT?
 4939 035402  001402                        BEQ     20$                     ;BRANCH IF NOT
 4940 035404  000137  034252                JMP     1$                      ;ELSE, DO IT AGAIN
 4941 035410  105737  002212          20$:   TSTB    CLOCK                   ;IS THE CLOCK ENABLED
 4942 035414  001421                        BEQ     25$                     ;NO, THEN CAN'T PRINT TIME
 4943 035416                                PRINTF  #TIME,<B,HOURS>,<B,MINUTE>,<B,SECOND>,
      035416  005046                        CLR     -(SP)
      035420  153716  002215                BISB    SECOND,(SP)
      035424  005046                        CLR     -(SP)
      035426  153716  002214                BISB    MINUTE,(SP)
      035432  005046                        CLR     -(SP)
      035434  153716  002213                BISB    HOURS,(SP)
      035440  012746  020044                MOV     #TIME,-(SP)
      035444  012746  000004                MOV     #4,-(SP)
      035450  010600                        MOV     SP,R0
      035452  104417                        TRAP    C$PNTF
      035454  062706  000012                ADD     #12,SP
 4944 035460                          25$:   POP     <R5,R4,R1>              ;RESTORE REGS
 4945 035466                                EXIT    RPT
      035466  000167                        .WORD   J$JMP
      035470  001316                        .WORD   L10007-2-.
 4946
 4958
```

```
                                        ;FORMAT STATEMENTS FOR PRINT CALLS

035472      045     116     000 STAT0:  .ASCIZ  ?%N?
035475      045     116     045 STAT1:  .ASCIZ  ?%N%ASTATISTICAL REPORT FOR UNIT %D1?
035541      045     116     045 STAT2:  .ASCIZ  ?%N%S8%S8%S8%S8%S2%AREAD%S4%S8%AWRITE?
035606      045     116     045 STAT3:  .ASCIZ  ?%N%S8%S8%S8%S6%ACH 1%S4%ACH 2%S4%ACH 1%S4%ACH 2?
035666      045     116     045 STAT4:  .ASCIZ  ?%N%ASOFT DATA ERRORS?
035713      045     116     045 STAT5:  .ASCIZ  ?%N%A  RETRY RECOVERED%S8%D8%D8%D8%D8?
035760      045     116     045 STAT6:  .ASCIZ  ?%N%A  ECC CORRECTED  %S8%D8%D8%S8%A  N.A.?
036032      045     116     045 STAT7:  .ASCIZ  ?%N%AHARD DATA ERRORS %S8%D8%D8%D8%D8?
036077      045     116     045 STAT8:  .ASCIZ  ?%N%ACRC ON ECC BLOCKS%S8%D8%D8%S8%A  N.A.?
036151      045     116     045 STAT9:  .ASCIZ  ?%N%ADATA COMPARE ERRORS  %S8%D8%S8%A      N.A.?
036230      045     116     045 STAT10: .ASCIZ  ?%N%ADATA UNDERRUNS%S7%S7%S7%AN.A.%S6%D8?
036300      045     116     045 STAT11: .ASCIZ  ?%N%ADATA OVERRUNS%S8%S8%D8%S8%A      N.A.?
036352      045     116     045 STAT12: .ASCIZ  ?%N%AMISPOSITIONS %S8%S8%D8%S8%D8?
036413      045     116     045 STAT13: .ASCIZ  ?%N%AOTHERS  %S8%D8?
036436      045     116     045 STAT14: .ASCIZ  ?%N%ADROPS   %S8%D8?
036461      045     116     045 STAT15: .ASCIZ  ?%N%ABYTES WRITTEN   %D3%A,%Z3%A,%Z3%A,%Z3?
036533      045     116     045 STAT16: .ASCIZ  ?%N%ABYTES READ      %D3%A,%Z3%A,%Z3%A,%Z3?
036605      045     116     045 STAT17: .ASCIZ  ?%N%A TRK  PHY BLK  HWR  HRD  SWR  SRD%N?
036655      045     116     045 STAT18: .ASCIZ  ?%N%S2%D2%S3%D5%S3%D3%S2%D3%S2%D3%S2%D3?
036724      045     116     045 TBLFUL::.ASCIZ  ?%N%AUNIT %D1%A MEDIA DATA TABLE HAS OVERFLOWED%N%N?
                                    .EVEN


                                    ENDRPT
037010                          L10007:
037010  104425                      TRAP    C$RPT
```

```
                                .SBTTL  INITIALIZE SECTION

                                ;++
                                ; THE INITIALIZE SECTION CONTAINS THE CODING THAT IS PERFORMED
                                ; AT THE BEGINNING OF EACH PASS.
                                ;--

                                        BGNINIT
                                L$INIT::

                                STINIT::
                                        READEF  #EF.START
037012  012700  000040                  MOV     #EF.START,R0
037016  104447                          TRAP    C$REFG
                                        BCOMPLETE       START
037020  103414                          BCS     START

                                        READEF  #EF.RESTART
037022  012700  000037                  MOV     #EF.RESTART,R0
037026  104447                          TRAP    C$REFG
                                        BCOMPLETE       START
037030  103410                          BCS     START

                                        READEF  #EF.NEW
037032  012700  000035                  MOV     #EF.NEW,R0
037036  104447                          TRAP    C$REFG
                                        BCOMPLETE       NUPASS
037040  103463                          BCS     NUPASS

                                        READEF  #EF.CONTINUE
037042  012700  000036                  MOV     #EF.CONTINUE,R0
037046  104447                          TRAP    C$REFG
                                        BCOMPLETE       NUPASS
037050  103457                          BCS     NUPASS

037052  112737  000001  003564  START:  MOVB    #1,DAYS         ;SET TO FIRST DAY
037060  005037  003522                  CLR     PASCNT          ;CLEAR THE PASS COUNTER
037064  005037  003444                  CLR     CMPERR          ;CLEAR THE COMPARE ERROR COUNTER

037070  012701  002314                  MOV     #LUNO,R1        ;SET R1 TO THE FIRST LUN
037074  010102                  5$:     MOV     R1,R2           ;LET R2 = R1
037076  062702  000156                  ADD     #URSPBF,R2      ;LET R2 = THE END OF THE CLEAR AREA
037102  005021                  10$:    CLR     (R1)+           ;CLEAR THE LUN LOCATION
037104  020201                          CMP     R2,R1           ;ARE WE AT THE END OF THE CLEAR AREA
037106  001375                          BNE     10$             ;NO, KEEP CLEARING
037110  062701  000014                  ADD     #14,R1          ;SET R1 TO THE NEXT LUN BLOCK
037114  022701  003264                  CMP     #PCMDBF,R1      ;HAVE WE DONE THEM ALL
037120  001365                          BNE     5$              ;GO CLEAR THE NEXT LUN BLOCK

037122  005021                  15$:    CLR     (R1)+           ;CLEAR THE LOCATION AND GET THE NEXT
037124  022701  003400                  CMP     #CMDCNT,R1      ;HAVE WE  CLEARED THEM ALL ?
037130  001374                          BNE     15$             ;NO, KEEP GOING

037132  012701  110560                  MOV     #MEDIAS,R1      ;PUT THE STATS TABLE ADDRESS INTO R1
037136  005021                  20$:    CLR     (R1)+           ;CLEAR THE LOCATION AND GET THE NEXT
037140  022701  115620                  CMP     #PATCH,R1       ;HAVE WE  CLEARED THEM ALL ?
037144  001374                          BNE     20$             ;NO, KEEP GOING
```

```
5031
5032 037146  012704  002314              MOV     #LUN0,R4            ;SET R4 TO THE FIRST LUN
5033 037152  013702  002012              MOV     L$UNIT,R2           ;SET UP R2
5034 037156  012764  001233  000136 25$: MOV     #RS1,SED1(R4)       ;SET UP THE SEED IN THE LUN BLOCK
5035 037164  012764  007622  000140      MOV     #RS2,SED2(R4)       ;SET UP THE SEED IN THE LUN BLOCK
5036 037172  012764  000000  000142      MOV     #RS3,SED3(R4)       ;SET UP THE SEED IN THE LUN BLOCK
5037
5038 037200  062704  000172        30$:  ADD     #LUNSTP,R4          ;SET UP THE NEXT LUN BLOCK
5039 037204  005302                      DEC     R2                  ;DECREMENT R2
5040 037206  001363                      BNE     25$                 ;DID YOU DO THEM ALL
5041
5042 037210                       NUPASS: BRESET
     037210  104433                      TRAP    C$RESET
5043 037212  005737  003522              TST     PASCNT              ;IS THIS THE FIRST PASS ?
5044 037216  001403                      BEQ     1$                  ;YES GO CLEAR THE MEDIA TABLE
5045 037220  105737  002226              TSTB    CLRMED              ;ARE WE CLEARING THE MEDIA TABLE ?
5046 037224  001457                      BEQ     25$                 ;NO GET OUT
5047
5048 037226                       1$:
5049 037226  013702  002012              MOV     L$UNIT,R2           ;SET UP R2
5050 037232  022702  000001              CMP     #1,R2               ;IS THERE 1 UNIT ?
5051 037236  001004                      BNE     3$                  ;NO, CHECK AGAIN
5052 037240  012737  005040  003544      MOV     #U1OFF,TBLOFF       ;SET OFFSET FOR 1 UNIT IN TBLOFF
5053 037246  000421                      BR      15$                 ;GO GET STARTED
5054
5055 037250  022702  000002        3$:   CMP     #2,R2               ;IS THERE 2 UNITS ?
5056 037254  001004                      BNE     5$                  ;NO, CHECK AGAIN
5057 037256  012737  002420  003544      MOV     #U2OFF,TBLOFF       ;SET OFFSET FOR 2 UNITS IN TBLOFF
5058 037264  000412                      BR      15$                 ;GO GET STARTED
5059
5060 037266  022702  000003        5$:   CMP     #3,R2               ;IS THERE 3 UNITS ?
5061 037272  001004                      BNE     10$                 ;NO, CHECK AGAIN
5062 037274  012737  001540  003544      MOV     #U3OFF,TBLOFF       ;SET OFFSET FOR 3 UNITS IN TBLOFF
5063 037302  000403                      BR      15$                 ;GO GET STARTED
5064
5065 037304  012737  001210  003544 10$:  MOV     #U4OFF,TBLOFF       ;SET OFFSET FOR 4 UNITS IN TBLOFF
5066
5067 037312  012704  002314        15$:  MOV     #LUN0,R4            ;SET R4 TO THE FIRST LUN
5068 037316  012737  110560  003530      MOV     #MEDIAS,R8          ;PUT THE STAT TABLE ADDRESS IN R8
5069
5070 037324  013764  003530  000130 20$: MOV     R8,TBLTOP(R4)       ;PUT THE TOP TABLE ADDR IN LUN BLOCK
5071 037332  013764  003530  000134      MOV     R8,LSTENT(R4)       ;PUT THE TABLE ENTRY ADDR IN LUN BLOCK
5072 037340  063737  003544  003530      ADD     TBLOFF,R8           ;ADD THE LENGTH FOR EACH UNIT
5073 037346  013764  003530  000132      MOV     R8,TBLBTM(R4)       ;PUT THE TABLE BOTTOM POINTER IN LUNBLK
5074 037354  062704  000172              ADD     #LUNSTP,R4          ;SET UP THE NEXT LUN BLOCK
5075 037360  005302                      DEC     R2                  ;DECREMENT R2
5076 037362  001360                      BNE     20$                 ;DID YOU DO THEM ALL
5077
5078 037364  005037  003516        25$:  CLR     PCFLAG              ;CLEAR THE PROGRAM CONTROL FLAG.
5079 037370  005037  003526              CLR     UEOT                ;CLEAR THE EOT FLAG
5080 037374  013737  002012  003524      MOV     L$UNIT,UDROP        ;SET UP THE DROP UNIT FLAG
5081 037402  005237  003522              INC     PASCNT              ;ADD 1 TO PASS COUNTER
5082 037406  105737  002227              TSTB    MEDTBL              ;IS THE MEDIA TABLE TO BE PRINTED
5083 037412  001003                      BNE     30$                 ;YES, DON'T DO ANYTHING
5084 037414  052737  000100  003516      BIS     #NOMDTB,PCFLAG      ;NO, SET THE PROGRAM CONTROL FLAG BIT
5085
5086 037422  012702  003566        30$:  MOV     #CMDBF1,R2          ;PUT COMMAND BUFFER ADDRESS IN R2
```

```
5087 037426  005022                    35$:  CLR     (R2)+                   ;CLEAR THE BUFFERS
5088 037430  022702  010226                  CMP     #DSRNGO,R2              ;ARE WE AT THE END OF THE BUFFER ?
5089 037434  001374                          BNE     35$                     ;KEPP GOING TILL WE ARE
5090
5091 037436  012704  002314                  MOV     #LUNO,R4                ;SET R4 TO THE FIRST LUN
5092 037442  013702  002012                  MOV     L$UNIT,R2               ;SET UP R2
5093 037446  005001                          CLR     R1                      ;CLEAR R1
5094 037450  005003                          CLR     R3                      ;CLEAR R3
5095
5096 037452  032761  000020  003350  40$:    BIT     #FAIL,DRINUS(R1)        ;HAS THIS DRIVE FAILED ?
5097 037460  001054                          BNE     60$                     ;YES, GET NEXT UNIT
5098
5099 037462  032761  000010  003350  45$:    BIT     #DROP,DRINUS(R1)        ;DID THIS DRIVE DROP LAST TIME
5100 037470  001002                          BNE     50$                     ;YES, KEEP GOING
5101 037472  005064  000032                  CLR     UNDROP(R4)              ;OTHERWISE CLEAR THE DROP COUNTER
5102 037476  012761  000001  003350  50$:    MOV     #AVB,DRINUS(R1)         ;SET UP ALL DRIVES TO AVAILABLE
5103
5104 037504  012764  003572  000014  55$:    MOV     #DCMDBF,CNUSAV(R4)      ;SET UP NEW COMMAND BUFFER SAVE
5105 037512  012764  003572  000016          MOV     #DCMDBF,COLSAV(R4)      ;SET UP OLD COMMAND BUFFER SAVE
5106 037520  016464  000166  000012          MOV     UCDSRG(R4),CMDSSV(R4)   ;SET UP COMMAND DESCRIPTOR SAVE
5107 037526  016464  000156  000020          MOV     URSPBF(R4),RNUSAV(R4)   ;SET UP NEW RESPONSE BUFFER SAVE
5108 037534  016464  000156  000022          MOV     URSPBF(R4),ROLSAV(R4)   ;SET UP OLD RESPONSE BUFFER SAVE
5109
5110 037542  005064  000006                  CLR     CMDSEQ(R4)              ;CLEAR THE COMMAND REFERENCE NUMBER
5111 037546  005064  000034                  CLR     OBJFDL(R4)              ;CLEAR THE LOW OBJECT FIELD
5112 037552  005064  000036                  CLR     OBJFDH(R4)              ;CLEAR THE HIGH OBJECT FIELD
5113 037556  005064  000010                  CLR     SLTUSE(R4)              ;CLEAR THE SLOT IN USE FLAG
5114 037562  010300                          MOV     R3,R0                   ;
5115
5116 037564                                  GPHARD  R0,R0
     037564  104442                          TRAP    C$GPHRD
5117 037566                                  BNCOMPLETE      60$
     037566  103011                          BCC     60$
5118
5119 037570  011064  000000                  MOV     (R0),TKIP(R4)           ;
5120 037574  012064  000002                  MOV     (R0)+,TKSA(R4)          ;
5121 037600  062764  000002  000002          ADD     #2,TKSA(R4)             ;
5122 037606  011064  000004                  MOV     (R0),TKUNIT(R4)         ;
5123
5124 037612  062701  000002          60$:    ADD     #2,R1                   ;SET R1 TO THE NEXT UNIT
5125 037616  062703  000001                  ADD     #1.,R3                  ;GET NEXT UNIT
5126 037622  062704  000172                  ADD     #LUNSTP,R4              ;SET UP THE NEXT LUN BLOCK
5127 037626  005302                          DEC     R2                      ;DECREMENT R2
5128 037630  001310                          BNE     40$                     ;DID YOU DO THEM ALL
5129
5130 037632  042737  000002  003516          BIC     #NCLKFL,PCFLAG          ;GET READY TO TEST FOR CLOCK PRESENT
5131 037640                                  SETVEC  #4,#NOCLK,#PRIOO        ;SET VECTOR 4 IN CASE NO CLOCK
     037640  012746  000000                  MOV     #PRIOO,-(SP)
     037644  012746  021044                  MOV     #NOCLK,-(SP)
     037650  012746  000004                  MOV     #4,-(SP)
     037654  012746  000003                  MOV     #3,-(SP)
     037660  104437                          TRAP    C$SVEC
     037662  062706  000010                  ADD     #10,SP
5132 037666  005737  177546                  TST     KWCSR                   ;IS THE CLOCK THERE ?
5133 037672  000240                          NOP
5134 037674  000240                          NOP
5135
```

```
5136 037676                                    CLRVEC  #4                      ;RETURN VECTOR TO TRAP CATCHER
     037676  012700  000004                    MOV     #4,R0
     037702  104436                            TRAP    C$CVEC
5137 037704  032737  000002  003516            BIT     #NCLKFL,PCFLAG          ;WAS A CLOCK PRESENT ?
5138 037712  001016                            BNE     ISTART                  ;NO CLOCK, START REGULAR INIT
5139 037714                                    SETVEC  #100,#KWHDL,#PRIOO      ;SET UP THE CLOCK VECTOR
     037714  012746  000000                    MOV     #PRIOO,-(SP)
     037720  012746  021100                    MOV     #KWHDL,-(SP)
     037724  012746  000100                    MOV     #100,-(SP)
     037730  012746  000003                    MOV     #3,-(SP)
     037734  104437                            TRAP    C$SVEC
     037736  062706  000010                    ADD     #10,SP
5140 037742  012737  000100  177546            MOV     #100,KWCSR              ;ENABLE THE CLOCK INTERUPTS
5141
5142 037750  005001                  ISTART:   CLR     R1                      ;SET R1 TO FIST UNIT
5143 037752  005037  002074                    CLR     L$LUN                   ;SET L$LUN TO FIRST UNIT
5144 037756  012704  002314                    MOV     #LUNO,R4                ;SET R4 TO THE FIRST LUN BLOCK
5145
5146 037762  032761  000001  003350  1$:       BIT     #AVB,DRINUS(R1)         ;SEE IF DRIVE IS PRESENT AND AVAILABLE
5147 037770  001547                            BEQ     20$                     ;GET THE NEXT DRIVE IF IT ISN'T
5148 037772  032761  000004  003350            BIT     #EOT,DRINUS(R1)         ;CHECK IF THE DRIVE IS AT EOT
5149 040000  001143                            BNE     20$                     ;GET NEXT DRIVE IF IT IS
5150
5151 040002  012764  000377  000010            MOV     #377,SLTUSE(R4)         ;SET ALL RESPONSE SLOTS TO THE PORT
5152 040010  004737  026230                    JSR     PC,PRTCLR               ;GO DO IT
5153 040014  112737  000004  010571            MOVB    #4,CRDLIM               ;CREDITS START AT 4 FOR NEW LUN
5154
5155 040022  012705  040344                    MOV     #INITIT,R5              ;PUT INIT TEST TABLE ADDRESS IN R5
5156 040026  004737  021406                    JSR     PC,CMMDSQ               ;GO DO INIT ON THIS DRIVE
5157 040032  032761  000001  003350            BIT     #AVB,DRINUS(R1)         ;SEE IF DRIVE IS PRESENT AND AVAILABLE
5158 040040  001523                            BEQ     20$                     ;GET THE NEXT DRIVE IF IT ISN'T
5159
5160 040042  012764  000377  000010            MOV     #377,SLTUSE(R4)         ;SET ALL RESPONSE SLOTS TO THE PORT
5161 040050  004737  026230                    JSR     PC,PRTCLR               ;GO DO IT
5162 040054  112737  000004  010571            MOVB    #4,CRDLIM               ;CREDITS START AT 4 FOR NEW LUN
5163 040062  062705  000006                    ADD     #TSTSTP,R5              ;POINT R5 TO THE SCC COMMAND
5164 040066  004737  021406                    JSR     PC,CMMDSQ               ;GO DO SCC ON THIS DRIVE
5165 040072  032761  000001  003350            BIT     #AVB,DRINUS(R1)         ;SEE IF DRIVE IS PRESENT AND AVAILABLE
5166 040100  001503                            BEQ     20$                     ;GET THE NEXT DRIVE IF IT ISN'T
5167
5168 040102  012764  000377  000010  5$:       MOV     #377,SLTUSE(R4)         ;SET ALL RESPONSE SLOTS TO THE PORT
5169 040110  004737  026230                    JSR     PC,PRTCLR               ;GO DO IT
5170 040114  112737  000004  010571            MOVB    #4,CRDLIM               ;CREDITS START AT 4 FOR NEW LUN
5171 040122  062705  000006                    ADD     #TSTSTP,R5              ;POINT R5 TO THE ONL COMMAND
5172 040126  004737  021406                    JSR     PC,CMMDSQ               ;GO DO ONLINE ON THIS DRIVE
5173
5174 040132  012764  000377  000010  10$:      MOV     #377,SLTUSE(R4)         ;SET ALL RESPONSE SLOTS TO THE PORT
5175 040140  004737  026230                    JSR     PC,PRTCLR               ;GO DO IT
5176 040144  112737  000004  010571            MOVB    #4,CRDLIM               ;CREDITS START AT 4 FOR NEW LUN
5177 040152  062705  000006                    ADD     #TSTSTP,R5              ;POINT R5 TO THE GUS COMMAND
5178 040156  012737  000040  003440            MOV     #AVLB,TSTMSK            ;ALLOW UNIT AVAILABLE ERRORS
5179 040164  004737  021406                    JSR     PC,CMMDSQ               ;GO DO GUS ON THIS DRIVE
5180 040170  005037  003440                    CLR     TSTMSK                  ;ALLOW NO ERRORS
5181 040174  032761  000001  003350            BIT     #AVB,DRINUS(R1)         ;SEE IF DRIVE IS PRESENT AND AVAILABLE
5182 040202  001442                            BEQ     20$                     ;GET THE NEXT DRIVE IF IT ISN'T
5183
5184 040204  016403  000022          15$:      MOV     ROLSAV(R4),R3           ;LET R3 = OLD RESPONSE BUFFER POINTER
```

```
5185 040210  162703  000104                SUB     #DRBSTP,R3              ;ADJUST R3 BACK TO THE LAST RESPONCE
5186 040214                                PRINTF  #CONTRV,L$LUN,<B,P.CSVR(R3)>,<B,P.CHVR(R3)>
     040214  005046                        CLR     -(SP)
     040216  156316  000051                BISB    P.CHVR(R3),(SP)
     040222  005046                        CLR     -(SP)
     040224  156316  000050                BISB    P.CSVR(R3),(SP)
     040230  013746  002074                MOV     L$LUN,-(SP)
     040234  012746  020532                MOV     #CONTRV,-(SP)
     040240  012746  000004                MOV     #4,-(SP)
     040244  010600                        MOV     SP,R0
     040246  104417                        TRAP    C$PNTF
     040250  062706  000012                ADD     #12,SP
5187 040254                                PRINTF  #UNITRV,<B,P.USVR(R3)>,<B,P.UHVR(R3)>
     040254  005046                        CLR     -(SP)
     040256  156316  000053                BISB    P.UHVR(R3),(SP)
     040262  005046                        CLR     -(SP)
     040264  156316  000052                BISB    P.USVR(R3),(SP)
     040270  012746  020662                MOV     #UNITRV,-(SP)
     040274  012746  000003                MOV     #3,-(SP)
     040300  010600                        MOV     SP,R0
     040302  104417                        TRAP    C$PNTF
     040304  062706  000010                ADD     #10,SP
5188
5189 040310  022701  000006        20$:    CMP     #6.,R1                  ;HAVE WE DONE THEM ALL ?
5190 040314  001411                        BEQ     EXTINT                  ;GET OUT
5191 040316  062701  000002                ADD     #UNTSTP,R1              ;GET NEXT UNIT
5192 040322  062704  000172                ADD     #LUNSTP,R4              ;SET UP THE NEXT LUN BLOCK
5193 040326  005237  002074                INC     L$LUN                   ;GET NEXT UNIT
5194 040332                                BREAK
     040332  104422                        TRAP    C$BRK
5195 040334  000137  037762                JMP     1$                              ;GO DO THE NEXT ONE
5196
5197 040340                        EXTINT: EXIT    INIT
     040340  104432                        TRAP    C$EXIT
     040342  000032                        .WORD   L10010-.
5198
5199                                       ;INIT TEST TABLE
5200 040344     170                INITIT::        .BYTE   INT     ;INITIALIZATION TABLE
5201 040345     000                             .BYTE   NULPAT
5202 040346  000000                             .WORD   0
5203 040350  000001                             .WORD   1
5204 040352     230                             .BYTE   SCC     ;SET CONTROLLER CHARACTERISTICS TABLE
5205 040353     000                             .BYTE   NULPAT
5206 040354  000000                             .WORD   0
5207 040356  000001                             .WORD   1
5208 040360     140                             .BYTE   ONL     ;ONLINE TABLE
5209 040361     000                             .BYTE   NULPAT
5210 040362  000000                             .WORD   0
5211 040364  000001                             .WORD   1
5212 040366     220                             .BYTE   GUS     ;GET UNIT STATUS TABLE
5213 040367     000                             .BYTE   NULPAT
5214 040370  000000                             .WORD   0
5215 040372  000001                             .WORD   1
5216                                       .EVEN
5217
5218 040374                                ENDINIT
     040374                        L10010:
```

INITIALIZE SECTION

```
        040374  104411                          TRAP    C$INIT
```

```
 5220 040376                          BGNAUTO
      040376                L$AUTO::
 5221 040376                          ENDAUTO
      040376                L10011:
      040376  104461                 TRAP    C$AUTO
```

```
                                        .SBTTL  CLEANUP CODING SECTION
                                        ; THE CLEANUP CODING SECTION CONTAINS THE CODING THAT IS PERFORMED
                                        ; AFTER THE HARDWARE TESTS HAVE BEEN PERFORMED.
                                        ;--

040400                                          BGNCLN
040400                                  L$CLEAN::

040400  032737  000002  003516                  BIT     #NCLKFL,PCFLAG          ;WAS A CLOCK PRESENT ?
040406  001005                                  BNE     5$                      ;NO CLOCK, DO REPORT
040410  005037  177546                          CLR     KWCSR
040414                                          CLRVEC  #100
040414  012700  000100                          MOV     #100,R0
040420  104436                                  TRAP    C$CVEC
040422                                  5$:     DORPT
040422  104424                                  TRAP    C$DRPT
040424  032737  000400  003516                  BIT     #DROPIT,PCFLAG
040432  001003                                  BNE     EXTCLN
040434  042737  000100  003516                  BIC     #NOMDTB,PCFLAG
040442                                  EXTCLN: EXIT    CLN
040442  104432                                  TRAP    C$EXIT
040444  000002                                  .WORD   L10012-.

                                        .EVEN

040446                                          ENDCLN
040446                                  L10012:
040446  104412                                  TRAP    C$CLEAN
```

```
                                .SBTTL  DROP UNIT SECTION

                                ;++
                                ; THE DROP-UNIT SECTION CONTAINS THE CODING THAT CAUSES A DEVICE
                                ; TO NO LONGER BE TESTED.
                                ;--

040450                          DROPUN::
040450                                  PUSH    <R1>                    ;SAVE R1
040450  010146                         MOV     R1,-(SP)        ;;PUSH R1 ON STACK
040452  010001                         MOV     R0,R1                   ;POINT R1 TO THE DRINUS TABLE
040454  006101                         ROL     R1                      ;MULTIPLY BY 2
040456  005264  000104                 INC     DROPPD(R4)              ;INC DROPPED FLAG FOR THIS UNIT
040462  052737  000400  003516         BIS     #DROPIT,PCFLAG          ;SET THE UNIT DROP FLAG
040470                                  PUSH    <R0>                    ;SAVE R0
040470  010046                         MOV     R0,-(SP)        ;;PUSH R0 ON STACK
040472                                  DORPT                           ;GO PRINT UNIT STATS
040472  104424                         TRAP    C$DRPT
040474                                  POP     <R0>                    ;RESTORE R0
040474  012600                         MOV     (SP)+,R0        ;;POP STACK INTO R0
040476  042737  000400  003516         BIC     #DROPIT,PCFLAG          ;CLEAR THE DROP FLAG
040504  105737  002230                 TSTB    NOCLR                   ;DO WE WANT TO CLEAR STATS ON ERROR ?
040510  001415                         BEQ     3$                      ;NO, DON'T CLEAR THE STATS
040512                                  PUSH    <R2,R3>
040512  010246                         MOV     R2,-(SP)        ;;PUSH R2 ON STACK
040514  010346                         MOV     R3,-(SP)        ;;PUSH R3 ON STACK
040516  012702  000040                 MOV     #S1READ,R2              ;STARTING ADDRESS OF STATS IN R2
040522  012703  000130                 MOV     #TBLTOP,R3              ;END ADDRESS OF STATS IN R3
040526  060402                         ADD     R4,R2                   ;ADD THE LUN BLOCK ADDRESS TO R2
040530  060403                         ADD     R4,R3                   ;ADD THE LUN BLOCK ADDRESS TO R3
040532  005022                 2$:     CLR     (R2)+                   ;CLEAR THE LOCATION
040534  020203                         CMP     R2,R3                   ;ARE WE AT THE END OF THE STATS
040536  001375                         BNE     2$                      ;NO, KEEP CLEARING
040540                                  POP     <R3,R2>
040540  012603                         MOV     (SP)+,R3        ;;POP STACK INTO R3
040542  012602                         MOV     (SP)+,R2        ;;POP STACK INTO R2
040544  042761  000001  003350 3$:     BIC     #AVB,DRINUS(R1)         ;CLEAR THE AVB BIT IN DRIVE IN USE TABLE
040552  032761  000004  003350         BIT     #EOT,DRINUS(R1)         ;IS THE DRIVE AT EOT ?
040560  001404                         BEQ     5$                      ;BRANCH IF NOT
040562  042761  000004  003350         BIC     #EOT,DRINUS(R1)         ;CLEAR THE EOT BIT IN DRIVE IN USE TABLE
040570  000402                         BR      10$                     ;GET OUT
040572  005337  003524         5$:     DEC     UDROP                   ;SUBTRACT 1 TO DROPPED FLAG
040576  052761  000010  003350 10$:    BIS     #DROP,DRINUS(R1)        ;SET DRIVE IN USE TABLE TO DROPPED
040604  005264  000032                 INC     UNDROP(R4)              ;ADD 1 TO THE UNIT DROP COUNT
040610  022764  000012  000032         CMP     #10.,UNDROP(R4)         ;DO WE HAVE 10. ERRORS ?
040616  001004                         BNE     15$                     ;NO, GET OUT
040620  052761  000020  003350         BIS     #FAIL,DRINUS(R1)        ;SET THE DRIVE TO FAIL
040626                                  DODU    R0
040626  104451                         TRAP    C$DODU
040630  005037  003406         15$:    CLR     RESPON                  ;CLEAR THE RESPONSE STATUS
040634                                  POP     <R1>                    ;RESTORE R1
040634  012601                         MOV     (SP)+,R1        ;;POP STACK INTO R1
040636                                  DELAY   20.                     ;DELAY FOR AWHILE
040636  012727  000024                 MOV     #20.,(PC)+
040642  000000                         .WORD   0
040644  013727  002116                 MOV     L$DLY,(PC)+
040650  000000                         .WORD   0
```

```
                040652  005367  177772                  DEC     -6(PC)
                040656  001375                          BNE     .-4
                040660  005367  177756                  DEC     -22(PC)
                040664  001367                          BNE     .-20
     5305       040666  010174  000000                  MOV     R1,@TKIP(R4)            ;FLUSH THE DRIVE
     5306       040672  012764  000377  000010          MOV     #377,SLTUSE(R4)         ;SET ALL RESPONCE SLOTS TO PORT
     5307       040700  004737  026230                  JSR     PC,PRTCLR               ;GO CLEAR THE PORT
     5308       040704  000207                          RTS     PC                      ;RETURN
     5309
     5310
     5311       040706                                  BGNDU
                040706                          L$DU::
     5312       040706                                  EXIT    DU
                040706  000167                          .WORD   J$JMP
                040710  000000                          .WORD   L10013-2-.
     5313
     5325
     5326                                               .EVEN
     5327
     5328       040712                                  ENDDU
                040712                          L10013:
                040712  104453                          TRAP    C$DU
```

```
 5330                                   .SBTTL  ADD UNIT SECTION
 5331
 5332                                   ;++
 5333                                   ; THE ADD-UNIT SECTION CONTAINS ANY CODE THE PROGRAMMER WISHES
 5334                                   ;  TO BE EXECUTED IN CONJUNCTION WITH THE ADDING OF A UNIT BACK
 5335                                   ;  TO THE TEST CYCLE.
 5336                                   ;--
 5337
 5338 040714                                   BGNAU
      040714                            L$AU::
 5339
 5345
 5346 040714                                   EXIT    AU
      040714  000167                          .WORD   J$JMP
      040716  000000                          .WORD   L10014-2-.
 5347
 5359
 5360                                          .EVEN
 5361
 5362 040720                                   ENDAU
      040720                            L10014:
      040720  104452                         TRAP    C$AU
 5363
 5364 040722                                   ENDMOD
 5365
```

```
 5368
 5369                                   .TITLE HARDWARE TESTS
 5380
 5381                                   .SBTTL  TEST 1: Basic Function Test
 5417
 5418 040722                                   BGNMOD
 5419
 5420                                   ;++
 5421                                   ;This test will execute a subset of the  legal  commands  on  the  unit
 5422                                   ;under  test.   It  serves as a quick verify test to ascertain that the
 5423                                   ;unit can move tape and write/read  predictably,  without  error.  The
 5424                                   ;subset of legal commands will be issued in a coherent manner.
 5425                                   ;--
 5426
 5433
 5439
 5440 040722                                   BGNTST
      040722                           T1::
 5441 040722  105737  002234                    TSTB    T3ONLY                  ;CHECK THE TEST 3 ONLY FLAG
 5442 040726  001414                            BEQ     START1                  ;BRANCH IF IT IS CLEAR
 5443 040730                                    PRINTF  #BYPASS,L$TEST          ;PRINT THE TEST BYPASSED MESSAGE
      040730  013746  002114                    MOV     L$TEST,-(SP)
      040734  012746  021001                    MOV     #BYPASS,-(SP)
      040740  012746  000002                    MOV     #2,-(SP)
      040744  010600                            MOV     SP,R0
      040746  104417                            TRAP    C$PNTF
      040750  062706  000006                    ADD     #6,SP
 5444 040754  000137  042632                    JMP     T1EXIT                  ;JUMP IF IT IS NOT CLEAR
 5445
 5446 040760  005737  003524            START1: TST     UDROP                   ;HAVE ALL UNITS BEEN DROPPED ?
 5447 040764  001014                            BNE     5$                      ;NO, CONTINUE
 5448 040766                                    PRINTF  #BYPASS,L$TEST          ;PRINT THE TEST BYPASSED MESSAGE
      040766  013746  002114                    MOV     L$TEST,-(SP)
      040772  012746  021001                    MOV     #BYPASS,-(SP)
      040776  012746  000002                    MOV     #2,-(SP)
      041002  010600                            MOV     SP,R0
      041004  104417                            TRAP    C$PNTF
      041006  062706  000006                    ADD     #6,SP
 5449 041012  000137  042632                    JMP     T1EXIT                  ;GET OUT IF NONE LEFT TO TEST
 5450
 5451 041016  105737  002212            5$:     TSTB    CLOCK                   ;IS THE CLOCK ENABLED
 5452 041022  001421                            BEQ     G01                     ;NO, THEN CAN'T PRINT TIME
 5453 041024                                    PRINTF  #TIME,<B,HOURS>,<B,MINUTE>,<B,SECOND>,
      041024  005046                            CLR     -(SP)
      041026  153716  002215                    BISB    SECOND,(SP)
      041032  005046                            CLR     -(SP)
      041034  153716  002214                    BISB    MINUTE,(SP)
      041040  005046                            CLR     -(SP)
      041042  153716  002213                    BISB    HOURS,(SP)
      041046  012746  020044                    MOV     #TIME,-(SP)
      041052  012746  000004                    MOV     #4,-(SP)
      041056  010600                            MOV     SP,R0
      041060  104417                            TRAP    C$PNTF
      041062  062706  000012                    ADD     #12,SP
 5454
 5455 041066  004737  033464            G01:    JSR     PC,CLREOT               ;MAKE SURE EOT STATUS IS CLEAR
 5456 041072  012737  000100  003440            MOV     #ONLB,TSTMSK            ;ALLOW ALREADY ONLINE STATUS
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5457
5458 041100  012705  042636          MOV     #T1ONL,R5       ;SET UP TO DO AN ONLINE
5459 041104  004737  021240          JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5460 041110  005737  003524          TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5461 041114  001002                  BNE     5$              ;NO, CONTINUE
5462 041116  000137  042632          JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5463
5464 041122  005037  003440    5$:   CLR     TSTMSK          ;ALLOW NO ERRORS
5465 041126  012705  042644          MOV     #T1REW,R5       ;SET UP TO DO A REWIND
5466 041132  004737  021240          JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5467 041136  005737  003524          TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5468 041142  001002                  BNE     10$             ;NO, CONTINUE
5469 041144  000137  042632          JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5470
5471 041150  012705  042652   10$:   MOV     #T1LEOT,R5      ;SET UP TO DO 2 TAPE MARK COMMANDS
5472 041154  004737  021240          JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5473 041160  005737  003524          TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5474 041164  001002                  BNE     15$             ;NO, CONTINUE
5475 041166  000137  042632          JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5476
5477 041172  012705  042674   15$:   MOV     #T1SKR,R5       ;SET UP TO SKIP REVERSE 2 TAPE MARKS
5478 041176  004737  021240          JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5479 041202  005737  003524          TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5480 041206  001002                  BNE     20$             ;NO, CONTINUE
5481 041210  000137  042632          JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5482
5483 041214  052737  000001  003440 20$:   BIS     #LEDB,TSTMSK    ;SET UP TO ALLOW LEOT DETECTED
5484 041222  012705  043004          MOV     #T1SKD,R5       ;SET UP TO DO A SPACE TO LEOT
5485 041226  004737  021240          JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5486 041232  042737  000001  003440 BIC     #LEDB,TSTMSK    ;DISALLOW LEOT DETECTED
5487 041240  005737  003524          TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5488 041244  001002                  BNE     25$             ;NO, CONTINUE
5489 041246  000137  042632          JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5490
5491 041252  012705  042644   25$:   MOV     #T1REW,R5       ;SET UP TO DO A REWIND
5492 041256  004737  021240          JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5493 041262  005737  003524          TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5494 041266  001002                  BNE     30$             ;NO, CONTINUE
5495 041270  000137  042632          JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5496
5497 041274  012705  043012   30$:   MOV     #T1WR1,R5       ;WRITE 99, 512 BYTE RECORDS
5498 041300  004737  033564          JSR     PC,SDSTUP       ;RESET THE RANDOM SEEDS
5499 041304  004737  021240          JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5500 041310  005737  003524          TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5501 041314  001002                  BNE     35$             ;NO, CONTINUE
5502 041316  000137  042632          JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5503
5504 041322  012705  042660   35$:   MOV     #T1WTM,R5       ;SET UP TO WRITE A TAPE MARK
5505 041326  004737  021240          JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5506 041332  005737  003524          TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5507 041336  001002                  BNE     40$             ;NO, CONTINUE
5508 041340  000137  042632          JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5509
5510 041344  012705  043020   40$:   MOV     #T1WR2,R5       ;WRITE 84, 525 BYTE RECORDS
5511 041350  004737  033564          JSR     PC,SDSTUP       ;RESET THE RANDOM SEEDS
5512 041354  004737  021240          JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5513 041360  005737  003524          TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
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5514 041364  001002                    BNE     45$             ;NO, CONTINUE
5515 041366  000137  042632             JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5516
5517 041372  012705  042660    45$:    MOV     #T1WTM,R5       ;SET UP TO WRITE A TAPE MARK
5518 041376  004737  021240             JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5519 041402  005737  003524             TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5520 041406  001002                    BNE     50$             ;NO, CONTINUE
5521 041410  000137  042632             JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5522
5523 041414  012705  043026    50$:    MOV     #T1WR3,R5       ;WRITE 69, 1038 BYTE RECORDS
5524 041420  004737  033564             JSR     PC,SDSTUP       ;RESET THE RANDOM SEEDS
5525 041424  004737  021240             JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5526 041430  005737  003524             TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5527 041434  001002                    BNE     55$             ;NO, CONTINUE
5528 041436  000137  042632             JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5529
5530 041442  012705  042660    55$:    MOV     #T1WTM,R5       ;SET UP TO WRITE A TAPE MARK
5531 041446  004737  021240             JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5532 041452  005737  003524             TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5533 041456  001002                    BNE     60$             ;NO, CONTINUE
5534 041460  000137  042632             JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5535
5536 041464  012705  043034    60$:    MOV     #T1WR4,R5       ;WRITE 54, 1551 BYTE RECORDS
5537 041470  004737  033564             JSR     PC,SDSTUP       ;RESET THE RANDOM SEEDS
5538 041474  004737  021240             JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5539 041500  005737  003524             TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5540 041504  001002                    BNE     65$             ;NO, CONTINUE
5541 041506  000137  042632             JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5542
5543 041512  012705  042660    65$:    MOV     #T1WTM,R5       ;SET UP TO WRITE A TAPE MARK
5544 041516  004737  021240             JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5545 041522  005737  003524             TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5546 041526  001002                    BNE     70$             ;NO, CONTINUE
5547 041530  000137  042632             JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5548
5549 041534  012705  043042    70$:    MOV     #T1WR5,R5       ;WRITE 39, 2064 BYTE RECORDS
5550 041540  004737  033564             JSR     PC,SDSTUP       ;RESET THE RANDOM SEEDS
5551 041544  004737  021240             JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5552 041550  005737  003524             TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5553 041554  001002                    BNE     75$             ;NO, CONTINUE
5554 041556  000137  042632             JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5555
5556 041562  012705  042660    75$:    MOV     #T1WTM,R5       ;SET UP TO WRITE A TAPE MARK
5557 041566  004737  021240             JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5558 041572  005737  003524             TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5559 041576  001002                    BNE     80$             ;NO, CONTINUE
5560 041600  000137  042632             JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5561
5562 041604  012705  043050    80$:    MOV     #T1WR6,R5       ;WRITE 24, 2577 BYTE RECORDS
5563 041610  004737  033564             JSR     PC,SDSTUP       ;RESET THE RANDOM SEEDS
5564 041614  004737  021240             JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5565 041620  005737  003524             TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5566 041624  001002                    BNE     85$             ;NO, CONTINUE
5567 041626  000137  042632             JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5568
5569 041632  012705  042652    85$:    MOV     #T1LEOT,R5      ;SET UP TO WRITE LOGICAL END OF TAPE
5570 041636  004737  021240             JSR     PC,SCHED        ;GO ISSUE THE COMMAND
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5571 041642  005737  003524            TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5572 041646  001002                    BNE     90$             ;NO, CONTINUE
5573 041650  000137  042632            JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5574
5575 041654  012705  042644    90$:    MOV     #T1REW,R5       ;SET UP TO REWIND
5576 041660  004737  021240            JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5577 041664  005737  003524            TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5578 041670  001002                    BNE     95$             ;NO, CONTINUE
5579 041672  000137  042632            JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5580
5581 041676  012705  043056    95$:    MOV     #T1RD1,R5       ;SET UP TO READ 100 RECORDS
5582 041702  004737  033564            JSR     PC,SDSTUP       ;RESET THE RANDOM SEEDS
5583 041706  004737  021240            JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5584 041712  005737  003524            TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5585 041716  001002                    BNE     100$            ;NO, CONTINUE
5586 041720  000137  042632            JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5587
5588 041724  012705  042666   100$:    MOV     #T1SKP,R5       ;SET UP TO SKIP A TAPE MARK
5589 041730  004737  021240            JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5590 041734  005737  003524            TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5591 041740  001002                    BNE     105$            ;NO, CONTINUE
5592 041742  000137  042632            JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5593
5594 041746  012705  042702   105$:    MOV     #T1SPC1,R5      ;SET UP TO SPACE 84 RECORDS
5595 041752  004737  021240            JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5596 041756  005737  003524            TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5597 041762  001002                    BNE     110$            ;NO, CONTINUE
5598 041764  000137  042632            JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5599
5600 041770  012705  042666   110$:    MOV     #T1SKP,R5       ;SET UP TO SKIP A TAPE MARK
5601 041774  004737  021240            JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5602 042000  005737  003524            TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5603 042004  001002                    BNE     115$            ;NO, CONTINUE
5604 042006  000137  042632            JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5605
5606 042012  012705  042710   115$:    MOV     #T1SPC2,R5      ;SET UP TO SPACE 69 RECORDS
5607 042016  004737  021240            JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5608 042022  005737  003524            TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5609 042026  001002                    BNE     120$            ;NO, CONTINUE
5610 042030  000137  042632            JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5611
5612 042034  012705  042724   120$:    MOV     #T1SP01,R5      ;SET UP TO SPACE 56 OBJECTS
5613 042040  004737  021240            JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5614 042044  005737  003524            TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5615 042050  001002                    BNE     125$            ;NO, CONTINUE
5616 042052  000137  042632            JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5617
5618 042056  012705  043106   125$:    MOV     #T1RD5,R5       ;SET UP TO READ 39 RECORDS
5619 042062  004737  033564            JSR     PC,SDSTUP       ;RESET THE RANDOM SEEDS
5620 042066  004737  021240            JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5621 042072  005737  003524            TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5622 042076  001002                    BNE     130$            ;NO, CONTINUE
5623 042100  000137  042632            JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5624
5625 042104  012705  042732   130$:    MOV     #T1SKR1,R5      ;SET UP TO SKIP REVERSE 4 TAPE MARKS
5626 042110  004737  021240            JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5627 042114  005737  003524            TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
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5628 042120  001002                    BNE     135$            ;NO, CONTINUE
5629 042122  000137  042632            JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5630
5631 042126  012705  042666  135$:     MOV     #T1SKP,R5       ;SET UP TO SKIP TAPE MARK FORWARD
5632 042132  004737  021240            JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5633 042136  005737  003524            TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5634 042142  001002                    BNE     140$            ;NO, CONTINUE
5635 042144  000137  042632            JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5636
5637 042150  012705  043064  140$:     MOV     #T1RD2,R5       ;SET UP TO READ 84 RECORDS
5638 042154  004737  033564            JSR     PC,SDSTUP       ;RESET THE RANDOM SEEDS
5639 042160  004737  021240            JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5640 042164  005737  003524            TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5641 042170  001002                    BNE     145$            ;NO, CONTINUE
5642 042172  000137  042632            JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5643
5644 042176  012705  042740  145$:     MOV     #T1SP02,R5      ;SET UP TO SPACE 71 OBJECTS
5645 042202  004737  021240            JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5646 042206  005737  003524            TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5647 042212  001002                    BNE     150$            ;NO, CONTINUE
5648 042214  000137  042632            JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5649
5650 042220  012705  043100  150$:     MOV     #T1RD4,R5       ;SET UP TO READ 54 RECORDS
5651 042224  004737  033564            JSR     PC,SDSTUP       ;RESET THE RANDOM SEEDS
5652 042230  004737  021240            JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5653 042234  005737  003524            TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5654 042240  001002                    BNE     155$            ;NO, CONTINUE
5655 042242  000137  042632            JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5656
5657 042246  012705  042746  155$:     MOV     #T1SP03,R5      ;SET UP TO SPACE 66 OBJECTS
5658 042252  004737  021240            JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5659 042256  005737  003524            TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5660 042262  001002                    BNE     160$            ;NO, CONTINUE
5661 042264  000137  042632            JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5662
5663 042270  012705  042754  160$:     MOV     #T1SPR1,R5      ;SET UP TO SPACE REVERSE 375 OBJECTS
5664 042274  004737  021240            JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5665 042300  005737  003524            TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5666 042304  001002                    BNE     165$            ;NO, CONTINUE
5667 042306  000137  042632            JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5668
5669 042312  012705  042762  165$:     MOV     #T1SKP1,R5      ;SET UP TO SKIP FORWARD 4 TAPE MARKS
5670 042316  004737  021240            JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5671 042322  005737  003524            TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5672 042326  001002                    BNE     170$            ;NO, CONTINUE
5673 042330  000137  042632            JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5674
5675 042334  012705  042716  170$:     MOV     #T1SPC3,R5      ;SET UP TO SPACE 39 RECORDS
5676 042340  004737  021240            JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5677 042344  005737  003524            TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5678 042350  001002                    BNE     175$            ;NO, CONTINUE
5679 042352  000137  042632            JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5680
5681 042356  012705  042666  175$:     MOV     #T1SKP,R5       ;SET UP TO SKIP A TAPE MARK
5682 042362  004737  021240            JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5683 042366  005737  003524            TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5684 042372  001002                    BNE     180$            ;NO, CONTINUE
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5685 042374  000137  042632                    JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5686
5687 042400  012705  043114          180$:     MOV     #T1RD6,R5       ;SET UP TO READ B24 RECORDS
5688 042404  004737  033564                    JSR     PC,SDSTUP       ;RESET THE RANDOM SEEDS
5689 042410  004737  021240                    JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5690 042414  005737  003524                    TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5691 042420  001002                            BNE     185$            ;NO, CONTINUE
5692 042422  000137  042632                    JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5693
5694 042426  012705  042770          185$:     MOV     #T1SKP2,R5      ;SET UP TO SKIP 2 TAPE MARKS
5695 042432  004737  021240                    JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5696 042436  005737  003524                    TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5697 042442  001002                            BNE     190$            ;NO, CONTINUE
5698 042444  000137  042632                    JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5699
5700 042450  012705  042776          190$:     MOV     #T1SPR2,R5      ;SET UP TO SPACE REVERSE 192 OBJECTS
5701 042454  004737  021240                    JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5702 042460  005737  003524                    TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5703 042464  001002                            BNE     195$            ;NO, CONTINUE
5704 042466  000137  042632                    JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5705
5706 042472  012705  042666          195$:     MOV     #T1SKP,R5       ;SET UP TO SKIP A TAPE MARK
5707 042476  004737  021240                    JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5708 042502  005737  003524                    TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5709 042506  001002                            BNE     200$            ;NO, CONTINUE
5710 042510  000137  042632                    JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5711
5712 042514  012705  043072          200$:     MOV     #T1RD3,R5       ;SET UP TO READ 69 RECORDS
5713 042520  004737  033564                    JSR     PC,SDSTUP       ;RESET THE RANDOM SEEDS
5714 042524  004737  021240                    JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5715 042530  005737  003524                    TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5716 042534  001002                            BNE     205$            ;NO, CONTINUE
5717 042536  000137  042632                    JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5718
5719 042542  012705  042644          205$:     MOV     #T1REW,R5       ;SET UP TO REWIND
5720 042546  004737  021240                    JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5721 042552  005737  003524                    TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5722 042556  001002                            BNE     210$            ;NO, CONTINUE
5723 042560  000137  042632                    JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5724
5725 042564  052737  000001  003440  210$:     BIS     #LEDB,TSTMSK    ;SET UP TO ALLOW LEOT DETECTED
5726 042572  012705  043004                    MOV     #T1SKD,R5       ;SET UP TO SKIP TO LEOT
5727 042576  004737  021240                    JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5728 042602  042737  000001  003440          BIC     #LEDB,TSTMSK    ;DISALLOW LEOT DETECTED
5729 042610  005737  003524                    TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5730 042614  001002                            BNE     215$            ;NO, CONTINUE
5731 042616  000137  042632                    JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5732
5733 042622  012705  042644          215$:     MOV     #T1REW,R5       ;SET UP TO REWIND
5734 042626  004737  021240                    JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5735
5736 042632                          T1EXIT:   EXIT    TST
     042632  104432                            TRAP    C$EXIT
     042634  000266                            .WORD   L10015-.
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5738
5739 042636     140            T1ONL:  .BYTE   ONL             ;ONLINE COMMAND
5740 042637     000                    .BYTE   NULPAT          ;NO DATA NEEDED
5741 042640  000000                    .WORD   0               ;NO ITEM COUNT
5742 042642  000001                    .WORD   1               ;DO IT ONE TIME
5743
5744 042644     160            T1REW:  .BYTE   REW             ;REWIND COMMAND
5745 042645     000                    .BYTE   NULPAT          ;NO DATA NEEDED
5746 042646  000000                    .WORD   0               ;NO ITEM COUNT
5747 042650  000001                    .WORD   1               ;DO IT ONE TIME
5748
5749 042652     100            T1LEOT: .BYTE   WTM             ;WRITE TAPE MARK
5750 042653     000                    .BYTE   NULPAT          ;NO DATA NEEDED
5751 042654  000000                    .WORD   0               ;NO ITEM COUNT
5752 042656  000002                    .WORD   2               ;DO IT TWICE
5753
5754 042660     100            T1WTM:  .BYTE   WTM             ;WRITE TAPE MARK
5755 042661     000                    .BYTE   NULPAT          ;NO DATA NEEDED
5756 042662  000000                    .WORD   0               ;NO ITEM COUNT
5757 042664  000001                    .WORD   1               ;DO IT ONE TIME
5758
5759 042666     060            T1SKP:  .BYTE   SKP             ;SKIP TAPE MARK
5760 042667     000                    .BYTE   NULPAT          ;NO DATA NEEDED
5761 042670  000001                    .WORD   1               ;SKIP 1 TAPE MARK
5762 042672  000001                    .WORD   1               ;DO IT ONE TIME
5763
5764 042674     061            T1SKR:  .BYTE   SKR             ;SKIP TAPE MARK REVERSE
5765 042675     000                    .BYTE   NULPAT          ;NO DATA NEEDED
5766 042676  000002                    .WORD   2               ;SKIP REVERSE 2 TAPE MARKS
5767 042700  000001                    .WORD   1               ;DO IT ONCE
5768
5769 042702     050            T1SPC1: .BYTE   SPC             ;SPACE RECORDS
5770 042703     000                    .BYTE   NULPAT          ;NO DATA NEEDED
5771 042704  000124                    .WORD   84.             ;SPACE 84 RECORDS
5772 042706  000001                    .WORD   1               ;DO IT ONE TIME
5773
5774 042710     050            T1SPC2: .BYTE   SPC             ;SPACE RECORDS
5775 042711     000                    .BYTE   NULPAT          ;NO DATA NEEDED
5776 042712  000105                    .WORD   69.             ;SPACE 69 RECORDS
5777 042714  000001                    .WORD   1               ;DO IT ONE TIME
5778
5779 042716     050            T1SPC3: .BYTE   SPC             ;SPACE RECORDS
5780 042717     000                    .BYTE   NULPAT          ;NO DATA NEEDED
5781 042720  000047                    .WORD   39.             ;SPACE 39 RECORDS
5782 042722  000001                    .WORD   1               ;DO IT ONE TIME
5783
5784 042724     070            T1SPO1: .BYTE   SPO             ;SPACE OBJECTS
5785 042725     000                    .BYTE   NULPAT          ;NO DATA NEEDED
5786 042726  000070                    .WORD   56.             ;SPACE 56 OBJECTS
5787 042730  000001                    .WORD   1               ;DO IT ONE TIME
5788
5789 042732     061            T1SKR1: .BYTE   SKR             ;SKIP TAPE MARK REVERSE
5790 042733     000                    .BYTE   NULPAT          ;NO DATA NEEDED
5791 042734  000004                    .WORD   4               ;4 TAPE MARKS
5792 042736  000001                    .WORD   1               ;DO IT ONCE
5793
5794 042740     070            T1SPO2: .BYTE   SPO             ;SPACE OBJECTS
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5795 042741     000                     .BYTE   NULPAT          ;NO DATA NEEDED
5796 042742  000107                     .WORD   71.             ;SPACE 71 OBJECTS
5797 042744  000001                     .WORD   1               ;DO IT ONE TIME
5798
5799 042746     070             T1SP03: .BYTE   SPO             ;SPACE OBJECTS
5800 042747     000                     .BYTE   NULPAT          ;NO DATA NEEDED
5801 042750  000102                     .WORD   66.             ;SPACE 66 OBJECTS
5802 042752  000001                     .WORD   1               ;DO IT ONE TIME
5803
5804 042754     071             T1SPR1: .BYTE   SPR             ;SPACE OBJECTS REVERSE
5805 042755     000                     .BYTE   NULPAT          ;NO DATA NEEDED
5806 042756  000567                     .WORD   375.            ;SPACE 375 OBJECTS
5807 042760  000001                     .WORD   1               ;DO IT ONE TIME
5808
5809 042762     060             T1SKP1: .BYTE   SKP             ;SKIP TAPE MARKS
5810 042763     000                     .BYTE   NULPAT          ;NO DATA NEEDED
5811 042764  000004                     .WORD   4.              ;SKIP 4 TAPE MARKS
5812 042766  000001                     .WORD   1               ;DO IT ONE TIME
5813
5814 042770     060             T1SKP2: .BYTE   SKP             ;SKIP TAPE MARKS
5815 042771     000                     .BYTE   NULPAT          ;NO DATA NEEDED
5816 042772  000002                     .WORD   2.              ;SKIP 2 TAPE MARKS
5817 042774  000001                     .WORD   1               ;DO IT ONE TIME
5818
5819 042776     071             T1SPR2: .BYTE   SPR             ;SPACE OBJECTS REVERSE
5820 042777     000                     .BYTE   NULPAT          ;NO DATA NEEDED
5821 043000  000300                     .WORD   192.            ;SPACE 192 OBJECTS
5822 043002  000001                     .WORD   1               ;DO IT ONE TIME
5823
5824 043004     062             T1SKD:  .BYTE   SKD             ;SKIP TO LEOT
5825 043005     000                     .BYTE   NULPAT          ;NO DATA NEEDED
5826 043006  000004                     .WORD   4               ;NO ITEM COUNT
5827 043010  000001                     .WORD   1               ;DO IT ONE TIME
5828
5829 043012     020             T1WR1:  .BYTE   WR              ;WRITE RECORD
5830 043013     001                     .BYTE   PAT1            ;DATA PATERN 1 (ALL 1'S)
5831 043014  000026                     .WORD   22.             ;BYTE COUNT OF 512.
5832 043016  000143                     .WORD   99.             ;DO IT 99 TIMES
5833
5834 043020     020             T1WR2:  .BYTE   WR              ;WRITE RECORD
5835 043021     002                     .BYTE   PAT2            ;DATA PATERN 2 (ALL 0'S)
5836 043022  001015                     .WORD   525.            ;BYTE COUNT OF 525
5837 043024  000124                     .WORD   84.             ;DO IT 84 TIMES
5838
5839 043026     020             T1WR3:  .BYTE   WR              ;WRITE RECORD
5840 043027     003                     .BYTE   PAT3            ;DATA PATERN 3 (WORST MFM)
5841 043030  002016                     .WORD   1038.           ;BYTE COUNT OF 1038
5842 043032  000105                     .WORD   69.             ;DO IT 69 TIMES
5843
5844 043034     020             T1WR4:  .BYTE   WR              ;WRITE RECORD
5845 043035     004                     .BYTE   PAT4            ;DATA PATERN 4 (ALTERNATE 1'S AND 0'S)
5846 043036  003017                     .WORD   1551.           ;BYTE COUNT OF 1551
5847 043040  000066                     .WORD   54.             ;DO IT 54 TIMES
5848
5849 043042     020             T1WR5:  .BYTE   WR              ;WRITE RECORD
5850 043043     003                     .BYTE   PAT3            ;DATA PATERN 3 (WORST MFM)
5851 043044  004020                     .WORD   2064.           ;BYTE COUNT OF 2064
```

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 5852 043046  000047                    .WORD   39.             ;DO IT 39 TIMES
 5853
 5854 043050     020            T1WR6:  .BYTE   WR              ;WRITE RECORD
 5855 043051     001                    .BYTE   PAT1            ;DATA PATERN 1 (ALL 1'S)
 5856 043052  005021                    .WORD   2577.           ;BYTE COUNT OF 2577
 5857 043054  000030                    .WORD   24.             ;DO IT 24 TIMES
 5858
 5859 043056     010            T1RD1:  .BYTE   RD              ;READ RECORD
 5860 043057     001                    .BYTE   PAT1            ;DATA PATERN 1 (ALL 1'S)
 5861 043060  000026                    .WORD   22.             ;BYTE COUNT OF 512.
 5862 043062  000143                    .WORD   99.             ;DO IT 99 TIMES
 5863
 5864 043064     010            T1RD2:  .BYTE   RD              ;READ RECORD
 5865 043065     002                    .BYTE   PAT2            ;DATA PATERN 2 (ALL 0'S)
 5866 043066  001015                    .WORD   525.            ;BYTE COUNT OF 525
 5867 043070  000124                    .WORD   84.             ;DO IT 84 TIMES
 5868
 5869 043072     010            T1RD3:  .BYTE   RD              ;READ RECORD
 5870 043073     003                    .BYTE   PAT3            ;DATA PATERN 3 (WORST MFM)
 5871 043074  002016                    .WORD   1038.           ;BYTE COUNT OF 1038
 5872 043076  000105                    .WORD   69.             ;DO IT 69 TIMES
 5873
 5874 043100     010            T1RD4:  .BYTE   RD              ;READ RECORD
 5875 043101     004                    .BYTE   PAT4            ;DATA PATERN 4 (ALTERNATE 1'S AND 0'S)
 5876 043102  003017                    .WORD   1551.           ;BYTE COUNT OF 1551
 5877 043104  000066                    .WORD   54.             ;DO IT 54 TIMES
 5878
 5879 043106     010            T1RD5:  .BYTE   RD              ;READ RECORD
 5880 043107     003                    .BYTE   PAT3            ;DATA PATERN 3 (WORST MFM)
 5881 043110  004020                    .WORD   2064.           ;BYTE COUNT OF 2064
 5882 043112  000047                    .WORD   39.             ;DO IT 39 TIMES
 5883
 5884 043114     010            T1RD6:  .BYTE   RD              ;READ RECORD
 5885 043115     001                    .BYTE   PAT1            ;DATA PATERN 1 (ALL 1'S)
 5886 043116  005021                    .WORD   2577.           ;BYTE COUNT OF 2577
 5887 043120  000030                    .WORD   24.             ;DO IT 24 TIMES
 5888
 5889                                   .EVEN
 5890
 5891 043122                            ENDTST
      043122                    L10015:
      043122  104401                    TRAP    C$ETST
```

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                                .SBTTL  TEST 2: Quick Verify Write/Read Test

                                ;++
                                ;This test rewinds the tape, then executes the following sequence:
                                ;
                                ;       1.  Write record set,
                                ;       2.  Reposition over just written record set,
                                ;       3.  Then read the current record set,
                                ;
                                ;for 5 iterations or until fatal error  is  encountered.   This  test
                                ;permits  retries,  fixed  record  length (2048 bytes), fixed number of
                                ;records/set (400), and predetermined data patterns.   This  test  will
                                ;execute in a round-robin manner.
                                ;--
043124                                  BGNTST
043124                          T2::
043124  105737  002234                  TSTB    T3ONLY                  ;CHECK THE TEST 3 ONLY FLAG
043130  001414                          BEQ     START2                  ;BRANCH IF IT IS CLEAR
043132                                  PRINTF  #BYPASS,L$TEST          ;PRINT THE TEST BYPASSED MESSAGE
043132  013746  002114                  MOV     L$TEST,-(SP)
043136  012746  021001                  MOV     #BYPASS,-(SP)
043142  012746  000002                  MOV     #2,-(SP)
043146  010600                          MOV     SP,R0
043150  104417                          TRAP    C$PNTF
043152  062706  000006                  ADD     #6,SP
043156  000137  043542                  JMP     T2EXIT                  ;GET OUT

043162  005737  003524          START2: TST     UDROP                   ;HAVE ALL UNITS BEEN DROPPED ?
043166  001014                          BNE     5$                      ;GO START THE TEST
043170                                  PRINTF  #BYPASS,L$TEST          ;PRINT THE TEST BYPASSED MESSAGE
043170  013746  002114                  MOV     L$TEST,-(SP)
043174  012746  021001                  MOV     #BYPASS,-(SP)
043200  012746  000002                  MOV     #2,-(SP)
043204  010600                          MOV     SP,R0
043206  104417                          TRAP    C$PNTF
043210  062706  000006                  ADD     #6,SP
043214  000137  043542                  JMP     T2EXIT                  ;GET OUT IF NONE LEFT TO TEST

043220  105737  002212          5$:     TSTB    CLOCK                   ;IS THE CLOCK ENABLED
043224  001421                          BEQ     G02                     ;NO, THEN CAN'T PRINT TIME
043226                                  PRINTF  #TIME,<B,HOURS>,<B,MINUTE>,<B,SECOND>,
043226  005046                          CLR     -(SP)
043230  153716  002215                  BISB    SECOND,(SP)
043234  005046                          CLR     -(SP)
043236  153716  002214                  BISB    MINUTE,(SP)
043242  005046                          CLR     -(SP)
043244  153716  002213                  BISB    HOURS,(SP)
043250  012746  020044                  MOV     #TIME,-(SP)
043254  012746  000004                  MOV     #4,-(SP)
043260  010600                          MOV     SP,R0
043262  104417                          TRAP    C$PNTF
043264  062706  000012                  ADD     #12,SP

043270  004737  033464          G02:    JSR     PC,CLREOT               ;MAKE SURE EOT STATUS IS CLEAR
043274  005037  003520                  CLR     OBJECT                  ;CLEAR THE OBJECT COUNTER
043300  005037  003440                  CLR     TSTMSK                  ;ALLOW NO ERRORS
```

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5931 043304  012705  043552              MOV     #T2REW,R5               ;SET UP TO DO A REWIND
5932 043310  004737  021240              JSR     PC,SCHED                ;GO ISSSUE A REWIND TO ALL DRIVES
5933 043314  005737  003524              TST     UDROP                   ;HAVE ALL UNITS BEEN DROPPED ?
5934 043320  001510                      BEQ     T2EXIT                  ;GET OUT IF NONE LEFT TO TEST
5935
5936
5937 043322  004737  033564        5$:   JSR     PC,SDSTUP               ;RESET THE RANDOM SEEDS
5938 043326  012705  043560              MOV     #T2WRT,R5               ;SET UP TO DO A WRITE ITERATION
5939 043332  004737  021240              JSR     PC,SCHED                ;GO ISSSUE WRITES TO ALL DRIVES
5940 043336  005737  003524              TST     UDROP                   ;HAVE ALL UNITS BEEN DROPPED ?
5941 043342  001477                      BEQ     T2EXIT                  ;GET OUT IF NONE LEFT TO TEST
5942
5943 043344  012705  043566              MOV     #T2LEOT,R5              ;SET UP TO DO A WRITE LEOT
5944 043350  004737  021240              JSR     PC,SCHED                ;GO ISSSUE WRITES TO ALL DRIVES
5945 043354  005737  003524              TST     UDROP                   ;HAVE ALL UNITS BEEN DROPPED ?
5946 043360  001470                      BEQ     T2EXIT                  ;GET OUT IF NONE LEFT TO TEST
5947
5948 043362  012705  043552              MOV     #T2REW,R5               ;SET UP TO DO A REWIND
5949 043366  004737  021240              JSR     PC,SCHED                ;GO ISSSUE A REWIND TO ALL DRIVES
5950 043372  005737  003524              TST     UDROP                   ;HAVE ALL UNITS BEEN DROPPED ?
5951 043376  001461                      BEQ     T2EXIT                  ;GET OUT IF NONE LEFT TO TEST
5952
5953 043400  005737  003520              TST     OBJECT                  ;IS THIS THE FIRST TIME THROUGH ?
5954 043404  001412                      BEQ     10$                     ;YES, DON'T DO THE SPACE FORWARD
5955 043406  012705  043610              MOV     #T2SPO,R5               ;SET UP TO SPACE OBJECTS
5956 043412  013765  003520  000002      MOV     OBJECTS,ITMCNT(R5)      ;SET UP # OF OBJECTS TO SPACE FORWARD
5957 043420  004737  021240              JSR     PC,SCHED                ;GO ISSSUE A REWIND TO ALL DRIVES
5958 043424  005737  003524              TST     UDROP                   ;HAVE ALL UNITS BEEN DROPPED ?
5959 043430  001444                      BEQ     T2EXIT                  ;GET OUT IF NONE LEFT TO TEST
5960
5961 043432  004737  033564       10$:   JSR     PC,SDSTUP               ;RESET THE RANDOM SEEDS
5962 043436  012705  043574              MOV     #T2RD,R5                ;SET UP TO DO A READITERATION
5963 043442  004737  021240              JSR     PC,SCHED                ;GO ISSSUE READS TO ALL DRIVES
5964 043446  005737  003524              TST     UDROP                   ;HAVE ALL UNITS BEEN DROPPED ?
5965 043452  001433                      BEQ     T2EXIT                  ;GET OUT IF NONE LEFT TO TEST
5966 043454  066537  000004  003520      ADD     ITRCNT(R5),OBJECTS      ;ADD THE # OF RECORDS TO OBJECTS
5967
5968 043462  052737  000001  003440      BIS     #LEDB,TSTMSK            ;SET UP TO ALLOW LEOT DETECTED
5969 043470  012705  043602              MOV     #T2SKD,R5               ;SET UP TO DO A SKIP TO LEOT
5970 043474  004737  021240              JSR     PC,SCHED                ;GO ISSSUE READS TO ALL DRIVES
5971 043500  042737  000001  003440      BIC     #LEDB,TSTMSK            ;DISALLOW LEOT DETECTED
5972 043506  005737  003524              TST     UDROP                   ;HAVE ALL UNITS BEEN DROPPED ?
5973 043512  001413                      BEQ     T2EXIT                  ;GET OUT IF NONE LEFT TO TEST
5974 043514  066537  000004  003520      ADD     ITRCNT(R5),OBJECTS      ;ADD THE # OF RECORDS TO OBJECTS
5975
5976 043522  022737  004716  003520      CMP     #T2END,OBJECTS          ;HAVE WE DONE 2 TRACKS ?
5977 043530  001274                      BNE     5$                      ;NO, KEEP GOING
5978 043532  012705  043552              MOV     #T2REW,R5               ;SET UP TO DO A REWIND
5979 043536  004737  021240              JSR     PC,SCHED                ;GO ISSSUE A REWIND TO ALL DRIVES
5980 043542  004737  033640  T2EXIT:    JSR     PC,SDSAVE               ;RESET THE RANDOM SEEDS
5981 043546                      EXIT    TST
     043546  104432                      TRAP    C$EXIT
     043550  000046                      .WORD   L10016-.
5982
5983
5984 043552     160              T2REW:  .BYTE   REW                     ;REWIND
5985 043553     000                      .BYTE   NULPAT
```

```
 5986 043554  000000                    .WORD   0
 5987 043556  000001                    .WORD   1
 5988
 5989 043560     020            T2WRT:  .BYTE   WR              ;WRITE RECORDS
 5990 043561     003                    .BYTE   PAT3
 5991 043562  010000                    .WORD   4096.
 5992 043564  000372                    .WORD   250.
 5993
 5994 043566     100            T2LEOT: .BYTE   WTM             ;WRITE TAPE MARK
 5995 043567     000                    .BYTE   NULPAT          ;NO DATA NEEDED
 5996 043570  000000                    .WORD   0               ;NO ITEM COUNT
 5997 043572  000002                    .WORD   2               ;DO IT TWICE
 5998
 5999 043574     010            T2RD:   .BYTE   RD              ;READ RECORDS
 6000 043575     003                    .BYTE   PAT3
 6001 043576  010000                    .WORD   4096.
 6002 043600  000372                    .WORD   250.
 6003
 6004 043602     062            T2SKD:  .BYTE   SKD             ;SKIP TAPE MARK TO LEOT
 6005 043603     000                    .BYTE   NULPAT          ;NO DATA NEEDED
 6006 043604  000062                    .WORD   50.             ;SKIP 50 TAPE MARKS
 6007 043606  000001                    .WORD   1               ;DO IT ONE TIME
 6008
 6009 043610     070            T2SPO:  .BYTE   SPO             ;SPACE OBJECTS
 6010 043611     000                    .BYTE   NULPAT
 6011 043612  000001                    .WORD   1
 6012 043614  000001                    .WORD   1
 6013
 6014                                   .EVEN
 6015 043616                            ENDTST
      043616                    L10016:
      043616  104401                    TRAP    C$ETST
 6016
```

```
 6018                                   .SBTTL  TEST 3: Complex Write/Read Test
 6019
 6020                                   ;++
 6021                                   ;This test rewinds the tape, and executes the following sequence:
 6022                                   ;
 6023                                   ;     1.  Write 1000 records,
 6024                                   ;     2.  Write a file mark,
 6025                                   ;     3.  Repeat 1 and 2 until EOT is reached,
 6026                                   ;     4.  Write 2 file marks (LEOT),
 6027                                   ;     5.  Rewind,
 6028                                   ;     6.  Read 1000 records,
 6029                                   ;     7.  Read 1 record (should see unexpected tape mark)
 6030                                   ;     8.  Repeat 6 and 7 until LEOT.
 6031                                   ;
 6032                                   ;# of records (N), and record size will be randomly selected.  This
 6033                                   ;sequence will permit hardware retries, if not user disabled.  This
 6034                                   ;test will run until EOT, LEOT or fatal error is detected.  All data
 6035                                   ;patterns including random data will be used in this test.
 6036                                   ;--
 6037 043620                                   BGNTST
      043620                           T3::
 6038
 6039 043620  005737  003524           START3: TST     UDROP                   ;HAVE ALL UNITS BEEN DROPPED ?
 6040 043624  001014                           BNE     5$                      ;GO START THE TEST
 6041 043626                                   PRINTF  #BYPASS,L$TEST          ;PRINT THE TEST BYPASSED MESSAGE
      043626  013746  002114                   MOV     L$TEST,-(SP)
      043632  012746  021001                   MOV     #BYPASS,-(SP)
      043636  012746  000002                   MOV     #2,-(SP)
      043642  010600                           MOV     SP,R0
      043644  104417                           TRAP    C$PNTF
      043646  062706  000006                   ADD     #6,SP
 6042 043652  000137  044226                   JMP     T3EXIT                  ;GET OUT IF NONE LEFT TO TEST
 6043
 6044 043656  105737  002212           5$:     TSTB    CLOCK                   ;IS THE CLOCK ENABLED
 6045 043662  001421                           BEQ     G03                     ;NO, THEN CAN'T PRINT TIME
 6046 043664                                   PRINTF  #TIME,<B,HOURS>,<B,MINUTE>,<B,SECOND>,
      043664  005046                           CLR     -(SP)
      043666  153716  002215                   BISB    SECOND,(SP)
      043672  005046                           CLR     -(SP)
      043674  153716  002214                   BISB    MINUTE,(SP)
      043700  005046                           CLR     -(SP)
      043702  153716  002213                   BISB    HOURS,(SP)
      043706  012746  020044                   MOV     #TIME,-(SP)
      043712  012746  000004                   MOV     #4,-(SP)
      043716  010600                           MOV     SP,R0
      043720  104417                           TRAP    C$PNTF
      043722  062706  000012                   ADD     #12,SP
 6047
 6048 043726  004737  033714           G03:    JSR     PC,PATCLR               ;MAKE SURE WE START WITH PATTERN 1
 6049 043732  004737  033564                   JSR     PC,SDSTUP               ;RESET THE RANDOM SEEDS
 6050 043736  004737  033464                   JSR     PC,CLREOT               ;CLEAR ALL EOT INDICATIONS
 6051
 6052 043742  005037  003440                   CLR     TSTMSK                  ;ALLOW NO ERRORS
 6053 043746  005737  003524                   TST     UDROP                   ;HAVE ALL UNITS BEEN DROPPED ?
 6054 043752  001525                           BEQ     T3EXIT                  ;GET OUT IF NONE LEFT TO TEST
 6055
 6056 043754  012705  044236                   MOV     #T3REW,R5               ;SET UP TO DO REWIND
```

```
6057 043760  004737  021240            JSR     PC,SCHED        ;GO ISSUE TO ALL DRIVES
6058 043764  005737  003524            TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
6059 043770  001516                    BEQ     T3EXIT          ;GET OUT IF NONE LEFT TO TEST
6060
6061 043772  012705  044244      5$:   MOV     #T3WRT,R5       ;SET UP A WRITE ITERATION
6062 043776  004737  021240            JSR     PC,SCHED        ;GO DO IT ON ALL DRIVES
6063 044002  005737  003524            TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
6064 044006  001507                    BEQ     T3EXIT          ;GET OUT IF NONE LEFT TO TEST
6065 044010  023737  003526  003524    CMP     UEOT,UDROP      ;ARE ALL UNITS AT EOT ?
6066 044016  001413                    BEQ     10$             ;YES, WRITE ONE MORE REC AND LEOT
6067
6068 044020  012705  044252            MOV     #T3WTM,R5       ;SET UP TO WRITE A TAPE MARK
6069 044024  004737  021240            JSR     PC,SCHED        ;GO DO IT ON ALL DRIVES
6070 044030  005737  003524            TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
6071 044034  001474                    BEQ     T3EXIT          ;GET OUT IF NONE LEFT TO TEST
6072 044036  023737  003526  003524    CMP     UEOT,UDROP      ;ARE ALL UNITS AT EOT ?
6073 044044  001352                    BNE     5$              ;NO, KEEP WRITING
6074
6075 044046  012737  000004  010560 10$:   MOV     #4,LOOPS        ;SET UP TO DO 4 TAPE MARKS
6076 044054  004737  033464      15$:  JSR     PC,CLREOT       ;CLEAR THE EOT INDICATORS
6077 044060  012705  044252            MOV     #T3WTM,R5       ;SET UP TO WRITE A TAPE MARK
6078 044064  004737  021240            JSR     PC,SCHED        ;GO DO IT ON ALL DRIVES
6079 044070  005737  003524            TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
6080 044074  001454                    BEQ     T3EXIT          ;GET OUT IF NONE LEFT TO TEST
6081 044076  005337  010560            DEC     LOOPS           ;SUBTRACT 1 FROM THE TAPE MARK COUNT
6082 044102  001364                    BNE     15$             ;KEEP GOING TIL THEY'RE ALL WRITTEN
6083
6084 044104  004737  033464            JSR     PC,CLREOT       ;CLEAR THE EOT INDICATORS
6085 044110  012705  044236            MOV     #T3REW,R5       ;SET UP TO REWIND ALL DRIVES
6086 044114  004737  021240            JSR     PC,SCHED        ;GO DO IT
6087 044120  005737  003524            TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
6088 044124  001440                    BEQ     T3EXIT          ;GET OUT IF NONE LEFT TO TEST
6089 044126  004737  033714            JSR     PC,PATCLR       ;START AT PATTERN 1
6090 044132  004737  033564            JSR     PC,SDSTUP       ;RESET THE RANDOM SEEDS
6091
6092 044136  012705  044260      20$:  MOV     #T3RD,R5        ;SET UP TO READ AN ITERATION SET
6093 044142  004737  021240            JSR     PC,SCHED        ;GO ISSUE TO ALL DRIVES
6094 044146  005737  003524            TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
6095 044152  001425                    BEQ     T3EXIT          ;GET OUT IF NONE LEFT TO TEST
6096 044154  023737  003526  003524    CMP     UEOT,UDROP      ;ALL UNITS AT EOT ?
6097 044162  001413                    BEQ     EX3REW          ;YES, GO REWIND ALL DRIVES
6098
6099 044164  012705  044266            MOV     #T3SPO,R5       ;SPACE 1 OBJECT (TAPE MARK)
6100 044170  004737  021240            JSR     PC,SCHED        ;GO DO IT AN ALL DRIVES
6101 044174  005737  003524            TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
6102 044200  001412                    BEQ     T3EXIT          ;GET OUT IF NONE LEFT TO TEST
6103 044202  023737  003526  003524    CMP     UEOT,UDROP      ;ALL UNITS AT EOT ?
6104 044210  001352                    BNE     20$             ;NO, KEEP READING
6105
6106 044212  004737  033464 EX3REW: JSR     PC,CLREOT       ;CLEAR THE EOT INDICATORS
6107 044216  012705  044236            MOV     #T3REW,R5       ;SET UP TO REWIND ALL DRIVES
6108 044222  004737  021240            JSR     PC,SCHED        ;GO DO IT
6109
6110 044226  004737  033640 T3EXIT: JSR     PC,SDSAVE       ;RESET THE RANDOM SEEDS
6111 044232                    EXIT    TST
     044232  104432                    TRAP    C$EXIT
     044234  000040                    .WORD   L10017-.
```

```
6112
```

```
 6114 044236     160                T3REW:  .BYTE   REW             ;REWIND
 6115 044237     000                        .BYTE   NULPAT
 6116 044240  000000                        .WORD   0
 6117 044242  000001                        .WORD   1
 6118
 6119 044244     020                T3WRT:  .BYTE   WR              ;WRITE RECORDS
 6120 044245     200                        .BYTE   ALLPAT
 6121 044246  000000                        .WORD   RNDBYT
 6122 044250  000000                        .WORD   RNDITR
 6123
 6124 044252     100                T3WTM:  .BYTE   WTM             ;WRITE TAPE MARK
 6125 044253     000                        .BYTE   NULPAT
 6126 044254  000000                        .WORD   0
 6127 044256  000001                        .WORD   1
 6128
 6129 044260     010                T3RD:   .BYTE   RD              ;READ RECORDS
 6130 044261     200                        .BYTE   ALLPAT
 6131 044262  000000                        .WORD   RNDBYT
 6132 044264  000000                        .WORD   RNDITR
 6133
 6134 044266     070                T3SPO:  .BYTE   SPO             ;SPACE OBJECT (TAPE MARK)
 6135 044267     000                        .BYTE   NULPAT
 6136 044270  000001                        .WORD   1
 6137 044272  000001                        .WORD   1
 6138
 6139                                       .EVEN
 6140 044274                                ENDTST
      044274                        L10017:
      044274  104401                        TRAP    C$ETST
```

```
                                .SBTTL  TEST 4: Write Interchange Tape

                                ;++
                                ;This test will rewind the tape, then write until EOT or a fatal error is
                                ;encountered This test  will keep track of the number of records and tape
                                ;marks written.  If a fatal error  is encountered, a  message will report
                                ;it, and the unit prevented from executing further write operations.
                                ;--
                                        BGNTST
044276                          T4::
044276  105737  002234                  TSTB    T3ONLY                  ;CHECK THE TEST 3 ONLY FLAG
044302  001414                          BEQ     START4                  ;BRANCH IF IT IS CLEAR
044304                                  PRINTF  #BYPASS,L$TEST          ;PRINT THE TEST BYPASSED MESSAGE
044304  013746  002114                  MOV     L$TEST,-(SP)
044310  012746  021001                  MOV     #BYPASS,-(SP)
044314  012746  000002                  MOV     #2,-(SP)
044320  010600                          MOV     SP,R0
044322  104417                          TRAP    C$PNTF
044324  062706  000006                  ADD     #6,SP
044330  000137  044626                  JMP     T4EXIT                  ;GET OUT

044334  005737  003524          START4: TST     UDROP                   ;HAVE ALL UNITS BEEN DROPPED ?
044340  001014                          BNE     5$                      ;GO START THE TEST
044342                                  PRINTF  #BYPASS,L$TEST          ;PRINT THE TEST BYPASSED MESSAGE
044342  013746  002114                  MOV     L$TEST,-(SP)
044346  012746  021001                  MOV     #BYPASS,-(SP)
044352  012746  000002                  MOV     #2,-(SP)
044356  010600                          MOV     SP,R0
044360  104417                          TRAP    C$PNTF
044362  062706  000006                  ADD     #6,SP
044366  000137  044626                  JMP     T4EXIT                  ;GET OUT IF NONE LEFT TO TEST

044372  105737  002212          5$:     TSTB    CLOCK                   ;IS THE CLOCK ENABLED
044376  001421                          BEQ     G04                     ;NO, THEN CAN'T PRINT TIME
044400                                  PRINTF  #TIME,<B,HOURS>,<B,MINUTE>,<B,SECOND>,
044400  005046                          CLR     -(SP)
044402  153716  002215                  BISB    SECOND,(SP)
044406  005046                          CLR     -(SP)
044410  153716  002214                  BISB    MINUTE,(SP)
044414  005046                          CLR     -(SP)
044416  153716  002213                  BISB    HOURS,(SP)
044422  012746  020044                  MOV     #TIME,-(SP)
044426  012746  000004                  MOV     #4,-(SP)
044432  010600                          MOV     SP,R0
044434  104417                          TRAP    C$PNTF
044436  062706  000012                  ADD     #12,SP

044442  004737  033714          G04:    JSR     PC,PATCLR               ;
044446  004737  033564                  JSR     PC,SDSTUP               ;SET UP THE RANDOM SEEDS
044452  004737  033464                  JSR     PC,CLREOT               ;CLEAR THE EOT FLAG
044456  005037  003440                  CLR     TSTMSK                  ;NO ALLOWABLE ERRORS

044462  012705  044632                  MOV     #T4REW,R5               ;POINT R5 TO THE REWIND TABLE
044466  004737  021240                  JSR     PC,SCHED                ;GO START THE TEST
044472  005737  003524                  TST     UDROP                   ;HAVE ALL UNITS BEEN DROPPED ?
044476  001453                          BEQ     T4EXIT                  ;GET OUT IF NONE LEFT TO TEST
```

```
 6175 044500  012705  044640          5$:     MOV     #T4WRT,R5               ;POINT R5 TO THE TEST TABLE
 6176 044504  004737  021240                  JSR     PC,SCHED                ;GO START THE TEST
 6177 044510  005737  003524                  TST     UDROP                   ;HAVE ALL UNITS BEEN DROPPED ?
 6178 044514  001444                          BEQ     T4EXIT                  ;GET OUT IF NONE LEFT TO TEST
 6179 044516  023737  003526  003524          CMP     UEOT,UDROP              ;ARE THEY ALL AT EOT ?
 6180 044524  001413                          BEQ     10$                     ;BRANCH IF IT IS
 6181
 6182 044526  012705  044646                  MOV     #T4WTM,R5               ;POINT R5 TO THE TEST TABLE
 6183 044532  004737  021240                  JSR     PC,SCHED                ;GO START THE TEST
 6184 044536  005737  003524                  TST     UDROP                   ;HAVE ALL UNITS BEEN DROPPED ?
 6185 044542  001431                          BEQ     T4EXIT                  ;GET OUT IF NONE LEFT TO TEST
 6186 044544  023737  003526  003524          CMP     UEOT,UDROP              ;ARE THEY ALL AT EOT ?
 6187 044552  001352                          BNE     5$                      ;BRANCH IF NOT
 6188
 6189 044554  012737  000004  010560  10$:    MOV     #4,LOOPS                ;SET UP TO DO 4 TAPE MARKS
 6190 044562  004737  033464          15$:    JSR     PC,CLREOT               ;CLEAR THE EOT INDICATORS
 6191 044566  012705  044252                  MOV     #T3WTM,R5               ;SET UP TO WRITE A TAPE MARK
 6192 044572  004737  021240                  JSR     PC,SCHED                ;GO DO IT ON ALL DRIVES
 6193 044576  005737  003524                  TST     UDROP                   ;HAVE ALL UNITS BEEN DROPPED ?
 6194 044602  001411                          BEQ     T4EXIT                  ;GET OUT IF NONE LEFT TO TEST
 6195 044604  005337  010560                  DEC     LOOPS                   ;SUBTRACT 1 FROM THE TAPE MARK COUNT
 6196 044610  001364                          BNE     15$                     ;KEEP GOING TIL THEY'RE ALL WRITTEN
 6197
 6198 044612  012705  044632                  MOV     #T4REW,R5               ;POINT R5 TO THE TEST TABLE
 6199 044616  004737  033464                  JSR     PC,CLREOT               ;
 6200 044622  004737  021240                  JSR     PC,SCHED                ;GO REWIND ALL UNITS
 6201 044626                  T4EXIT: EXIT    TST
      044626  104432                  TRAP    C$EXIT
      044630  000024                  .WORD   L10020-.
 6202
 6203 044632     160          T4REW:  .BYTE   REW                             ;REWIND
 6204 044633     000                  .BYTE   NULPAT
 6205 044634  000000                  .WORD   0
 6206 044636  000001                  .WORD   1
 6207
 6208 044640     020          T4WRT:  .BYTE   WR                              ;WRITE RECORDS
 6209 044641     200                  .BYTE   ALLPAT
 6210 044642  010000                  .WORD   4096.
 6211 044644  001750                  .WORD   1000.
 6212
 6213 044646     100          T4WTM:  .BYTE   WTM                             ;WRITE TAPE MARK
 6214 044647     000                  .BYTE   NULPAT
 6215 044650  000000                  .WORD   0
 6216 044652  000001                  .WORD   1
 6217                                 .EVEN
 6218 044654                          ENDTST
      044654                  L10020:
      044654  104401                  TRAP    C$ETST
 6219
```

```
                                .SBTTL  TEST 5: Read Unknown Tape

                                ;++
                                ;This test will rewind a tape, then read until EOT, LEOT or fatal error
                                ;is  encountered.   This  test will keep track of the number of records
                                ;and files read.  If a fatal  error  is  encountered,  a  message  will
                                ;report  it,  the  tape  on  the  unit  will  be  rewound, and the unit
                                ;prevented from executing further read operations.
                                ;--
044656                                  BGNTST
044656                          T5::
044656  105737  002234                  TSTB    T3ONLY                  ;CHECK THE TEST 3 ONLY FLAG
044662  001414                          BEQ     START5                  ;BRANCH IF IT IS CLEAR
044664                                  PRINTF  #BYPASS,L$TEST          ;PRINT THE TEST BYPASSED MESSAGE
044664  013746  002114                  MOV     L$TEST,-(SP)
044670  012746  021001                  MOV     #BYPASS,-(SP)
044674  012746  000002                  MOV     #2,-(SP)
044700  010600                          MOV     SP,R0
044702  104417                          TRAP    C$PNTF
044704  062706  000006                  ADD     #6,SP
044710  000137  045154                  JMP     T5EXIT                  ;GET OUT

044714  005737  003524          START5: TST     UDROP                   ;HAVE ALL UNITS BEEN DROPPED ?
044720  001014                          BNE     5$                      ;GO START THE TEST
044722                                  PRINTF  #BYPASS,L$TEST          ;PRINT THE TEST BYPASSED MESSAGE
044722  013746  002114                  MOV     L$TEST,-(SP)
044726  012746  021001                  MOV     #BYPASS,-(SP)
044732  012746  000002                  MOV     #2,-(SP)
044736  010600                          MOV     SP,R0
044740  104417                          TRAP    C$PNTF
044742  062706  000006                  ADD     #6,SP
044746  000137  045154                  JMP     T5EXIT                  ;GET OUT IF NONE LEFT TO TEST

044752  105737  002212          5$:     TSTB    CLOCK                   ;IS THE CLOCK ENABLED
044756  001421                          BEQ     GO5                     ;NO, THEN CAN'T PRINT TIME
044760                                  PRINTF  #TIME,<B,HOURS>,<B,MINUTE>,<B,SECOND>,
044760  005046                          CLR     -(SP)
044762  153716  002215                  BISB    SECOND,(SP)
044766  005046                          CLR     -(SP)
044770  153716  002214                  BISB    MINUTE,(SP)
044774  005046                          CLR     -(SP)
044776  153716  002213                  BISB    HOURS,(SP)
045002  012746  020044                  MOV     #TIME,-(SP)
045006  012746  000004                  MOV     #4,-(SP)
045012  010600                          MOV     SP,R0
045014  104417                          TRAP    C$PNTF
045016  062706  000012                  ADD     #12,SP

045022  004737  033714          GO5:    JSR     PC,PATCLR               ;MAKE SURE WE START WITH PATTERN 1
045026  004737  033564                  JSR     PC,SDSTUP               ;SET UP THE RANDOM SEEDS
045032  004737  033464                  JSR     PC,CLREOT               ;CLEAR THE EOT FLAG

045036  132737  000001  002236          BITB    #BIT0,DMPBUF            ;ARE WE DUMPING ALL RECORDS?
045044  001403                          BEQ     1$                      ;NO - BRANCH
045046  012737  000001  045172          MOV     #1,T5RD+4               ;CHANGE ITER COUNT TO 1

045054  005037  003440          1$:     CLR     TSTMSK                  ;NO ALLOWABLE ERRORS
```

TEST 5: Read Unknown Tape

```
 6254 045060  012705  045160            MOV     #T5REW,R5       ;POINT R5 TO THE REWIND TABLE
 6255 045064  004737  021240            JSR     PC,SCHED        ;GO START THE TEST
 6256 045070  005737  003524            TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
 6257 045074  001427                    BEQ     T5EXIT          ;GET OUT IF NONE LEFT TO TEST
 6258
 6259 045076  012737  000012  003440    MOV     #TMB!RDTB,TSTMSK ;TAPE MARKS AND TRUNC. RECORDS OK
 6260 045104  012705  045166    5$:     MOV     #T5RD,R5        ;POINT R5 TO THE TEST TABLE
 6261 045110  004737  021240            JSR     PC,SCHED        ;GO START THE TEST
 6262 045114  005737  003524            TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
 6263 045120  001415                    BEQ     T5EXIT          ;GET OUT IF NONE LEFT TO TEST
 6264 045122  023737  003526  003524    CMP     UEOT,UDROP      ;ARE THEY ALL AT EOT ?
 6265 045130  001365                    BNE     5$              ;BRANCH IF THEY ARE NOT
 6266
 6267 045132  004737  033464    10$:    JSR     PC,CLREOT       ;
 6268 045136  012705  045160            MOV     #T5REW,R5       ;POINT R5 TO THE REWIND TABLE
 6269 045142  004737  021240            JSR     PC,SCHED        ;GO REWIND ALL UNITS
 6270 045146  012737  001751  045172    MOV     #1001.,T5RD+4   ;RESTORE ITER COUNT
 6271 045154            T5EXIT: EXIT    TST
      045154  104432                    TRAP    C$EXIT
      045156  000016                    .WORD   L10021-.
 6272
 6273 045160     160    T5REW:  .BYTE   REW                     ;REWIND
 6274 045161     000            .BYTE   NULPAT
 6275 045162  000000            .WORD   0
 6276 045164  000001            .WORD   1
 6277
 6278 045166     010    T5RD:   .BYTE   RD                      ;READ RECORDS
 6279 045167     200            .BYTE   ALLPAT
 6280 045170  010000            .WORD   4096.
 6281 045172  001751            .WORD   1001.
 6282
 6283                            .EVEN
 6284 045174                    ENDTST
      045174                L10021:
      045174  104401            TRAP    C$ETST
```

```
 6286                                   .SBTTL  TEST 6: Start/Stop Write/Read Test
 6287
 6288                                   ;++
 6289                                   ;This test rewinds the tape, and executes the following sequence:
 6290                                   ;
 6291                                   ;     1.  Write 1300 records one at a time,
 6292                                   ;     2.  Write 2 file marks (LEOT),
 6293                                   ;     3.  Rewind,
 6294                                   ;     4.  Read 1300 records one at a time,
 6295                                   ;     5.  Skip to LEOT.
 6296                                   ;     6.  Rewind,
 6297                                   ;
 6298                                   ;This sequence  will  permit  hardware  retries, if not user disabled.
 6299                                   ;This test will run until exhaustion of the command count or fatal error
 6300                                   ;is  detected.   All  data patterns including random data will be used
 6301                                   ;in this test.
 6302                                   ;--
 6303 045176                                   BGNTST
      045176                           T6::
 6304 045176  105737  002234                   TSTB    T3ONLY                  ;CHECK THE TEST 3 ONLY FLAG
 6305 045202  001414                           BEQ     START6                  ;BRANCH IF IT IS CLEAR
 6306 045204                                   PRINTF  #BYPASS,L$TEST          ;PRINT THE TEST BYPASSED MESSAGE
      045204  013746  002114                   MOV     L$TEST,-(SP)
      045210  012746  021001                   MOV     #BYPASS,-(SP)
      045214  012746  000002                   MOV     #2,-(SP)
      045220  010600                           MOV     SP,R0
      045222  104417                           TRAP    C$PNTF
      045224  062706  000006                   ADD     #6,SP
 6307 045230  000137  045604                   JMP     T6EXIT                  ;GET OUT
 6308
 6309 045234  005737  003524           START6: TST     UDROP                   ;HAVE ALL UNITS BEEN DROPPED ?
 6310 045240  001014                           BNE     5$                      ;GO START THE TEST
 6311 045242                                   PRINTF  #BYPASS,L$TEST          ;PRINT THE TEST BYPASSED MESSAGE
      045242  013746  002114                   MOV     L$TEST,-(SP)
      045246  012746  021001                   MOV     #BYPASS,-(SP)
      045252  012746  000002                   MOV     #2,-(SP)
      045256  010600                           MOV     SP,R0
      045260  104417                           TRAP    C$PNTF
      045262  062706  000006                   ADD     #6,SP
 6312 045266  000137  045604                   JMP     T6EXIT                  ;GET OUT IF NONE LEFT TO TEST
 6313
 6314 045272  105737  002212           5$:     TSTB    CLOCK                   ;IS THE CLOCK ENABLED
 6315 045276  001421                           BEQ     G06                     ;NO, THEN CAN'T PRINT TIME
 6316 045300                                   PRINTF  #TIME,<B,HOURS>,<B,MINUTE>,<B,SECOND>,
      045300  005046                           CLR     -(SP)
      045302  153716  002215                   BISB    SECOND,(SP)
      045306  005046                           CLR     -(SP)
      045310  153716  002214                   BISB    MINUTE,(SP)
      045314  005046                           CLR     -(SP)
      045316  153716  002213                   BISB    HOURS,(SP)
      045322  012746  020044                   MOV     #TIME,-(SP)
      045326  012746  000004                   MOV     #4,-(SP)
      045332  010600                           MOV     SP,R0
      045334  104417                           TRAP    C$PNTF
      045336  062706  000012                   ADD     #12,SP
 6317
 6318 045342  004737  033714           G06:    JSR     PC,PATCLR               ;MAKE SURE WE START WITH PATTERN 1
```

```
6319 045346  004737  033564                JSR     PC,SDSTUP       ;RESET THE RANDOM SEEDS
6320 045352  004737  033464                JSR     PC,CLREOT       ;CLEAR ALL EOT INDICATIONS
6321
6322 045356  005037  003440                CLR     TSTMSK          ;ALLOW NO ERRORS
6323 045362  005737  003524                TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
6324 045366  001506                        BEQ     T6EXIT          ;GET OUT IF NONE LEFT TO TEST
6325
6326 045370  012705  045614                MOV     #T6REW,R5       ;SET UP TO DO REWIND
6327 045374  004737  021240                JSR     PC,SCHED        ;GO ISSUE TO ALL DRIVES
6328 045400  005737  003524                TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
6329 045404  001477                        BEQ     T6EXIT          ;GET OUT IF NONE LEFT TO TEST
6330 045406  012737  002424  003404        MOV     #1300.,COUNT    ;STEP UP THE WRITE ITERATION COUNT
6331
6332 045414  012705  045622        5$:     MOV     #T6WRT,R5       ;SET UP A WRITE ITERATION
6333 045420  004737  021240                JSR     PC,SCHED        ;GO DO IT ON ALL DRIVES
6334 045424  005737  003524                TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
6335 045430  001465                        BEQ     T6EXIT          ;GET OUT IF NONE LEFT TO TEST
6336 045432  005337  003404                DEC     COUNT           ;SUBTRACT 1 FROM THE ITERATION COUNT
6337 045436  001366                        BNE     5$              ;MORE COMMANDS TO DO, KEEP GOING
6338
6339 045440  012705  045630                MOV     #T6WTM,R5       ;SET UP TO WRITE A TAPE MARK
6340 045444  004737  021240                JSR     PC,SCHED        ;GO DO IT ON ALL DRIVES
6341 045450  005737  003524                TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
6342 045454  001453                        BEQ     T6EXIT          ;GET OUT IF NONE LEFT TO TEST
6343
6344 045456  012705  045614                MOV     #T6REW,R5       ;SET UP TO REWIND ALL DRIVES
6345 045462  004737  021240                JSR     PC,SCHED        ;GO DO IT
6346 045466  005737  003524                TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
6347 045472  001444                        BEQ     T6EXIT          ;GET OUT IF NONE LEFT TO TEST
6348
6349 045474  004737  033714                JSR     PC,PATCLR       ;START AT PATTERN 1
6350 045500  004737  033564                JSR     PC,SDSTUP       ;RESET THE RANDOM SEEDS
6351 045504  012737  002424  003404        MOV     #1300.,COUNT    ;STEP UP THE WRITE ITERATION COUNT
6352
6353 045512  012705  045636        10$:    MOV     #T6RD,R5        ;SET UP TO READ AN ITERATION SET
6354 045516  004737  021240                JSR     PC,SCHED        ;GO DO IT ON ALL DRIVES
6355 045522  005737  003524                TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
6356 045526  001426                        BEQ     T6EXIT          ;GET OUT IF NONE LEFT TO TEST
6357 045530  005337  003404                DEC     COUNT           ;SUBTRACT 1 FROM THE ITERATION COUNT
6358 045534  001366                        BNE     10$             ;MORE COMMANDS TO DO, KEEP GOING
6359
6360 045536  052737  000001  003440        BIS     #LEDB,TSTMSK    ;SET UP TO ALLOW LEOT DETECTED
6361 045544  012705  045644                MOV     #T6SKD,R5       ;SKIP TO LEOT
6362 045550  004737  021240                JSR     PC,SCHED        ;GO DO IT AN ALL DRIVES
6363 045554  042737  000001  003440        BIC     #LEDB,TSTMSK    ;DISALLOW LEOT DETECTED
6364 045562  005737  003524                TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
6365 045566  001406                        BEQ     T6EXIT          ;GET OUT IF NONE LEFT TO TEST
6366
6367 045570  004737  033464                JSR     PC,CLREOT       ;CLEAR THE EOT INDICATORS
6368 045574  012705  045614                MOV     #T6REW,R5       ;SET UP TO REWIND ALL DRIVES
6369 045600  004737  021240                JSR     PC,SCHED        ;GO DO IT
6370
6371 045604  004737  033640        T6EXIT: JSR     PC,SDSAVE       ;RESET THE RANDOM SEEDS
6372 045610                        EXIT    TST
     045610  104432                TRAP    C$EXIT
     045612  000040                .WORD   L10022-.
6373
```

```
 6375 045614     160                T6REW:  .BYTE   REW             ;REWIND
 6376 045615     000                        .BYTE   NULPAT
 6377 045616  000000                        .WORD   0
 6378 045620  000001                        .WORD   1.
 6379
 6380 045622     020                T6WRT:  .BYTE   WR              ;WRITE RECORDS
 6381 045623     200                        .BYTE   ALLPAT
 6382 045624  020000                        .WORD   8192.
 6383 045626  000001                        .WORD   1.
 6384
 6385 045630     100                T6WTM:  .BYTE   WTM             ;WRITE TAPE MARK
 6386 045631     000                        .BYTE   NULPAT
 6387 045632  000000                        .WORD   0
 6388 045634  000002                        .WORD   2.
 6389
 6390 045636     010                T6RD:   .BYTE   RD              ;READ RECORDS
 6391 045637     200                        .BYTE   ALLPAT
 6392 045640  020000                        .WORD   8192.
 6393 045642  000001                        .WORD   1.
 6394
 6395 045644     062                T6SKD:  .BYTE   SKD             ;SKIP TO LEOT
 6396 045645     000                        .BYTE   NULPAT
 6397 045646  000001                        .WORD   1
 6398 045650  000001                        .WORD   1
 6399
 6400                                       .EVEN
 6401 045652                                ENDTST
      045652                        L10022:
      045652  104401                        TRAP    C$ETST
```

```
                                .SBTTL  TEST 7: Conversation Test

                                ;++
                                ;Conversation mode will run with or without error reports.  The user
                                ;can  select,  from a list of commands, a sequence which can be used to
                                ;emulate a known failure mode.  Between commands, the user can  specify
                                ;unique  delays,  ranging  from 10 to 250 ms.  The user can follow each
                                ;tape  command  with  integer  values,  the  first  indicating  the
                                ;byte/record/file  count and the second indicating the # of repetitions
                                ;necessary for that command.
                                ;--
045654                                  BGNTST
045654                          T7::
045654  105737  002234                    TSTB    T3ONLY                  ;CHECK THE TEST 3 ONLY FLAG
045660  001414                            BEQ     START7                  ;BRANCH IF IT IS CLEAR
045662                                  PRINTF  #BYPASS,L$TEST          ;PRINT THE TEST BYPASSED MESSAGE
045662  013746  002114                    MOV     L$TEST,-(SP)
045666  012746  021001                    MOV     #BYPASS,-(SP)
045672  012746  000002                    MOV     #2,-(SP)
045676  010600                            MOV     SP,R0
045700  104417                            TRAP    C$PNTF
045702  062706  000006                    ADD     #6,SP
045706  000137  046230                    JMP     T7EXIT                  ;GET OUT

045712  005737  003524          START7:   TST     UDROP                   ;HAVE ALL UNITS BEEN DROPPED ?
045716  001014                            BNE     5$                      ;GO START THE TEST
045720                                  PRINTF  #BYPASS,L$TEST          ;PRINT THE TEST BYPASSED MESSAGE
045720  013746  002114                    MOV     L$TEST,-(SP)
045724  012746  021001                    MOV     #BYPASS,-(SP)
045730  012746  000002                    MOV     #2,-(SP)
045734  010600                            MOV     SP,R0
045736  104417                            TRAP    C$PNTF
045740  062706  000006                    ADD     #6,SP
045744  000137  046230                    JMP     T7EXIT                  ;GET OUT IF NONE LEFT TO TEST

045750  105737  002212            5$:     TSTB    CLOCK                   ;IS THE CLOCK ENABLED
045754  001421                            BEQ     G07                     ;NO, THEN CAN'T PRINT TIME
045756                                  PRINTF  #TIME,<B,HOURS>,<B,MINUTE>,<B,SECOND>,
045756  005046                          CLR     -(SP)
045760  153716  002215                  BISB    SECOND,(SP)
045764  005046                          CLR     -(SP)
045766  153716  002214                  BISB    MINUTE,(SP)
045772  005046                          CLR     -(SP)
045774  153716  002213                  BISB    HOURS,(SP)
046000  012746  020044                  MOV     #TIME,-(SP)
046004  012746  000004                  MOV     #4,-(SP)
046010  010600                          MOV     SP,R0
046012  104417                          TRAP    C$PNTF
046014  062706  000012                  ADD     #12,SP

046020  005037  003410            G07:    CLR     BRCNT                   ; CLEAR THE BRANCH COUNTER
046024  012705  002232                    MOV     #T7TBL,R5               ;POINT R5 TO TEST 7 TABLE
046030  005037  003440                    CLR     TSTMSK                  ;NO ALLOWABLE ERRORS
046034  052737  000001  003440            BIS     #LEDB,TSTMSK            ;SET UP TO ALLOW LEOT DETECTED

046042  004737  033564            10$:    JSR     PC,SDSTUP               ;SET UP THE RANDOM SEEDS
046046  004737  033714                    JSR     PC,PATCLR               ;USE THE SAME PATTERN
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 6436 046052  004737  033464            JSR     PC,CLREOT       ;CLEAR THE EOT FLAG
 6437 046056  062705  000006            ADD     #TSTSTP,R5      ;MOVE R5 TO THE NEXT TEST TABLE
 6438 046062  122765  177777  000000    CMPB    #-1,CMD(R5)     ;IS IT AN END OF SEQUENCE COMMAND ?
 6439 046070  001457                    BEQ     T7EXIT          ;GET OUT IF IT IS
 6440 046072  122765  000310  000000    CMPB    #310,CMD(R5)    ;IS IT A DELAY COMMAND ?
 6441 046100  001011                    BNE     40$             ;NO KEEP GOING
 6442 046102  016501  000002            MOV     ITMCNT(R5),R1   ;PUT THE DELAY VARIABLE IN R1
 6443
 6444 046106  013702  002116    20$:    MOV     L$DLY,R2        ;GET THE PROGRAM DELAY VARIABLE
 6445 046112  005302    30$:    DEC     R2              ;DECREMENT R2
 6446 046114  001376                    BNE     30$             ;KEEP GOING TILL ZERO
 6447 046116  005301                    DEC     R1              ;DECREMENT R1
 6448 046120  001372                    BNE     20$             ;RESET R2 AND GO TILL R1 IS ZERO
 6449 046122  000747                    BR      10$             ;GET THE NEXT COMMAND
 6450
 6451 046124  122765  000300  000000  40$:    CMPB    #300,CMD(R5)    ;IS IT A BRANCH COMMAND ?
 6452 046132  001031                    BNE     80$             ;NO, GO ON
 6453 046134  032737  000001  003516    BIT     #T7BRFL,PCFLAG  ; HAVE WE ALREADY LOAD THE BRANCH COUNT ?
 6454 046142  001006                    BNE     50$             ; YES, DON'T OVER WRITE IT
 6455 046144  052737  000001  003516    BIS     #T7BRFL,PCFLAG  ; REMEMBER THAT YOUR IN A LOOP
 6456 046152  016537  000004  003410    MOV     ITRCNT(R5),BRCNT ; ITERATION COUNT TO BRANCH COUNT
 6457
 6458 046160  005337  003410    50$:    DEC     BRCNT           ; HAVE WE BRANCHED THE REQUIRED TIMES ?
 6459 046164  001004                    BNE     60$             ; NO, CONTINUE LOOPING
 6460 046166  042737  000001  003516    BIC     #T7BRFL,PCFLAG  ; CLEAR THE BRANCH FLAG
 6461 046174  000722                    BR      10$             ; GET NEXT COMMAND
 6462 046176  016501  000002    60$:    MOV     ITMCNT(R5),R1   ;PUT THE COMMAND NUMBER IN R1
 6463 046202  012705  002232            MOV     #T7TBL,R5       ;POINT R5 TO TEST 7 TABLE
 6464
 6465 046206  062705  000006    70$:    ADD     #TSTSTP,R5      ;START STEPPING R5 TO THE COMMAND
 6466 046212  005301                    DEC     R1              ;IS THIS THE RIGHT PLACE ?
 6467 046214  001374                    BNE     70$             ;NO, KEEP GOING
 6468
 6469 046216  004737  021240    80$:    JSR     PC,SCHED        ;GO START THE TEST
 6470 046222  005737  003524            TST     @DROP           ;HAVE ALL UNITS BEEN DROPPED ?
 6471 046226  001305                    BNE     10$             ;NO, KEEP TESTING
 6472 046230  004737  033640  T7EXIT:   JSR     PC,SDSAVE       ;SAVE THE RANDOM SEEDS
 6473 046234                            EXIT    TST
      046234  104432                    TRAP    C$EXIT
      046236  000002                    .WORD   L10023-.
 6474
 6475
 6476                                   .EVEN
 6477
 6478 046240                            ENDTST
      046240                    L10023:
      046240  104401                    TRAP    C$ETST
 6479
 6480 046242                            ENDMOD
 6481
```

```
 6484
 6486                                   .TITLE PARAMETER CODING
 6497
 6498                                   .SBTTL  HARDWARE PARAMETER CODING SECTION
 6526
 6527 046242                                   BGNMOD
 6528
 6529                                   ;++
 6530                                   ; THE HARDWARE PARAMETER CODING SECTION CONTAINS MACROS
 6531                                   ; THAT ARE USED BY THE SUPERVISOR TO BUILD P-TABLES.  THE
 6532                                   ; MACROS ARE NOT EXECUTED AS MACHINE INSTRUCTIONS BUT ARE
 6533                                   ; INTERPRETED BY THE SUPERVISOR AS DATA STRUCTURES.  THE
 6534                                   ; MACROS ALLOW THE SUPERVISOR TO ESTABLISH COMMUNICATIONS
 6535                                   ; WITH THE OPERATOR.
 6536                                   ;--
 6537
 6538 046242                                   BGNHRD
      046242  000032                           .WORD L10024-L$HARD/2
      046244                           L$HARD::
 6539
 6540 046244                                   GPRMA   TKIPAD,0,0,160002,177564,YES
      046244  000031                           .WORD   T$CODE
      046246  046270                           .WORD   TKIPAD
      046250  160002                           .WORD   T$LOLIM
      046252  177564                           .WORD   T$HILIM
 6541 046254                                   GPRMD   TKUNT,2,0,777,0,251,YES
      046254  001032                           .WORD   T$CODE
      046256  046305                           .WORD   TKUNT
      046260  000777                           .WORD   777
      046262  000000                           .WORD   T$LOLIM
      046264  000251                           .WORD   T$HILIM
 6542
 6543 046266                                   EXIT HRD
      046266  021004                           .WORD   T$CODE
 6544
 6545
 6546 046270      124     113     111  TKIPAD: .ASCIZ  ?TKIP ADDRESS?
 6547 046305      124     057     115  TKUNT:  .ASCIZ  ?T/MSCP UNIT NUMBER?
 6548                                   .EVEN
 6549 046330                                   ENDHRD
                                               .EVEN
      046330                           L10024:
```

```
 6551                                   .SBTTL  SOFTWARE PARAMETER CODING SECTION
 6552
 6553                                   ;++
 6554                                   ; THE SOFTWARE PARAMETER CODING SECTION CONTAINS MACROS
 6555                                   ; THAT ARE USED BY THE SUPERVISOR TO BUILD P-TABLES.  THE
 6556                                   ; MACROS ARE NOT EXECUTED AS MACHINE INSTRUCTIONS BUT ARE
 6557                                   ; INTERPRETED BY THE SUPERVISOR AS DATA STRUCTURES.  THE
 6558                                   ; MACROS ALLOW THE SUPERVISOR TO ESTABLISH COMMUNICATIONS
 6559                                   ; WITH THE OPERATOR.
 6560                                   ;--
 6561
 6562 046330                                   BGNSFT
      046330  001107                          .WORD L10025-L$SOFT/2
      046332                           L$SOFT::
 6563
 6564 046332                                   GPRML   ECLK,0,1,YES
      046332  000130                          .WORD   T$CODE
      046334  047216                          .WORD   ECLK
      046336  000001                          .WORD   1
 6565 046340                                   XFERF   5$
      046340  013044                          .WORD   T$CODE
 6566 046342                                   GPRMD   HOUR,0,D,177400,0,24.,YES
      046342  000052                          .WORD   T$CODE
      046344  047247                          .WORD   HOUR
      046346  177400                          .WORD   177400
      046350  000000                          .WORD   T$LOLIM
      046352  000030                          .WORD   T$HILIM
 6567 046354                                   GPRMD   MINT,2,D,000377,0,60.,YES
      046354  001052                          .WORD   T$CODE
      046356  047331                          .WORD   MINT
      046360  000377                          .WORD   000377
      046362  000000                          .WORD   T$LOLIM
      046364  000074                          .WORD   T$HILIM
 6568
 6569 046366                            5$:    GPRML   CTPA,4,400,YES
      046366  002130                          .WORD   T$CODE
      046370  047376                          .WORD   CTPA
      046372  000400                          .WORD   400
 6570 046374                                   XFERF   10$
      046374  012044                          .WORD   T$CODE
 6571 046376                                   GPRML   SERR,6,1,YES
      046376  003130                          .WORD   T$CODE
      046400  047433                          .WORD   SERR
      046402  000001                          .WORD   1
 6572 046404                                   GPRML   SERC,6,400,YES
      046404  003130                          .WORD   T$CODE
      046406  047477                          .WORD   SERC
      046410  000400                          .WORD   400
 6573 046412                                   GPRML   PADD,10,1,YES
      046412  004130                          .WORD   T$CODE
      046414  047541                          .WORD   PADD
      046416  000001                          .WORD   1
 6574
 6575 046420                            10$:   GPRML   PRPA,10,400,YES
      046420  004130                          .WORD   T$CODE
      046422  047570                          .WORD   PRPA
      046424  000400                          .WORD   400
```

```
6576 046426                                XFERF   15$
     046426  024044                        .WORD   T$CODE
6577 046430                                GPRML   SOER,12,1,YES
     046430  005130                        .WORD   T$CODE
     046432  047623                        .WORD   SOER
     046434  000001                        .WORD   1
6578 046436                                XFERT   11$
     046436  004024                        .WORD   T$CODE
6579 046440                                GPRML   SRER,12,400,YES
     046440  005130                        .WORD   T$CODE
     046442  047666                        .WORD   SRER
     046444  000400                        .WORD   400
6580 046446                         11$:   GPRML   CLMD,14,1,YES
     046446  006130                        .WORD   T$CODE
     046450  047725                        .WORD   CLMD
     046452  000001                        .WORD   1
6581 046454                                GPRML   MDTB,14,400,YES
     046454  006130                        .WORD   T$CODE
     046456  047774                        .WORD   MDTB
     046460  000400                        .WORD   400
6582 046462                                GPRML   NOCL,16,1,YES
     046462  007130                        .WORD   T$CODE
     046464  050034                        .WORD   NOCL
     046466  000001                        .WORD   1
6583 046470                                GPRML   PDMP,16,400,YES
     046470  007130                        .WORD   T$CODE
     046472  050077                        .WORD   PDMP
     046474  000400                        .WORD   400
6584
6585 046476                         15$:   GPRML   TSPA,20,1,YES
     046476  010130                        .WORD   T$CODE
     046500  050142                        .WORD   TSPA
     046502  000001                        .WORD   1
6586 046504                                XFERF   20$
     046504  023044                        .WORD   T$CODE
6587 046506                                GPRMD   PATE,20,0,177400,0,7,YES
     046506  010032                        .WORD   T$CODE
     046510  050171                        .WORD   PATE
     046512  177400                        .WORD   177400
     046514  000000                        .WORD   T$LOLIM
     046516  000007                        .WORD   T$HILIM
6588 046520                                GPRML   T3ON,22,1,YES
     046520  011130                        .WORD   T$CODE
     046522  050207                        .WORD   T3ON
     046524  000001                        .WORD   1
6589 046526                                GPRML   T5CP,22,400,YES
     046526  011130                        .WORD   T$CODE
     046530  050230                        .WORD   T5CP
     046532  000400                        .WORD   400
6590 046534                                GPRML   BDMP,24,1,YES
     046534  012130                        .WORD   T$CODE
     046536  050270                        .WORD   BDMP
     046540  000001                        .WORD   1
6591 046542                                GPRML   CHGF,24,400,YES
     046542  012130                        .WORD   T$CODE
     046544  050334                        .WORD   CHGF
     046546  000400                        .WORD   400
```

```
6592 046550                                    XFERT   25$
     046550  002024                            .WORD   T$CODE
6593 046552                            20$:    XFER    SFTEX1
     046552  076004                            .WORD   T$CODE
6594
6595 046554                            25$:    GPRMD   CMD1,26,0,000377,0,377,YES
     046554  013032                            .WORD   T$CODE
     046556  050476                            .WORD   CMD1
     046560  000377                            .WORD   000377
     046562  000000                            .WORD   T$LOLIM
     046564  000377                            .WORD   T$HILIM
6596 046566                                    GPRMD   DPAT,26,0,177400,0,7,YES
     046566  013032                            .WORD   T$CODE
     046570  050370                            .WORD   DPAT
     046572  177400                            .WORD   177400
     046574  000000                            .WORD   T$LOLIM
     046576  000007                            .WORD   T$HILIM
6597 046600                                    GPRMD   ICNT,30,D,177777,0,MAXBUF,YES
     046600  014052                            .WORD   T$CODE
     046602  050407                            .WORD   ICNT
     046604  177777                            .WORD   177777
     046606  000000                            .WORD   T$LOLIM
     046610  020000                            .WORD   T$HILIM
6598 046612                                    GPRMD   ITER,32,D,177777,0,65000,YES
     046612  015052                            .WORD   T$CODE
     046614  050451                            .WORD   ITER
     046616  177777                            .WORD   177777
     046620  000000                            .WORD   T$LOLIM
     046622  065000                            .WORD   T$HILIM
6599
6600 046624                                    GPRMD   CMD2,34,0,000377,0,377,YES
     046624  016032                            .WORD   T$CODE
     046626  050504                            .WORD   CMD2
     046630  000377                            .WORD   000377
     046632  000000                            .WORD   T$LOLIM
     046634  000377                            .WORD   T$HILIM
6601 046636                                    GPRMD   DPAT,34,0,177400,0,7,YES
     046636  016032                            .WORD   T$CODE
     046640  050370                            .WORD   DPAT
     046642  177400                            .WORD   177400
     046644  000000                            .WORD   T$LOLIM
     046646  000007                            .WORD   T$HILIM
6602 046650                                    GPRMD   ICNT,36,D,177777,0,MAXBUF,YES
     046650  017052                            .WORD   T$CODE
     046652  050407                            .WORD   ICNT
     046654  177777                            .WORD   177777
     046656  000000                            .WORD   T$LOLIM
     046660  020000                            .WORD   T$HILIM
6603 046662                                    GPRMD   ITER,40,D,177777,0,65000,YES
     046662  020052                            .WORD   T$CODE
     046664  050451                            .WORD   ITER
     046666  177777                            .WORD   177777
     046670  000000                            .WORD   T$LOLIM
     046672  065000                            .WORD   T$HILIM
6604
6605 046674                                    GPRMD   CMD3,42,0,000377,0,377,YES
     046674  021032                            .WORD   T$CODE
```

```
        046676  050512                          .WORD   CMD3
        046700  000377                          .WORD   000377
        046702  000000                          .WORD   T$LOLIM
        046704  000377                          .WORD   T$HILIM
  6606  046706                                  GPRMD   DPAT,42,0,177400,0,7,YES
        046706  021032                          .WORD   T$CODE
        046710  050370                          .WORD   DPAT
        046712  177400                          .WORD   177400
        046714  000000                          .WORD   T$LOLIM
        046716  000007                          .WORD   T$HILIM
  6607  046720                                  GPRMD   ICNT,44,D,177777,0,MAXBUF,YES
        046720  022052                          .WORD   T$CODE
        046722  050407                          .WORD   ICNT
        046724  177777                          .WORD   177777
        046726  000000                          .WORD   T$LOLIM
        046730  020000                          .WORD   T$HILIM
  6608  046732                                  GPRMD   ITER,46,D,177777,0,65000,YES
        046732  023052                          .WORD   T$CODE
        046734  050451                          .WORD   ITER
        046736  177777                          .WORD   177777
        046740  000000                          .WORD   T$LOLIM
        046742  065000                          .WORD   T$HILIM
  6609  046744                                  XFER    CONT1
        046744  002004                          .WORD   T$CODE
  6610
  6611  046746                        SFTEX1:   XFER    SFTEX2
        046746  076004                          .WORD   T$CODE
  6612
  6613  046750                        CONT1:    GPRMD   CMD4,50,0,000377,0,377,YES
        046750  024032                          .WORD   T$CODE
        046752  050520                          .WORD   CMD4
        046754  000377                          .WORD   000377
        046756  000000                          .WORD   T$LOLIM
        046760  000377                          .WORD   T$HILIM
  6614  046762                                  GPRMD   DPAT,50,0,177400,0,7,YES
        046762  024032                          .WORD   T$CODE
        046764  050370                          .WORD   DPAT
        046766  177400                          .WORD   177400
        046770  000000                          .WORD   T$LOLIM
        046772  000007                          .WORD   T$HILIM
  6615  046774                                  GPRMD   ICNT,52,D,177777,0,MAXBUF,YES
        046774  025052                          .WORD   T$CODE
        046776  050407                          .WORD   ICNT
        047000  177777                          .WORD   177777
        047002  000000                          .WORD   T$LOLIM
        047004  020000                          .WORD   T$HILIM
  6616  047006                                  GPRMD   ITER,54,D,177777,0,65000,YES
        047006  026052                          .WORD   T$CODE
        047010  050451                          .WORD   ITER
        047012  177777                          .WORD   177777
        047014  000000                          .WORD   T$LOLIM
        047016  065000                          .WORD   T$HILIM
  6617
  6618  047020                                  GPRMD   CMD5,56,0,000377,0,377,YES
        047020  027032                          .WORD   T$CODE
        047022  050526                          .WORD   CMD5
        047024  000377                          .WORD   000377
```

```
                047026  000000                  .WORD   T$LOLIM
                047030  000377                  .WORD   T$HILIM
        6619    047032                          GPRMD   DPAT,56,0,177400,0,7,YES
                047032  027032                  .WORD   T$CODE
                047034  050370                  .WORD   DPAT
                047036  177400                  .WORD   177400
                047040  000000                  .WORD   T$LOLIM
                047042  000007                  .WORD   T$HILIM
        6620    047044                          GPRMD   ICNT,60,D,177777,0,MAXBUF,YES
                047044  030052                  .WORD   T$CODE
                047046  050407                  .WORD   ICNT
                047050  177777                  .WORD   177777
                047052  000000                  .WORD   T$LOLIM
                047054  020000                  .WORD   T$HILIM
        6621    047056                          GPRMD   ITER,62,D,177777,0,65000,YES
                047056  031052                  .WORD   T$CODE
                047060  050451                  .WORD   ITER
                047062  177777                  .WORD   177777
                047064  000000                  .WORD   T$LOLIM
                047066  065000                  .WORD   T$HILIM
        6622
        6623    047070                          GPRMD   CMD6,64,0,000377,0,377,YES
                047070  032032                  .WORD   T$CODE
                047072  050534                  .WORD   CMD6
                047074  000377                  .WORD   000377
                047076  000000                  .WORD   T$LOLIM
                047100  000377                  .WORD   T$HILIM
        6624    047102                          GPRMD   DPAT,64,0,177400,0,7,YES
                047102  032032                  .WORD   T$CODE
                047104  050370                  .WORD   DPAT
                047106  177400                  .WORD   177400
                047110  000000                  .WORD   T$LOLIM
                047112  000007                  .WORD   T$HILIM
        6625    047114                          GPRMD   ICNT,66,D,177777,0,MAXBUF,YES
                047114  033052                  .WORD   T$CODE
                047116  050407                  .WORD   ICNT
                047120  177777                  .WORD   177777
                047122  000000                  .WORD   T$LOLIM
                047124  020000                  .WORD   T$HILIM
        6626    047126                          GPRMD   ITER,70,D,177777,0,65000,YES
                047126  034052                  .WORD   T$CODE
                047130  050451                  .WORD   ITER
                047132  177777                  .WORD   177777
                047134  000000                  .WORD   T$LOLIM
                047136  065000                  .WORD   T$HILIM
        6627    047140                          XFER    CONT2
                047140  002004                  .WORD   T$CODE
        6628
        6629    047142                  SFTEX2: XFER    SFTEX3
                047142  025004                  .WORD   T$CODE
        6630
        6631    047144                  CONT2:  GPRMD   CMD7,72,0,000377,0,377,YES
                047144  035032                  .WORD   T$CODE
                047146  050542                  .WORD   CMD7
                047150  000377                  .WORD   000377
                047152  000000                  .WORD   T$LOLIM
                047154  000377                  .WORD   T$HILIM
```

```
6632 047156                                    GPRMD   DPAT,72,0,177400,0,7,YES
     047156  035032                              .WORD   T$CODE
     047160  050370                              .WORD   DPAT
     047162  177400                              .WORD   177400
     047164  000000                              .WORD   T$LOLIM
     047166  000007                              .WORD   T$HILIM
6633 047170                                    GPRMD   ICNT,74,D,177777,0,MAXBUF,YES
     047170  036052                              .WORD   T$CODE
     047172  050407                              .WORD   ICNT
     047174  177777                              .WORD   177777
     047176  000000                              .WORD   T$LOLIM
     047200  020000                              .WORD   T$HILIM
6634 047202                                    GPRMD   ITER,76,D,177777,0,65000,YES
     047202  037052                              .WORD   T$CODE
     047204  050451                              .WORD   ITER
     047206  177777                              .WORD   177777
     047210  000000                              .WORD   T$LOLIM
     047212  065000                              .WORD   T$HILIM
6635
6636 047214                            SFTEX3: XFER    SFTEX4
     047214  070004                              .WORD   T$CODE
6637
6638 047216     105     116     101    ECLK:   .ASCIZ  /ENABLE TIME OF DAY CLOCK/
6639 047247     040     111     116    HOUR:   .ASCIZ  / INPUT HOUR IN 24 HOUR FORMAT (OMIT LEADING ZERO)/
6640 047331     040     111     116    MINT:   .ASCIZ  / INPUT MINUTES (OMIT LEADING ZERO)/
6641                                           .EVEN
6642
6643 047374                            SFTEX4: XFER    SFTEX5
     047374  075004                              .WORD   T$CODE
6644
6645 047376     103     110     101    CTPA:   .ASCIZ  /CHANGE CONTROLLER PARAMETERS/
6646 047433     040     105     116    SERR:   .ASCIZ  / ENABLE CONTROLLER ERROR CORRECTION/
6647 047477     040     105     116    SERC:   .ASCIZ  / ENABLE CONTROLLER ERROR RECOVERY/
6648 047541     040     105     116    PADD:   .ASCIZ  / ENABLE PAD BLOCKING/
6649                                           .EVEN
6650
6651 047566                            SFTEX5: XFER    SFTEX6
     047566  102004                              .WORD   T$CODE
6652
6653 047570     103     110     101    PRPA:   .ASCIZ  /CHANGE PRINTING PARAMETERS/
6654 047623     040     105     116    SOER:   .ASCIZ  / ENABLE SOFT ERROR REPORT PRINTING/
6655 047666     040     040     105    SRER:   .ASCIZ  /  ENABLE READ SOFT ERRORS ONLY/
6656 047725     040     105     116    CLMD:   .ASCIZ  / ENABLE CLEAR MEDIA TABLE EVERY PASS/
6657                                           .EVEN
6658
6659 047772                            SFTEX6: XFER    SFTEX7
     047772  063004                              .WORD   T$CODE
6660
6661 047774     040     105     116    MDTB:   .ASCIZ  / ENABLE PRINTING OF MEDIA TABLE/
6662 050034     040     105     116    NOCL:   .ASCIZ  / ENABLE CLEAR STATS ON FATAL ERROR/
6663 050077     040     105     116    PDMP:   .ASCIZ  / ENABLE VARIABLES DUMP ON ERROR/
6664                                           .EVEN
6665
6666 050140                            SFTEX7: XFER    SFTEX8
     050140  113004                              .WORD   T$CODE
6667
6668 050142     103     110     101    TSPA:   .ASCIZ  /CHANGE TEST PARAMETERS/
```

```
6669 050171      040     104     101  PATE:   .ASCIZ  / DATA PATTERN/
6670 050207      040     122     125  T3ON:   .ASCIZ  / RUN TEST 3 ONLY/
6671 050230      040     105     116  T5CP:   .ASCIZ  / ENABLE DATA COMPARES IN TEST 5/
6672 050270      040     105     116  BDMP:   .ASCIZ  / ENABLE PRINT READ BUFFER IN TEST 5/
6673 050334      040     103     110  CHGF:   .ASCIZ  / CHANGE COMMAND SEQUENCE/
6674                                          .EVEN
6675
6676 050366                           SFTEX8: XFER    SFTEX9
     050366  043004                           .WORD   T$CODE
6677
6678 050370      040     040     104  DPAT:   .ASCIZ  /  DATA PATTERN/
6679 050407      040     040     111  ICNT:   .ASCIZ  /  ITEM COUNT (BYTE,RECORD,OBJECT)/
6680 050451      040     040     111  ITER:   .ASCIZ  /  ITERATION COUNT/
6681                                          .EVEN
6682
6683 050474                           SFTEX9: XFER    SFTEXT
     050474  026004                           .WORD   T$CODE
6684
6685 050476      103     115     104  CMD1:   .ASCIZ  "CMD/1"
6686 050504      103     115     104  CMD2:   .ASCIZ  "CMD/2"
6687 050512      103     115     104  CMD3:   .ASCIZ  "CMD/3"
6688 050520      103     115     104  CMD4:   .ASCIZ  "CMD/4"
6689 050526      103     115     104  CMD5:   .ASCIZ  "CMD/5"
6690 050534      103     115     104  CMD6:   .ASCIZ  "CMD/6"
6691 050542      103     115     104  CMD7:   .ASCIZ  "CMD/7"
6692                                          .EVEN
6693
6694 050550                           SFTEXT:
6695 050550                                   ENDSFT
                                              .EVEN
     050550                           L10025:
6696
6703
6704 050550                                   ENDMOD
6705
6706 050550                                           .BLKW   4
6707 050560                           RDBUF::         .BLKW   10000   ;READ BUFFER
6708 070560                           WRTBUF::        .BLKW   10000   ;WRITE BUFFER
6709
6710 110560                           MEDIAS::        .BLKW   1296.   ;MEDIA STATISTICS TABLE
6711
6712 115620                           PATCH::         .BLKW   50      ;PATCH SPACE
6713
6714
6715 115740                           LASTAD
                                              .EVEN
     115740  115754                           .WORD T$FREE
     115742  000004                           .WORD T$SIZE
     115744                           L$LAST::
6716
6717 115744                                   BGNSETUP        1       ;NUMBER OF P-TABLES
6718 115744                                   BGNPTAB
     115744  000000                           .WORD   0
     115746  000002                           .WORD   L10030-./2-1
     115750                           L10026:
6719 115750  174500                                   .WORD   174500  ;IP ADDRESS
6720 115752  000000                                   .WORD   0       ;UNIT NUMBER
```

```
6721 115754                                 ENDPTAB
     115754                          L10030:
6722 115754                                 ENDSETUP
6723         000001                 .END
```

Symbol table

```
ABO    = 000200 G
ABOER    011525
ABOR     025346
ABORT  = 000004 G
ABOT     010662 G
ACC    = 000040 G
ACCESS   024522
ACR    = 000041 G
ADJUST   027146
ADR    = 000020 G
ALLPAT = 000200 G
ASSEMB = 000010
AVALAB   025026
AVB    = 000001 G
AVL    = 000130 G
AVLB   = 000040 G
AVLER    011556
AVLT     010702 G
AVU    = 000134 G
BADEL    013233
BADER    011643
BADERL   011142
BDMP     050270
BIT0   = 000001 G
BIT00  = 000001 G
BIT01  = 000002 G
BIT02  = 000004 G
BIT03  = 000010 G
BIT04  = 000020 G
BIT05  = 000040 G
BIT06  = 000100 G
BIT07  = 000200 G
BIT08  = 000400 G
BIT09  = 001000 G
BIT1   = 000002 G
BIT10  = 002000 G
BIT11  = 004000 G
BIT12  = 010000 G
BIT13  = 020000 G
BIT14  = 040000 G
BIT15  = 100000 G
BIT2   = 000004 G
BIT3   = 000010 G
BIT4   = 000020 G
BIT5   = 000040 G
BIT6   = 000100 G
BIT7   = 000200 G
BIT8   = 000400 G
BIT9   = 001000 G
BOE    = 000400 G
BOTER    011751
BOTT     011012 G
BRCNT    003410 G
BUFADR   003422 G
BUFDMP   034074
BUFDSC   025616
BUFOFF = 000012 G
BYPASS   021001 G
BYTADD   003446 G
BYTCNT   022124 G
BYTES    003416 G
CDRECV   023710 G
CDREN0   010312 G
CDREN1   010376 G
CDREN2   010462 G
CDREN3   010546 G
CDSRG0   010272 G
CDSRG1   010356 G
CDSRG2   010442 G
CDSRG3   010526 G
CF.ATN = 000200 G
CF.MSC = 000100 G
CF.OTH = 000040 G
CF.THS = 000020 G
CHGF     050334
CHGFLG   002237 G
CHODAT   024502
CLMD     047725
CLOCK    002212 G
CLREOT   033464 G
CLRMED   002226 G
CLSDRV   023444 G
CMD    = 000000 G
CMDASC   011322 G
CMDBF1   003566 G
CMDBF2   003636 G
CMDBF3   003706 G
CMDBF4   003756 G
CMDBLD   022002 G
CMDCNT   003400 G
CMDER    011502
CMDLST = 000001 G
CMDONE = 000200 G
CMDSEQ = 000006 G
CMDSSV = 000012 G
CMDT     010652 G
CMDTBL   024366
CMD1     050476
CMD2     050504
CMD3     050512
CMD4     050520
CMD5     050526
CMD6     050534
CMD7     050542
CMLSER   012213
CMMDSQ   021406 G
CMP    = 000030 G
CMPDAT   032564 G
CMPEL    013030
CMPER    012464
CMPERL   011152
CMPERR   003444 G
CMPPRI   014210
CMPT     010732 G
CMR    = 000031 G
CMSTSV   010550 G
CNTEL    013145
CNTER    011674
CNTERL   011172
CNTFLG   010562 G
CNTHI    010554 G
CNTLEL   013172
CNTLER   011132
CNTT     010762 G
CNUSAV = 000014 G
COLSAV = 000016 G
COMEXI   025700
CONID  = 177777 G
CONTPA   002217 G
CONTRV   020532 G
CONT1    046750
CONT2    047144
CORDMP   033742
COREL    012627
CORERL   011232
COUNT    003404 G
COUNTS   020202 G
CPRIEX   014350
CRD    = 177776 G
CRDLIM   010571 G
CTPA     047376
C$AU   = 000052
C$AUTO = 000061
C$BRK  = 000022
C$BSEG = 000004
C$BSUB = 000002
C$CLCK = 000062
C$CLEA = 000012
C$CLOS = 000035
C$CLP1 = 000006
C$CPBF = 000074
C$CPME = 000075
C$CVEC = 000036
C$DCLN = 000044
C$DODU = 000051
C$DRPT = 000024
C$DU   = 000053
C$EDIT = 000000
C$ERDF = 000055
C$ERHR = 000056
C$ERRO = 000060
C$ERSF = 000054
C$ERSO = 000057
C$ESCA = 000010
C$ESEG = 000005
C$ESUB = 000003
C$ETST = 000001
C$EXIT = 000032
C$FREQ = 000101
C$FRME = 000100
C$GETB = 000026
C$GETW = 000027
C$GMAN = 000043
C$GPHR = 000042
C$GPRI = 000040
C$INIT = 000011
C$INLP = 000020
C$MANI = 000050
C$MAP  = 000102
C$MEM  = 000031
C$MMU  = 000103
C$MSG  = 000023
C$OPNR = 000034
C$OPNW = 000104
C$PNTB = 000014
C$PNTF = 000017
C$PNTS = 000016
C$PNTX = 000015
C$PUTB = 000072
C$PUTW = 000073
C$QIO  = 000377
C$RDBU = 000007
C$REFG = 000047
C$REL  = 000077
C$RESE = 000033
C$REVI = 000004
C$RFLA = 000021
C$RPT  = 000025
C$SEFG = 000046
C$SPRI = 000041
C$SVEC = 000037
C$TOME = 000076
DATAEL   031436
DATBL    003472 G
DATER    011630
DATPAT = 000001 G
DATT     010742 G
DAY      020125 G
DAYS     003564 G
DCBEND   004032 G
DCBSTP = 000050 G
DCB3SP = 000170 G
DCMDBF   003572 G
DCMPER   012507
DCMPT    011112 G
DEVERR   013272 G
DEVEXT   014400
DEVFAT = 000001 G
DFPTBL   002204 G
DIAGMC = 000000
DMPBUF   002236 G
DMPFLG   002231 G
DPAT     050370
DQCMD    027674 G
DRBEN0   005072 G
DRBEN1   006132 G
DRBEN2   007172 G
DRBEN3   010232 G
DRBSTP = 000104 G
DRERFL = 000010 G
DRINUS   003350 G
DROP   = 000010 G
DROPIT = 000400 G
DROPPD = 000104 G
DROPUN   040450 G
DRSPB0   004032 G
DRSPB1   005072 G
DRSPB2   006132 G
DRSPB3   007172 G
DRVEL    013125
DRVER    011715
DRVERL   011162
DRVT     010772 G
DSPSTP = 000004 G
DSRNG0   010226 G
DSRNG1   010312 G
DSRNG2   010376 G
DSRNG3   010462 G
DSTEL    013103
DTCPER = 000070 G
DUMP     020347 G
DUMPKT   003344 G
DUMP1    020430 G
DUMP2    020471 G
ECBEL    013001
ECBERL   011272
ECCBC  = 000036 G
ECCDC  = 000026 G
ECCFLG = 000100 G
ECCTC  = 000030 G
ECDEL    012663
ECDERL   011312
ECLK     047216
ECTEL    012707
ECTERL   011302
EC1COR = 000050 G
EC2COR = 000052 G
EDCEXT   031244
EDLEXT   032042
EF.CON = 000036 G
EF.EOT = 000010 G
EF.LOG = 000040 G
EF.NEW = 000035 G
EF.PWR = 000034 G
EF.RES = 000037 G
EF.SEX = 000020 G
EF.STA = 000040 G
ELTEXT   032170
ENDPAT = 000010 G
EOT    = 000004 G
EOTBIT = 000002 G
EOTPR  = 000010 G
ERASE    024750
ERASGP   025006
ERG    = 000120 G
```

```
ERI    = 000113 G
ERLGER  014502 G
ERL00   017146 G
ERL01   017203 G
ERL02   017301 G
ERL03   017365 G
ERL04   017454 G
ERL05   017540 G
ERL06   017627 G
ERL07   017713 G
ERL08   017743 G
ERR    = 100000 G
ERRBLK  013270 G
ERRDEC  030316 G
ERRDEI  031006 G
ERRDEL  031250 G
ERREXT  031026
ERRLOG= 040000 G
ERRMSG  013266 G
ERRNBR  013264 G
ERRTLY  032050 G
ERRTYP  013262 G
ERR00   015770 G
ERR01   016040 G
ERR02   016116 G
ERR03   016175 G
ERR04   016253 G
ERR05   016332 G
ERR06   016411 G
ERR07   016461 G
ERR08   016521 G
ERR09   016556 G
ERR10   016617 G
ERR11   016651 G
ERR12   016675 G
ERR13   016733 G
ERR14   016764 G
ERR15   017012 G
ERR16   017062 G
ERR17   017107 G
ERS    = 000110 G
ERTLY   031154
ETLLY   032132 G
EVENT   003556 G
EVL    = 000004 G
EV.COR= 000150 G
EV.CTO= 000052 G
EV.DST= 000050 G
EV.HER= 000213 G
EV.IDS= 000152 G
EV.LGP= 000010 G
EV.SER= 000153 G
EV.SRI= 000113 G
EV.SRT= 000053 G
EV.URE= 000350 G
EXC1A2  027322
EXC2A3  027344
EXC3A4  027366
EXC4A1  027410
EXIT    025722
EXTCLN  040442
EXTINT  040340
EXTSRT  032526
EX3REW  044212
E$END  = 002100
E$LOAD= 000035
FAIL   = 000020 G
FLAG   = 040000 G
FMTER   011731
FMTT    011002 G
FM.BAD= 000001 G
FM.CNT= 000000 G
FM.TPE= 000005 G
F$AU   = 000015
F$AUTO= 000020
F$BGN  = 000040
F$CLEA= 000007
F$DU   = 000016
F$END  = 000041
F$HARD= 000004
F$HW   = 000013
F$INIT= 000006
F$JMP  = 000050
F$MOD  = 000000
F$MSG  = 000011
F$PROT= 000021
F$PWR  = 000017
F$RPT  = 000012
F$SEG  = 000003
F$SOFT= 000005
F$SRV  = 000010
F$SUB  = 000002
F$SW   = 000014
F$TEST= 000001
GCMDST  025400
GCS    = 000210 G
GCSCFL= 000020 G
GCSEXT  027320
GCSHDL  026534 G
GCSREF  010552 G
GCSRFL= 000040 G
GO     = 000001 G
GO1     041066
GO2     043270
GO3     043726
GO4     044442
GO5     045022
GO6     045342
GO7     046020
GUNSTA  025440
GUS    = 000220 G
G$CNTO= 000200
G$DELM= 000372
G$DISP= 000003
G$EXCP= 000400
G$HILI= 000002
G$LOLI= 000001
G$NO   = 000000
G$OFFS= 000400
G$OFSI= 000376
G$PRMA= 000001
G$PRMD= 000002
G$PRML= 000000
G$RADA= 000140
G$RADB= 000000
G$RADD= 000040
G$RADL= 000120
G$RADO= 000020
G$XFER= 000004
G$YES  = 000010
HARD   = 000002 G
HDLEXT  021236
HELP   = 000000
HEXTBL  011442 G
HIADDR= 000002 G
HIBYTE= 177777 G
HIHEX   003554 G
HNDLRP  003412 G
HOE    = 100000 G
HOUR    047247
HOURS   002213 G
HRD    = 000007 G
HSTER   012165
HSTIMO= 000000 G
HSTT    010752 G
HUNGER  012246
HWR    = 000006 G
H1READ= 000054 G
H1WRIT= 000060 G
H2READ= 000056 G
H2WRIT= 000062 G
IBE    = 010000 G
ICNT    050407
IDONE   026506
IDU    = 000040 G
IER    = 020000 G
ILCMD   025604
ILLCMD= 000007 G
ILOOP   026350
IMM    = 000200 G
IMMBIT= 000003 G
INIT    025342
INITER  012400
INITIT  040344 G
INT    = 000170 G
INTDON= 000001 G
INTERR= 000006 G
INTTBL  026524
IOERTB  010572 G
IOHUNG= 000002 G
IOICRD= 020000 G
IONORM= 000000 G
IOPDRE= 000003 G
IOSTAT  010546 G
IOTIME= 000004 G
ISR    = 000100 G
ISTART  037750
ITER    050451
ITERS   003420 G
ITMCNT= 000002 G
ITMOFF= 000002 G
ITRCNT= 000004 G
IVSER   012135
IVST1   010712 G
IVST2   011032 G
IVST3   011102 G
IXE    = 004000 G
I$AU   = 000041
I$AUTO= 000041
I$CLN  = 000041
I$DU   = 000041
I$HRD  = 000041
I$INIT= 000041
I$MOD  = 000041
I$MSG  = 000041
I$PROT= 000040
I$PTAB= 000041
I$PWR  = 000041
I$RPT  = 000041
I$SEG  = 000041
I$SETU= 000041
I$SFT  = 000041
I$SRV  = 000041
I$SUB  = 000041
I$TST  = 000041
J$JMP  = 000167
KWCSR  = 177546 G
KWHDL   021100 G
LEDB   = 000001 G
LEDER   012105
LEDT    011072 G
LEOTFL= 000030 G
LF.CON= 000100 G
LF.SNR= 000001 G
LF.SUC= 000200 G
LGPEL   013057
LGPERL  011202
LGSTAT  027732 G
LINE    020527 G
LOBYTE= 177776 G
LOE    = 040000 G
LOHEX   003552 G
LOOP    026340
LOOPS   010560 G
LOT    = 000010 G
LSTENT= 000134 G
LUNFLG= 000026 G
LUNSTP= 000172 G
LUN0    002314 G
LUN1    002506 G
LUN2    002700 G
LUN3    003072 G
L$ACP   002110 G
L$APT   002036 G
L$AU    040714 G
L$AUT   002070 G
L$AUTO  040376 G
L$CCP   002106 G
L$CLEA  040400 G
L$CO    002032 G
L$DEPO  002011 G
L$DESC  002142 G
L$DESP  002076 G
L$DEVP  002060 G
L$DISP  002124 G
L$DLY   002116 G
L$DTP   002040 G
L$DTYP  002034 G
L$DU    040706 G
L$DUT   002072 G
L$DVTY  002174 G
L$EF    002052 G
L$ENVI  002044 G
L$ERRT  013262 G
L$ETP   002102 G
L$EXP1  002046 G
L$EXP4  002064 G
L$EXP5  002066 G
L$HARD  046244 G
L$HIME  002120 G
L$HPCP  002016 G
L$HPTP  002022 G
L$HW    002204 G
L$ICP   002104 G
L$INIT  037012 G
L$LADP  002026 G
L$LAST  115744 G
L$LOAD  002100 G
L$LUN   002074 G
L$MREV  002050 G
L$NAME  002000 G
L$PRIO  002042 G
L$PROT  021036 G
L$PRT   002112 G
L$REPP  002062 G
L$REV   002010 G
L$RPT   034216 G
L$SOFT  046332 G
L$SPC   002056 G
L$SPCP  002020 G
L$SPTP  002024 G
L$STA   002030 G
L$SW    002212 G
L$TEST  002114 G
L$TIML  002014 G
```

Symbol table

```
L$UNIT  002012 G
L.BADR= 000030 G
L.CHVR= 000025 G
L.CNTI= 000014 G
L.CNTO= 000061 G
L.CNT1= 000062 G
L.CNT2= 000063 G
L.CRF = 000000 G
L.CSVR= 000024 G
L.DFLG= 000054 G
L.DRVC= 000053 G
L.DRVS= 000064 G
L.EVNT= 000012 G
L.FHVR= 000050 G
L.FLGS= 000011 G
L.FMT = 000010 G
L.FMTD= 000042 G
L.FSVR= 000051 G
L.GPCT= 000044 G
L.LBLK= 000060 G
L.LVL = 000042 G
L.MLUN= 000026 G
L.OPFL= 000070 G
L.PBLK= 000056 G
L.PSTN= 000044 G
L.RTRY= 000043 G
L.RWST= 000066 G
L.SEQN= 000006 G
L.STI = 000050 G
L.STS = 000052 G
L.TRK = 000055 G
L.UHVR= 000041 G
L.UNIT= 000004 G
L.UNTI= 000030 G
L.USVR= 000040 G
L.VSER= 000044 G
L10000  002210
L10001  002314
L10002  014500
L10003  021034
L10005  021076
L10006  021236
L10007  037010
L10010  040374
L10011  040376
L10012  040446
L10013  040712
L10014  040720
L10015  043122
L10016  043616
L10017  044274
L10020  044654
L10021  045174
L10022  045652
L10023  046240
L10024  046330
L10025  050550
L10026  115750
L10030  115754
MAXBUF= 020000 G
MAXITR= 003720 G
MDTB    047774
MD.ALL= 000002 G
MD.CMP= 040000 G
MD.CSE= 020000 G
MD.DLE= 000200 G
MD.EXC= 000040 G
MD.IMM= 000100 G
MD.NXU= 000001 G
MD.OBC= 000004 G
MD.REV= 000010 G
MD.RWD= 000002 G
MD.SEC= 001000 G
MD.SER= 000400 G
MD.SPD= 000001 G
MD.SWP= 000004 G
MD.UNL= 000020 G
MEDIAS  110560 G
MEDTBL  002227 G
MINBUF= 000024 G
MINITR= 000144 G
MINLIM  010570 G
MINT    047331
MINUTE  002214 G
MISSEQ= 000005 G
MSCPVR= 000000 G
MSGEXT  015670
MSGLEN= 177774 G
MSKTST  030774
MTBLOV= 000040 G
N       = 000004 G
NCLK    017770 G
NCLKFL= 000002 G
NOCL    050034
NOCLK   021044 G
NOCLR   002230 G
NOERR = 000106 G
NOMDTB= 000100 G
NOTALY= 000004 G
NRDY  = 000002 G
NUL   = 000000 G
NULL    024436
NULPAT= 000000 G
NUPASS  037210
NURESP= 100000 G
OBCTHD  023276 G
OBJECT  003520 G
OBJFDH= 000036 G
OBJFDL= 000034 G
OBOFFH= 000006 G
OBOFFL= 000004 G
OCTHEX  033376 G
ODDFLG= 000020 G
OFLER   011541
OFLT    010672 G
OLDBLK= 000152 G
OLDTRK= 000154 G
OLD1    026652
OLD2    026732
OLD3    027012
OLD4    027072
ONE   = 000001 G
ONEFIL= 000001
ONL   = 000140 G
ONLB  = 000100 G
ONLINE  025064
OP.ABO= 000001 G
OP.ACC= 000020 G
OP.ACP= 000102 G
OP.AVA= 000100 G
OP.AVL= 000010 G
OP.CMP= 000040 G
OP.DAP= 000013 G
OP.END= 000200 G
OP.ERG= 000026 G
OP.ERS= 000022 G
OP.GCS= 000002 G
OP.GUS= 000003 G
OP.ONL= 000011 G
OP.RD = 000041 G
OP.REP= 000045 G
OP.SCC= 000004 G
OP.SUC= 000012 G
OP.WR = 000042 G
OP.WTM= 000044 G
OTHER = 000102 G
OVERUN  012557
OVRRUN= 000074 G
OWN   = 100000 G
O$APTS= 000000
O$AU  = 000000
O$BGNR= 000001
O$BGNS= 000001
O$DU  = 000001
O$ERRT= 000001
O$GNSW= 000001
O$POIN= 000001
O$SETU= 000001
PADD    047541
PADING  002222 G
PASCNT  003522 G
PATCH   115620 G
PATCLR  033714
PATE    050171
PATERN  002233 G
PATGN1  022362
PATGN2  022376
PATGN3  022410
PATGN4  022450
PATGN5  022464
PATGN6  022504
PATGN7  022520
PATSAV= 000024 G
PATTBL  022344 G
PAT1  = 000001 G
PAT2  = 000002 G
PAT3  = 000003 G
PAT4  = 000004 G
PAT5  = 000005 G
PAT6  = 000006 G
PAT7  = 000007 G
PCBEND= 003344 G
PCBSTP= 000014 G
PCB3SP= 000044 G
PCFLAG  003516 G
PCKSIZ  010564 G
PCMDBF  003264 G
PDMP    050077
PDRECV  026106 G
PHB   = 000002 G
PKPRNT  015476
PNT   = 001000 G
POLER   012045
POLT    011052 G
PORTER  012266
PRI   = 002000 G
PRIERR  032550 G
PRIPCK  014136
PRI00 = 000000 G
PRI01 = 000040 G
PRI02 = 000100 G
PRI03 = 000140 G
PRI04 = 000200 G
PRI05 = 000240 G
PRI06 = 000300 G
PRI07 = 000340 G
PRNTPA  002223 G
PRPA    047570
PRTCLR  026230 G
PRTDRV  025730 G
PRTEXT  031736
PRTINT  026306 G
P.BCNT= 000014 G
P.BUFF= 000020 G
P.CHVR= 000051 G
P.CMST= 000020 G
P.CNTF= 000016 G
P.CRF = 000000 G
P.CSVR= 000050 G
P.CTPM= 000034 G
P.DVPM= 000034 G
P.FLGS= 000011 G
P.FMEM= 000044 G
P.FORM= 000040 G
P.HTMO= 000020 G
P.MEDI= 000034 G
P.MLUN= 000014 G
P.MOD = 000012 G
P.MXWR= 000044 G
P.NREC= 000050 G
P.OPCD= 000010 G
P.OTRF= 000014 G
P.POS = 000034 G
P.RCSK= 000014 G
P.REDD= 000014 G
P.SPED= 000042 G
P.STS = 000012 G
P.TIME= 000024 G
P.TMGC= 000020 G
P.TMSK= 000020 G
P.TRBC= 000040 G
P.UHVR= 000053 G
P.UNFL= 000016 G
P.UNIT= 000004 G
P.UNTI= 000024 G
P.USVR= 000052 G
P.VRSN= 000014 G
QCMD    023050 G
RANGEN  022716 G
RANWRD  003426 G
RAN1    003430 G
RAN2    003432 G
RAN3    003434 G
RD    = 000010 G
RDBUF   050560 G
RDBYT1= 000110 G
RDBYT2= 000112 G
RDBYT3= 000114 G
RDBYT4= 000116 G
RDERL   031572
RDR   = 000011 G
RDREN0  010272 G
RDREN1  010356 G
RDREN2  010442 G
RDREN3  010526 G
RDSOER  002225 G
RDSRG0  010232 G
RDSRG1  010316 G
RDSRG2  010402 G
RDSRG3  010466 G
RDSTEL  011212
RDTB  = 000002 G
RDTER   012017
RDTT    011042 G
READ    024442
RECCNT  003546 G
RESP    003414 G
RESPON  003406 G
REVBIT= 000001 G
REW   = 000160 G
REWIND  025254
RLSER   012421
RLST    011122 G
RMSPOS= 000076 G
RNDBYT= 000000 G
```

Symbol table

```
RNDITR= 000000 G
RNUSAV= 000020 G
ROLSAV= 000022 G
RSPBF0  004026 G
RSPBF1  005066 G
RSPBF2  006126 G
RSPBF3  007166 G
RSPCNT  003402 G
RSPHDL  027432 G
RS1   = 001233 G
RS2   = 007622 G
RS3   = 000000 G
RTYEC1= 000064 G
RTYEC2= 000066 G
RTYEL   012574
RTYERL  011252
RWI   = 000163 G
R10     003534 G
R11     003536 G
R12     003540 G
R3SAVE  003560 G
R4SAVE  003562 G
R8      003530 G
R9      003532 G
SAERR   010566 G
SAVDIF  003436 G
SCC   = 000230 G
SCD   = 000052 G
SCHED   021240 G
SCNTCH  025466
SCR   = 000051 G
SDSAVE  033640 G
SDSTUP  033564 G
SECOND  002215 G
SECRNS  003542 G
SED1  = 000136 G
SED2  = 000140 G
SED3  = 000142 G
SEED1 = 000144 G
SEED2 = 000146 G
SEED3 = 000150 G
SELDAT  022212 G
SELREC  022644 G
SEQER   012347 G
SERC    047477
SERCOR  002221 G
SEREXC= 000002 G
SERR    047433
SERREC  002220 G
SEXB  = 000004 G
SEXER   012063
SEXT    011062 G
SFPTBL  002212 G
SFTEXT  050550
SFTEX1  046746
SFTEX2  047142
SFTEX3  047214
SFTEX4  047374
SFTEX5  047566
SFTEX6  047772
SFTEX7  050140
SFTEX8  050366
SFTEX9  050474
SKD   = 000062 G
SKP   = 000060 G
SKPTMK  024610
SKR   = 000061 G
SLTUSE= 000010 G
SOER    047623
SOERRP  002224 G
SOFT  = 000003 G
SPC   = 000050 G
SPCASC  011346
SPCOBJ  024664
SPCREC  024542
SPO   = 000070 G
SPR   = 000071 G
SRD   = 000005 G
SRER    047666
SRTBL   031732
START   037052
START1  040760
START2  043162
START3  043620
START4  044334
START5  044714
START6  045234
START7  045712
STATER  012445
STATUS= 000004 G
STAT0   035472
STAT1   035475
STAT10  036230
STAT11  036300
STAT12  036352
STAT13  036413
STAT14  036436
STAT15  036461
STAT16  036533
STAT17  036605
STAT18  036655
STAT2   035541
STAT3   035606
STAT4   035666
STAT5   035713
STAT6   035760
STAT7   036032
STAT8   036077
STAT9   036151
STFPCK  024164 G
STINIT  037012 G
ST.ABO= 000002 G
ST.AVL= 000004 G
ST.BOT= 000015 G
ST.CMD= 000001 G
ST.CMP= 000007 G
ST.CNT= 000012 G
ST.DAT= 000010 G
ST.DIA= 000037 G
ST.DRV= 000013 G
ST.FNT= 000014 G
ST.HST= 000011 G
ST.LED= 000023 G
ST.MFE= 000005 G
ST.MSK= 000037 G
ST.OFL= 000003 G
ST.ONL= 000400 G
ST.POL= 000021 G
ST.RDT= 000020 G
ST.SEX= 000022 G
ST.SUB= 000040 G
ST.SUC= 000000 G
ST.TMI= 000016 G
ST.WPR= 000006 G
SUBCNT  003424 G
SUBITR  023142 G
SUBSEC  002216 G
SUC   = 000150 G
SUCCES= 000001 G
SUNCHR  025162
SUPRES  025650
SUW   = 000155 G
SVCGBL= 000000
SVCINS= 000000
SVCSUB= 000000
SVCTAG= 000000
SVCTST= 000000
SWR   = 000004 G
SYSFAT= 000000 G
S$LSYM= 010000
S1    = 004000 G
S1READ= 000040 G
S1WRIT= 000044 G
S2READ= 000042 G
S2WRIT= 000046 G
TBLBTM= 000132 G
TBLEND= 003472 G
TBLFUL  036724 G
TBLOFF  003544 G
TBLSRT  032174 G
TBLTOP= 000130 G
TCNTFL= 000004 G
TESTPA  002232 G
TF.BLK= 000010 G
TF.GCR= 000004 G
TF.PE = 000002 G
TF.800= 000001 G
TIME    020044 G
TIMER   010556 G
TIMERR  012312
TKERR   026500
TKINIT= 111400 G
TKIP  = 000000 G
TKIPAD  046270
TKSA  = 000002 G
TKUNIT= 000004 G
TKUNT   046305
TMB   = 000010 G
TMCNT   003550 G
TMER    011771
TMT     011022 G
TRK   = 000000 G
TSPA    050142
TSTMSK  003440 G
TSTSTP= 000006 G
T$ARGC= 000004
T$CODE= 026004
T$ERRN= 000000
T$EXCP= 000000
T$FLAG= 000041
T$FREE= 115754
T$GMAN= 000000
T$HILI= 065000
T$LAST= 000001
T$LOLI= 000000
T$LSYM= 010000
T$LTNO= 000007
T$NEST= 177777
T$NS0 = 000000
T$NS1 = 000005
T$PCNT= 000000
T$PTAB= 010027
T$PTHV= 000001
T$PTNU= 000001
T$SAVL= 177777
T$SEGL= 177777
T$SIZE= 000004
T$SUBN= 000000
T$TAGL= 177777
T$TAGN= 010031
T$TEMP= 000000
T$TEST= 000007
T$TSTM= 177777
T$TSTS= 000001
T$$AU = 010014
T$$AUT= 010011
T$$CLE= 010012
T$$DAT= 010030
T$$DU = 010013
T$$HAR= 010024
T$$HW = 010000
T$$INI= 010010
T$$MSG= 010003
T$$PC = 000001
T$$PRO= 010004
T$$PTA= 010027
T$$RPT= 010007
T$$SOF= 010025
T$$SRV= 010006
T$$SW = 010001
T$$TES= 010023
T1      040722 G
T1EXIT  042632
T1LEOT  042652
T1ONL   042636
T1RD1   043056
T1RD2   043064
T1RD3   043072
T1RD4   043100
T1RD5   043106
T1RD6   043114
T1REW   042644
T1SKD   043004
T1SKP   042666
T1SKP1  042762
T1SKP2  042770
T1SKR   042674
T1SKR1  042732
T1SPC1  042702
T1SPC2  042710
T1SPC3  042716
T1SPO1  042724
T1SPO2  042740
T1SPO3  042746
T1SPR1  042754
T1SPR2  042776
T1WR1   043012
T1WR2   043020
T1WR3   043026
T1WR4   043034
T1WR5   043042
T1WR6   043050
T1WTM   042660
T2      043124 G
T2END = 004716 G
T2EXIT  043542
T2LEOT  043566
T2RD    043574
T2REW   043552
T2SKD   043602
T2SPO   043610
T2WRT   043560
T3      043620 G
T3EXIT  044226
T3ON    050207
T3ONLY  002234 G
T3RD    044260
T3REW   044236
T3SPO   044266
T3WRT   044244
T3WTM   044252
T4      044276 G
T4EXIT  044626
T4REW   044632
T4WRT   044640
```

Symbol table

```
T4WTM   044646          T7CMD2  002246          UF.RMV= 000200 G        URDSRG= 000162 G        WR    = 000020 G
T5      044656 G        T7CMD3  002254          UF.VSS= 000040 G        UREEL   012740          WRBYT1= 000120 G
T5CMP   002235 G        T7CMD4  002262          UF.VSU= 020000 G        UREERL  011262          WRBYT2= 000122 G
T5CP    050230          T7CMD5  002270          UF.WPH= 020000 G        URSPBF= 000156 G        WRBYT3= 000124 G
T5EXIT  045154          T7CMD6  002276          UF.WPS= 010000 G        UWEEL   012760          WRBYT4= 000126 G
T5RD    045166          T7CMD7  002304          UNDROP= 000032 G        UWEERL  011242          WRERL   031516
T5REW   045160          T7END   002312          UNDRUN= 000072 G        U1OFF = 005040 G        WRITE   024462
T6      045176 G        T7EXIT  046230          UNITRV  020662 G        U2OFF = 002420 G        WRKMSK  003442 G
T6EXIT  045604          T7TBL   002232 G        UNJAM   033250 G        U3OFF = 001540 G        WRTBUF  070560 G
T6RD    045636          UAM   = 000200 G        UNLBIT= 000004 G        U4OFF = 001210 G        WTAPMK  024722
T6REW   045614          UCDEND= 000170 G        UNTEOT  020256 G        WDSTEL  011222          WTM   = 000100 G
T6SKD   045644          UCDSRG= 000166 G        UNTLOT  020312 G        WMSPOS= 000100 G        XFERST= 000010 G
T6WRT   045622          UDRNER  012541          UNTSTP= 000002 G        WPRB  = 000020 G        X$ALWA= 000000
T6WTM   045630          UDROP   003524 G        UNTTBL  003360 G        WPRBIT= 000005 G        X$FALS= 000040
T7      045654 G        UEOT    003526 G        URBEND= 000160 G        WPRER   011603          X$OFFS= 000400
T7BRFL= 000001 G        UF.CMR= 000001 G        URDEND= 000164 G        WPRT    010722 G        X$TRUE= 000020
T7CMD1  002240          UF.CMW= 000002 G

. ABS.  115754    000   (RW,I,GBL,ABS,OVR)
        000000    001   (RW,I,LCL,REL,CON)
Errors detected:  0

*** Assembler statistics


Work  file  reads: 335
Work  file writes: 332
Size of work file: 35448 Words  ( 139 Pages)
Size of core pool: 19714 Words  ( 75 Pages)
Operating  system: RSX-11M/PLUS (Under VAX/VMS)

Elapsed time: 00:10:37.33
CZTKBB.BIN,CZTKBB.LST/-SP=SVC40R.MLB/ML,CZTKBB
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