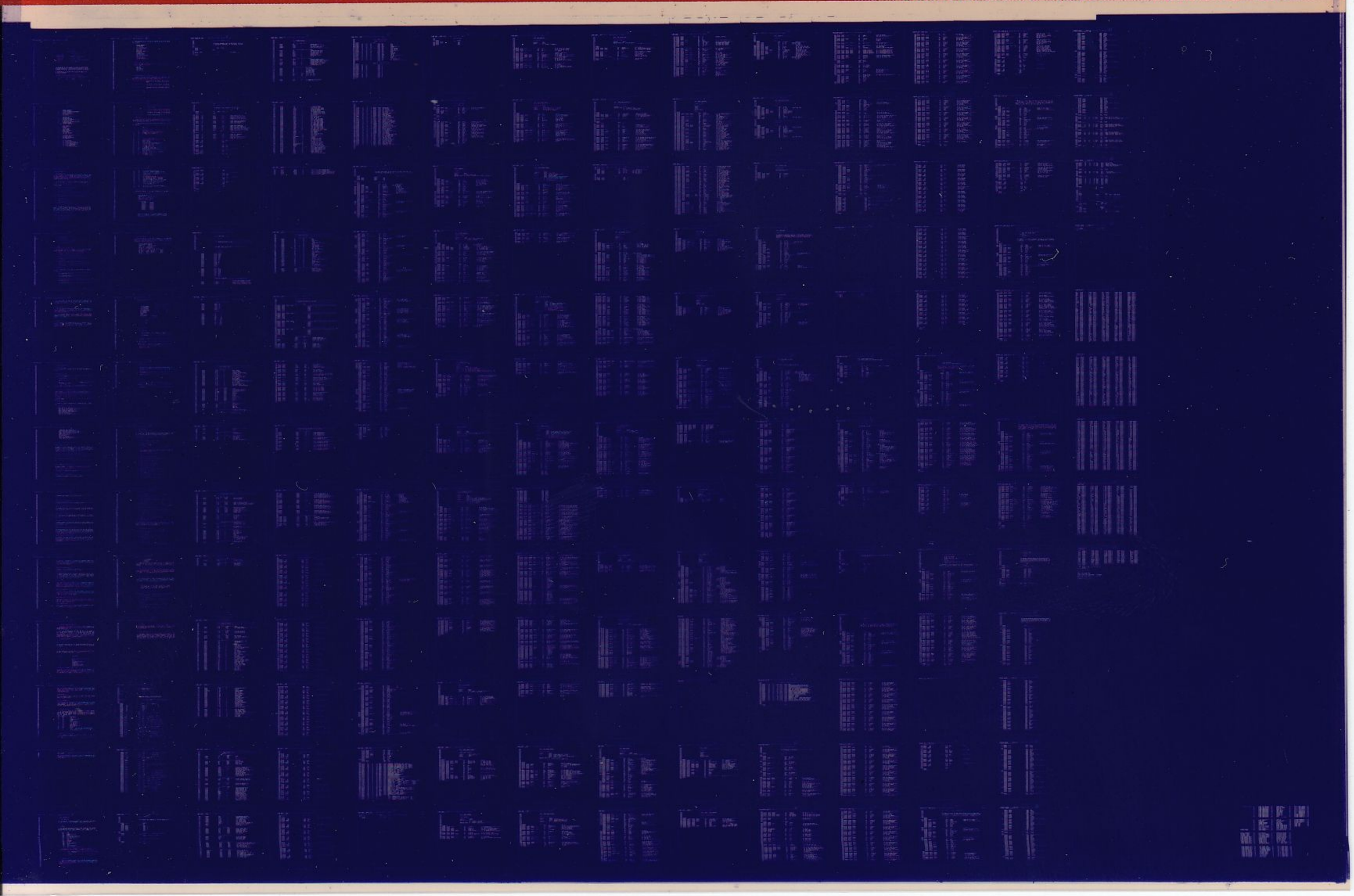
TK50

TK50 DATA RELIAB TST
CZTKBA0

AH-T774A-MC
1 OF 1 JUL 1985

digital
MADE IN USA



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IDENTIFICATION

PRODUCT CODE:	AC - T773A - MC
PRODUCT NAME:	CZTKBAO TK50 DATA RELIABILITY
PRODUCT DATE:	17 - APRIL - 1985
MAINTAINER:	TAPE OPTICAL DIAGNOSTIC ENGINEERING
AUTHOR:	BRIAN T. LEBLANC

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1 GENERAL INFORMATION

1.1 Program Abstract

The TK50 PDP11 Q-bus 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 Q-bus XXDP+ environment.

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

The PDP11 Q-bus 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 Q-bus 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 Q-bus 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 ?
```

```
                                ENABLE READ SOFT ERRORS ONLY (L) Y ?
                               CLEAR MEDIA TABLE ON EVERY PASS (L) N ?
                               ENABLE PRINTING OF MEDIA DEFECTS TABLE (L) N ?
                               ENABLE PROGRAM VARIABLES DUMP ON ERROR (L) N ?
                               ENABLE CLEAR STATS ON FATAL ERROR (L) N ?
                              CHANGE TEST PARAMETERS (L) N ?
                               DATA PATTERN (D) 0 ?
                               RUN TEST 3 ONLY (L) Y ?
                               ENABLE DATA COMPARES IN TEST 5 (L) Y ?
                               ENABLE PRINT READ BUFFER IN TEST 5 (L) N ?
                               CHANGE COMMAND SEQUENCE (L) N ?
```

2.3.1 Definition Of Software Questions -

ENABLE TIME OF DAY CLOCK (L) N ?

The default is to not enable the clock. This question allows the operated to start a program clock to track time on a 24 hour basis during the running of the program. The clock will remain fairly accurate as long as the program is running. Any time you stop the program the clock will stop running. It is therefore necessary to reset the time whenever the program is started.

INPUT HOUR IN 24 HOUR FORMAT (OMIT LEADING ZEROS) (D) 0 ?

Input the hour in a decimal number leaving off any leading zeros.

INPUT MINUTES (OMIT LEADING ZEROS) (L) 0 ?

Input the minutes in a decimal number leaving off any leading zeros.

CHANGE CONTROLLER PARAMETERS (L) N ?

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

ENABLE CONTROLLER ERROR CORRECTION (L) Y ?

If answered "yes" (default) the program will enable the controller's error correction algorithms for read errors.

ENABLE CONTROLLER ERROR RECOVERY (L) Y ?

If answered "yes" (default) the program will enable the controller's error recovery algorithms for write and read errors.

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 - necessary 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.

```
581                 Data  reliability programs do not lend themselves to implementation of
582                 error loops.
583
584                 IDR - Inhibit Drop Units - This flag will not  be  supported  by  this
585                 program due to the devices sequential operation.  If an error of fatal
586                 extent happens on the device there is no way to  continue  running  in
587                 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 the 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 : 000000026352(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)
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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

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

   O 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,

1098
1099
1100
1101
1102
1103
1104
1105
1106
1107
1108
1109
1110
1111
1112
1113
1114
1115
1116
1117

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$HPCP::                ;POINTER TO H.W. QUES.
     002016  046236                             .WORD   L$HARD
     002020                             L$SPCP::                ;POINTER TO S.W. QUES.
     002020  046324                             .WORD   L$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$LADP::                ;DIAG. END ADDRESS
     002026  115736                             .WORD   L$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
```

```
PROGRAM HEADER

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  034210                  .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$DUT::                 ;PTR. TO DROP UNIT CODE
002072  040700                  .WORD   L$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  037004                  .WORD   L$INIT
002106                  L$CCP::                 ;PTR. TO CLEAN-UP CODE
002106  040372                  .WORD   L$CLEAN
002110                  L$ACP::                 ;PTR. TO AUTO CODE
002110  040370                  .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  040714                          .WORD   T1
002126  043116                          .WORD   T2
002130  043612                          .WORD   T3
002132  044270                          .WORD   T4
002134  044650                          .WORD   T5
002136  045170                          .WORD   T6
002140  045646                          .WORD   T7

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

```
                                .TITLE GLOBAL AREAS
                                .SBTTL  GLOBAL EQUATES SECTION

002314                                  BGNMOD


                                ;/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\
                                ; 1.0   SUPERVISOR DEFINED LITERALS
                                ;/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\


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

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
```

```
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
```

H3


```
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
```

```
GLOBAL EQUATES SECTION

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
```

J3


```
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
```

```
GLOBAL EQUATES SECTION

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
```

```
GLOBAL EQUATES SECTION

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
```

```
GLOBAL EQUATES SECTION

                        ;/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\
                        ; 5.0   PROGRAM DEFINED LITERALS
                        ;/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\/*\

                        ; 5.1   TKSA BIT DEFINITIONS
100000                  ERR     ==      100000          ;ERROR
004000                  S1      ==      004000          ;STEP 1
000001                  GO      ==      000001          ;GO
111400                  TKINIT  ==      111400          ;TK50 STEP 1 RESPONSE

                        ; 5.2   DRIVE IN USE TABLE BIT DEFINITIONS
000001                  AVB     ==      000001          ;DRIVE AVAILABLE
000002                  NRDY    ==      000002          ;DRIVE NOT READY
000004                  EOT     ==      000004          ;DRIVE AT EOT
000010                  DROP    ==      000010          ;DRIVE DROPPED
000020                  FAIL    ==      000020          ;DRIVE FAILED

                        ; 5.3   I/O STATUS MESSAGES
000000                  IONORM  ==      0               ;SUCCESSFUL COMMAND TRANSMISSION
100000                  NURESP  ==      BIT15           ;NEW RESPONSE RECEIVED
040000                  ERRLOG  ==      BIT14           ;ERROR LOG PACKET RECEIVED
020000                  IOICRD  ==      BIT13           ;INSUFFICIENT CREDIT TO POST COMMAND
000001                  CMDLST  ==      1.              ;GCS RESPONSE NEVER CAME BACK
000002                  IOHUNG  ==      2.              ;CONTROLLER HUNG
000003                  IOPDRE  ==      3.              ;PORT DETECTED ERROR
000004                  IOTIME  ==      4.              ;CONTROLLER TIME OUT
000005                  MISSEQ  ==      5.              ;COMMAND RETURNED IN WRONG SEQUENCE
000006                  INTERR  ==      6.              ;ERROR DURING INITIALIZATION
000007                  ILLCMD  ==      7.              ;ILLEGAL COMMAND

                        ; 5.4   RESPONSE CONDITION CODES
000001                  SUCCES  ==      000001          ;RESPONSE HANDLED SUCCESSFULLY
000002                  SEREXC  ==      000002          ;SERIOUS EXCEPTION CONDITION
000004                  ABORT   ==      000004          ;SYSTEM FATAL ERROR ABORT PROGRAM

                        ; 5.5   U/Q PORT LITERALS
100000                  OWN     ==      BIT15           ;DESCRIPTOR OWNERSHIP BIT
040000                  FLAG    ==      BIT14           ;DESCRIPTOR INTERUPT FLAG BIT
000200                  IMM     ==      BIT07           ;IMMEDIATE COMMAND FLAG

                        ; 5.6   PROGRAM LITERALS
177546                  KWCSR   ==      177546          ;LINE CLOCK REGISTER ADDRESS
001233                  RS1     ==      1233            ;RANDOM GENERATOR SEED
007622                  RS2     ==      7622            ;RANDOM GENERATOR SEED
000000                  RS3     ==      0               ;RANDOM GENERATOR SEED
000000                  NULPAT  ==      0               ;NO DATA PATTERN NEEDED
000000                  RNDBYT  ==      0               ;RANDOM BYTE COUNT
020000                  MAXBUF  ==      8192.           ;MAXIMUM BUFFER SIZE
000024                  MINBUF  ==      20.             ;MINIMUM BUFFER SIZE
000000                  RNDITR  ==      0               ;RANDOM ITERATION COUNT
003720                  MAXITR  ==      2000.           ;MAXIMUM ITERATION SET
000144                  MINITR  ==      100.            ;MINIMUM ITERATION SET
000001                  PAT1    ==      1               ;ALL 1'S DATA PATTERN
000002                  PAT2    ==      2               ;ALL 0'S DATA PATTERN
000003                  PAT3    ==      3               ;WORST CASE MFM DATA PATTERN
000004                  PAT4    ==      4               ;ALTERNATING 1'S AND 0'S
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  ==      0C0100          ;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
```

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

GLOBAL EQUATES SECTION

```
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
```

GLOBAL DATA SECTION

```
                                .SBTTL  GLOBAL DATA SECTION

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

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

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

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

003072  000000  000000  000000  LUN3::          .WORD   0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
003162  000C00  000000  000000                          0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
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
```

GLOBAL DATA SECTION

```
1964
1965 003414  000000          RESP::          .WORD   0       ;DRIVER RESPONSE COUNT
1966 003416  000000          BYTES::         .WORD   0       ;BYTE COUNT
1967 003420  000000          ITERS::         .WORD   0       ;ITERATION COUNT
1968 003422  000000          BUFADR::        .WORD   0       ;COMMAND BUFFER ADDRESS
1969 003424  000000          SUBCNT::        .WORD   0       ;SUB-ITERATION COUNT FOR DATA COMPARES
1970
1971 003426  000000          RANWRD::        .WORD   0       ;USED BY RANGEN
1972 003430  000000          RAN1::          .WORD   0       ;SEED WORK LOCATION
1973 003432  000000          RAN2::          .WORD   0       ;SEED WORK LOCATION
1974 003434  000000          RAN3::          .WORD   0       ;SEED WORK LOCATION
1975
1976 003436  000000          SAVDIF::        .WORD   0       ;COMMAND AND RESPONSE COUNT DIFFERENCE
1977 003440  000000          TSTMSK::        .WORD   0       ;TEST LOAD WITH ACCEPTABLE ERROR CODES
1978 003442  000000          WRKMSK::        .WORD   0       ;USED BY ERROR DECODE
1979
1980 003444  000000          CMPERR::        .WORD   0       ;NUMBER OF BYTES IN ERROR
1981 003446                  BYTADD::        .BLKW   10.     ;SAVE TABLE FOR BYTE IN ERROR ADDRESS
1982         003472          TBLEND == .                     ;END OF BYTE ADDRESS TABLE
1983 003472                  DATBL::         .BLKW   10.     ;SAVE TABLE FOR BYTE IN ERROR DATA
1984 003516  000000          PCFLAG::        .WORD   0       ;PROGRAM CONTROL FLAGS
1985
1986 003520  000000          OBJECT::        .WORD   0       ;OBJECT COUNTER FOR TEST 2
1987 003522  000000          PASCNT::        .WORD   0       ;PASS COUNTER
1988 003524  000000          UDROP::         .WORD   0       ;NUMBER OF DROPPED UNITS
1989 003526  000000          UEOT::          .WORD   0       ;COUNT OF UNITS AT EOT
1990
1991 003530  000000          R8::            .WORD   0       ;USED FOR TEMP STORAGE
1992 003532  000000          R9::            .WORD   0       ;USED FOR TEMP STORAGE
1993 003534  000000          R10::           .WORD   0       ;USED FOR TEMP STORAGE
1994 003536  000000          R11::           .WORD   0       ;USED FOR TEMP STORAGE
1995 003540  000000          R12::           .WORD   0       ;USED FOR TEMP STORAGE
1996
1997 003542  000000          SECRNS::        .WORD   0       ;SERIOUS EXCEPTION CMD REF #
1998 003544  000000          TBLOFF::        .WORD   0       ;MEDIA ERROR TABLE OFFSET
1999 003546  000000          RECCNT::        .WORD   0       ;NUMBER OF RECORDS
2000 003550  000000          TMCNT::         .WORD   0       ;NUMBER OF TAPE MARKS
2001 003552  000000          LOHEX::         .WORD   0       ;LOW ORDER HEX DIGIT
2002
2003 003554  000000          HIHEX::         .WORD   0       ;HIGH ORDER HEX DIGIT
2004 003556  000000          EVENT::         .WORD   0       ;EVENT CODE STORAGE
2005 003560  000000          R3SAVE::        .WORD   0       ;SAVE LOCATION FOR R3
2006 003562  000000          R4SAVE::        .WORD   0       ;SAVE LOCATION FOR R4
2007 003564     000          DAYS::          .BYTE   0       ;NUMBER OF DAYS IN RUN
2008                         .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
```

GLOBAL DATA SECTION

```
                                ; 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
```

GLOBAL DATA SECTION

```
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
```

```
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
```

GLOBAL DATA SECTION

```
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
```

GLOBAL ERROR REPORT SECTION

```
                                .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..
                                ;--

                                        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

                                        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$:     BIT     #EOTBIT,R8              ;IS IT A DETECT LEOT ?
013440  001414                          BEQ     3$                      ;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
```

GLOBAL ERROR REPORT SECTION

```
2544 014206  001353                    BNE     PRIPCK                  ;KEEP PRINTING TILL ALL DONE
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
```

```
                                                BGNMSG  ERLGER
                                        ERLGER::
                                                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
014506  013703  003560                          MOV     R3SAVE,R3               ;RESTORE R3
014512  013704  003562                          MOV     R4SAVE,R4               ;RESTORE R4
014516  113705  003536                          MOVB    R11,R5                  ;GET THE COMMAND PRIMITIVE
014522  042705  177407                          BIC     #177407,R5              ;CLEAR MODIFIERS
014526  006205                                  ASR     R5                      ;THE PRIMITIVE
014530  062705  011322                          ADD     #CMDASC,R5              ;PUT ADDRESS IN R5
014534  013737  003536  003530                  MOV     R11,R8                  ;GET THE PRIMITIVE AGAIN
014542  042737  177770  003530                  BIC     #177770,R8              ;SAVE THE LAST 3 BITS
014550  001014                                  BNE     5$                      ;BRANCH IF NOT ZERO
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$PNTB
014574  062706  000010                          ADD     #10,SP
000512                                          BR      30$                     ;GO PRINT THE REST OF THE MESSAGE
022737  000001  003530          5$:             CMP     #REVBIT,R8              ;IS IT A REVERSE ?
001013                                          BNE     10$                     ;BRANCH IF NOT
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$PNTB
014634  062706  000010                          ADD     #10,SP
032737  000002  003530          10$:            BIT     #EOTBIT,R8              ;IS IT A DETECT LEOT ?
001414                                          BEQ     15$                     ;BRANCH IF NOT
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$PNTB
014672  062706  000010                          ADD     #10,SP
000453                                          BR      30$                     ;GO PRINT THE REST OF THE MESSAGE
022737  000003  003530          15$:            CMP     #IMMBIT,R8              ;IS IT A IMMEDIATE ?
001014                                          BNE     20$                     ;BRANCH IF NOT
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$PNTB
014732  062706  000010                          ADD     #10,SP
000433                                          BR      30$                     ;GO PRINT THE REST OF THE MESSAGE
022737  000004  003530          20$:            CMP     #UNLBIT,R8              ;IS IT A UNLOAD ?
001014                                          BNE     25$                     ;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)
```

GLOBAL ERROR REPORT SECTION

```
        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)
```

GLOBAL ERROR REPORT SECTION

```
        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  ?%ACOMMAND: %T%S3%AT/MSCP UNIT: %03%A(0)?
  2637  016040    045   101   103   ERR01:: .ASCIZ  ?%ACOMMAND: %T%A-REV%S3%AT/MSCP UNIT: %03%A(0)?
  2638  016116    045   101   103   ERR02:: .ASCIZ  ?%ACOMMAND: %T%A-LEOT%S3%AT/MSCP UNIT: %03%A(0)?
  2639  016175    045   101   103   ERR03:: .ASCIZ  ?%ACOMMAND: %T%A-IMM%S3%AT/MSCP UNIT: %03%A(0)?
  2640  016253    045   101   103   ERR04:: .ASCIZ  ?%ACOMMAND: %T%A-UNLD%S3%AT/MSCP UNIT: %03%A(0)?
  2641  016332    045   101   103   ERR05:: .ASCIZ  ?%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
                                        L$PROT::
021036                                          .WORD   0
021036  000000                                  .WORD   -1
021040  177777                                  .WORD   -1
021042  177777                                  ENDPROT
021044
```

```
                                .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
                                        MOV     #NCLK,-(SP)
                                        MOV     #1,-(SP)
                                        MOV     SP,R0
                                        TRAP    C$PNTF
                                        ADD     #4,SP

                                        ENDSRV
                                L10005:
                                        RTI

                                        BGNSRV  KWHDL
                                KWHDL::
                                        INCB    SUBSEC          ;INCREMENT THE SUB-SECOND COUNTER
                                        CMPB    #60.,SUBSEC     ;IS IT A SECOND YET ?
                                        BNE     HDLEXT          ;NO, GET OUT
                                        CLRB    SUBSEC          ;CLEAR THE SUBSEC COUNTER
                                        INCB    SECOND          ;INCREMNET THE SECONDS COUNTER
                                        INC     TIMER           ;INCREMENT THE COMMAND TIMER
                                        CMPB    #60.,SECOND     ;IS IT A MINUTE YET ?
                                        BNE     HDLEXT          ;NO, GET OUT
                                        CLRB    SECOND          ;CLEAR THE SECOND COUNTER
                                        INCB    MINUTE          ;INCREMENT THE MINUTE COUNTER
                                        CMPB    #60.,MINUTE     ;IS IT AN HOUR YET ?
                                        BNE     HDLEXT          ;NO, GET OUT
                                        CLRB    MINUTE          ;CLEAR THE MINUTE COUNTER
                                        INCB    HOURS           ;INCREMENT THE HOUR COUNTER
                                        CMPB    #24.,HOURS      ;IS IT A DAY YET ?
                                        BNE     HDLEXT          ;NO, GET OUT
                                        CLRB    HOURS           ;CLEAR THE HOURS COUNTER
                                        INCB    DAYS            ;INCREMENT THE DAY COUNT
                                        PRINTF  #DAY,<B,DAYS>   ;PRINT END OF DAY STATMENT
                                        CLR     -(SP)
                                        BISB    DAYS,(SP)
                                        MOV     #DAY,-(SP)
                                        MOV     #2,-(SP)
                                        MOV     SP,R0
                                        TRAP    C$PNTF
                                        ADD     #6,SP
                                HDLEXT:
                                        ENDSRV
                                L10006:
                                        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
2750
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
2755
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  033734                  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  027426                  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  033242                  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
```

COMMAND BUILDER

```
                                .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  070552          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::
022344  022362                          .WORD   PATGN1                  ;ALL 1'S
022346  022376                          .WORD   PATGN2                  ;ALL 0'S
022350  022410                          .WORD   PATGN3                  ;WORST CASE MFM
022352  022450                          .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
```

K6

SELECT DATA PATTERN

```
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
                                ;

022716                          RANGEN::
022716                                  PUSH    <R5>                    ;SAVE R5
022720  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 SFED 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
                        ;
023142                  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  070550  MOV     OBOFFL(R3),WRTBUF-2     ;PUT LOW ORDER OBJECT COUNT IN WRTBUF
023174  012737  000004  003424  MOV     #N,SUBCNT               ;REINIT SUBCNT
023202  012737  050552  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  070550  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 A COMPARE HOST DATA COMMAND
023266  012737  070552  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  026530          JSR     PC,GCSHDL               ;GO TO THE GCS HANDLING ROUTINE
024002  000461                  BR      35$                     ;GET OUT

024004  112737  000005  010546  7$:     MOVB    #MISSEQ,IOSTAT          ;SET MISSING SEQUENCE IN I/O STATUS
024012  004737  033734          JSR     PC,CORDMP
024016  000240                  NOP
024020  000452                  BR      35$                     ;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  C00012  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
```

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 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  026522  MOV     URDSRG(R4),INTTBL+2     ;PUT RESP DESCRIPTOR ADDRESS IN TABLE
026330  012703  026520          MOV     #INTTBL,R3              ;PUT THE TABLE ADDRESS INTO R3
026334  012701  004000          MOV     #S1,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                  ILOOP:
026350                          BREAK
026350  104422                  TRAP    C$BRK

026352  005202                  INC     R2                      ;INCREMENT HI TIME OUT VALUE ?
026354  001003                  BNE     2$                      ;IF NOT, BRANCH
026356  005337  010554          DEC     CNTHI                   ;ELSE, INCREMENT HI TIMEOUT
026362  001444                  BEQ     TKERR                   ;GET OUT, WE'VE TIMED OUT

026364  037401  000002  2$:     BIT     @TKSA(R4),R1            ;TEST FOR STEP BIT FROM DRIVE
026370  001767                  BEQ     ILOOP                   ;LOOP UNTIL SOMETHING SETS
026372  017437  000002  010566  MOV     @TKSA(R4),SAERR         ;SAVE THE SA FOR THE ERROR PRINTOUT
026400  005737  010566          TST     SAERR                   ;CHECK FOR ERROR
026404  100433                  BMI     TKERR                   ;GET OUT ON ERROR
026406  012374  000002  3$:     MOV     (R3)+,@TKSA(R4)         ;WRITE WORD FROM TABLE TO CONTROLLER
026412  006301                  ASL     R1                      ;SHIFT TO NEXT STEP
026414  100351                  BPL     LOOP                    ;IF NOT AT LAST STEP LOOP

026416  016402  000162          MOV     URDSRG(R4),R2           ;PUT THE RESPONSE DESCRIPTOR ADD IN R2
026422  016403  000156          MOV     URSPBF(R4),R3           ;PUT THE RESPONSE BUFFER ADDRESS IN R3
026426  010322          5$:     MOV     R3,(R2)+                ;PUT THE BUFF ADD IN THE DESCRIPTOR
026430  005022                  CLR     (R2)+                   ;CLEAR THE NEXT WORD
026432  062703  000104          ADD     #DRBSTP,R3              ;STEP TO THE NEXT BUFFER SLOT
026436  026403  000160          CMP     URBEND(R4),R3           ;ARE WE AT THE END OF THE BUFFER ?
026442  001371                  BNE     5$                      ;NO, KEEP GOING

026444  016402  000166          MOV     UCDSRG(R4),R2           ;PUT THE CMD DESCRIPTOR ADDRESS IN R2
026450  012703  003572          MOV     #DCMDBF,R3              ;PUT THE CMD BUFFER ADDRESS IN R3
026454  010322          10$:    MOV     R3,(R2)+                ;PUT THE BUFF ADD IN THE DESCRIPTOR
026456  005022                  CLR     (R2)+                   ;CLEAR THE NEXT WORD
026460  062703  000050          ADD     #DCBSTP,R3              ;STEP TO THE NEXT BUFFER SLOT
026464  022703  004032          CMP     #DCBEND,R3              ;ARE WE AT THE END OF THE BUFFER ?
026470  001371                  BNE     10$                     ;NO, KEEP GOING
026472  000403                  BR      IDONE                   ;ALL DONE
```

```
3790 026474  012737  000006  010546  TKERR:  MOV     #INTERR,IOSTAT          ;SET UP FOR A FATAL ERROR
3791
3792 026502  005337  003402          IDONE:  DEC     RSPCNT
3793 026506                                  POP     <R5,R3,R2,R1>           ;RESTORE THE REGISTERS
     026506  012605                          MOV     (SP)+,R5        ;;POP STACK INTO R5
     026510  012603                          MOV     (SP)+,R3        ;;POP STACK INTO R3
     026512  012602                          MOV     (SP)+,R2        ;;POP STACK INTO R2
     026514  012601                          MOV     (SP)+,R1        ;;POP STACK INTO R1
3794 026516  000207                          RTS     PC                      ;RETURN
3795
3796                                 ;INIT DATA TABLE
3797
3798 026520  111400                  INTTBL:         .WORD   TKINIT
3799 026522  000000                                  .WORD   0
3800 026524  000000                                  .WORD   0
3801 026526  000001                                  .WORD   GO
```

```
3803                                    .SBTTL  GCS RESPONSE HANDLER
3804                                    ;*****************************
3805                                    ;
3806                                    ;GCS RESPONSE HANDLER
3807                                    ;
3808                                    ;Called By        :
3809                                    ;Calls To         :
3810                                    ;Register Inputs  :
3811                                    ;                 :
3812                                    ;Register Inputs  :
3813                                    ;
3814
3815 026530                            GCSHDL::
3816 026530  023761  010550  000020            CMP     CMSTSV,P.CMST(R1)       ;ANY PROGRESS ?
3817 026536  101017                            BHI     5$                      ;YES, CLKEAN UP THE MESS
3818 026540  042737  000040  003516            BIC     #GCSRFL,PCFLAG          ;CLEAR THE GCS MODE FLAG
3819 026546  005037  003414                    CLR     RESP                    ;TAKE OFF THE RESPONSE
3820 026552  005037  003412                    CLR     HNDLRP                  ;TAKE OFF THE RESPONSE
3821 026556  112737  000002  010546            MOVB    #IOHUNG,IOSTAT          ;SET HUNG CONTROLLER BIT
3822 026564  004737  033734                    JSR     PC,CORDMP
3823 026570  000240                            NOP
3824 026572  000137  027314                    JMP     GCSEXT                  ;GET OUT
3825
3826 026576                            5$:     PUSH    <R1,R2>                 ;
     026576  010146                            MOV     R1,-(SP)        ;;PUSH R1 ON STACK
     026600  010246                            MOV     R2,-(SP)        ;;PUSH R2 ON STACK
3827 026602  016401  000016                    MOV     COLSAV(R4),R1           ;PUT THE OLD POINTER IN R1
3828 026606  162701  000004                    SUB     #4,R1                   ;ADJUST TO INCLUDE DESCRIPTOR WORDS
3829 026612  016402  000014                    MOV     CNUSAV(R4),R2           ;PUT THE NEW POINTER IN R2
3830 026616  162702  000004                    SUB     #4,R2                   ;ADJUST TO INCLUDE DESCRIPTOR WORDS
3831 026622  022701  003566                    CMP     #CMDBF1,R1              ;OLD POINTER AT BF1 ?
3832 026626  001407                            BEQ     OLD1                    ;YES, GO HANDLE IT
3833 026630  022701  003636                    CMP     #CMDBF2,R1              ;OLD POINTER AT BF2 ?
3834 026634  001434                            BEQ     OLD2                    ;YES, GO HANDLE IT
3835 026636  022701  003706                    CMP     #CMDBF3,R1              ;OLD POINTER AT BF3 ?
3836 026642  001461                            BEQ     OLD3                    ;YES, GO HANDLE IT
3837 026644  000510                            BR      OLD4                    ;NO, GO HANDLE BF4
3838
3839 026646  022702  003706            OLD1:   CMP     #CMDBF3,R2              ;NEW POINTER AT BF3 ?
3840 026652  001004                            BNE     5$                      ;NO, TRY AGAIN
3841 026654  004737  027316                    JSR     PC,EXC1A2               ;GO MOVE COMMAND 1 TO 2
3842 026660  000137  027142                    JMP     ADJUST                  ;GO ADJUST THE OLD POINTER
3843 026664  022702  003756            5$:     CMP     #CMDBF4,R2              ;NEW POINTER AT BF4 ?
3844 026670  001006                            BNE     10$                     ;NO, TRY AGAIN
3845 026672  004737  027340                    JSR     PC,EXC2A3               ;GO MOVE COMMAND 2 TO 3
3846 026676  004737  027316                    JSR     PC,EXC1A2               ;GO MOVE COMMAND 1 TO 2
3847 026702  000137  027142                    JMP     ADJUST                  ;GO ADJUST THE OLD POINTER
3848 026706  004737  027362            10$:    JSR     PC,EXC3A4               ;GO MOVE COMMAND 3 TO 4
3849 026712  004737  027340                    JSR     PC,EXC2A3               ;GO MOVE COMMAND 2 TO 3
3850 026716  004737  027316                    JSR     PC,EXC1A2               ;GO MOVE COMMAND 1 TO 2
3851 026722  000137  027142                    JMP     ADJUST                  ;GO ADJUST THE OLD POINTER
3852
3853 026726  022702  003756            OLD2:   CMP     #CMDBF4,R2              ;NEW POINTER AT BF4 ?
3854 026732  001004                            BNE     5$                      ;NO, TRY AGAIN
3855 026734  004737  027340                    JSR     PC,EXC2A3               ;GO MOVE COMMAND 2 TO 3
3856 026740  000137  027142                    JMP     ADJUST                  ;GO ADJUST THE OLD POINTER
3857 026744  022702  003566            5$:     CMP     #CMDBF1,R2              ;NEW POINTER AT BF1 ?
```

```
3858 026750  001006                    BNE     10$             ;NO, TRY AGAIN
3859 026752  004737  027362            JSR     PC,EXC3A4       ;GO MOVE COMMAND 3 TO 4
3860 026756  004737  027340            JSR     PC,EXC2A3       ;GO MOVE COMMAND 2 TO 3
3861 026762  000137  027142            JMP     ADJUST          ;GO ADJUST THE OLD POINTER
3862 026766  004737  027404  10$:      JSR     PC,EXC4A1       ;GO MOVE COMMAND 4 TO 1
3863 026772  004737  027362            JSR     PC,EXC3A4       ;GO MOVE COMMAND 3 TO 4
3864 026776  004737  027340            JSR     PC,EXC2A3       ;GO MOVE COMMAND 2 TO 3
3865 027002  000137  027142            JMP     ADJUST          ;GO ADJUST THE OLD POINTER
3866
3867 027006  022702  003566  OLD3:     CMP     #CMDBF1,R2      ;NEW POINTER AT BF1 ?
3868 027012  001004                    BNE     5$              ;NO, TRY AGAIN
3869 027014  004737  027362            JSR     PC,EXC3A4       ;GO MOVE COMMAND 3 TO 4
3870 027020  000137  027142            JMP     ADJUST          ;GO ADJUST THE OLD POINTER
3871 027024  022702  003636  5$:       CMP     #CMDBF2,R2      ;NEW POINTER AT BF2 ?
3872 027030  001006                    BNE     10$             ;NO, TRY AGAIN
3873 027032  004737  027404            JSR     PC,EXC4A1       ;GO MOVE COMMAND 4 TO 1
3874 027036  004737  027362            JSR     PC,EXC3A4       ;GO MOVE COMMAND 3 TO 4
3875 027042  000137  027142            JMP     ADJUST          ;GO ADJUST THE OLD POINTER
3876 027046  004737  027316  10$:      JSR     PC,EXC1A2       ;GO MOVE COMMAND 1 TO 2
3877 027052  004737  027404            JSR     PC,EXC4A1       ;GO MOVE COMMAND 4 TO 1
3878 027056  004737  027362            JSR     PC,EXC3A4       ;GO MOVE COMMAND 3 TO 4
3879 027062  000137  027142            JMP     ADJUST          ;GO ADJUST THE OLD POINTER
3880
3881 027066  022702  003636  OLD4:     CMP     #CMDBF2,R2      ;NEW POINTER AT BF2 ?
3882 027072  001004                    BNE     5$              ;NO, TRY AGAIN
3883 027074  004737  027404            JSR     PC,EXC4A1       ;GO MOVE COMMAND 4 TO 1
3884 027100  000137  027142            JMP     ADJUST          ;GO ADJUST THE OLD POINTER
3885 027104  022702  003706  5$:       CMP     #CMDBF3,R2      ;NEW POINTER AT BF3 ?
3886 027110  001006                    BNE     10$             ;NO, TRY AGAIN
3887 027112  004737  027316            JSR     PC,EXC1A2       ;GO MOVE COMMAND 1 TO 2
3888 027116  004737  027404            JSR     PC,EXC4A1       ;GO MOVE COMMAND 4 TO 1
3889 027122  000137  027142            JMP     ADJUST          ;GO ADJUST THE OLD POINTER
3890 027126  004737  027340  10$:      JSR     PC,EXC2A3       ;GO MOVE COMMAND 2 TO 3
3891 027132  004737  027316            JSR     PC,EXC1A2       ;GO MOVE COMMAND 1 TO 2
3892 027136  004737  027404            JSR     PC,EXC4A1       ;GO MOVE COMMAND 4 TO 1
3893
3894 027142          ADJUST: POP       <R2,R1>         ;
     027142  012602                    MOV     (SP)+,R2        ;;POP STACK INTO R2
     027144  012601                    MOV     (SP)+,R1        ;;POP STACK INTO R1
3895 027146  042737  000040  003516    BIC     #GCSRFL,PCFLAG  ;CLEAR THE GCS MODE FLAG
3896 027154  016137  000020  010550    MOV     P.CMST(R1),CMSTSV ;PUT THE CMD STATUS INTO THE SAVE LOC
3897 027162  005037  003414            CLR     RESP            ;TAKE OFF THE RESPONSE
3898 027166  005037  003412            CLR     HNDLRP          ;TAKE OFF THE RESPONSE
3899 027172  005364  000006            DEC     CMDSEQ(R4)      ;ADJUST THE CMDSEQ NUMBER BACK 1
3900 027176  042737  100000  010546    BIC     #NURESP,IOSTAT  ;CLEAR THE NEW RESPONSE FLAG IN IOSTAT
3901 027204  105237  010571            INCB    CRDLIM          ;ADD 1 TO THE CREDIT LIMIT
3902
3903 027210  062764  000050  000016    ADD     #DCBSTP,COLSAV(R4) ;ADJUST THE OLD COMMAND POINTER
3904 027216  022764  004032  000016    CMP     #DCBEND,COLSAV(R4) ;IS IT AT THE END OF THE RING ?
3905 027224  001003                    BNE     5$              ;NO, BRANCH
3906 027226  012764  003572  000016    MOV     #DCMDBF,COLSAV(R4) ;YES, SET IT TO THE TOP OF THE RING
3907
3908 027234  062705  000050  5$:       ADD     #DCBSTP,R5      ;ADJUST THE OLD COMMAND POINTER
3909 027240  022705  004032            CMP     #DCBEND,R5      ;IS IT AT THE END OF THE RING ?
3910 027244  001002                    BNE     10$             ;NO, BRANCH
3911 027246  012705  003572            MOV     #DCMDBF,R5      ;YES, SET IT TO THE TOP OF THE RING
3912
```

```
3913 027252  062764  000104  000022  10$:    ADD     #DRBSTP,ROLSAV(R4)      ;ADJUST THE OLD RESPONSE POINTER
3914 027260  026464  000160  000022          CMP     URBEND(R4),ROLSAV(R4)   ;IS IT AT THE END OF THE BUFFER ?
3915 027266  001003                          BNE     15$                     ;NO, KEEP GOING
3916 027270  016464  000156  000022          MOV     URSPBF(R4),ROLSAV(R4)   ;YES, SET IT TO BEGINNING OF THE BUFFER
3917
3918 027276  062701  000104          15$:    ADD     #DRBSTP,R1              ;ADJUST R1
3919 027302  026401  000160                  CMP     URBEND(R4),R1           ;IS IT AT THE END OF THE BUFFER ?
3920 027306  001002                          BNE     GCSEXT                  ;NO, GET OUT
3921 027310  016401  000156                  MOV     URSPBF(R4),R1           ;YES, SET IT TO BEGINNING OF THE BUFFER
3922
3923 027314                          GCSEXT:
3924 027314  000207                          RTS     PC                      ;RETURN
3925
3926
3927 027316  012701  003566          EXC1A2: MOV     #CMDBF1,R1              ;SET R1 TO BF1
3928 027322  012702  003636                  MOV     #CMDBF2,R2              ;SET R2 TO BF2
3929 027326  012122                  5$:     MOV     (R1)+,(R2)+             ;MOV BF1 CONTENTS TO BF2
3930 027330  022701  003636                  CMP     #CMDBF2,R1              ;HAVE WE MOVED THEM ALL
3931 027334  001374                          BNE     5$                      ;NO, KEEP MOVING IT
3932 027336  000207                          RTS     PC                      ;YES, GET OUT
3933
3934 027340  012701  003636          EXC2A3: MOV     #CMDBF2,R1              ;SET R1 TO BF2
3935 027344  012702  003706                  MOV     #CMDBF3,R2              ;SET R2 TO BF3
3936 027350  012122                  5$:     MOV     (R1)+,(R2)+             ;MOV BF2 CONTENTS TO BF3
3937 027352  022701  003706                  CMP     #CMDBF3,R1              ;HAVE WE MOVED THEM ALL
3938 027356  001374                          BNE     5$                      ;NO, KEEP MOVING IT
3939 027360  000207                          RTS     PC                      ;YES, GET OUT
3940
3941 027362  012701  003706          EXC3A4: MOV     #CMDBF3,R1              ;SET R1 TO BF3
3942 027366  012702  003756                  MOV     #CMDBF4,R2              ;SET R2 TO BF4
3943 027372  012122                  5$:     MOV     (R1)+,(R2)+             ;MOV BF3 CONTENTS TO BF4
3944 027374  022701  003756                  CMP     #CMDBF4,R1              ;HAVE WE MOVED THEM ALL
3945 027400  001374                          BNE     5$                      ;NO, KEEP MOVING IT
3946 027402  000207                          RTS     PC                      ;YES, GET OUT
3947
3948 027404  012701  003756          EXC4A1: MOV     #CMDBF4,R1              ;SET R1 TO BF4
3949 027410  012702  003566                  MOV     #CMDBF1,R2              ;SET R2 TO BF1
3950 027414  012122                  5$:     MOV     (R1)+,(R2)+             ;MOV BF4 CONTENTS TO BF1
3951 027416  022702  003636                  CMP     #CMDBF2,R2              ;HAVE WE MOVED THEM ALL
3952 027422  001374                          BNE     5$                      ;NO, KEEP MOVING IT
3953 027424  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
                                ;

027426                          RSPHDL::
027426                                  PUSH    <R3>
027426  010346                         MOV     R3,-(SP)        ;;PUSH R3 ON STACK
027430  005037  003406                  CLR     RESPON                  ;0 HERE TELLS CMDSEQ ALL'S OKAY
027434  105737  010546                  TSTB    IOSTAT                  ;DID WE HAVE I/O TYPE FAILURE?
027440  001403                          BEQ     5$                      ;BRANCH AROUND IF NOT
027442  004737  030774                  JSR     PC,ERRDEI               ;ELSE DECODE AND PRINT IT
027446  000501                          BR      60$                     ;GET OUT NOW

027450  016403  000022          5$:     MOV     ROLSAV(R4),R3           ;GET OLD RESPONSE BUFFER POINTER
027454  005737  003412                  TST     HNDLRP                  ;DID WE HAVE ANY RESPONSES ?
027460  001474                          BEQ     60$                     ;NO, GET OUT OF HERE
027462  032763  000200  000010  10$:    BIT     #OP.END,P.OPCD(R3)      ;IS IT AN END PACKET?
027470  001003                          BNE     15$                     ;YES, BRANCH
027472  004737  031236                  JSR     PC,ERRDEL               ;GO HANDLE ERROR LOG PACKET
027476  000453                          BR      50$                     ;SEE IF THERE'S MORE RESPONSES

027500  005763  000012          15$:    TST     P.STS(R3)               ;WAS STATUS "NORMAL"?
027504  001413                          BEQ     25$                     ;YES - BRANCH
027506  022763  000022  000012          CMP     #ST.SEX,P.STS(R3)       ;IS IT SERIOUS EXCEPTION STATUS?
027514  001004                          BNE     20$                     ;NO - GO HANDLE THE ERROR
027516  052764  000004  000026          BIS     #NOTALY,LUNFLG(R4)      ;SET THE NO-TALLY FLAG
027524  000436                          BR      45$                     ;YES, GO DE-QUE THE COMMANDS
027526  004737  030304          20$:    JSR     PC,ERRDEC               ;GO HANDLE ERROR STATUS
027532  000403                          BR      30$
027534  000241                  25$:    CLC                             ;CLEAR THE CARRY BIT
027536  006164  000030                  ROL     LEOTFL(R4)              ;ROTATE THE CARRY INTO THE LEOT FLAG

027542  032761  000001  003350  30$:    BIT     #AVB,DRINUS(R1)         ;HAVE WE DROPPED THE UNIT?
027550  001440                          BEQ     60$                     ;YES - GET OUT
027552  022763  000241  000010          CMP     #OP.END!OP.RD,P.OPCD(R3) ;DID WE READ THIS TIME?
027560  001020                          BNE     45$                     ;NO - SKIP DATA COMPARE
027562  022737  000005  002114          CMP     #5,L$TEST               ;ARE WE IN TEST 5?
027570  001003                          BNE     35$                     ;YES - SKIP DATA COMPARE
027572  105737  002235                  TSTB    T5CMP                   ;DO DATA COMPARES IN TEST 5 ?
027576  001403                          BEQ     40$                     ;NO, SKIP DATA COMPARE
027600  004737  032552          35$:    JSR     PC,CMPDAT               ;DO COMPARE DATA
027604  000406                          BR      45$                     ;

027606  132737  000001  002236  40$:    BITB    #BIT0,DMPBUF            ;SHOULD WE DUMP RDBUF?
027614  001402                          BEQ     45$                     ;NO - BRANCH
027616  004737  034066                  JSR     PC,BUFDMP

027622  004737  027662          45$:    JSR     PC,DQCMD                ;DEQUEUE THE COMMAND
027626  062703  000104          50$:    ADD     #DRBSTP,R3              ;ADJUST POINTER TO NEXT PACKET
027632  026403  000160                  CMP     URBEND(R4),R3           ;END OF RESPONSE BUFFER?
```

```
4011 027636  001002                    BNE     55$                     ;NO - BRANCH AROUND
4012 027640  016403  000156            MOV     URSPBF(R4),R3           ;PUT POINTER AT BEGINNING OF BUFFER
4013
4014 027644  005337  003412    55$:    DEC     HNDLRP                  ;DECREMENT RESPONSE COUNTER
4015 027650  001304                    BNE     10$                     ;GO HANDLE ANOTHER ONE
4016
4017 027652  010364  000022    60$:    MOV     R3,ROLSAV(R4)           ;SAVE OLD RESPONSE BUFFER POINTER
4018 027656                            POP     <R3>
     027656  012603                    MOV     (SP)+,R3        ;;POP STACK INTO R3
4019 027660  000207                    RTS     PC
```

J8


```
                                .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
                                ;
027662                          DQCMD::
027662  004737  027720                  JSR     PC,LGSTAT               ;CALL LOG STATS
027666  062702  000014                  ADD     #PCBSTP,R2              ;ADJUST THE OLD COMMAND POINTER
027672  022702  003344                  CMP     #PCBEND,R2              ;ARE WE AT THE END OF THE BUFFER ?
027676  001002                          BNE     5$                      ;NO, KEEP GOING
027700  012702  003264                  MOV     #PCMDBF,R2              ;YES, SET IT BACK TO THE TOP
                                
027704  005337  003402          5$:     DEC     RSPCNT                  ;DECREMENT THE RESPONSE COUNTER
027710  012737  177777  010550        MOV     #-1,CMSTSV              ;RESET THE GCS PROGRESS COUNT
027716  000207                          RTS     PC                      ;RETURN
```

```
                                .SBTTL  LOG STATISTICS
                                ;**********************************
                                ;
                                ; LOG STATISTICS
                                ;
                                ;Called By       : DQCMD
                                ;Register Inputs : R2 - OLD PROGRAM COMMAND POINTER
                                ;                  R4 - LUN BLOCK POINTER
                                ;
                                ;
027720                          LGSTAT::
027720  032764  000004  000026          BIT     #NOTALY,LUNFLG(R4)      ;IS THIS NOT TO BE TALLIED ?
027726  001162                          BNE     10$                     ;YES, GET OUT
027730  122762  000040  000000          CMPB    #ACC,CMD(R2)            ;SEE IF COMMAND A READ OR WRITE
027736  103556                          BLO     10$                     ;NO, EXIT SUBROUTINE
027740  105762  000000                  TSTB    CMD(R2)                 ;IS IT A NULL ?
027744  001553                          BEQ     10$                     ;YES, EXIT SUBROUTINE
027746  122762  000020  000000          CMPB    #WR,CMD(R2)             ;IS IT A WRITE ?
027754  001056                          BNE     5$                      ;NO, HANDLE READ
027756  066264  000002  000120          ADD     ITMOFF(R2),WRBYT1(R4)   ;YES, ADD THE BYTES WRITTEN TO TOTAL
027764  026427  000120  001747  1$:     CMP     WRBYT1(R4),#999.        ;IS IT HIGER THAN 999. ?
027772  003406                          BLE     2$                      ;BRANCH IF IT'S NOT
027774  162764  001750  000120          SUB     #1000.,WRBYT1(R4)       ;SUBTRACT 1000. FROM THE LOWER ORDER WORD
030002  005264  000122                  INC     WRBYT2(R4)              ;INCREMENT THE SECOND WORD
030006  000766                          BR      1$
030010  026427  000122  001747  2$:     CMP     WRBYT2(R4),#999.        ;IS IT HIGER THAN 999. ?
030016  003406                          BLE     3$                      ;BRANCH IF IT'S NOT
030020  162764  001750  000122          SUB     #1000.,WRBYT2(R4)       ;SUBTRACT 1000. FROM THE LOWER ORDER WORD
030026  005264  000124                  INC     WRBYT3(R4)              ;INCREMENT THE SECOND WORD
030032  000766                          BR      2$
030034  026427  000124  001747  3$:     CMP     WRBYT3(R4),#999.        ;IS IT HIGER THAN 999. ?
030042  003406                          BLE     4$                      ;BRANCH IF IT'S NOT
030044  162764  001750  000124          SUB     #1000.,WRBYT3(R4)       ;SUBTRACT 1000. FROM THE LOWER ORDER WORD
030052  005264  000126                  INC     WRBYT4(R4)              ;INCREMENT THE SECOND WORD
030056  000766                          BR      3$
030060  026427  000126  001747  4$:     CMP     WRBYT4(R4),#999.        ;IS IT HIGER THAN 999. ?
030066  003502                          BLE     10$                     ;BRANCH IF IT'S NOT
030070  005064  000120                  CLR     WRBYT1(R4)              ;
030074  005064  000122                  CLR     WRBYT2(R4)              ;
030100  005064  000124                  CLR     WRBYT3(R4)              ;
030104  005064  000126                  CLR     WRBYT4(R4)              ;
030110  000471                          BR      10$                     ;EXIT
                                ;
030112  022763  000016  000012  5$:     CMP     #ST.TM,P.STS(R3)        ;WAS THIS A TAPE MARK DURING READ
030120  001465                          BEQ     10$                     ;YES, GET OUT
030122  022763  000010  000012          CMP     #10,P.STS(R3)           ;WAS THIS A DATA ERROR DURING READ
030130  001461                          BEQ     10$                     ;YES, GET OUT
030132  022763  000350  000012          CMP     #350,P.STS(R3)          ;WAS THIS A DATA ERROR DURING READ
030140  001455                          BEQ     10$                     ;YES, GET OUT
030142  066364  000040  000110          ADD     P.TRBC(R3),RDBYT1(R4)   ;YES, ADD THE BYTES WRITTEN TO TOTAL
030150  026427  000110  001747  6$:     CMP     RDBYT1(R4),#999.        ;IS IT HIGER THAN 999. ?
030156  003406                          BLE     7$                      ;BRANCH IF IT'S NOT
030160  162764  001750  000110          SUB     #1000.,RDBYT1(R4)       ;SUBTRACT 1000. FROM THE LOWER ORDER WORD
030166  005264  000112                  INC     RDBYT2(R4)              ;INCREMENT THE SECOND WORD
030172  000766                          BR      6$
030174  026427  000112  001747  7$:     CMP     RDBYT2(R4),#999.        ;IS IT HIGER THAN 999. ?
030202  003406                          BLE     8$                      ;BRANCH IF IT'S NOT
```

```
 4101 030204  162764  001750  000112          SUB     #1000.,RDBYT2(R4)       ;SUBTRACT 1000. FROM THE LOWER ORDER WORD
 4102 030212  005264  000114                  INC     RDBYT3(R4)              ;INCREMENT THE SECOND WORD
 4103 030216  000766                          BR      7$
 4104 030220  026427  000114  001747  8$:     CMP     RDBYT3(R4),#999.        ;IS IT HIGER THAN 999. ?
 4105 030226  003406                          BLE     9$                      ;BRANCH IF IT'S NOT
 4106 030230  162764  001750  000114          SUB     #1000.,RDBYT3(R4)       ;SUBTRACT 1000. FROM THE LOWER ORDER WORD
 4107 030236  005264  000116                  INC     RDBYT4(R4)              ;INCREMENT THE SECOND WORD
 4108 030242  000766                          BR      8$
 4109 030244  026427  000116  001747  9$:     CMP     RDBYT4(R4),#999.        ;IS IT HIGER THAN 999. ?
 4110 030252  003410                          BLE     10$                     ;BRANCH IF IT'S NOT
 4111 030254  005064  000110                  CLR     RDBYT1(R4)              ;
 4112 030260  005064  000112                  CLR     RDBYT2(R4)              ;
 4113 030264  005064  000114                  CLR     RDBYT3(R4)              ;
 4114 030270  005064  000116                  CLR     RDBYT4(R4)              ;
 4115 030274  042764  000004  000026  10$:     BIC     #NOTALY,LUNFLG(R4)      ;CLEAR THE NO-TALLY FLAG BEFORE EXITING
 4116 030302  000207                          RTS     PC                      ;RETURN
```

```
                                .SBTTL ERROR DECODE
                                ;**********************************
                                ;
                                ; ERROR DECODE
                                ;
                                ;Called By        : RSPHDL
                                ;Calls To         : ERRTLY, PRIERR
                                ;Register Inputs : R2 - OLD PROGRAM COMMAND BUFFER POINTER
                                ;

030304                          ERRDEC::
030304                                  PUSH    <R5>                    ;SAVE R5
030304  010546                         MOV     R5,-(SP)        ;;PUSH R5 ON STACK
030306  016205  000010                  MOV     XFERST(R2),R5           ;PUT THE COMMAND STATUS IN R5
030312  022705  000400                  CMP     #ST.ONL,R5              ;IS IT A UNIT ONLINE ERROR ?
030316  001005                         BNE     997$                    ;BRANCH IF IT ISN'T
030320  012737  000100  003442          MOV     #ONLB,WRKMSK            ;SET THE ERROR BIT IN THE MASK
030326  000137  030762                 JMP     MSKTST                  ;GO TEST IF IT'S O.K.
030332  042705  177740          997$:   BIC     #177740,R5              ;CLEAR THE UNWANTED BITS
030336  022762  002000  000010          CMP     #2000,XFERST(R2)        ;IS EOT SET IN TRANSFER STATUS ?
030344  001037                         BNE     1$                      ;BRANCH IF IT ISN'T
030346  052761  000004  003350          BIS     #EOT,DRINUS(R1)         ;SET THE DRIVE TO EOT
030354  005237  003526                 INC     UEOT                    ;INC THE EOT FLAG
030360  163737  003400  003402          SUB     CMDCNT,RSPCNT           ;SET RESPONSE COUNT TO NUMBER OUT
030366  005037  003400                 CLR     CMDCNT                  ;ISSUE NO MORE COMMANDS
030372  032764  000010  000026          BIT     #EOTPR,LUNFLG(R4)       ;HAS EOT BEEN PRINTED FOR THIS DRIVE ?
030400  001017                         BNE     999$                    ;DON'T PRINT IT AGAIN
030402                                  PUSH    <R1>                    ;SAVE R1
030402  010146                         MOV     R1,-(SP)        ;;PUSH R1 ON STACK
030404  006001                         ROR     R1                      ;DIVIDE R1 BY 2
030406                                  PRINTF  #UNTEOT,R1              ;PRINT UNIT AT EOT MESSAGE
030406  010146                         MOV     R1,-(SP)
030410  012746  020256                 MOV     #UNTEOT,-(SP)
030414  012746  000002                 MOV     #2,-(SP)
030420  010600                         MOV     SP,R0
030422  104417                         TRAP    C$PNTF
030424  062706  000006                 ADD     #6,SP
030430                                  POP     <R1>                    ;RESTORE R1
030432  052764  000010  000026          BIS     #EOTPR,LUNFLG(R4)       ;EOT BEEN PRINTED FOR THIS DRIVE
030440  000137  031232          999$:   JMP     EDCEXT                  ;GET OUT

030444  012737  010652  003530  1$:     MOV     #CMDT,R8                ;PUT THE ERROR TABLE ADDRESS IN R8
030452  022705  000013                 CMP     #13,R5                  ;IS IT A DRIVE ERROR ?
030456  001005                         BNE     4$                      ;NO, CONTINUE
030460  052737  000010  003516          BIS     #DRERFL,PCFLAG          ;SET THE DRIVE ERROR FLAG
030466  004737  033370                 JSR     PC,OCTHEX               ;GO DECODE THE STATUS
030472  022705  000023          4$:     CMP     #23,R5                  ;IS IT A VALID STATUS ?
030476  103003                         BHIS    5$                      ;IT'S VALID, BRANCH
030500  012705  000024                 MOV     #24,R5                  ;MAKE SURE ITS NOT MORE THAN 24
030504  000543                         BR      ERREXT                  ;TAKE THE ERROR EXIT

030506  012737  000002  003406  5$:     MOV     #SEREXC,RESPON          ;SET SERIOUS EXCEPTION
030514  016337  000000  003542          MOV     P.CRF(R3),SECRNS        ;SAVE THE CURRENT COMMAND REF #
030522  022705  000006                 CMP     #ST.WPR,R5              ;IS IT A WRITE PROTECT ERROR ?
030526  001004                         BNE     10$                     ;BRANCH IF IT ISN'T
030530  012737  000020  003442          MOV     #WPRB,WRKMSK            ;SET THE ERROR BIT IN THE MASK
030536  000511                         BR      MSKTST                  ;GO TEST IF IT'S O.K.
```

```
4167
4168 030540  022705  000016          10$:   CMP     #ST.TM,R5              ;IS IT A TAPE MARK ERROR ?
4169 030544  001061                         BNE     15$                    ;BRANCH IF IT ISN'T
4170 030546  052764  000002  000026         BIS     #SEREXC,LUNFLG(R4)     ;SET SERIOUS EXCEPTION
4171 030554  000261                         SEC                            ;
4172 030556  006164  000030                 ROL     LEOTFL(R4)             ;
4173 030562  042764  177774  000030         BIC     #177774,LEOTFL(R4)     ;
4174 030570  022764  000003  000030         CMP     #3,LEOTFL(R4)          ;
4175 030576  001032                         BNE     13$                    ;
4176 030600  052761  000004  003350         BIS     #EOT,DRINUS(R1)        ;
4177 030606  005237  003526                 INC     UEOT                   ;INC THE EOT FLAG
4178 030612                                 PUSH    <R1>                   ;SAVE R1
4179 030614  006001                         ROR     R1                     ;DIVIDE R1 BY 2
4180 030616                                 PRINTF  #UNTLOT,R1             ;PRINT UNIT AT EOT MESSAGE
     030616  010146                         MOV     R1,-(SP)
     030620  012746  020312                 MOV     #UNTLOT,-(SP)
     030624  012746  000002                 MOV     #2,-(SP)
     030630  010600                         MOV     SP,R0
     030632  104417                         TRAP    C$PNTF
     030634  062706  000006                 ADD     #6,SP
4181 030640                                 POP     <R1>                   ;RESTORE R1
4182 030642  163737  003400  003402         SUB     CMDCNT,RSPCNT          ;SET RESPONSE COUNT TO NUMBER OUT
4183 030650  005037  003400                 CLR     CMDCNT                 ;ISSUE NO MORE COMMANDS
4184 030654  005037  003406                 CLR     RESPON                 ;MAKE SURE WE
4185 030660  000137  031232                 JMP     EDCEXT                 ;GET OUT
4186
4187 030664  132763  000010  000011  13$:   BITB    #EF.EOT,P.FLGS(R3)     ;IS THE TAPE MARK AT EOT ?
4188 030672  001402                         BEQ     14$                    ;NO, KEEP ON GOING
4189 030674  000137  031232                 JMP     EDCEXT                 ;YES, GET OUT
4190 030700  012737  000010  003442  14$:   MOV     #TMB,WRKMSK            ;SET THE ERROR BIT IN THE MASK
4191 030706  000425                         BR      MSKTST                 ;GO TEST IF IT'S O.K.
4192
4193 030710  022705  000020          15$:   CMP     #ST.RDT,R5             ;IS IT A RECORD DATA TRUNCATED ERROR ?
4194 030714  001007                         BNE     20$                    ;BRANCH IF IT ISN'T
4195 030716  000241                         CLC                            ;CLEAR THE CARRY BIT
4196 030720  006164  000030                 ROL     LEOTFL(R4)             ;ROTATE THE CARRY INTO THE LEOT FLAG
4197 030724  012737  000002  003442         MOV     #RDTB,WRKMSK           ;SET THE ERROR BIT IN THE MASK
4198 030732  000413                         BR      MSKTST                 ;GO TEST IF IT'S O.K.
4199
4200 030734  022705  000023          20$:   CMP     #ST.LED,R5             ;IS IT A LOGICAL END OF TAPE ERROR ?
4201 030740  001002                         BNE     25$                    ;BRANCH IF IT ISN'T
4202 030742  000137  031232                 JMP     EDCEXT                 ;GET OUT IF LEOT DETECTED
4203
4204 030746  022705  000004          25$:   CMP     #ST.AVL,R5             ;IS IT A UNIT AVAILABLE ERROR ?
4205 030752  001020                         BNE     ERREXT                 ;BRANCH IF IT ISN'T
4206 030754  012737  000040  003442         MOV     #AVLB,WRKMSK           ;SET THE ERROR BIT IN THE MASK
4207
4208 030762  033737  003442  003440  MSKTST: BIT    WRKMSK,TSTMSK          ;IS IT AN ACCEPTABLE ERROR ?
4209 030770  001120                         BNE     EDCEXT                 ;GET OUT IF IT IS
4210 030772  000410                         BR      ERREXT                 ;OTHERWISE PRINT THE ERROR
4211  .
4212 030774                          ERRDEI::
4213 030774                                 PUSH    <R5>                   ;SAVE R5
4214 030776  113705  010546                 MOVB    IOSTAT,R5              ;PUT THE I/O ERROR CODE INTO R5
4215 031002  012737  010572  003530         MOV     #IOERTB,R8             ;SET THE ERROR TABLE ADDRESS IN R8
4216 031010  042705  177770                 BIC     #177770,R5             ;CLEAR OFF ALL UNWANTED BITS
4217
```

```
4218 031014  005305                    ERREXT: DEC     R5                      ;SUBTRACT 1 FROM R5
4219 031016  006305                            ASL     R5                      ;MULTIPLY R5 BY 10(8)
4220 031020  006305                            ASL     R5                      ;
4221 031022  006305                            ASL     R5                      ;
4222 031024  063705  003530                    ADD     R8,R5                   ;ADD THE TABLE ADDRESS TO R5
4223 031030                                    PUSH    <R3>
4224 031032  012703  013262                    MOV     #L$ERRTBL,R3            ;SET R3 TO THE GENERIC ERROR TABLE
4225 031036  012523                            MOV     (R5)+,(R3)+             ;MOVE ERROR TABLE CONTENTS
4226 031040  012523                            MOV     (R5)+,(R3)+             ;MOVE ERROR TABLE CONTENTS
4227 031042  012523                            MOV     (R5)+,(R3)+             ;MOVE ERROR TABLE CONTENTS
4228 031044  011513                            MOV     (R5),(R3)               ;MOVE ERROR TABLE CONTENTS
4229 031046                                    POP     <R3>
4230
4231 031050  022762  000010  000010            CMP     #EV.LGP,XFERST(R2)      ;IS IS A LONG GAP ENCOUNTERED ?
4232 031056  001031                            BNE     ERTLY                   ;NO, KEEP GOING
4233 031060  112737  000001  013262            MOVB    #DEVFAT,ERRTYP          ;YES, DROP THE UNIT
4234 031066  004737  033734                    JSR     PC,CORDMP               ;;;;GO DO IT
4235 031072  000240                            NOP                             ;;;;
4236 031074  122762  000020  000000            CMPB    #WR,CMD(R2)             ;IS IT A WRITE ?
4237 031102  001004                            BNE     1$                      ;NO TRY AGAIN
4238 031104  112737  000060  013263            MOVB    #H1WRIT,ERRTYP+1        ;AND TALLY THE HARD WRITE ERROR
4239 031112  000413                            BR      ERTLY                   ;GO TALLY THE ERROR
4240 031114  122762  000100  000000  1$:       CMPB    #WTM,CMD(R2)            ;IS IT A WRITE TAPE MARK ?
4241 031122  001004                            BNE     5$                      ;NO, MUST BE A READ
4242 031124  112737  000060  013263            MOVB    #H1WRIT,ERRTYP+1        ;AND TALLY THE HARD WRITE ERROR
4243 031132  000403                            BR      ERTLY                   ;TALLY THE ERROR
4244 031134  112737  000054  013263  5$:       MOVB    #H1READ,ERRTYP+1        ;TALLY THE HARD READ ERROR
4245 031142  004737  032036          ERTLY:    JSR     PC,ERRTLY               ;TALLY THE ERROR
4246 031146  105037  013263                    CLRB    ERRTYP+1                ;CLEAR UPPER BYTE
4247 031152  105737  002224                    TSTB    SOERRP                  ;ARE SOFT ERRORS ENABLED ?
4248 031156  001004                            BNE     6$                      ;YES, GO PRINT THE ERROR
4249 031160  122737  000003  013262            CMPB    #SOFT,L$ERRTBL          ;IS IT A SOFT ERROR ?
4250 031166  001402                            BEQ     8$                      ;YES, DON'T PRINT IT
4251 031170  004737  032536          6$:       JSR     PC,PRIERR               ;GO PRINT THE ERROR
4252
4253 031174  132737  000001  002231  8$:       BITB    #BIT0,DMPFLG            ;SHOULD WE DUMP PROGRAM TABLES?
4254 031202  001403                            BEQ     10$                     ;NO - BRANCH
4255 031204  004737  033734                    JSR     PC,CORDMP               ;GO DO IT
4256 031210  000240                            NOP
4257 031212  022737  000001  013262  10$:      CMP     #DEVFAT,ERRTYP          ;IS IT A FATAL ERROR ?
4258 031220  001004                            BNE     EDCEXT                  ;NO EXIT
4259 031222  010100                            MOV     R1,R0                   ;MOVE UNIT # * 2 TO R0
4260 031224  006000                            ROR     R0                      ;DIVIDE BY 2
4261 031226  004737  040442                    JSR     PC,DROPUN               ;DROP DRIVE FROM TESTING
4262 031232                          EDCEXT:   POP     <R5>                    ;RESTORE REGISTERS
4263 031234  000207                            RTS     PC                      ;RETURN
4264
```

```
                                .SBTTL ERROR LOG DECODE
                                ;**********************************
                                ;
                                ; ERROR LOG DECODE
                                ;
                                ;Called By       :
                                ;Calls To        :
                                ;Inputs          :
                                ;Outputs         :
                                ;Register Inputs :
                                ;Register Outputs:
                                ;
031236                          ERRDEL::
031236                                  PUSH    <R3,R5>
031242  116237  000000  003536          MOVB    CMD(R2),R11             ;GET THE COMMAND PRIMITIVE FOR LATER USE
031250  042737  177407  003536          BIC     #177407,R11             ;GET JUST THE ROOT PRIMATIVE
031256                                  PUSH    <R1>                    ;SAVE R1
031260  122763  000005  000010          CMPB    #FM.TPE,L.FMT(R3)       ;TAPE TRANSFER ERROR LOG?
031266  001420                          BEQ     5$                      ;YES, DECODE IT
031270  122763  000000  000010          CMPB    #FM.CNT,L.FMT(R3)       ;CONTROLLER ERROR LOG?
031276  001004                          BNE     1$                      ;NO, SEE WHAT IT IS
031300  012705  011132                  MOV     #CNTLER,R5              ;PRINT PACKET
031304  000137  031724                  JMP     PRTEXT                  ;GET OUT
031310  122763  000001  000010  1$:     CMPB    #FM.BAD,L.FMT(R3)       ;HOST MEMORY ACCESS ERROR LOG?
031316  001004                          BNE     5$                      ;NO, GET OUT
031320  012705  011142                  MOV     #BADERL,R5              ;SET UP TO PRINT HOST MEM ACC ERL
031324  000137  031724                  JMP     PRTEXT                  ;GO PRINT IT
031330  016337  000012  003556  5$:     MOV     L.EVNT(R3),EVENT        ;GET A COPY OF THE EVENT CODE
031336  042737  177740  003556          BIC     #177740,EVENT           ;GET RID OF THE SUBCODES
031344  022737  000007  003556          CMP     #ST.CMP,EVENT           ;IS IT A COMPARE ERROR ?
031352  001004                          BNE     10$                     ;NO, KEEP GOING
031354  012705  011152                  MOV     #CMPERL,R5              ;SET UP TO PRINT ERROR
031360  000137  031724                  JMP     PRTEXT                  ;GO PRINT THE ERROR
031364  022737  000013  003556  10$:    CMP     #ST.DRV,EVENT           ;IS IT A DRIVE ERROR ?
031372  001004                          BNE     15$                     ;NO, KEEP GOING
031374  012705  011162                  MOV     #DRVERL,R5              ;SET UP TO PRINT ERROR
031400  000137  031724                  JMP     PRTEXT                  ;GO PRINT THE ERROR
031404  022737  000012  003556  15$:    CMP     #ST.CNT,EVENT           ;IS IT A CONTROLLER ERROR ?
031412  001004                          BNE     DATAEL                  ;NO, MUST BE A DATA ERROR
031414  012705  011172                  MOV     #CNTERL,R5              ;SET UP TO PRINT ERROR
031420  000137  031724                  JMP     PRTEXT                  ;GO PRINT THE ERROR
031424  022763  000010  000012  DATAEL: CMP     #EV.LGP,L.EVNT(R3)      ;IS IT A LONG GAP ENCOUNTERED ?
031432  001004                          BNE     1$                      ;NO, KEEP TRYING
031434  012705  011202                  MOV     #LGPERL,R5              ;SET UP TO PRINT LGE ERROR
031440  000137  031724                  JMP     PRTEXT                  ;GO PRINT IT
031444  012701  003360          1$:     MOV     #UNTTBL,R1              ;PUT THE TEMP TABLE ADDRESS IN R1
031450  116361  000055  000000          MOVB    L.TRK(R3),TRK(R1)       ;PUT THE TRACK NUMBER IN TEMP
031456  016361  000056  000002          MOV     L.PBLK(R3),PHB(R1)      ;PHYSICAL BLOCK NUMBER TO TEMP
031464  022737  000020  003536          CMP     #WR,R11                 ;WAS IT A WRITE COMMAND ?
031472  001404                          BEQ     WRERL                   ;GO HANDLE WRITE ERROR
031474  022737  000100  003536          CMP     #WTM,R11                ;IS IT A WRITE TAPE MARK COMMAND ?
031502  001026                          BNE     RDERL                   ;GO HANDLE READ ERROR LOG
031504  022763  000150  000012  WRERL:  CMP     #EV.COR,L.EVNT(R3)      ;IS IT A SOFT ERROR ?
031512  001005                          BNE     1$                      ;NO, INCREMENT HARD ERROR
031514  105261  000004                  INCB    SWR(R1)                 ;YES, INCREMENT SOFT WRITE ERROR
031520  012705  011232                  MOV     #CORERL,R5              ;SET UP TO PRINT ERROR
031524  000413                          BR      10$                     ;KEEP GOING
```

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4323 031526  105261  000006          1$:     INCB    HWR(R1)          ;INCREMENT HARD WRITE ERROR
4324 031532  022763  000050  000012          CMP     #EV.DST,L.EVNT(R3) ;IS IT A DATA SYNC TIMEOUT ?
4325 031540  001003                          BNE     5$               ;NO, KEEP TRYING
4326 031542  012705  011222                  MOV     #WDSTEL,R5       ;SET UP TO PRINT DST ERROR
4327 031546  000402                          BR      10$              ;GO PRINT IT
4328 031550  012705  011242          5$:     MOV     #UWEERL,R5       ;SET UP TO PRINT ERROR
4329 031554  000137  031720          10$:    JMP     SRTBL            ;GO SORT THE ERROR AND PRINT
4330 031560  022763  000350  000012  RDERL:  CMP     #EV.URE,L.EVNT(R3) ;IS IT A HARD READ ERROR ?
4331 031566  001006                          BNE     1$               ;NO, HANDLE SOFT READ
4332 031570  105261  000007                  INCB    HRD(R1)          ;INC THE HARD READ ERROR
4333 031574  012705  011262                  MOV     #UREERL,R5       ;SET UP TO PRINT ERROR
4334 031600  000137  031720                  JMP     SRTBL            ;GO SORT AND PRINT IT
4335 031604  022763  000050  000012  1$:     CMP     #EV.DST,L.EVNT(R3) ;IS IT A DATA SYNC TIMEOUT ?
4336 031612  001006                          BNE     5$               ;NO, KEEP TRYING
4337 031614  105261  000007                  INCB    HRD(R1)          ;INC THE HARD READ ERROR
4338 031620  012705  011212                  MOV     #RDSTEL,R5       ;SET UP TO PRINT DST ERROR
4339 031624  000137  031720                  JMP     SRTBL            ;GO SORT AND PRINT IT
4340 031630  105261  000005          5$:     INCB    SRD(R1)          ;INC THE SOFT READ ERROR
4341 031634  105763  000042                  TSTB    L.LVL(R3)        ;WAS IT RECOVERED BY ECC ?
4342 031640  001025                          BNE     20$              ;NO, KEEP TRYING
4343 031642  122763  000036  000052          CMPB    #ECCBC,L.STS(R3) ;WAS THE ERROR ON AN ECC BLOCK ?
4344 031650  001003                          BNE     10$              ;NO TRY AGAIN
4345 031652  012705  011272                  MOV     #ECBERL,R5       ;SET UP TO PRINT ERROR
4346 031656  000420                          BR      SRTBL            ;GO SORT AND PRINT ERROR
4347 031660  122763  000030  000052  10$:    CMPB    #ECCTC,L.STS(R3) ;WAS ERROR ON A TAPE MARK ?
4348 031666  001003                          BNE     15$              ;TRY AGAIN
4349 031670  012705  011302                  MOV     #ECTERL,R5       ;SET UP TO PRINT ERROR
4350 031674  000411                          BR      SRTBL            ;GO SORT AND PRINT ERROR
4351 031676  122763  000026  000052  15$:    CMPB    #ECCDC,L.STS(R3) ;WAS ERROR ON DATA BLOCK ?
4352 031704  001003                          BNE     20$              ;NO, TRY AGAIN
4353 031706  012705  011312                  MOV     #ECDERL,R5       ;SET UP TO PRINT ERROR
4354 031712  000402                          BR      SRTBL            ;GO SORT AND PRINT ERROR
4355 031714  012705  011252          20$:    MOV     #RTYERL,R5       ;SET UP RETRY RECOVERED
4356 031720  004737  032162          SRTBL:  JSR     PC,TBLSRT        ;GO TALLY ERROR IN MEDIA TABLE
4357 031724  116237  000000  003536  PRTEXT: MOVB    CMD(R2),R11      ;GET THE COMMAND PRIMITIVE FOR LATER USE
4358 031732  012701  013262                  MOV     #L$ERRTBL,R1     ;R1 = SUPERVISORS ERROR TABLE
4359 031736  012521                          MOV     (R5)+,(R1)+      ;COPY PROGRAM'S ERROR TABLE
4360 031740  012521                          MOV     (R5)+,(R1)+      ;  TO SUPERVISOR'S
4361 031742  012521                          MOV     (R5)+,(R1)+      ;     ERROR
4362 031744  011511                          MOV     (R5),(R1)        ;        TABLE
4363 031746                                  POP     <R1>             ;RESTORE R1
4364 031750  004737  032120                  JSR     PC,ETLLY         ;TALLY ERROR FIRST
4365 031754  105037  013263                  CLRB    ERRTYP+1         ;DISCARD INFO USED BY ERRTLLY
4366 031760  105737  002224                  TSTB    SOERRP           ;ARE SOFT ERRORS ENABLED ?
4367 031764  001017                          BNE     1$               ;YES, GO PRINT THE ERROR
4368 031766  122737  000003  013262          CMPB    #SOFT,L$ERRTBL   ;IS IT A SOFT ERROR ?
4369 031774  001013                          BNE     1$               ;NO, PRINT IT
4370 031776  022737  000020  003536          CMP     #WR,R11          ;IS IT A WRITE ?
4371 032004  001411                          BEQ     EDLEXT           ;DON'T PRINT IT
4372 032006  022737  000100  003536          CMP     #WTM,R11         ;IS IT A WRITE TAPE MARK ?
4373 032014  001405                          BEQ     EDLEXT           ;DON'T PRINT IT
4374 032016  105737  002225                  TSTB    RDSOER           ;ARE WE PRINTING SOFT READ ERRORS ?
4375 032022  001402                          BEQ     EDLEXT           ;NO, DON'T PRINT IT
4376 032024  004737  032536          1$:     JSR     PC,PRIERR        ;GO PRINT IT
4377 032030                          EDLEXT: POP     <R5,R3>
4378 032034  000207                          RTS     PC
```

```
                                .SBTTL  ERROR TALLY
                                ;**********************************
                                ;
                                ; ERROR TALLY
                                ;
                                ;Called By       : ERRDEC, ERRDEI, ERRDEL
                                ;
032036                          ERRTLY::
032036                                  PUSH    <R1>                    ;SAVE R1
032040  122737  000106  013263          CMPB    #NOERR,ERRTYP+1         ;IS IT A STATUS ERROR ?
032046  001422                          BEQ     15$                     ;YES, GET OUT
032050  113701  013263                  MOVB    ERRTYP+1,R1             ;PUT THE ERROR TYPE IN R1
032054  122737  000076  013263          CMPB    #RMSPOS,ERRTYP+1        ;IS IT A MISPOSITION ERROR
032062  001012                          BNE     10$                     ;NO KEEP GOING
032064  122762  000020  000000          CMPB    #WR,CMD(R2)             ;IS IT A WRITE ?
032072  001404                          BEQ     5$                      ;NO TRY AGAIN
032074  122762  000100  000000          CMPB    #WTM,CMD(R2)            ;IS IT A WRITE TAPE MARK ?
032102  001002                          BNE     10$                     ;NO, MUST BE A READ
032104  112701  000100          5$:     MOVB    #WMSPOS,R1              ;SET IT TO A WRITE MISPOSITON
032110  060401                  10$:    ADD     R4,R1                   ;ADD THE OFFSET TO THE LUN POINTER
032112  005211                          INC     (R1)                    ;INC THE ERROR COUNT
032114                          15$:    POP     <R1>                    ;RESTORE R1 AND R4
032116  000207                          RTS     PC                      ;EXIT
```

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

032120                                  ETLLY::
032120                                          PUSH    <R1>                    ;SAVE R1
032122  122737  000106  013263                  CMPB    #NOERR,ERRTYP+1         ;IS IT A STATUS ERROR ?
032130  001412                                  BEQ     ELTEXT                  ;YES, GET OUT
032132  113701  013263                          MOVB    ERRTYP+1,R1             ;LET R1 = THE ERROR TYPE
032136  060401                                  ADD     R4,R1                   ;ADD THE LUN BLOCK POINTER TO R1
032140  132763  000001  000055                  BITB    #BIT0,L.TRK(R3)         ;IS IT AN ODD TRACK NUMBER ?
032146  001402                                  BEQ     1$                      ;YES, GO TALLY THE ERROR
032150  062701  000002                          ADD     #2,R1                   ;NO, TALLY THE EVEN TRACK
032154  005211                          1$:     INC     (R1)                    ;INC THE ERROR COUNT
032156                                  ELTEXT: POP     <R1>                    ;RESTORE R1
032160  000207                                  RTS     PC                      ;RETURN
```

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

032162                          TBLSRT::PUSH    <R1,R2,R3,R5>           ;SAVE R1,R2,R3,R5 ON STACK
032172  012701  003360                  MOV     #UNTTBL,R1              ;INITIALIZE R1,R2,R3,R5
032176  016402  000130                  MOV     TBLTOP(R4),R2           ;FOR LOCAL USAGE
032202  016403  000134                  MOV     LSTENT(R4),R3
032206  010205                          MOV     R2,R5
032210  020203                          CMP     R2,R3                   ;FIRST ENTRY?
032212  001524                          BEQ     30$                     ;YES, PUT IT IN THE TABLE

032214  126162  000000  000000  1$:     CMPB    TRK(R1),TRK(R2)         ;GET TO THE RIGHT TRACK
032222  101405                          BLOS    5$
032224  062702  000010                  ADD     #8.,R2
032230  020203                          CMP     R2,R3                   ;NEXT UNUSED SLOT ?
032232  001514                          BEQ     30$                     ;YES, PUT IT IN THE TABLE
032234  000767                          BR      1$

032236  126162  000000  000000  5$:     CMPB    TRK(R1),TRK(R2)         ;MAKE SURE ITS THE SAME TRACK
032244  001024                          BNE     15$
032246  026162  000002  000002          CMP     PHB(R1),PHB(R2)         ;IF OUR OBJ CNT HIGHER
032254  101405                          BLOS    10$
032256  062702  000010                  ADD     #8.,R2                  ;GO TO NEXT TABLE LOCATION
032262  020203                          CMP     R2,R3                   ;NEXT UNUSED SLOT ?
032264  001477                          BEQ     30$                     ;YES, PUT IT IN THE TABLE
032266  000763                          BR      5$

032270  026162  000002  000002  10$:    CMP     PHB(R1),PHB(R2)         ;IF THE ENTRY ALREADY EXIST
032276  001007                          BNE     15$
032300  066162  000004  000004          ADD     SWR(R1),SWR(R2)         ;THEN ADD THE ERROR COUNT
032306  066162  000006  000006          ADD     HWR(R1),HWR(R2)
032314  000477                          BR      EXTSRT

032316  026464  000134  000132  15$:    CMP     LSTENT(R4),TBLBTM(R4)   ;IF THE TABLES FULL, GET OUT
032324  001022                          BNE     20$
032326  032764  000040  000026  17$:    BIT     #MTBLOV,LUNFLG(R4)
032334  001067                          BNE     EXTSRT
032336  052764  000040  000026          BIS     #MTBLOV,LUNFLG(R4)
032344                                  PRINTF  #TBLFUL,L$LUN
032344  013746  002074                  MOV     L$LUN,-(SP)
032350  012746  036716                  MOV     #TBLFUL,-(SP)
032354  012746  000002                  MOV     #2,-(SP)
032360  010600                          MOV     SP,R0
032362  104417                          TRAP    C$PNTF
032364  062706  000006                  ADD     #6,SP
032370  000451                          BR      EXTSRT

032372  016405  000134  20$:    MOV     LSTENT(R4),R5           ;MOVE THE TABLE CONTENTS
032376  010503                          MOV     R5,R3                   ;DOWN TO PUT IN THE ENTRY
032400  162703  000010                  SUB     #8.,R3
```

```
 4482 032404  116365  000000  000000  25$:    MOVB    TRK(R3),TRK(R5)
 4483 032412  016365  000002  000002          MOV     PHB(R3),PHB(R5)
 4484 032420  116365  000004  000004          MOVB    SWR(R3),SWR(R5)
 4485 032426  116365  000005  000005          MOVB    SRD(R3),SRD(R5)
 4486 032434  116365  000006  000006          MOVB    HWR(R3),HWR(R5)
 4487 032442  116365  000007  000007          MOVB    HRD(R3),HRD(R5)
 4488 032450  162703  000010                  SUB     #8.,R3
 4489 032454  162705  000010                  SUB     #8.,R5
 4490 032460  020502                          CMP     R5,R2                   ;KEEP GOING TILL THE RIGHT SLOT
 4491 032462  101350                          BHI     25$                     ;IS OPEN
 4492
 4493 032464  026464  C00134  000132  30$:    CMP     LSTENT(R4),TBLBTM(R4)   ;IF THE TABLES FULL, GET OUT
 4494 032472  001715                          BEQ     17$
 4495 032474  020301                          CMP     R3,R1
 4496 032476  103403                          BLO     35$
 4497 032500  010103                          MOV     R1,R3
 4498 032502  010205                          MOV     R2,R5
 4499 032504  000737                          BR      25$
 4500 032506  062764  000010  000134  35$:    ADD     #8.,LSTENT(R4)          ;ADJUST THE LAST ENTRY POINTER
 4501 032514  005061  000004          EXTSRT: CLR     SWR(R1)                 ;CLEAR SOFT ERROR COUNTERS
 4502 032520  005061  000006                  CLR     HWR(R1)                 ;CLEAR HARD ERROR COUNTERS
 4503 032524                                  POP     <R5,R3,R2,R1>           ;RESTORE REGISTERS
 4504 032534  000207                          RTS     PC
```

```
4506                                    .SBTTL  PRINT ERROR
4507                                    ;**********************************
4508                                    ;
4509                                    ; PRINT ERROR
4510                                    ;
4511                                    ;Called By       : ERRDEC, ERRDEI, ERRDEL
4512                                    ;Calls To        : ERROR
4513                                    ;Register Inputs :
4514                                    ;Register Outputs:
4515
4516 032536                             PRIERR::
4517 032536  010337  003560                    MOV     R3,R3SAVE               ;SAVE R3
4518 032542  010437  003562                    MOV     R4,R4SAVE               ;SAVE R4
4519 032546                                    ERROR                           ;ERROR MACRO
     032546  104460                            TRAP    C$ERROR
4520 032550  000207                            RTS     PC                      ;RETURN
4521
```

```
                        .SBTTL  COMPARE DATA
                        ;**********************************
                        ;
                        ; COMPARE DATA
                        ;
                        ;Called By       :
                        ;Calls To        :
                        ;Inputs          :
                        ;Outputs         :
                        ;Register Inputs :
                        ;Register Outputs:
                        ;
032552                  CMPDAT::
032552                          PUSH    <R1,R2,R3,R5>           ;SAVE R1,R2,R3,R5
032552  010146                  MOV     R1,-(SP)        ;;PUSH R1 ON STACK
032554  010246                  MOV     R2,-(SP)        ;;PUSH R2 ON STACK
032556  010346                  MOV     R3,-(SP)        ;;PUSH R3 ON STACK
032560  010546                  MOV     R5,-(SP)        ;;PUSH R5 ON STACK
032562  026363  000040  000014          CMP     P.TRBC(R3),P.BCNT(R3)   ;AS MANY BYTES READ AS WRITTEN ?
032570  001426                  BEQ     5$                      ;BRANCH IF YES
032572  012705  011122          MOV     #RLST,R5                ;PUT THE RLS TABLE ADDRESS IN R5
032576  012702  013262          MOV     #L$ERRTBL,R2            ;PUT THE ERROR TABLE ADDRES IN R2
032602  012522                  MOV     (R5)+,(R2)+             ;MOV THE RLS TABLE TO THE ERROR TABLE
032604  012522                  MOV     (R5)+,(R2)+             ;
032606  012522                  MOV     (R5)+,(R2)+             ;
032610  011512                  MOV     (R5),(R2)               ;
032612                          POP     <R5,R3,R2,R1>           ;RESTORE REGISTERS
032612  012605                  MOV     (SP)+,R5        ;;POP STACK INTO R5
032614  012603                  MOV     (SP)+,R3        ;;POP STACK INTO R3
032616  012602                  MOV     (SP)+,R2        ;;POP STACK INTO R2
032620  012601                  MOV     (SP)+,R1        ;;POP STACK INTO R1
032622  004737  032036          JSR     PC,ERRTLY               ;GO TALLY THE ERROR
032626  105037  013263          CLRB    ERRTYP+1                ;CLEAR THE LUN POINTER
032632  004737  032536          JSR     PC,PRIERR               ;GO PRINT THE ERROR
032636                          PUSH    <R1,R2,R3,R5>           ;SAVE R1,R2,R3,R5
032636  010146                  MOV     R1,-(SP)        ;;PUSH R1 ON STACK
032640  010246                  MOV     R2,-(SP)        ;;PUSH R2 ON STACK
032642  010346                  MOV     R3,-(SP)        ;;PUSH R3 ON STACK
032644  010546                  MOV     R5,-(SP)        ;;PUSH R5 ON STACK
032646  005037  003444          5$:     CLR     CMPERR                  ;CLEAR LOCATION CMPERR
032652  042764  000020  000026          BIC     #ODDFLG,LUNFLG(R4)      ;CLEAR THE ODD BYTE COUNT FLAG
032660  016337  000014  003530          MOV     P.BCNT(R3),R8           ;PUT THE TAPE RECORD BYTE COUNT IN R8
032666  005037  003532                  CLR     R9                      ;CLEAR THE BYTE ADDRESS COUNTER
032672  032737  000001  003530          BIT     #BIT0,R8                ;IS THE BYTE COUNT ODD
032700  001406                  BEQ     10$                     ;BRANCH IF NOT
032702  042737  000001  003530          BIC     #BIT0,R8                ;MAKE THE COUNT EVEN
032710  052764  000020  000026          BIS     #ODDFLG,LUNFLG(R4)      ;SET THE ODD BYTE FLAG
032716  012701  003446          10$:    MOV     #BYTADD,R1              ;LET R1 POINT TO THE ADDRESS TABLE
032722  022737  000003  002114          CMP     #3,L$TEST               ;ARE WE IN TEST 3 ?
032730  001003                  BNE     11$                     ;NO, SO JUST SET RDBUF IN BUFADR
032732  012702  070550          MOV     #WRTBUF-2,R2            ;LET R2 POINT TO THE WRITE BUFFER
032736  000402                  BR      12$
032740  012702  070552          11$:    MOV     #WRTBUF,R2              ;LET R2 POINT TO THE WRITE BUFFER
032744  012703  050552          12$:    MOV     #RDBUF,R3               ;LET R3 POINT TO THE READ BUFFER
032750  012705  003472                  MOV     #DATBL,R5               ;LET R5 POINT TO THE ERROR DATA TABLE
032754  022322                  14$:    CMP     (R3)+,(R2)+             ;COMPARE THE FIRST WORD OF DATA
```

```
4568 032756 001447                        BEQ     25$                     ;BRANCH IF THEY ARE EQUAL
4569 032760 126362 177776 177776          CMPB    LOBYTE(R3),LOBYTE(R2)   ;COMPARE THE LOW BYTE
4570 032766 001415                        BEQ     15$                     ;BRANCH IF EQUAL
4571 032770 005237 003444                 INC     CMPERR                  ;ADD 1 TO THE ERROR COUNT
4572 032774 022701 003472                 CMP     #TBLEND,R1              ;IS THERE ROOM TO SAVE THIS DATA ?
4573 033000 001410                        BEQ     15$                     ;BRANCH IF NOT
4574 033002 116315 177776                 MOVB    LOBYTE(R3),(R5)         ;LOW READ BYTE IN SAVE BYTE
4575 033006 116265 177776 000001          MOVB    LOBYTE(R2),ONE(R5)      ;LOW WRITE BYTE IN SAVE BYTE
4576 033014 013721 003532                 MOV     R9,(R1)+                ;SAVE THE ADDRESS FOR PRINTING
4577 033020 005725                        TST     (R5)+                   ;POINT R5 TO NEXT TABLE LOCATION
4578 033022 005237 003532           15$:  INC     R9                      ;ADD 1 TO THE BYTE COUNT
4579 033026 126362 177777 177777          CMPB    HIBYTE(R3),HIBYTE(R2)   ;COMPARE THE HIGH BYTE
4580 033034 001415                        BEQ     20$                     ;BRANCH IF THEY ARE THE SAME
4581 033036 005237 003444                 INC     CMPERR                  ;ADD 1 TO THE ERROR COUNT
4582 033042 022701 003472                 CMP     #TBLEND,R1              ;ROOM TO SAVE THIS DATA ?
4583 033046 001410                        BEQ     20$                     ;BRANCH IF NOT
4584 033050 116315 177777                 MOVB    HIBYTE(R3),(R5)         ;HI READ BYTE TO LOW SAVE BYTE
4585 033054 116265 177777 000001          MOVB    HIBYTE(R2),ONE(R5)      ;HIGH WRITE BYTE TO HIGH SAVE BYTE
4586 033062 013721 003532                 MOV     R9,(R1)+                ;SAVE THE ADDRESS TO PRINT
4587 033066 005725                        TST     (R5)+                   ;POINT R5 TO THE NEXT TABLE LOCATION
4588 033070 005237 003532           20$:  INC     R9                      ;ADD 1 TO THE BYTE COUNTER
4589 033074 000403                        BR      30$                     ;BRANCH
4590 033076 062737 000002 003532    25$:  ADD     #2,R9                   ;ADD 2 TO THE BYTE COUNT
4591 033104 023737 003532 003530    30$:  CMP     R9,R8                   ;HAVE WE COMPARED THEM ALL ?
4592 033112 001320                        BNE     14$                     ;NO, GO DO SOME MORE
4593 033114 032764 000020 000026          BIT     #ODDFLG,LUNFLG(R4)      ;WAS IT AN ODD BYTE COUNT ?
4594 033122 001414                        BEQ     35$                     ;BRANCH IF NOT
4595 033124 121312                        CMPB    (R3),(R2)               ;COMPARE THE LOW BYTES
4596 033126 001412                        BEQ     35$                     ;BRANCH IF THEY MATCH
4597 033130 005237 003444                 INC     CMPERR                  ;ADD 1 TO THE ERROR COUNT
4598 033134 022701 003472                 CMP     #TBLEND,R1              ;IS THERE ROOM FOR THIS DATA ?
4599 033140 001405                        BEQ     35$                     ;BRANCH IF NOT
4600 033142 111315                        MOVB    (R3),(R5)               ;LOW READ BYTE IN THE LOW SAVE BYTE
4601 033144 111265 000001                 MOVB    (R2),ONE(R5)            ;LOW WRITE BYTE TO HIGH SAVE BYTE
4602 033150 013721 003532                 MOV     R9,(R1)+                ;SAVE THE ADDRESS TO PRINT
4603 033154 005737 003444           35$:  TST     CMPERR                  ;DID WE HAVE ANY ERRORS ?
4604 033160 001423                        BEQ     40$                     ;BRANCH TO EXIT IF NOT
4605 033162 012705 011112                 MOV     #DCMPT,R5               ;POINT R5 TO THE DATA COMPARE ERROR TABLE
4606 033166 012702 013262                 MOV     #L$ERRTBL,R2            ;POINT R2 TO THE ERROR TABLE
4607 033172 012522                        MOV     (R5)+,(R2)+             ;MOVE THE DATA COMPARE COMPARE TABLE
4608 033174 012522                        MOV     (R5)+,(R2)+             ;TO THE ERROR TABLE
4609 033176 012522                        MOV     (R5)+,(R2)+             ;
4610 033200 011512                        MOV     (R5),(R2)               ;
4611 033202                               POP     <R5,R3,R2,R1>           ;RESTORE THE REGISTERS
     033202 012605                        MOV     (SP)+,R5        ;;POP STACK INTO R5
     033204 012603                        MOV     (SP)+,R3        ;;POP STACK INTO R3
     033206 012602                        MOV     (SP)+,R2        ;;POP STACK INTO R2
     033210 012601                        MOV     (SP)+,R1        ;;POP STACK INTO R1
4612 033212 004737 032036                 JSR     PC,ERRTLY               ;GO TALLY THE ERROR
4613 033216 105037 013263                 CLRB    ERRTYP+1                ;CLEAR THE UPPER BYTE OF ERROR TYPE
4614 033222 004737 032536                 JSR     PC,PRIERR               ;GO PRINT THE ERROR
4615 033226 000404                        BR      45$                     ;EXIT
4616 033230                         40$:  POP     <R5,R3,R2,R1>           ;RESTORE THE REGISTERS
     033230 012605                        MOV     (SP)+,R5        ;;POP STACK INTO R5
     033232 012603                        MOV     (SP)+,R3        ;;POP STACK INTO R3
     033234 012602                        MOV     (SP)+,R2        ;;POP STACK INTO R2
     033236 012601                        MOV     (SP)+,R1        ;;POP STACK INTO R1
```

L9


```
   4617 033240  000207                45$:    RTS     PC                  ;RETURN
```

```
                                .SBTTL  UNJAM
                                ;**********************************
                                ;
                                ; UNJAM
                                ;
                                ;Called By       :
                                ;Calls To        :
                                ;Inputs          :
                                ;Outputs         :
                                ;Register Inputs :
                                ;Register Outputs:
                                ;
033242                          UNJAM::
033242  005737  003344                  TST     DUMPKT                  ;ARE WE ISSUEING NULL COMMANDS
033246  001444                          BEQ     15$                     ;YES , THEN EXIT
033250  023764  003542  000006          CMP     SECRNS,CMDSEQ(R4)       ;IS IT THE ONLY COMMAND OUT ?
033256  001440                          BEQ     15$                     ;YES , THEN EXIT
033260  016437  000006  003436          MOV     CMDSEQ(R4),SAVDIF       ;SET UP TO UNJAM THE QUEUES
033266  163737  003542  003436          SUB     SECRNS,SAVDIF           ;SUBTRACT CURRENT FROM THE HIGHEST
033274  063737  003436  003400          ADD     SAVDIF,CMDCNT           ;ADJUST THE COMMAND COUNT
033302  063737  003436  003402          ADD     SAVDIF,RSPCNT           ;ADJUST THE RESPONSE COUNT
033310  042737  000200  003516          BIC     #CMDONE,PCFLAG          ;CLEAR THE ALL COMMANDS ISSUED FLAG
033316  163764  003436  000034          SUB     SAVDIF,OBJFDL(R4)       ;ADUST THE OBJECT COUNT
033324  103002                          BCC     5$                      ;GET OUT IF NO CARRY
033326  005364  000036                  DEC     OBJFDH(R4)              ;OTHERWISE, ADJUST THE HIGH WORD
033332  022737  000004  003424  5$:     CMP     #N,SUBCNT
033340  001002                          BNE     10$
033342  005037  003424                  CLR     SUBCNT
033346  005237  003424          10$:    INC     SUBCNT
033352  005337  003436                  DEC     SAVDIF
033356  001365                          BNE     5$
033360  052764  000002  000026  15$:    BIS     #SEREXC,LUNFLG(R4)      ;SET THE SERIOUS EXCEPTION FLAG
033366  000207                          RTS     PC                      ;RETURN
033370                                  ENDMOD
```

```
                                        .SBTTL  OCTAL -> HEX CONVERTER
                                        ;************************************
                                        ;
                                        ; OCTAL -> HEX CONVERTER
                                        ;
                                        OCTHEX::
033370                                          MOVB    P.STS+1(R3),LOHEX       ;GET THE UPPER STATUS BYTE
033376  013737  003552  003554                  MOV     LOHEX,HIHEX             ;GET A SECOND COPY
033404  042737  177760  003552                  BIC     #177760,LOHEX           ;CLEAR THE UNWANTED BITS
033412  042737  177417  003554                  BIC     #177417,HIHEX           ;CLEAR THE UNWANTED BITS
033420  006037  003554                          ROR     HIHEX                   ;SHIFT THE
033424  006037  003554                          ROR     HIHEX                   ;       UPPER NIBBLE
033430  006037  003554                          ROR     HIHEX                   ;                OVER 3 PLACES
033434  006137  003552                          ROL     LOHEX                   ;SHIFT THE LOWER NIBBLE OVER 1
033440  062737  011442  003552                  ADD     #HEXTBL,LOHEX           ;ADD ASCII TABLE BASE ADDRESS
033446  062737  011442  003554                  ADD     #HEXTBL,HIHEX           ;ADD ASCII TABLE BASE ADDRESS
033454  000207                                  RTS     PC                      ;RETURN
```

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

033456                          CLREOT::
033456                                  PUSH    <R1,R2,R4>              ;SAVE R1, R2, AND R4
033456  010146                          MOV     R1,-(SP)        ;;PUSH R1 ON STACK
033460  010246                          MOV     R2,-(SP)        ;;PUSH R2 ON STACK
033462  010446                          MOV     R4,-(SP)        ;;PUSH R4 ON STACK
033464  005002                          CLR     R2                      ;CLEAR OUT R2
033466  012701  177776                  MOV     #-2.,R1                 ;SET R1 TO THE FIRST UNIT
033472  012704  002314                  MOV     #LUNO,R4                ;LET R4 EQUAL THE FIRDT LUN
033476  062701  000002          5$:     ADD     #2.,R1                  ;ADD 2 TO THE UNIT POINTER
033502  062702  000001                  ADD     #1.,R2                  ;ADD 1 TO R2
033506  112764  177777  000154          MOVB    #-1,OLDTRK(R4)          ;INITIALIZE OLD TRACK
033514  012764  177777  000152          MOV     #-1,OLDBLK(R4)          ;INITIALIZE OLD BLOCK
033522  062704  000172                  ADD     #LUNSTP,R4              ;SET R4 TO THE NEXT LUN
033526  042761  000004  003350          BIC     #EOT,DRINUS(R1)         ;CLEAR THE EOT BIT IN DRINUS
033534  005037  003526                  CLR     UEOT                    ;CLEAR THE EOT FLAG
033540  023702  002012          10$:    CMP     L$UNIT,R2               ;HAVE WE DONE THEM ALL
033544  001354                          BNE     5$                      ;NO, KEEP GOING TILL ALL DONE
033546                                  POP     <R4,R2,R1>              ;RESTORE R4, R2, AND R1
033546  012604                          MOV     (SP)+,R4        ;;POP STACK INTO R4
033550  012602                          MOV     (SP)+,R2        ;;POP STACK INTO R2
033552  012601                          MOV     (SP)+,R1        ;;POP STACK INTO R1
033554  000207                          RTS     PC                      ;RETURN
```

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

033556                          SDSTUP::
033556                                  PUSH    <R1,R4>                 ;
033556  010146                          MOV     R1,-(SP)        ;;PUSH R1 ON STACK
033560  010446                          MOV     R4,-(SP)        ;;PUSH R4 ON STACK
033562  013701  002012                  MOV     L$UNIT,R1               ;
033566  012704  002314                  MOV     #LUNO,R4                ;
033572  016464  000136  000144  5$:     MOV     SED1(R4),SEED1(R4)      ;
033600  016464  000140  000146          MOV     SED2(R4),SEED2(R4)      ;
033606  016464  000142  000150          MOV     SED3(R4),SEED3(R4)      ;
033614  062704  000172                  ADD     #LUNSTP,R4              ;
033620  005301                          DEC     R1                      ;
033622  001363                          BNE     5$                      ;
033624                                  POP     <R4,R1>                 ;
033624  012604                          MOV     (SP)+,R4        ;;POP STACK INTO R4
033626  012601                          MOV     (SP)+,R1        ;;POP STACK INTO R1
033630  000207                          RTS     PC                      ;

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

033632                          SDSAVE::
033632                                  PUSH    <R1,R4>                 ;
033632  010146                          MOV     R1,-(SP)        ;;PUSH R1 ON STACK
033634  010446                          MOV     R4,-(SP)        ;;PUSH R4 ON STACK
033636  013701  002012                  MOV     L$UNIT,R1               ;
033642  012704  002314                  MOV     #LUNO,R4                ;
033646  016464  000144  000136  5$:     MOV     SEED1(R4),SED1(R4)      ;
033654  016464  000146  000140          MOV     SEED2(R4),SED2(R4)      ;
033662  016464  000150  000142          MOV     SEED3(R4),SED3(R4)      ;
033670  062704  000172                  ADD     #LUNSTP,R4              ;
033674  005301                          DEC     R1                      ;
033676  001363                          BNE     5$                      ;
033700                                  POP     <R4,R1>                 ;
033700  012604                          MOV     (SP)+,R4        ;;POP STACK INTO R4
033702  012601                          MOV     (SP)+,R1        ;;POP STACK INTO R1
033704  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 033706                            PATCLR:
 4745 033706  012704  002314                       MOV     #LUN0,R4                ;
 4746 033712  005064  000024            1$:        CLR     PATSAV(R4)              ;
 4747 033716  022704  003072                       CMP     #LUN3,R4                ;
 4748 033722  001403                               BEQ     2$                      ;
 4749 033724  062704  000172                       ADD     #LUNSTP,R4              ;
 4750 033730  000770                               BR      1$                      ;
 4751 033732  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.

033734                          CORDMP:
033734                                  PUSH    <R1,R2>
033734  010146                          MOV     R1,-(SP)        ;;PUSH R1 ON STACK
033736  010246                          MOV     R2,-(SP)        ;;PUSH R2 ON STACK
033740                                  PRINTF  #DUMP,R1,R2,R3,R4,R5
033740  010546                          MOV     R5,-(SP)
033742  010446                          MOV     R4,-(SP)
033744  010346                          MOV     R3,-(SP)
033746  010246                          MOV     R2,-(SP)
033750  010146                          MOV     R1,-(SP)
033752  012746  020347                  MOV     #DUMP,-(SP)
033756  012746  000006                  MOV     #6,-(SP)
033762  010600                          MOV     SP,R0
033764  104417                          TRAP    C$PNTF
033766  062706  000016                  ADD     #16,SP
033772  012701  002314                  MOV     #LUN0,R1                ;PUT STARING ADDRESS IN R1
034000  012702  002314                  MOV     #LUN0,R2                ;AND ANOTHER COPY IN R2
034002                          1$:     PRINTF  #DUMP2,R1,(R2),2(R2),4(R2),6(R2)
034002  016246  000006                  MOV     6(R2),-(SP)
034006  016246  000004                  MOV     4(R2),-(SP)
034012  016246  000002                  MOV     2(R2),-(SP)
034016  011246                          MOV     (R2),-(SP)
034020  010146                          MOV     R1,-(SP)
034022  012746  020471                  MOV     #DUMP2,-(SP)
034026  012746  000006                  MOV     #6,-(SP)
034032  010600                          MOV     SP,R0
034034  104417                          TRAP    C$PNTF
034036  062706  000016                  ADD     #16,SP

034042  062701  000010                  ADD     #10,R1                  ;UPDATE R1
034046  062702  000010                  ADD     #10,R2                  ;UPDATE R2
034052  022701  010572                  CMP     #IOERTB,R1              ;ARE WE AT THE END OF DUMP AREA
034056  101351                          BHI     1$                      ;KEEP GOING IF NOT
034060                                  POP     <R2,R1>
034064  000207                          RTS     PC
```

```
                                .SBTTL BUFFER DUMP
                                ;**********************************
                                ;
                                ; BUFFER DUMP
                                ;
                                ;THIS ROUTINE WILL PRINT THE READ BUFFER FOR EVERY RECORD READ IN
                                ;TEST 5.

034066                          BUFDMP:
034066                                  PUSH    <R1,R2>
034072  016301  000014                  MOV     P.BCNT(R3),R1           ;GET NUMBER OF BYTES X-FERRED
034076  012702  050552                  MOV     #RDBUF,R2               ;GET BUFFER ADDRESS
034102                                  PRINTF  #DUMP1,R1               ;PRINT NUMBER OF BYTES
034102  010146                          MOV     R1,-(SP)
034104  012746  020430                  MOV     #DUMP1,-(SP)
034110  012746  000002                  MOV     #2,-(SP)
034114  010600                          MOV     SP,R0
034116  104417                          TRAP    C$PNTF
034120  062706  000006                  ADD     #6,SP

034124                          1$:     PRINTF  #DUMP2,(R2),2(R2),4(R2),6(R2),10(R2)
034124  016246  000010                  MOV     10(R2),-(SP)
034130  016246  000006                  MOV     6(R2),-(SP)
034134  016246  000004                  MOV     4(R2),-(SP)
034140  016246  000002                  MOV     2(R2),-(SP)
034144  011246                          MOV     (R2),-(SP)
034146  012746  020471                  MOV     #DUMP2,-(SP)
034152  012746  000006                  MOV     #6,-(SP)
034156  010600                          MOV     SP,R0
034160  104417                          TRAP    C$PNTF
034162  062706  000016                  ADD     #16,SP
034166  062702  000012                  ADD     #12,R2                  ;ADJUST BUFFER POINTER
034172  162701  000012                  SUB     #12,R1                  ;ADJUST BYTE COUNT
034176  001401                          BEQ     5$                      ;IF ZERO GET OUT
034200  100351                          BPL     1$                      ;KEEP GOING IF POSITIVE

034202                          5$:     POP     <R2,R1>
034206  000207                          RTS     PC
```

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

 4846 034210                            BGNMOD

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

 4853 034210                            BGNRPT
      034210                    L$RPT::

 4860 034210                            PUSH    <R1,R4,R5>
      034210  010146                    MOV     R1,-(SP)        ;;PUSH R1 ON STACK
      034212  010446                    MOV     R4,-(SP)        ;;PUSH R4 ON STACK
      034214  010546                    MOV     R5,-(SP)        ;;PUSH R5 ON STACK
 4861 034216  032737  000400  003516    BIT     #DROPIT,PCFLAG          ;ARE WE DROPPING A UNIT
 4862 034224  001015                    BNE     5$                      ;YES, ONLY PRINT STATS FOR THIS UNIT
 4863 034226  005001                    CLR     R1                      ;SET R1 TO FIRST UNIT
 4864 034230  005037  002074            CLR     L$LUN                   ;START WITH UNIT 0
 4865 034234  012704  002314            MOV     #LUNO,R4                ;START WITH LUN BLOCK FOP UNIT 0
 4866 034240  013705  002012            MOV     L$UNIT,R5               ;INIT UNIT COUNTER
 4867 034244  032761  000010  003350  1$:BIT     #DROP,DRINUS(R1)        ;HAS THE DRIVE BEEN DROPPED ?
 4868 034252  001402                    BEQ     5$                      ;NO, PRINT ITS STATS
 4869 034254  000137  035346            JMP     15$                     ;OTHERWISE GET THE NEXT DRIVE

 4871 034260                    5$:     PRINTS  #STAT0
      034260  012746  035464            MOV     #STAT0,-(SP)
      034264  012746  000001            MOV     #1,-(SP)
      034270  010600                    MOV     SP,R0
      034272  104416                    TRAP    C$PNTS
      034274  062706  000004            ADD     #4,SP

 4873 034300                            PRINTS  #STAT1,L$LUN
      034300  013746  002074            MOV     L$LUN,-(SP)
      034304  012746  035467            MOV     #STAT1,-(SP)
      034310  012746  000002            MOV     #2,-(SP)
      034314  010600                    MOV     SP,R0
      034316  104416                    TRAP    C$PNTS
      034320  062706  000006            ADD     #6,SP

 4875 034324                            PRINTS  #STAT2
      034324  012746  035533            MOV     #STAT2,-(SP)
      034330  012746  000001            MOV     #1,-(SP)
      034334  010600                    MOV     SP,R0
      034336  104416                    TRAP    C$PNTS
      034340  062706  000004            ADD     #4,SP

 4877 034344                            PRINTS  #STAT3
      034344  012746  035600            MOV     #STAT3,-(SP)
      034350  012746  000001            MOV     #1,-(SP)
      034354  010600                    MOV     SP,R0
      034356  104416                    TRAP    C$PNTS
      034360  062706  000004            ADD     #4,SP

 4879 034364                            PRINTS  #STAT4
```

```
        034364  012746  035660                  MOV     #STAT4,-(SP)
        034370  012746  000001                  MOV     #1,-(SP)
        034374  010600                          MOV     SP,R0
        034376  104416                          TRAP    C$PNTS
        034400  062706  000004                  ADD     #4,SP
  4880
  4881 034404                                   PRINTS  #STAT5,S1READ(R4),S2READ(R4),S1WRIT(R4),S2WRIT(R4)
        034404  016446  000046                  MOV     S2WRIT(R4),-(SP)
        034410  016446  000044                  MOV     S1WRIT(R4),-(SP)
        034414  016446  000042                  MOV     S2READ(R4),-(SP)
        034420  016446  000040                  MOV     S1READ(R4),-(SP)
        034424  012746  035705                  MOV     #STAT5,-(SP)
        034430  012746  000005                  MOV     #5,-(SP)
        034434  010600                          MOV     SP,R0
        034436  104416                          TRAP    C$PNTS
        034440  062706  000014                  ADD     #14,SP
  4882
  4883 034444                                   PRINTS  #STAT6,EC1COR(R4),EC2COR(R4)
        034444  016446  000052                  MOV     EC2COR(R4),-(SP)
        034450  016446  000050                  MOV     EC1COR(R4),-(SP)
        034454  012746  035752                  MOV     #STAT6,-(SP)
        034460  012746  000003                  MOV     #3,-(SP)
        034464  010600                          MOV     SP,R0
        034466  104416                          TRAP    C$PNTS
        034470  062706  000010                  ADD     #10,SP
  4884
  4885 034474                                   PRINTS  #STAT7,H1READ(R4),H2READ(R4),H1WRIT(R4),H2WRIT(R4)
        034474  016446  000062                  MOV     H2WRIT(R4),-(SP)
        034500  016446  000060                  MOV     H1WRIT(R4),-(SP)
        034504  016446  000056                  MOV     H2READ(R4),-(SP)
        034510  016446  000054                  MOV     H1READ(R4),-(SP)
        034514  012746  036024                  MOV     #STAT7,-(SP)
        034520  012746  000005                  MOV     #5,-(SP)
        034524  010600                          MOV     SP,R0
        034526  104416                          TRAP    C$PNTS
        034530  062706  000014                  ADD     #14,SP
  4886
  4887 034534                                   PRINTS  #STAT8,RTYEC1(R4),RTYEC2(R4)
        034534  016446  000066                  MOV     RTYEC2(R4),-(SP)
        034540  016446  000064                  MOV     RTYEC1(R4),-(SP)
        034544  012746  036071                  MOV     #STAT8,-(SP)
        034550  012746  000003                  MOV     #3,-(SP)
        034554  010600                          MOV     SP,R0
        034556  104416                          TRAP    C$PNTS
        034560  062706  000010                  ADD     #10,SP
  4888
  4889 034564                                   PRINTS  #STAT9,DTCPER(R4)
        034564  016446  000070                  MOV     DTCPER(R4),-(SP)
        034570  012746  036143                  MOV     #STAT9,-(SP)
        034574  012746  000002                  MOV     #2,-(SP)
        034600  010600                          MOV     SP,R0
        034602  104416                          TRAP    C$PNTS
        034604  062706  000006                  ADD     #6,SP
  4890
  4891 034610                                   PRINTS  #STAT10,UNDRUN(R4)
        034610  016446  000072                  MOV     UNDRUN(R4),-(SP)
        034614  012746  036222                  MOV     #STAT10,-(SP)
```

```
                034620  012746  000002          MOV     #2,-(SP)
                034624  010600                  MOV     SP,R0
                034626  104416                  TRAP    C$PNTS
                034630  062706  000006          ADD     #6,SP
          4892
          4893  034634                          PRINTS  #STAT11,OVRRUN(R4)
                034634  016446  000074          MOV     OVRRUN(R4),-(SP)
                034640  012746  036272          MOV     #STAT11,-(SP)
                034644  012746  000002          MOV     #2,-(SP)
                034650  010600                  MOV     SP,R0
                034652  104416                  TRAP    C$PNTS
                034654  062706  000006          ADD     #6,SP
          4894
          4895  034660                          PRINTS  #STAT12,RMSPOS(R4),WMSPOS(R4)
                034660  016446  000100          MOV     WMSPOS(R4),-(SP)
                034664  016446  000076          MOV     RMSPOS(R4),-(SP)
                034670  012746  036344          MOV     #STAT12,-(SP)
                034674  012746  000003          MOV     #3,-(SP)
                034700  010600                  MOV     SP,R0
                034702  104416                  TRAP    C$PNTS
                034704  062706  000010          ADD     #10,SP
          4896
          4897  034710                          PRINTS  #STAT13,OTHER(R4)
                034710  016446  000102          MOV     OTHER(R4),-(SP)
                034714  012746  036405          MOV     #STAT13,-(SP)
                034720  012746  000002          MOV     #2,-(SP)
                034724  010600                  MOV     SP,R0
                034726  104416                  TRAP    C$PNTS
                034730  062706  000006          ADD     #6,SP
          4898
          4899  034734                          PRINTS  #STAT14,DROPPD(R4)
                034734  016446  000104          MOV     DROPPD(R4),-(SP)
                034740  012746  036430          MOV     #STAT14,-(SP)
                034744  012746  000002          MOV     #2,-(SP)
                034750  010600                  MOV     SP,R0
                034752  104416                  TRAP    C$PNTS
                034754  062706  000006          ADD     #6,SP
          4900
          4901  034760                          PRINTS  #STAT15,WRBYT4(R4),WRBYT3(R4),WRBYT2(R4),WRBYT1(R4)
                034760  016446  000120          MOV     WRBYT1(R4),-(SP)
                034764  016446  000122          MOV     WRBYT2(R4),-(SP)
                034770  016446  000124          MOV     WRBYT3(R4),-(SP)
                034774  016446  000126          MOV     WRBYT4(R4),-(SP)
                035000  012746  036453          MOV     #STAT15,-(SP)
                035004  012746  000005          MOV     #5,-(SP)
                035010  010600                  MOV     SP,R0
                035012  104416                  TRAP    C$PNTS
                035014  062706  000014          ADD     #14,SP
          4902
          4903  035020                          PRINTS  #STAT16,RDBYT4(R4),RDBYT3(R4),RDBYT2(R4),RDBYT1(R4)
                035020  016446  000110          MOV     RDBYT1(R4),-(SP)
                035024  016446  000112          MOV     RDBYT2(R4),-(SP)
                035030  016446  000114          MOV     RDBYT3(R4),-(SP)
                035034  016446  000116          MOV     RDBYT4(R4),-(SP)
                035040  012746  036525          MOV     #STAT16,-(SP)
                035044  012746  000005          MOV     #5,-(SP)
                035050  010600                  MOV     SP,R0
```

```
        035052  104416                          TRAP    C$PNTS
        035054  062706  000014                  ADD     #14,SP
  4904
  4905  035060                                  PRINTS  #STAT0
        035060  012746  035464                  MOV     #STAT0,-(SP)
        035064  012746  000001                  MOV     #1,-(SP)
        035070  010600                          MOV     SP,R0
        035072  104416                          TRAP    C$PNTS
        035074  062706  000004                  ADD     #4,SP
  4906
  4907  035100  032737  000100  003516          BIT     #NOMDTB,PCFLAG          ;IS THE TABLE TO BE PRINTED
  4908  035106  001117                          BNE     15$                     ;NO, GET OUT
  4909  035110                                  PUSH    <R1,R2,R3>
  4910  035116  016401  000130                  MOV     TBLTOP(R4),R1           ;POINT R1 TO THE TOP OF THE TABLE
  4911  035122  016402  000134                  MOV     LSTENT(R4),R2           ;POINT R2 TO THE LAST ENTRY IN TABLE
  4912
  4913  035126                                  PRINTS  #STAT17,L$LUN
        035126  013746  002074                  MOV     L$LUN,-(SP)
        035132  012746  036577                  MOV     #STAT17,-(SP)
        035136  012746  000002                  MOV     #2,-(SP)
        035142  010600                          MOV     SP,R0
        035144  104416                          TRAP    C$PNTS
        035146  062706  000006                  ADD     #6,SP
  4914
  4915  035152  016103  000000          10$:    MOV     TRK(R1),R3              ;MOV THE TRACK # TO TEMP STORAGE
  4916  035156  020102                          CMP     R1,R2                   ;HAVE WE PRINTED ALL ENTRIES ?
  4917  035160  001451                          BEQ     12$                     ;YES, GET OUT
  4918  035162  026103  000000                  CMP     TRK(R1),R3              ;ARE WE STILL ON THE SAME TRACK ?
  4919  035166  001412                          BEQ     11$                     ;YES, KEEP GOING
  4920  035170  016103  000000                  MOV     TRK(R1),R3              ;MOV THE TRACK # TO TEMP STORAGE
  4921
  4922  035174                                  PRINTS  #STAT0
        035174  012746  035464                  MOV     #STAT0,-(SP)
        035200  012746  000001                  MOV     #1,-(SP)
        035204  010600                          MOV     SP,R0
        035206  104416                          TRAP    C$PNTS
        035210  062706  000004                  ADD     #4,SP
  4923
  4924  035214                          11$:    PRINTS  #STAT18,<B,TRK(R1)>,PHB(R1),<B,HWR(R1)>,<B,HRD(R1)>,<B,SWR(R1)>,<B,SRD(R1)>
        035214  005046                          CLR     -(SP)
        035216  156116  000005                  BISB    SRD(R1),(SP)
        035222  005046                          CLR     -(SP)
        035224  156116  000004                  BISB    SWR(R1),(SP)
        035230  005046                          CLR     -(SP)
        035232  156116  000007                  BISB    HRD(R1),(SP)
        035236  005046                          CLR     -(SP)
        035240  156116  000006                  BISB    HWR(R1),(SP)
        035244  016146  000002                  MOV     PHB(R1),-(SP)
        035250  005046                          CLR     -(SP)
        035252  156116  000000                  BISB    TRK(R1),(SP)
        035256  012746  036647                  MOV     #STAT18,-(SP)
        035262  012746  000007                  MOV     #7,-(SP)
        035266  010600                          MOV     SP,R0
        035270  104416                          TRAP    C$PNTS
        035272  062706  000020                  ADD     #20,SP
  4925
  4926  035276  062701  000010                  ADD     #8.,R1                  ;STEP R1 TO THE NEXT TABLE LOCATION
```

```
 4927 035302  000725                        BR      10$                     ;NO, KEEP PRINTING
 4928 035304                        12$:    POP     <R3,R2,R1>
 4929 035312  032764  000040  000026        BIT     #MTBLOV,LUNFLG(R4)      ;IS THE TABLE FULL ?
 4930 035320  001412                        BEQ     15$                     ;NO, GET NEXT DRIVE
 4931 035322                                PRINTF  #TBLFUL,L$LUN           ;PRINT TABLE FULL MESSAGE
      035322  013746  002074                MOV     L$LUN,-(SP)
      035326  012746  036716                MOV     #TBLFUL,-(SP)
      035332  012746  000002                MOV     #2,-(SP)
      035336  010600                        MOV     SP,R0
      035340  104417                        TRAP    C$PNTF
      035342  062706  000006                ADD     #6,SP
 4932
 4933 035346  032737  000400  003516  15$:  BIT     #DROPIT,PCFLAG          ;ARE WE DROPPING A UNIT
 4934 035354  001036                        BNE     25$                     ;YES, ONLY PRINT STATS FOR THIS UNIT
 4935 035356  062704  000172                ADD     #LUNSTP,R4              ;R4 POINTS TO NEXT LUN BLOCK
 4936 035362  062701  000002                ADD     #2,R1                   ;POINT R1 TO THE NEXT UNIT
 4937 035366  005237  002074                INC     L$LUN                   ;POINTS TO NEXT UNIT NUMBER
 4938 035372  005305                        DEC     R5                      ;ANY UNITS LEFT TO REPORT?
 4939 035374  001402                        BEQ     20$                     ;BRANCH IF NOT
 4940 035376  000137  034244                JMP     1$                      ;ELSE, DO IT AGAIN
 4941 035402  105737  002212        20$:    TSTB    CLOCK                   ;IS THE CLOCK ENABLED
 4942 035406  001421                        BEQ     25$                     ;NO, THEN CAN'T PRINT TIME
 4943 035410                                PRINTF  #TIME,<B,HOURS>,<B,MINUTE>,<B,SECOND>,
      035410  005046                        CLR     -(SP)
      035412  153716  002215                BISB    SECOND,(SP)
      035416  005046                        CLR     -(SP)
      035420  153716  002214                BISB    MINUTE,(SP)
      035424  005046                        CLR     -(SP)
      035426  153716  002213                BISB    HOURS,(SP)
      035432  012746  020044                MOV     #TIME,-(SP)
      035436  012746  000004                MOV     #4,-(SP)
      035442  010600                        MOV     SP,R0
      035444  104417                        TRAP    C$PNTF
      035446  062706  000012                ADD     #12,SP
 4944 035452                        25$:    POP     <R5,R4,R1>              ;RESTORE REGS
 4945 035460                                EXIT    RPT
      035460  000167                        .WORD   J$JMP
      035462  001316                        .WORD   L10007-2-.
 4946
 4958
```

```
                                        ;FORMAT STATEMENTS FOR PRINT CALLS

035464      045     116     000  STAT0:  .ASCIZ  ?%N?
035467      045     116     045  STAT1:  .ASCIZ  ?%N%ASTATISTICAL REPORT FOR UNIT %D1?
035533      045     116     045  STAT2:  .ASCIZ  ?%N%S8%S8%S8%S8%S2%AREAD%S4%S8%AWRITE?
035600      045     116     045  STAT3:  .ASCIZ  ?%N%S8%S8%S8%S6%ACH 1%S4%ACH 2%S4%ACH 1%S4%ACH 2?
035660      045     116     045  STAT4:  .ASCIZ  ?%N%ASOFT DATA ERRORS?
035705      045     116     045  STAT5:  .ASCIZ  ?%N%A  RETRY RECOVERED%S8%D8%D8%D8%D8?
035752      045     116     045  STAT6:  .ASCIZ  ?%N%A  ECC CORRECTED  %S8%D8%D8%S8%A  N.A.?
036024      045     116     045  STAT7:  .ASCIZ  ?%N%AHARD DATA ERRORS %S8%D8%D8%D8%D8?
036071      045     116     045  STAT8:  .ASCIZ  ?%N%ACRC ON ECC BLOCKS%S8%D8%D8%S8%A  N.A.?
036143      045     116     045  STAT9:  .ASCIZ  ?%N%ADATA COMPARE ERRORS  %S8%D8%S8%A      N.A.?
036222      045     116     045  STAT10: .ASCIZ  ?%N%ADATA UNDERRUNS%S7%S7%S7%AN.A.%S6%D8?
036272      045     116     045  STAT11: .ASCIZ  ?%N%ADATA OVERRUNS%S8%S8%D8%S8%A      N.A.?
036344      045     116     045  STAT12: .ASCIZ  ?%N%AMISPOSITIONS %S8%S8%D8%S8%D8?
036405      045     116     045  STAT13: .ASCIZ  ?%N%AOTHERS  %S8%D8?
036430      045     116     045  STAT14: .ASCIZ  ?%N%ADROPS   %S8%D8?
036453      045     116     045  STAT15: .ASCIZ  ?%N%ABYTES WRITTEN   %D3%A,%Z3%A,%Z3%A,%Z3?
036525      045     116     045  STAT16: .ASCIZ  ?%N%ABYTES READ      %D3%A,%Z3%A,%Z3%A,%Z3?
036577      045     116     045  STAT17: .ASCIZ  ?%N%A TRK  PHY BLK  HWR  HRD  SWR  SRD%N?
036647      045     116     045  STAT18: .ASCIZ  ?%N%S2%D2%S3%D5%S3%D3%S2%D3%S2%D3%S2%D3?
036716      045     116     045  TBLFUL::.ASCIZ  ?%N%AUNIT %D1%A MEDIA DATA TABLE HAS OVERFLOWED%N%N?
                                        .EVEN


037002                                  ENDRPT
037002                          L10007:
037002  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
037004  012700  000040                  MOV     #EF.START,R0
037010  104447                          TRAP    C$REFG
                                        BCOMPLETE       START
037012  103414                          BCS     START

                                        READEF  #EF.RESTART
037014  012700  000037                  MOV     #EF.RESTART,R0
037020  104447                          TRAP    C$REFG
                                        BCOMPLETE       START
037022  103410                          BCS     START

                                        READEF  #EF.NEW
037024  012700  000035                  MOV     #EF.NEW,R0
037030  104447                          TRAP    C$REFG
                                        BCOMPLETE       NUPASS
037032  103463                          BCS     NUPASS

                                        READEF  #EF.CONTINUE
037034  012700  000036                  MOV     #EF.CONTINUE,R0
037040  104447                          TRAP    C$REFG
                                        BCOMPLETE       NUPASS
037042  103457                          BCS     NUPASS

037044  112737  000001  003564  START:  MOVB    #1,DAYS         ;SET TO FIRST DAY
037052  005037  003522                  CLR     PASCNT          ;CLEAR THE PASS COUNTER
037056  005037  003444                  CLR     CMPERR          ;CLEAR THE COMPARE ERROR COUNTER

037062  012701  002314                  MOV     #LUNO,R1        ;SET R1 TO THE FIRST LUN
037066  010102          5$:             MOV     R1,R2           ;LET R2 = R1
037070  062702  000156                  ADD     #URSPBF,R2      ;LET R2 = THE END OF THE CLEAR AREA
037074  005021          10$:            CLR     (R1)+           ;CLEAR THE LUN LOCATION
037076  020201                          CMP     R2,R1           ;ARE WE AT THE END OF THE CLEAR AREA
037100  001375                          BNE     10$             ;NO, KEEP CLEARING
037102  062701  000014                  ADD     #14,R1          ;SET R1 TO THE NEXT LUN BLOCK
037106  022701  003264                  CMP     #PCMDBF,R1      ;HAVE WE DONE THEM ALL
037112  001365                          BNE     5$              ;GO CLEAR THE NEXT LUN BLOCK

037114  005021          15$:            CLR     (R1)+           ;CLEAR THE LOCATION AND GET THE NEXT
037116  022701  003400                  CMP     #CMDCNT,R1      ;HAVE WE  CLEARED THEM ALL ?
037122  001374                          BNE     15$             ;NO, KEEP GOING

037124  012701  110552                  MOV     #MEDIAS,R1      ;PUT THE STATS TABLE ADDRESS INTO R1
037130  005021          20$:            CLR     (R1)+           ;CLEAR THE LOCATION AND GET THE NEXT
037132  022701  115612                  CMP     #PATCH,R1       ;HAVE WE  CLEARED THEM ALL ?
037136  001374                          BNE     20$             ;NO, KEEP GOING
```

```
5031
5032 037140  012704  002314                MOV     #LUNO,R4                ;SET R4 TO THE FIRST LUN
5033 037144  013702  002012                MOV     L$UNIT,R2               ;SET UP R2
5034 037150  012764  001233  000136  25$:   MOV     #RS1,SED1(R4)           ;SET UP THE SEED IN THE LUN BLOCK
5035 037156  012764  007622  000140        MOV     #RS2,SED2(R4)           ;SET UP THE SEED IN THE LUN BLOCK
5036 037164  012764  000000  000142        MOV     #RS3,SED3(R4)           ;SET UP THE SEED IN THE LUN BLOCK
5037
5038 037172  062704  000172        30$:    ADD     #LUNSTP,R4              ;SET UP THE NEXT LUN BLOCK
5039 037176  005302                DEC     R2                              ;DECREMENT R2
5040 037200  001363                BNE     25$                             ;DID YOU DO THEM ALL
5041
5042 037202                        NUPASS: BRESET
     037202  104433                TRAP    C$RESET
5043 037204  005737  003522        TST     PASCNT                          ;IS THIS THE FIRST PASS ?
5044 037210  001403                BEQ     1$                              ;YES GO CLEAR THE MEDIA TABLE
5045 037212  105737  002226        TSTB    CLRMED                          ;ARE WE CLEARING THE MEDIA TABLE ?
5046 037216  001457                BEQ     25$                             ;NO GET OUT
5047
5048 037220                        1$:
5049 037220  013702  002012        MOV     L$UNIT,R2                       ;SET UP R2
5050 037224  022702  000001        CMP     #1,R2                           ;IS THERE 1 UNIT ?
5051 037230  001004                BNE     3$                              ;NO, CHECK AGAIN
5052 037232  012737  005040  003544  MOV     #U1OFF,TBLOFF                   ;SET OFFSET FOR 1 UNIT IN TBLOFF
5053 037240  000421                BR      15$                             ;GO GET STARTED
5054
5055 037242  022702  000002        3$:     CMP     #2,R2                   ;IS THERE 2 UNITS ?
5056 037246  001004                BNE     5$                              ;NO, CHECK AGAIN
5057 037250  012737  002420  003544  MOV     #U2OFF,TBLOFF                   ;SET OFFSET FOR 2 UNITS IN TBLOFF
5058 037256  000412                BR      15$                             ;GO GET STARTED
5059
5060 037260  022702  000003        5$:     CMP     #3,R2                   ;IS THERE 3 UNITS ?
5061 037264  001004                BNE     10$                             ;NO, CHECK AGAIN
5062 037266  012737  001540  003544  MOV     #U3OFF,TBLOFF                   ;SET OFFSET FOR 3 UNITS IN TBLOFF
5063 037274  000403                BR      15$                             ;GO GET STARTED
5064
5065 037276  012737  001210  003544  10$:    MOV     #U4OFF,TBLOFF           ;SET OFFSET FOR 4 UNITS IN TBLOFF
5066
5067 037304  012704  002314        15$:    MOV     #LUNO,R4                ;SET R4 TO THE FIRST LUN
5068 037310  012737  110552  003530        MOV     #MEDIAS,R8              ;PUT THE STAT TABLE ADDRESS IN R8
5069
5070 037316  013764  003530  000130  20$:   MOV     R8,TBLTOP(R4)           ;PUT THE TOP TABLE ADDR IN LUN BLOCK
5071 037324  013764  003530  000134        MOV     R8,LSTENT(R4)           ;PUT THE TABLE ENTRY ADDR IN LUN BLOCK
5072 037332  063737  003544  003530        ADD     TBLOFF,R8               ;ADD THE LENGTH FOR EACH UNIT
5073 037340  013764  003530  000132        MOV     R8,TBLBTM(R4)           ;PUT THE TABLE BOTTOM POINTER IN LUNBLK
5074 037346  062704  000172                ADD     #LUNSTP,R4              ;SET UP THE NEXT LUN BLOCK
5075 037352  005302                        DEC     R2                      ;DECREMENT R2
5076 037354  001360                        BNE     20$                     ;DID YOU DO THEM ALL
5077
5078 037356  005037  003516        25$:    CLR     PCFLAG                  ;CLEAR THE PROGRAM CONTROL FLAG.
5079 037362  005037  003526        CLR     UEOT                            ;CLEAR THE EOT FLAG
5080 037366  013737  002012  003524  MOV     L$UNIT,UDROP                    ;SET UP THE DROP UNIT FLAG
5081 037374  005237  003522        INC     PASCNT                          ;ADD 1 TO PASS COUNTER
5082 037400  105737  002227        TSTB    MEDTBL                          ;IS THE MEDIA TABLE TO BE PRINTED
5083 037404  001003                BNE     30$                             ;YES, DON'T DO ANYTHING
5084 037406  052737  000100  003516  BIS     #NOMDTB,PCFLAG                  ;NO, SET THE PROGRAM CONTROL FLAG BIT
5085
5086 037414  012702  003566        30$:    MOV     #CMDBF1,R2              ;PUT COMMAND BUFFER ADDRESS IN R2
```

```
5087 037420  005022                    35$:   CLR     (R2)+                   ;CLEAR THE BUFFERS
5088 037422  022702  010226                   CMP     #DSRNGO,R2              ;ARE WE AT THE END OF THE BUFFER ?
5089 037426  001374                           BNE     35$                     ;KEPP GOING TILL WE ARE
5090
5091 037430  012704  002314                   MOV     #LUNO,R4                ;SET R4 TO THE FIRST LUN
5092 037434  013702  002012                   MOV     L$UNIT,R2               ;SET UP R2
5093 037440  005001                           CLR     R1                      ;CLEAR R1
5094 037442  005003                           CLR     R3                      ;CLEAR R3
5095
5096 037444  032761  000020  003350  40$:    BIT     #FAIL,DRINUS(R1)        ;HAS THIS DRIVE FAILED ?
5097 037452  001054                           BNE     60$                     ;YES, GET NEXT UNIT
5098
5099 037454  032761  000010  003350  45$:    BIT     #DROP,DRINUS(R1)        ;DID THIS DRIVE DROP LAST TIME
5100 037462  001002                           BNE     50$                     ;YES, KEEP GOING
5101 037464  005064  000032                   CLR     UNDROP(R4)              ;OTHERWISE CLEAR THE DROP COUNTER
5102 037470  012761  000001  003350  50$:    MOV     #AVB,DRINUS(R1)         ;SET UP ALL DRIVES TO AVAILABLE
5103
5104 037476  012764  003572  000014  55$:    MOV     #DCMDBF,CNUSAV(R4)      ;SET UP NEW COMMAND BUFFER SAVE
5105 037504  012764  003572  000016          MOV     #DCMDBF,COLSAV(R4)      ;SET UP OLD COMMAND BUFFER SAVE
5106 037512  016464  000166  000012          MOV     UCDSRG(R4),CMDSSV(R4)   ;SET UP COMMAND DESCRIPTOR SAVE
5107 037520  016464  000156  000020          MOV     URSPBF(R4),RNUSAV(R4)   ;SET UP NEW RESPONSE BUFFER SAVE
5108 037526  016464  000156  000022          MOV     URSPBF(R4),ROLSAV(R4)   ;SET UP OLD RESPONSE BUFFER SAVE
5109
5110 037534  005064  000006                   CLR     CMDSEQ(R4)              ;CLEAR THE COMMAND REFERENCE NUMBER
5111 037540  005064  000034                   CLR     OBJFDL(R4)              ;CLEAR THE LOW OBJECT FIELD
5112 037544  005064  000036                   CLR     OBJFDH(R4)              ;CLEAR THE HIGH OBJECT FIELD
5113 037550  005064  000010                   CLR     SLTUSE(R4)              ;CLEAR THE SLOT IN USE FLAG
5114 037554  010300                           MOV     R3,R0                   ;
5115
5116 037556                                   GPHARD  R0,R0
     037556  104442                          TRAP    C$GPHRD
5117 037560                                   BNCOMPLETE      60$
     037560  103011                          BCC     60$
5118
5119 037562  011064  000000                   MOV     (R0),TKIP(R4)           ;
5120 037566  012064  000002                   MOV     (R0)+,TKSA(R4)          ;
5121 037572  062764  000002  000002          ADD     #2,TKSA(R4)             ;
5122 037600  011064  000004                   MOV     (R0),TKUNIT(R4)         ;
5123
5124 037604  062701  000002          60$:    ADD     #2,R1                   ;SET R1 TO THE NEXT UNIT
5125 037610  062703  000001                   ADD     #1.,R3                  ;GET NEXT UNIT
5126 037614  062704  000172                   ADD     #LUNSTP,R4              ;SET UP THE NEXT LUN BLOCK
5127 037620  005302                           DEC     R2                      ;DECREMENT R2
5128 037622  001310                           BNE     40$                     ;DID YOU DO THEM ALL
5129
5130 037624  042737  000002  003516          BIC     #NCLKFL,PCFLAG          ;GET READY TO TEST FOR CLOCK PRESENT
5131 037632                                   SETVEC  #4,#NOCLK,#PRI00        ;SET VECTOR 4 IN CASE NO CLOCK
     037632  012746  000000                   MOV     #PRI00,-(SP)
     037636  012746  021044                   MOV     #NOCLK,-(SP)
     037642  012746  000004                   MOV     #4,-(SP)
     037646  012746  000003                   MOV     #3,-(SP)
     037652  104437                          TRAP    C$SVEC
     037654  062706  000010                   ADD     #10,SP
5132 037660  005737  177546                   TST     KWCSR                   ;IS THE CLOCK THERE ?
5133 037664  000240                          NOP
5134 037666  000240                          NOP
5135
```

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5136 037670                                    CLRVEC  #4                      ;RETURN VECTOR TO TRAP CATCHER
     037670  012700  000004                    MOV     #4,R0
     037674  104436                            TRAP    C$CVEC
5137 037676  032737  000002  003516            BIT     #NCLKFL,PCFLAG          ;WAS A CLOCK PRESENT ?
5138 037704  001016                            BNE     ISTART                  ;NO CLOCK, START REGULAR INIT
5139 037706                                    SETVEC  #100,#KWHDL,#PRI00      ;SET UP THE CLOCK VECTOR
     037706  012746  000000                    MOV     #PRI00,-(SP)
     037712  012746  021100                    MOV     #KWHDL,-(SP)
     037716  012746  000100                    MOV     #100,-(SP)
     037722  012746  000003                    MOV     #3,-(SP)
     037726  104437                            TRAP    C$SVEC
     037730  062706  000010                    ADD     #10,SP
5140 037734  012737  000100  177546            MOV     #100,KWCSR              ;ENABLE THE CLOCK INTERUPTS
5141
5142 037742  005001                  ISTART:   CLR     R1                      ;SET R1 TO FIST UNIT
5143 037744  005037  002074                    CLR     L$LUN                   ;SET L$LUN TO FIRST UNIT
5144 037750  012704  002314                    MOV     #LUNO,R4                ;SET R4 TO THE FIRST LUN BLOCK
5145
5146 037754  032761  000001  003350  1$:       BIT     #AVB,DRINUS(R1)         ;SEE IF DRIVE IS PRESENT AND AVAILABLE
5147 037762  001547                            BEQ     20$                     ;GET THE NEXT DRIVE IF IT ISN'T
5148 037764  032761  000004  003350            BIT     #EOT,DRINUS(R1)         ;CHECK IF THE DRIVE IS AT EOT
5149 037772  001143                            BNE     20$                     ;GET NEXT DRIVE IF IT IS
5150
5151 037774  012764  000377  000010            MOV     #377,SLTUSE(R4)         ;SET ALL RESPONSE SLOTS TO THE PORT
5152 040002  004737  026230                    JSR     PC,PRTCLR               ;GO DO IT
5153 040006  112737  000004  010571            MOVB    #4,CRDLIM               ;CREDITS START AT 4 FOR NEW LUN
5154
5155 040014  012705  040336                    MOV     #INITIT,R5              ;PUT INIT TEST TABLE ADDRESS IN R5
5156 040020  004737  021406                    JSR     PC,CMMDSQ               ;GO DO INIT ON THIS DRIVE
5157 040024  032761  000001  003350            BIT     #AVB,DRINUS(R1)         ;SEE IF DRIVE IS PRESENT AND AVAILABLE
5158 040032  001523                            BEQ     20$                     ;GET THE NEXT DRIVE IF IT ISN'T
5159
5160 040034  012764  000377  000010            MOV     #377,SLTUSE(R4)         ;SET ALL RESPONSE SLOTS TO THE PORT
5161 040042  004737  026230                    JSR     PC,PRTCLR               ;GO DO IT
5162 040046  112737  000004  010571            MOVB    #4,CRDLIM               ;CREDITS START AT 4 FOR NEW LUN
5163 040054  062705  000006                    ADD     #TSTSTP,R5              ;POINT R5 TO THE SCC COMMAND
5164 040060  004737  021406                    JSR     PC,CMMDSQ               ;GO DO SCC ON THIS DRIVE
5165 040064  032761  000001  003350            BIT     #AVB,DRINUS(R1)         ;SEE IF DRIVE IS PRESENT AND AVAILABLE
5166 040072  001503                            BEQ     20$                     ;GET THE NEXT DRIVE IF IT ISN'T
5167
5168 040074  012764  000377  000010  5$:       MOV     #377,SLTUSE(R4)         ;SET ALL RESPONSE SLOTS TO THE PORT
5169 040102  004737  026230                    JSR     PC,PRTCLR               ;GO DO IT
5170 040106  112737  000004  010571            MOVB    #4,CRDLIM               ;CREDITS START AT 4 FOR NEW LUN
5171 040114  062705  000006                    ADD     #TSTSTP,R5              ;POINT R5 TO THE ONL COMMAND
5172 040120  004737  021406                    JSR     PC,CMMDSQ               ;GO DO ONLINE ON THIS DRIVE
5173
5174 040124  012764  000377  000010  10$:      MOV     #377,SLTUSE(R4)         ;SET ALL RESPONSE SLOTS TO THE PORT
5175 040132  004737  026230                    JSR     PC,PRTCLR               ;GO DO IT
5176 040136  112737  000004  010571            MOVB    #4,CRDLIM               ;CREDITS START AT 4 FOR NEW LUN
5177 040144  062705  000006                    ADD     #TSTSTP,R5              ;POINT R5 TO THE GUS COMMAND
5178 040150  012737  000040  003440            MOV     #AVLB,TSTMSK            ;ALLOW UNIT AVAILABLE ERRORS
5179 040156  004737  021406                    JSR     PC,CMMDSQ               ;GO DO GUS ON THIS DRIVE
5180 040162  005037  003440                    CLR     TSTMSK                  ;ALLOW NO ERRORS
5181 040166  032761  000001  003350            BIT     #AVB,DRINUS(R1)         ;SEE IF DRIVE IS PRESENT AND AVAILABLE
5182 040174  001442                            BEQ     20$                     ;GET THE NEXT DRIVE IF IT ISN'T
5183
5184 040176  016403  000022          15$:      MOV     ROLSAV(R4),R3           ;LET R3 = OLD RESPONSE BUFFER POINTER
```

```
 5185 040202  162703  000104                    SUB     #DRBSTP,R3                ;ADJUST R3 BACK TO THE LAST RESPONCE
 5186 040206                                    PRINTF  #CONTRV,L$LUN,<B,P.CSVR(R3)>,<B,P.CHVR(R3)>
      040206  005046                            CLR     -(SP)
      040210  156316  000051                    BISB    P.CHVR(R3),(SP)
      040214  005046                            CLR     -(SP)
      040216  156316  000050                    BISB    P.CSVR(R3),(SP)
      040222  013746  002074                    MOV     L$LUN,-(SP)
      040226  012746  020532                    MOV     #CONTRV,-(SP)
      040232  012746  000004                    MOV     #4,-(SP)
      040236  010600                            MOV     SP,R0
      040240  104417                            TRAP    C$PNTF
      040242  062706  000012                    ADD     #12,SP
 5187 040246                                    PRINTF  #UNITRV,<B,P.USVR(R3)>,<B,P.UHVR(R3)>
      040246  005046                            CLR     -(SP)
      040250  156316  000053                    BISB    P.UHVR(R3),(SP)
      040254  005046                            CLR     -(SP)
      040256  156316  000052                    BISB    P.USVR(R3),(SP)
      040262  012746  020662                    MOV     #UNITRV,-(SP)
      040266  012746  000003                    MOV     #3,-(SP)
      040272  010600                            MOV     SP,R0
      040274  104417                            TRAP    C$PNTF
      040276  062706  000010                    ADD     #10,SP
 5188
 5189 040302  022701  000006          20$:      CMP     #6.,R1                    ;HAVE WE DONE THEM ALL ?
 5190 040306  001411                            BEQ     EXTINT                    ;GET OUT
 5191 040310  062701  000002                    ADD     #UNTSTP,R1                ;GET NEXT UNIT
 5192 040314  062704  000172                    ADD     #LUNSTP,R4                ;SET UP THE NEXT LUN BLOCK
 5193 040320  005237  002074                    INC     L$LUN                     ;GET NEXT UNIT
 5194 040324                                    BREAK
      040324  104422                            TRAP    C$BRK
 5195 040326  000137  037754                    JMP     1$                        ;GO DO THE NEXT ONE
 5196
 5197 040332                          EXTINT:   EXIT    INIT
      040332  104432                            TRAP    C$EXIT
      040334  000032                            .WORD   L10010-.
 5198
 5199                                ;INIT TEST TABLE
 5200 040336     170                INITIT::            .BYTE   INT       ;INITIALIZATION TABLE
 5201 040337     000                                 .BYTE   NULPAT
 5202 040340  000000                                 .WORD   0
 5203 040342  000001                                 .WORD   1
 5204 040344     230                                 .BYTE   SCC       ;SET CONTROLLER CHARACTERISTICS TABLE
 5205 040345     000                                 .BYTE   NULPAT
 5206 040346  000000                                 .WORD   0
 5207 040350  000001                                 .WORD   1
 5208 040352     140                                 .BYTE   ONL       ;ONLINE TABLE
 5209 040353     000                                 .BYTE   NULPAT
 5210 040354  000000                                 .WORD   0
 5211 040356  000001                                 .WORD   1
 5212 040360     220                                 .BYTE   GUS       ;GET UNIT STATUS TABLE
 5213 040361     000                                 .BYTE   NULPAT
 5214 040362  000000                                 .WORD   0
 5215 040364  000001                                 .WORD   1
 5216                                        .EVEN
 5217
 5218 040366                                 ENDINIT
      040366                          L10010:
```

INITIALIZE SECTION

```
        040366  104411                          TRAP    C$INIT
```

```
5220 040370                          BGNAUTO
     040370                L$AUTO::
5221 040370                          ENDAUTO
     040370                L10011:
     040370  104461                 TRAP    C$AUTO
```

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

                                        BGNCLN
                                L$CLEAN::

                                        BIT     #NCLKFL,PCFLAG          ;WAS A CLOCK PRESENT ?
                                        BNE     5$                      ;NO CLOCK, DO REPORT
                                        CLR     KWCSR
                                        CLRVEC  #100
                                        MOV     #100,R0
                                        TRAP    C$CVEC
                                5$:     DORPT
                                        TRAP    C$DRPT
                                        BIT     #DROPIT,PCFLAG
                                        BNE     EXTCLN
                                        BIC     #NOMDTB,PCFLAG
                                EXTCLN: EXIT    CLN
                                        TRAP    C$EXIT
                                        .WORD   L10012-.

                                        .EVEN

                                        ENDCLN
                                L10012:
                                        TRAP    C$CLEAN
```

```
                                .SBTTL  DROP UNIT SECTION

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

040442                          DROPUN::
040442                                  PUSH    <R1>                    ;SAVE R1
040442  010146                         MOV     R1,-(SP)        ;;PUSH R1 ON STACK
040444  010001                         MOV     R0,R1                   ;POINT R1 TO THE DRINUS TABLE
040446  006101                         ROL     R1                      ;MULTIPLY BY 2
040450  005264  000104                 INC     DROPPD(R4)              ;INC DROPPED FLAG FOR THIS UNIT
040454  052737  000400  003516         BIS     #DROPIT,PCFLAG          ;SET THE UNIT DROP FLAG
040462                                  PUSH    <R0>                    ;SAVE R0
040462  010046                         MOV     R0,-(SP)        ;;PUSH R0 ON STACK
040464                                  DORPT                           ;GO PRINT UNIT STATS
040464  104424                         TRAP    C$DRPT
040466                                  POP     <R0>                    ;RESTORE R0
040466  012600                         MOV     (SP)+,R0        ;;POP STACK INTO R0
040470  042737  000400  003516         BIC     #DROPIT,PCFLAG          ;CLEAR THE DROP FLAG
040476  105737  002230                 TSTB    NOCLR                   ;DO WE WANT TO CLEAR STATS ON ERROR ?
040502  001415                         BEQ     3$                      ;NO, DON'T CLEAR THE STATS
040504                                  PUSH    <R2,R3>
040504  010246                         MOV     R2,-(SP)        ;;PUSH R2 ON STACK
040506  010346                         MOV     R3,-(SP)        ;;PUSH R3 ON STACK
040510  012702  000040                 MOV     #S1READ,R2              ;STARTING ADDRESS OF STATS IN R2
040514  012703  000130                 MOV     #TBLTOP,R3              ;END ADDRESS OF STATS IN R3
040520  060402                         ADD     R4,R2                   ;ADD THE LUN BLOCK ADDRESS TO R2
040522  060403                         ADD     R4,R3                   ;ADD THE LUN BLOCK ADDRESS TO R3
040524  005022                 2$:     CLR     (R2)+                   ;CLEAR THE LOCATION
040526  020203                         CMP     R2,R3                   ;ARE WE AT THE END OF THE STATS
040530  001375                         BNE     2$                      ;NO, KEEP CLEARING
040532                                  POP     <R3,R2>
040532  012603                         MOV     (SP)+,R3        ;;POP STACK INTO R3
040534  012602                         MOV     (SP)+,R2        ;;POP STACK INTO R2
040536  042761  000001  003350 3$:     BIC     #AVB,DRINUS(R1)         ;CLEAR THE AVB BIT IN DRIVE IN USE TABLE
040544  032761  000004  003350         BIT     #EOT,DRINUS(R1)         ;IS THE DRIVE AT EOT ?
040552  001404                         BEQ     5$                      ;BRANCH IF NOT
040554  042761  000004  003350         BIC     #EOT,DRINUS(R1)         ;CLEAR THE EOT BIT IN DRIVE IN USE TABLE
040562  000402                         BR      10$                     ;GET OUT
040564  005337  003524         5$:     DEC     UDROP                   ;SUBTRACT 1 TO DROPPED FLAG
040570  052761  000010  003350 10$:    BIS     #DROP,DRINUS(R1)        ;SET DRIVE IN USE TABLE TO DROPPED
040576  005264  000032                 INC     UNDROP(R4)              ;ADD 1 TO THE UNIT DROP COUNT
040602  022764  000012  000032         CMP     #10.,UNDROP(R4)         ;DO WE HAVE 10. ERRORS ?
040610  001004                         BNE     15$                     ;NO, GET OUT
040612  052761  000020  003350         BIS     #FAIL,DRINUS(R1)        ;SET THE DRIVE TO FAIL
040620                                  DODU    R0
040620  104451                         TRAP    C$DODU
040622  005037  003406         15$:    CLR     RESPON                  ;CLEAR THE RESPONSE STATUS
040626                                  POP     <R1>                    ;RESTORE R1
040626  012601                         MOV     (SP)+,R1        ;;POP STACK INTO R1
040630                                  DELAY   20.                     ;DELAY FOR AWHILE
040630  012727  000024                 MOV     #20.,(PC)+
040634  000000                         .WORD   0
040636  013727  002116                 MOV     L$DLY,(PC)+
040642  000000                         .WORD   0
```

```
                040644  005367  177772                  DEC     -6(PC)
                040650  001375                          BNE     .-4
                040652  005367  177756                  DEC     -22(PC)
                040656  001367                          BNE     .-20
     5305       040660  010174  000000                  MOV     R1,@TKIP(R4)            ;FLUSH THE DRIVE
     5306       040664  012764  000377  000010          MOV     #377,SLTUSE(R4)         ;SET ALL RESPONCE SLOTS TO PORT
     5307       040672  004737  026230                  JSR     PC,PRTCLR               ;GO CLEAR THE PORT
     5308       040676  000207                          RTS     PC                      ;RETURN
     5309
     5310
     5311       040700                                  BGNDU
                040700                          L$DU::
     5312       040700                                  EXIT    DU
                040700  000167                          .WORD   J$JMP
                040702  000000                          .WORD   L10013-2-.
     5313
     5325
     5326                                               .EVEN
     5327
     5328       040704                                  ENDDU
                040704                          L10013:
                040704  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 040706                                   BGNAU
      040706                           L$AU::
 5339
 5345
 5346 040706                                   EXIT    AU
      040706  000167                           .WORD   J$JMP
      040710  000000                           .WORD   L10014-2-.
 5347
 5359
 5360                                          .EVEN
 5361
 5362 040712                                   ENDAU
      040712                           L10014:
      040712  104452                         TRAP    C$AU
 5363
 5364 040714                                   ENDMOD
 5365
```

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 5368
 5369                                   .TITLE HARDWARE TESTS
 5380
 5381                                   .SBTTL  TEST 1: Basic Function Test
 5417
 5418 040714                                    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 040714                                    BGNTST
      040714                           T1::
 5441 040714  105737  002234                     TSTB    T3ONLY                  ;CHECK THE TEST 3 ONLY FLAG
 5442 040720  001414                             BEQ     START1                  ;BRANCH IF IT IS CLEAR
 5443 040722                                     PRINTF  #BYPASS,L$TEST          ;PRINT THE TEST BYPASSED MESSAGE
      040722  013746  002114                     MOV     L$TEST,-(SP)
      040726  012746  021001                     MOV     #BYPASS,-(SP)
      040732  012746  000002                     MOV     #2,-(SP)
      040736  010600                             MOV     SP,R0
      040740  104417                             TRAP    C$PNTF
      040742  062706  000006                     ADD     #6,SP
 5444 040746  000137  042624                     JMP     T1EXIT                  ;JUMP IF IT IS NOT CLEAR
 5445
 5446 040752  005737  003524             START1: TST     UDROP                   ;HAVE ALL UNITS BEEN DROPPED ?
 5447 040756  001014                             BNE     5$                      ;NO, CONTINUE
 5448 040760                                     PRINTF  #BYPASS,L$TEST          ;PRINT THE TEST BYPASSED MESSAGE
      040760  013746  002114                     MOV     L$TEST,-(SP)
      040764  012746  021001                     MOV     #BYPASS,-(SP)
      040770  012746  000002                     MOV     #2,-(SP)
      040774  010600                             MOV     SP,R0
      040776  104417                             TRAP    C$PNTF
      041000  062706  000006                     ADD     #6,SP
 5449 041004  000137  042624                     JMP     T1EXIT                  ;GET OUT IF NONE LEFT TO TEST
 5450
 5451 041010  105737  002212             5$:     TSTB    CLOCK                   ;IS THE CLOCK ENABLED
 5452 041014  001421                             BEQ     G01                     ;NO, THEN CAN'T PRINT TIME
 5453 041016                                     PRINTF  #TIME,<B,HOURS>,<B,MINUTE>,<B,SECOND>,
      041016  005046                             CLR     -(SP)
      041020  153716  002215                     BISB    SECOND,(SP)
      041024  005046                             CLR     -(SP)
      041026  153716  002214                     BISB    MINUTE,(SP)
      041032  005046                             CLR     -(SP)
      041034  153716  002213                     BISB    HOURS,(SP)
      041040  012746  020044                     MOV     #TIME,-(SP)
      041044  012746  000004                     MOV     #4,-(SP)
      041050  010600                             MOV     SP,R0
      041052  104417                             TRAP    C$PNTF
      041054  062706  000012                     ADD     #12,SP
 5454
 5455 041060  004737  033456             G01:    JSR     PC,CLREOT               ;MAKE SURE EOT STATUS IS CLEAR
 5456 041064  012737  000100  003440             MOV     #ONLB,TSTMSK            ;ALLOW ALREADY ONLINE STATUS
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5457
5458 041072  012705  042630                MOV     #T1ONL,R5       ;SET UP TO DO AN ONLINE
5459 041076  004737  021240                JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5460 041102  005737  003524                TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5461 041106  001002                       BNE     5$              ;NO, CONTINUE
5462 041110  000137  042624                JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5463
5464 041114  005037  003440          5$:   CLR     TSTMSK          ;ALLOW NO ERRORS
5465 041120  012705  042636                MOV     #T1REW,R5       ;SET UP TO DO A REWIND
5466 041124  004737  021240                JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5467 041130  005737  003524                TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5468 041134  001002                       BNE     10$             ;NO, CONTINUE
5469 041136  000137  042624                JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5470
5471 041142  012705  042644          10$:  MOV     #T1LEOT,R5      ;SET UP TO DO 2 TAPE MARK COMMANDS
5472 041146  004737  021240                JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5473 041152  005737  003524                TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5474 041156  001002                       BNE     15$             ;NO, CONTINUE
5475 041160  000137  042624                JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5476
5477 041164  012705  042666          15$:  MOV     #T1SKR,R5       ;SET UP TO SKIP REVERSE 2 TAPE MARKS
5478 041170  004737  021240                JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5479 041174  005737  003524                TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5480 041200  001002                       BNE     20$             ;NO, CONTINUE
5481 041202  000137  042624                JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5482
5483 041206  052737  000001  003440  20$:  BIS     #LEDB,TSTMSK    ;SET UP TO ALLOW LEOT DETECTED
5484 041214  012705  042776                MOV     #T1SKD,R5       ;SET UP TO DO A SPACE TO LEOT
5485 041220  004737  021240                JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5486 041224  042737  000001  003440        BIC     #LEDB,TSTMSK    ;DISALLOW LEOT DETECTED
5487 041232  005737  003524                TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5488 041236  001002                       BNE     25$             ;NO, CONTINUE
5489 041240  000137  042624                JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5490
5491 041244  012705  042636          25$:  MOV     #T1REW,R5       ;SET UP TO DO A REWIND
5492 041250  004737  021240                JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5493 041254  005737  003524                TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5494 041260  001002                       BNE     30$             ;NO, CONTINUE
5495 041262  000137  042624                JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5496
5497 041266  012705  043004          30$:  MOV     #T1WR1,R5       ;WRITE 99, 512 BYTE RECORDS
5498 041272  004737  033556                JSR     PC,SDSTUP       ;RESET THE RANDOM SEEDS
5499 041276  004737  021240                JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5500 041302  005737  003524                TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5501 041306  001002                       BNE     35$             ;NO, CONTINUE
5502 041310  000137  042624                JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5503
5504 041314  012705  042652          35$:  MOV     #T1WTM,R5       ;SET UP TO WRITE A TAPE MARK
5505 041320  004737  021240                JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5506 041324  005737  003524                TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5507 041330  001002                       BNE     40$             ;NO, CONTINUE
5508 041332  000137  042624                JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5509
5510 041336  012705  043012          40$:  MOV     #T1WR2,R5       ;WRITE 84, 525 BYTE RECORDS
5511 041342  004737  033556                JSR     PC,SDSTUP       ;RESET THE RANDOM SEEDS
5512 041346  004737  021240                JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5513 041352  005737  003524                TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
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5514 041356  001002                    BNE     45$             ;NO, CONTINUE
5515 041360  000137  042624            JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5516
5517 041364  012705  042652  45$:      MOV     #T1WTM,R5       ;SET UP TO WRITE A TAPE MARK
5518 041370  004737  021240            JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5519 041374  005737  003524            TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5520 041400  001002                    BNE     50$             ;NO, CONTINUE
5521 041402  000137  042624            JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5522
5523 041406  012705  043020  50$:      MOV     #T1WR3,R5       ;WRITE 69, 1038 BYTE RECORDS
5524 041412  004737  033556            JSR     PC,SDSTUP       ;RESET THE RANDOM SEEDS
5525 041416  004737  021240            JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5526 041422  005737  003524            TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5527 041426  001002                    BNE     55$             ;NO, CONTINUE
5528 041430  000137  042624            JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5529
5530 041434  012705  042652  55$:      MOV     #T1WTM,R5       ;SET UP TO WRITE A TAPE MARK
5531 041440  004737  021240            JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5532 041444  005737  003524            TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5533 041450  001002                    BNE     60$             ;NO, CONTINUE
5534 041452  000137  042624            JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5535
5536 041456  012705  043026  60$:      MOV     #T1WR4,R5       ;WRITE 54, 1551 BYTE RECORDS
5537 041462  004737  033556            JSR     PC,SDSTUP       ;RESET THE RANDOM SEEDS
5538 041466  004737  021240            JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5539 041472  005737  003524            TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5540 041476  001002                    BNE     65$             ;NO, CONTINUE
5541 041500  000137  042624            JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5542
5543 041504  012705  042652  65$:      MOV     #T1WTM,R5       ;SET UP TO WRITE A TAPE MARK
5544 041510  004737  021240            JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5545 041514  005737  003524            TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5546 041520  001002                    BNE     70$             ;NO, CONTINUE
5547 041522  000137  042624            JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5548
5549 041526  012705  043034  70$:      MOV     #T1WR5,R5       ;WRITE 39, 2064 BYTE RECORDS
5550 041532  004737  033556            JSR     PC,SDSTUP       ;RESET THE RANDOM SEEDS
5551 041536  004737  021240            JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5552 041542  005737  003524            TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5553 041546  001002                    BNE     75$             ;NO, CONTINUE
5554 041550  000137  042624            JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5555
5556 041554  012705  042652  75$:      MOV     #T1WTM,R5       ;SET UP TO WRITE A TAPE MARK
5557 041560  004737  021240            JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5558 041564  005737  003524            TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5559 041570  001002                    BNE     80$             ;NO, CONTINUE
5560 041572  000137  042624            JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5561
5562 041576  012705  043042  80$:      MOV     #T1WR6,R5       ;WRITE 24, 2577 BYTE RECORDS
5563 041602  004737  033556            JSR     PC,SDSTUP       ;RESET THE RANDOM SEEDS
5564 041606  004737  021240            JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5565 041612  005737  003524            TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5566 041616  001002                    BNE     85$             ;NO, CONTINUE
5567 041620  000137  042624            JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5568
5569 041624  012705  042644  85$:      MOV     #T1LEOT,R5      ;SET UP TO WRITE LOGICAL END OF TAPE
5570 041630  004737  021240            JSR     PC,SCHED        ;GO ISSUE THE COMMAND
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5571 041634  005737  003524                TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5572 041640  001002                        BNE     90$             ;NO, CONTINUE
5573 041642  000137  042624                JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5574
5575 041646  012705  042636  90$:          MOV     #T1REW,R5       ;SET UP TO REWIND
5576 041652  004737  021240                JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5577 041656  005737  003524                TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5578 041662  001002                        BNE     95$             ;NO, CONTINUE
5579 041664  000137  042624                JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5580
5581 041670  012705  043050  95$:          MOV     #T1RD1,R5       ;SET UP TO READ 100 RECORDS
5582 041674  004737  033556                JSR     PC,SDSTUP       ;RESET THE RANDOM SEEDS
5583 041700  004737  021240                JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5584 041704  005737  003524                TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5585 041710  001002                        BNE     100$            ;NO, CONTINUE
5586 041712  000137  042624                JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5587
5588 041716  012705  042660  100$:         MOV     #T1SKP,R5       ;SET UP TO SKIP A TAPE MARK
5589 041722  004737  021240                JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5590 041726  005737  003524                TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5591 041732  001002                        BNE     105$            ;NO, CONTINUE
5592 041734  000137  042624                JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5593
5594 041740  012705  042674  105$:         MOV     #T1SPC1,R5      ;SET UP TO SPACE 84 RECORDS
5595 041744  004737  021240                JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5596 041750  005737  003524                TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5597 041754  001002                        BNE     110$            ;NO, CONTINUE
5598 041756  000137  042624                JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5599
5600 041762  012705  042660  110$:         MOV     #T1SKP,R5       ;SET UP TO SKIP A TAPE MARK
5601 041766  004737  021240                JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5602 041772  005737  003524                TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5603 041776  001002                        BNE     115$            ;NO, CONTINUE
5604 042000  000137  042624                JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5605
5606 042004  012705  042702  115$:         MOV     #T1SPC2,R5      ;SET UP TO SPACE 69 RECORDS
5607 042010  004737  021240                JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5608 042014  005737  003524                TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5609 042020  001002                        BNE     120$            ;NO, CONTINUE
5610 042022  000137  042624                JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5611
5612 042026  012705  042716  120$:         MOV     #T1SP01,R5      ;SET UP TO SPACE 56 OBJECTS
5613 042032  004737  021240                JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5614 042036  005737  003524                TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5615 042042  001002                        BNE     125$            ;NO, CONTINUE
5616 042044  000137  042624                JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5617
5618 042050  012705  043100  125$:         MOV     #T1RD5,R5       ;SET UP TO READ 39 RECORDS
5619 042054  004737  033556                JSR     PC,SDSTUP       ;RESET THE RANDOM SEEDS
5620 042060  004737  021240                JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5621 042064  005737  003524                TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5622 042070  001002                        BNE     130$            ;NO, CONTINUE
5623 042072  000137  042624                JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5624
5625 042076  012705  042724  130$:         MOV     #T1SKR1,R5      ;SET UP TO SKIP REVERSE 4 TAPE MARKS
5626 042102  004737  021240                JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5627 042106  005737  003524                TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
```

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5628 042112  001002                    BNE     135$            ;NO, CONTINUE
5629 042114  000137  042624            JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5630
5631 042120  012705  042660  135$:     MOV     #T1SKP,R5       ;SET UP TO SKIP TAPE MARK FORWARD
5632 042124  004737  021240            JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5633 042130  005737  003524            TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5634 042134  001002                    BNE     140$            ;NO, CONTINUE
5635 042136  000137  042624            JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5636
5637 042142  012705  043056  140$:     MOV     #T1RD2,R5       ;SET UP TO READ 84 RECORDS
5638 042146  004737  033556            JSR     PC,SDSTUP       ;RESET THE RANDOM SEEDS
5639 042152  004737  021240            JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5640 042156  005737  003524            TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5641 042162  001002                    BNE     145$            ;NO, CONTINUE
5642 042164  000137  042624            JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5643
5644 042170  012705  042732  145$:     MOV     #T1SP02,R5      ;SET UP TO SPACE 71 OBJECTS
5645 042174  004737  021240            JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5646 042200  005737  003524            TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5647 042204  001002                    BNE     150$            ;NO, CONTINUE
5648 042206  000137  042624            JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5649
5650 042212  012705  043072  150$:     MOV     #T1RD4,R5       ;SET UP TO READ 54 RECORDS
5651 042216  004737  033556            JSR     PC,SDSTUP       ;RESET THE RANDOM SEEDS
5652 042222  004737  021240            JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5653 042226  005737  003524            TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5654 042232  001002                    BNE     155$            ;NO, CONTINUE
5655 042234  000137  042624            JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5656
5657 042240  012705  042740  155$:     MOV     #T1SP03,R5      ;SET UP TO SPACE 66 OBJECTS
5658 042244  004737  021240            JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5659 042250  005737  003524            TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5660 042254  001002                    BNE     160$            ;NO, CONTINUE
5661 042256  000137  042624            JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5662
5663 042262  012705  042746  160$:     MOV     #T1SPR1,R5      ;SET UP TO SPACE REVERSE 375 OBJECTS
5664 042266  004737  021240            JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5665 042272  005737  003524            TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5666 042276  001002                    BNE     165$            ;NO, CONTINUE
5667 042300  000137  042624            JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5668
5669 042304  012705  042754  165$:     MOV     #T1SKP1,R5      ;SET UP TO SKIP FORWARD 4 TAPE MARKS
5670 042310  004737  021240            JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5671 042314  005737  003524            TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5672 042320  001002                    BNE     170$            ;NO, CONTINUE
5673 042322  000137  042624            JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5674
5675 042326  012705  042710  170$:     MOV     #T1SPC3,R5      ;SET UP TO SPACE 39 RECORDS
5676 042332  004737  021240            JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5677 042336  005737  003524            TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5678 042342  001002                    BNE     175$            ;NO, CONTINUE
5679 042344  000137  042624            JMP     T1EXIT          ;GET OUT IF NONE LEFT TO TEST
5680
5681 042350  012705  042660  175$:     MOV     #T1SKP,R5       ;SET UP TO SKIP A TAPE MARK
5682 042354  004737  021240            JSR     PC,SCHED        ;GO ISSUE THE COMMAND
5683 042360  005737  003524            TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
5684 042364  001002                    BNE     180$            ;NO, CONTINUE
```

```
 5685 042366  000137  042624                    JMP     T1EXIT                  ;GET OUT IF NONE LEFT TO TEST
 5686
 5687 042372  012705  043106          180$:     MOV     #T1RD6,R5               ;SET UP TO READ B24 RECORDS
 5688 042376  004737  033556                    JSR     PC,SDSTUP               ;RESET THE RANDOM SEEDS
 5689 042402  004737  021240                    JSR     PC,SCHED                ;GO ISSUE THE COMMAND
 5690 042406  005737  003524                    TST     UDROP                   ;HAVE ALL UNITS BEEN DROPPED ?
 5691 042412  001002                            BNE     185$                    ;NO, CONTINUE
 5692 042414  000137  042624                    JMP     T1EXIT                  ;GET OUT IF NONE LEFT TO TEST
 5693
 5694 042420  012705  042762          185$:     MOV     #T1SKP2,R5              ;SET UP TO SKIP 2 TAPE MARKS
 5695 042424  004737  021240                    JSR     PC,SCHED                ;GO ISSUE THE COMMAND
 5696 042430  005737  003524                    TST     UDROP                   ;HAVE ALL UNITS BEEN DROPPED ?
 5697 042434  001002                            BNE     190$                    ;NO, CONTINUE
 5698 042436  000137  042624                    JMP     T1EXIT                  ;GET OUT IF NONE LEFT TO TEST
 5699
 5700 042442  012705  042770          190$:     MOV     #T1SPR2,R5              ;SET UP TO SPACE REVERSE 192 OBJECTS
 5701 042446  004737  021240                    JSR     PC,SCHED                ;GO ISSUE THE COMMAND
 5702 042452  005737  003524                    TST     UDROP                   ;HAVE ALL UNITS BEEN DROPPED ?
 5703 042456  001002                            BNE     195$                    ;NO, CONTINUE
 5704 042460  000137  042624                    JMP     T1EXIT                  ;GET OUT IF NONE LEFT TO TEST
 5705
 5706 042464  012705  042660          195$:     MOV     #T1SKP,R5               ;SET UP TO SKIP A TAPE MARK
 5707 042470  004737  021240                    JSR     PC,SCHED                ;GO ISSUE THE COMMAND
 5708 042474  005737  003524                    TST     UDROP                   ;HAVE ALL UNITS BEEN DROPPED ?
 5709 042500  001002                            BNE     200$                    ;NO, CONTINUE
 5710 042502  000137  042624                    JMP     T1EXIT                  ;GET OUT IF NONE LEFT TO TEST
 5711
 5712 042506  012705  043064          200$:     MOV     #T1RD3,R5               ;SET UP TO READ 69 RECORDS
 5713 042512  004737  033556                    JSR     PC,SDSTUP               ;RESET THE RANDOM SEEDS
 5714 042516  004737  021240                    JSR     PC,SCHED                ;GO ISSUE THE COMMAND
 5715 042522  005737  003524                    TST     UDROP                   ;HAVE ALL UNITS BEEN DROPPED ?
 5716 042526  001002                            BNE     205$                    ;NO, CONTINUE
 5717 042530  000137  042624                    JMP     T1EXIT                  ;GET OUT IF NONE LEFT TO TEST
 5718
 5719 042534  012705  042636          205$:     MOV     #T1REW,R5               ;SET UP TO REWIND
 5720 042540  004737  021240                    JSR     PC,SCHED                ;GO ISSUE THE COMMAND
 5721 042544  005737  003524                    TST     UDROP                   ;HAVE ALL UNITS BEEN DROPPED ?
 5722 042550  001002                            BNE     210$                    ;NO, CONTINUE
 5723 042552  000137  042624                    JMP     T1EXIT                  ;GET OUT IF NONE LEFT TO TEST
 5724
 5725 042556  052737  000001  003440  210$:     BIS     #LEDB,TSTMSK            ;SET UP TO ALLOW LEOT DETECTED
 5726 042564  012705  042776                    MOV     #T1SKD,R5               ;SET UP TO SKIP TO LEOT
 5727 042570  004737  021240                    JSR     PC,SCHED                ;GO ISSUE THE COMMAND
 5728 042574  042737  000001  003440          BIC     #LEDB,TSTMSK            ;DISALLOW LEOT DETECTED
 5729 042602  005737  003524                    TST     UDROP                   ;HAVE ALL UNITS BEEN DROPPED ?
 5730 042606  001002                            BNE     215$                    ;NO, CONTINUE
 5731 042610  000137  042624                    JMP     T1EXIT                  ;GET OUT IF NONE LEFT TO TEST
 5732
 5733 042614  012705  042636          215$:     MOV     #T1REW,R5               ;SET UP TO REWIND
 5734 042620  004737  021240                    JSR     PC,SCHED                ;GO ISSUE THE COMMAND
 5735
 5736 042624                          T1EXIT:   EXIT    TST
      042624  104432                            TRAP    C$EXIT
      042626  000266                            .WORD   L10015-.
```

```
5738
5739 042630     140          T1ONL:  .BYTE   ONL             ;ONLINE COMMAND
5740 042631     000                  .BYTE   NULPAT          ;NO DATA NEEDED
5741 042632  000000                  .WORD   0               ;NO ITEM COUNT
5742 042634  000001                  .WORD   1               ;DO IT ONE TIME
5743
5744 042636     160          T1REW:  .BYTE   REW             ;REWIND COMMAND
5745 042637     000                  .BYTE   NULPAT          ;NO DATA NEEDED
5746 042640  000000                  .WORD   0               ;NO ITEM COUNT
5747 042642  000001                  .WORD   1               ;DO IT ONE TIME
5748
5749 042644     100          T1LEOT: .BYTE   WTM             ;WRITE TAPE MARK
5750 042645     000                  .BYTE   NULPAT          ;NO DATA NEEDED
5751 042646  000000                  .WORD   0               ;NO ITEM COUNT
5752 042650  000002                  .WORD   2               ;DO IT TWICE
5753
5754 042652     100          T1WTM:  .BYTE   WTM             ;WRITE TAPE MARK
5755 042653     000                  .BYTE   NULPAT          ;NO DATA NEEDED
5756 042654  000000                  .WORD   0               ;NO ITEM COUNT
5757 042656  000001                  .WORD   1               ;DO IT ONE TIME
5758
5759 042660     060          T1SKP:  .BYTE   SKP             ;SKIP TAPE MARK
5760 042661     000                  .BYTE   NULPAT          ;NO DATA NEEDED
5761 042662  000001                  .WORD   1               ;SKIP 1 TAPE MARK
5762 042664  000001                  .WORD   1               ;DO IT ONE TIME
5763
5764 042666     061          T1SKR:  .BYTE   SKR             ;SKIP TAPE MARK REVERSE
5765 042667     000                  .BYTE   NULPAT          ;NO DATA NEEDED
5766 042670  000002                  .WORD   2               ;SKIP REVERSE 2 TAPE MARKS
5767 042672  000001                  .WORD   1               ;DO IT ONCE
5768
5769 042674     050          T1SPC1: .BYTE   SPC             ;SPACE RECORDS
5770 042675     000                  .BYTE   NULPAT          ;NO DATA NEEDED
5771 042676  000124                  .WORD   84.             ;SPACE 84 RECORDS
5772 042700  000001                  .WORD   1               ;DO IT ONE TIME
5773
5774 042702     050          T1SPC2: .BYTE   SPC             ;SPACE RECORDS
5775 042703     000                  .BYTE   NULPAT          ;NO DATA NEEDED
5776 042704  000105                  .WORD   69.             ;SPACE 69 RECORDS
5777 042706  000001                  .WORD   1               ;DO IT ONE TIME
5778
5779 042710     050          T1SPC3: .BYTE   SPC             ;SPACE RECORDS
5780 042711     000                  .BYTE   NULPAT          ;NO DATA NEEDED
5781 042712  000047                  .WORD   39.             ;SPACE 39 RECORDS
5782 042714  000001                  .WORD   1               ;DO IT ONE TIME
5783
5784 042716     070          T1SPO1: .BYTE   SPO             ;SPACE OBJECTS
5785 042717     000                  .BYTE   NULPAT          ;NO DATA NEEDED
5786 042720  000070                  .WORD   56.             ;SPACE 56 OBJECTS
5787 042722  000001                  .WORD   1               ;DO IT ONE TIME
5788
5789 042724     061          T1SKR1: .BYTE   SKR             ;SKIP TAPE MARK REVERSE
5790 042725     000                  .BYTE   NULPAT          ;NO DATA NEEDED
5791 042726  000004                  .WORD   4               ;4 TAPE MARKS
5792 042730  000001                  .WORD   1               ;DO IT ONCE
5793
5794 042732     070          T1SPO2: .BYTE   SPO             ;SPACE OBJECTS
```

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 5795 042733     000                .BYTE   NULPAT          ;NO DATA NEEDED
 5796 042734  000107                .WORD   71.             ;SPACE 71 OBJECTS
 5797 042736  000001                .WORD   1               ;DO IT ONE TIME
 5798
 5799 042740     070        T1SPO3: .BYTE   SPO             ;SPACE OBJECTS
 5800 042741     000                .BYTE   NULPAT          ;NO DATA NEEDED
 5801 042742  000102                .WORD   66.             ;SPACE 66 OBJECTS
 5802 042744  000001                .WORD   1               ;DO IT ONE TIME
 5803
 5804 042746     071        T1SPR1: .BYTE   SPR             ;SPACE OBJECTS REVERSE
 5805 042747     000                .BYTE   NULPAT          ;NO DATA NEEDED
 5806 042750  000567                .WORD   375.            ;SPACE 375 OBJECTS
 5807 042752  000001                .WORD   1               ;DO IT ONE TIME
 5808
 5809 042754     060        T1SKP1: .BYTE   SKP             ;SKIP TAPE MARKS
 5810 042755     000                .BYTE   NULPAT          ;NO DATA NEEDED
 5811 042756  000004                .WORD   4.              ;SKIP 4 TAPE MARKS
 5812 042760  000001                .WORD   1               ;DO IT ONE TIME
 5813
 5814 042762     060        T1SKP2: .BYTE   SKP             ;SKIP TAPE MARKS
 5815 042763     000                .BYTE   NULPAT          ;NO DATA NEEDED
 5816 042764  000002                .WORD   2.              ;SKIP 2 TAPE MARKS
 5817 042766  000001                .WORD   1               ;DO IT ONE TIME
 5818
 5819 042770     071        T1SPR2: .BYTE   SPR             ;SPACE OBJECTS REVERSE
 5820 042771     000                .BYTE   NULPAT          ;NO DATA NEEDED
 5821 042772  000300                .WORD   192.            ;SPACE 192 OBJECTS
 5822 042774  000001                .WORD   1               ;DO IT ONE TIME
 5823
 5824 042776     062        T1SKD:  .BYTE   SKD             ;SKIP TO LEOT
 5825 042777     000                .BYTE   NULPAT          ;NO DATA NEEDED
 5826 043000  000004                .WORD   4               ;NO ITEM COUNT
 5827 043002  000001                .WORD   1               ;DO IT ONE TIME
 5828
 5829 043004     020        T1WR1:  .BYTE   WR              ;WRITE RECORD
 5830 043005     001                .BYTE   PAT1            ;DATA PATERN 1 (ALL 1'S)
 5831 043006  000026                .WORD   22.             ;BYTE COUNT OF 512.
 5832 043010  000143                .WORD   99.             ;DO IT 99 TIMES
 5833
 5834 043012     020        T1WR2:  .BYTE   WR              ;WRITE RECORD
 5835 043013     002                .BYTE   PAT2            ;DATA PATERN 2 (ALL 0'S)
 5836 043014  001015                .WORD   525.            ;BYTE COUNT OF 525
 5837 043016  000124                .WORD   84.             ;DO IT 84 TIMES
 5838
 5839 043020     020        T1WR3:  .BYTE   WR              ;WRITE RECORD
 5840 043021     003                .BYTE   PAT3            ;DATA PATERN 3 (WORST MFM)
 5841 043022  002016                .WORD   1038.           ;BYTE COUNT OF 1038
 5842 043024  000105                .WORD   69.             ;DO IT 69 TIMES
 5843
 5844 043026     020        T1WR4:  .BYTE   WR              ;WRITE RECORD
 5845 043027     004                .BYTE   PAT4            ;DATA PATERN 4 (ALTERNATE 1'S AND 0'S)
 5846 043030  003017                .WORD   1551.           ;BYTE COUNT OF 1551
 5847 043032  000066                .WORD   54.             ;DO IT 54 TIMES
 5848
 5849 043034     020        T1WR5:  .BYTE   WR              ;WRITE RECORD
 5850 043035     003                .BYTE   PAT3            ;DATA PATERN 3 (WORST MFM)
 5851 043036  004020                .WORD   2064.           ;BYTE COUNT OF 2064
```

TEST 1: Basic Function Test

```
5852 043040  000047                        .WORD   39.                    ;DO IT 39 TIMES
5853
5854 043042     020              T1WR6:    .BYTE   WR                     ;WRITE RECORD
5855 043043     001                        .BYTE   PAT1                   ;DATA PATERN 1 (ALL 1'S)
5856 043044  005021                        .WORD   2577.                  ;BYTE COUNT OF 2577
5857 043046  000030                        .WORD   24.                    ;DO IT 24 TIMES
5858
5859 043050     010              T1RD1:    .BYTE   RD                     ;READ RECORD
5860 043051     001                        .BYTE   PAT1                   ;DATA PATERN 1 (ALL 1'S)
5861 043052  000026                        .WORD   22.                    ;BYTE COUNT OF 512.
5862 043054  000143                        .WORD   99.                    ;DO IT 99 TIMES
5863
5864 043056     010              T1RD2:    .BYTE   RD                     ;READ RECORD
5865 043057     002                        .BYTE   PAT2                   ;DATA PATERN 2 (ALL 0'S)
5866 043060  001015                        .WORD   525.                   ;BYTE COUNT OF 525
5867 043062  000124                        .WORD   84.                    ;DO IT 84 TIMES
5868
5869 043064     010              T1RD3:    .BYTE   RD                     ;READ RECORD
5870 043065     003                        .BYTE   PAT3                   ;DATA PATERN 3 (WORST MFM)
5871 043066  002016                        .WORD   1038.                  ;BYTE COUNT OF 1038
5872 043070  000105                        .WORD   69.                    ;DO IT 69 TIMES
5873
5874 043072     010              T1RD4:    .BYTE   RD                     ;READ RECORD
5875 043073     004                        .BYTE   PAT4                   ;DATA PATERN 4 (ALTERNATE 1'S AND 0'S)
5876 043074  003017                        .WORD   1551.                  ;BYTE COUNT OF 1551
5877 043076  000066                        .WORD   54.                    ;DO IT 54 TIMES
5878
5879 043100     010              T1RD5:    .BYTE   RD                     ;READ RECORD
5880 043101     003                        .BYTE   PAT3                   ;DATA PATERN 3 (WORST MFM)
5881 043102  004020                        .WORD   2064.                  ;BYTE COUNT OF 2064
5882 043104  000047                        .WORD   39.                    ;DO IT 39 TIMES
5883
5884 043106     010              T1RD6:    .BYTE   RD                     ;READ RECORD
5885 043107     001                        .BYTE   PAT1                   ;DATA PATERN 1 (ALL 1'S)
5886 043110  005021                        .WORD   2577.                  ;BYTE COUNT OF 2577
5887 043112  000030                        .WORD   24.                    ;DO IT 24 TIMES
5888
5889                                       .EVEN
5890
5891 043114                               ENDTST
     043114                    L10015:
     043114  104401                       TRAP    C$ETST
```

```
                                .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.
                                ;--
043116                                  BGNTST
043116                          T2::
043116  105737  002234                  TSTB    T3ONLY                  ;CHECK THE TEST 3 ONLY FLAG
043122  001414                          BEQ     START2                  ;BRANCH IF IT IS CLEAR
043124                                  PRINTF  #BYPASS,L$TEST          ;PRINT THE TEST BYPASSED MESSAGE
043124  013746  002114                  MOV     L$TEST,-(SP)
043130  012746  021001                  MOV     #BYPASS,-(SP)
043134  012746  000002                  MOV     #2,-(SP)
043140  010600                          MOV     SP,R0
043142  104417                          TRAP    C$PNTF
043144  062706  000006                  ADD     #6,SP
043150  000137  043534                  JMP     T2EXIT                  ;GET OUT

043154  005737  003524          START2: TST     UDROP                   ;HAVE ALL UNITS BEEN DROPPED ?
043160  001014                          BNE     5$                      ;GO START THE TEST
043162                                  PRINTF  #BYPASS,L$TEST          ;PRINT THE TEST BYPASSED MESSAGE
043162  013746  002114                  MOV     L$TEST,-(SP)
043166  012746  021001                  MOV     #BYPASS,-(SP)
043172  012746  000002                  MOV     #2,-(SP)
043176  010600                          MOV     SP,R0
043200  104417                          TRAP    C$PNTF
043202  062706  000006                  ADD     #6,SP
043206  000137  043534                  JMP     T2EXIT                  ;GET OUT IF NONE LEFT TO TEST

043212  105737  002212          5$:     TSTB    CLOCK                   ;IS THE CLOCK ENABLED
043216  001421                          BEQ     G02                     ;NO, THEN CAN'T PRINT TIME
043220                                  PRINTF  #TIME,<B,HOURS>,<B,MINUTE>,<B,SECOND>,
043220  005046                          CLR     -(SP)
043222  153716  002215                  BISB    SECOND,(SP)
043226  005046                          CLR     -(SP)
043230  153716  002214                  BISB    MINUTE,(SP)
043234  005046                          CLR     -(SP)
043236  153716  002213                  BISB    HOURS,(SP)
043242  012746  020044                  MOV     #TIME,-(SP)
043246  012746  000004                  MOV     #4,-(SP)
043252  010600                          MOV     SP,R0
043254  104417                          TRAP    C$PNTF
043256  062706  000012                  ADD     #12,SP

043262  004737  033456          G02:    JSR     PC,CLREOT               ;MAKE SURE EOT STATUS IS CLEAR
043266  005037  003520                  CLR     OBJECT                  ;CLEAR THE OBJECT COUNTER
043272  005037  003440                  CLR     TSTMSK                  ;ALLOW NO ERRORS
```

```
 5931 043276  012705  043544                MOV     #T2REW,R5               ;SET UP TO DO A REWIND
 5932 043302  004737  021240                JSR     PC,SCHED                ;GO ISSSUE A REWIND TO ALL DRIVES
 5933 043306  005737  003524                TST     UDROP                   ;HAVE ALL UNITS BEEN DROPPED ?
 5934 043312  001510                       BEQ     T2EXIT                  ;GET OUT IF NONE LEFT TO TEST
 5935
 5936
 5937 043314  004737  033556          5$:   JSR     PC,SDSTUP               ;RESET THE RANDOM SEEDS
 5938 043320  012705  043552                MOV     #T2WRT,R5               ;SET UP TO DO A WRITE ITERATION
 5939 043324  004737  021240                JSR     PC,SCHED                ;GO ISSSUE WRITES TO ALL DRIVES
 5940 043330  005737  003524                TST     UDROP                   ;HAVE ALL UNITS BEEN DROPPED ?
 5941 043334  001477                       BEQ     T2EXIT                  ;GET OUT IF NONE LEFT TO TEST
 5942
 5943 043336  012705  043560                MOV     #T2LEOT,R5              ;SET UP TO DO A WRITE LEOT
 5944 043342  004737  021240                JSR     PC,SCHED                ;GO ISSSUE WRITES TO ALL DRIVES
 5945 043346  005737  003524                TST     UDROP                   ;HAVE ALL UNITS BEEN DROPPED ?
 5946 043352  001470                       BEQ     T2EXIT                  ;GET OUT IF NONE LEFT TO TEST
 5947
 5948 043354  012705  043544                MOV     #T2REW,R5               ;SET UP TO DO A REWIND
 5949 043360  004737  021240                JSR     PC,SCHED                ;GO ISSSUE A REWIND TO ALL DRIVES
 5950 043364  005737  003524                TST     UDROP                   ;HAVE ALL UNITS BEEN DROPPED ?
 5951 043370  001461                       BEQ     T2EXIT                  ;GET OUT IF NONE LEFT TO TEST
 5952
 5953 043372  005737  003520                TST     OBJECT                  ;IS THIS THE FIRST TIME THROUGH ?
 5954 043376  001412                       BEQ     10$                     ;YES, DON'T DO THE SPACE FORWARD
 5955 043400  012705  043602                MOV     #T2SPO,R5               ;SET UP TO SPACE OBJECTS
 5956 043404  013765  003520  000002        MOV     OBJECTS,ITMCNT(R5)      ;SET UP # OF OBJECTS TO SPACE FORWARD
 5957 043412  004737  021240                JSR     PC,SCHED                ;GO ISSSUE A REWIND TO ALL DRIVES
 5958 043416  005737  003524                TST     UDROP                   ;HAVE ALL UNITS BEEN DROPPED ?
 5959 043422  001444                       BEQ     T2EXIT                  ;GET OUT IF NONE LEFT TO TEST
 5960
 5961 043424  004737  033556         10$:   JSR     PC,SDSTUP               ;RESET THE RANDOM SEEDS
 5962 043430  012705  043566                MOV     #T2RD,R5                ;SET UP TO DO A READITERATION
 5963 043434  004737  021240                JSR     PC,SCHED                ;GO ISSSUE READS TO ALL DRIVES
 5964 043440  005737  003524                TST     UDROP                   ;HAVE ALL UNITS BEEN DROPPED ?
 5965 043444  001433                       BEQ     T2EXIT                  ;GET OUT IF NONE LEFT TO TEST
 5966 043446  066537  000004  003520        ADD     ITRCNT(R5),OBJECTS      ;ADD THE # OF RECORDS TO OBJECTS
 5967
 5968 043454  052737  000001  003440        BIS     #LEDB,TSTMSK            ;SET UP TO ALLOW LEOT DETECTED
 5969 043462  012705  043574                MOV     #T2SKD,R5               ;SET UP TO DO A SKIP TO LEOT
 5970 043466  004737  021240                JSR     PC,SCHED                ;GO ISSSUE READS TO ALL DRIVES
 5971 043472  042737  000001  003440        BIC     #LEDB,TSTMSK            ;DISALLOW LEOT DETECTED
 5972 043500  005737  003524                TST     UDROP                   ;HAVE ALL UNITS BEEN DROPPED ?
 5973 043504  001413                       BEQ     T2EXIT                  ;GET OUT IF NONE LEFT TO TEST
 5974 043506  066537  000004  003520        ADD     ITRCNT(R5),OBJECTS      ;ADD THE # OF RECORDS TO OBJECTS
 5975
 5976 043514  022737  004716  003520        CMP     #T2END,OBJECTS          ;HAVE WE DONE 2 TRACKS ?
 5977 043522  001274                       BNE     5$                      ;NO, KEEP GOING
 5978 043524  012705  043544                MOV     #T2REW,R5               ;SET UP TO DO A REWIND
 5979 043530  004737  021240                JSR     PC,SCHED                ;GO ISSSUE A REWIND TO ALL DRIVES
 5980 043534  004737  033632        T2EXIT: JSR     PC,SDSAVE               ;RESET THE RANDOM SEEDS
 5981 043540                        EXIT    TST
      043540  104432                       TRAP    C$EXIT
      043542  000046                       .WORD   L10016-.
 5982
 5983
 5984 043544     160                T2REW:  .BYTE   REW                     ;REWIND
 5985 043545     000                        .BYTE   NULPAT
```

```
 5986 043546  000000                    .WORD   0
 5987 043550  000001                    .WORD   1
 5988
 5989 043552     020            T2WRT:  .BYTE   WR              ;WRITE RECORDS
 5990 043553     003                    .BYTE   PAT3
 5991 043554  010000                    .WORD   4096.
 5992 043556  000372                    .WORD   250.
 5993
 5994 043560     100            T2LEOT: .BYTE   WTM             ;WRITE TAPE MARK
 5995 043561     000                    .BYTE   NULPAT          ;NO DATA NEEDED
 5996 043562  000000                    .WORD   0               ;NO ITEM COUNT
 5997 043564  000002                    .WORD   2               ;DO IT TWICE
 5998
 5999 043566     010            T2RD:   .BYTE   RD              ;READ RECORDS
 6000 043567     003                    .BYTE   PAT3
 6001 043570  010000                    .WORD   4096.
 6002 043572  000372                    .WORD   250.
 6003
 6004 043574     062            T2SKD:  .BYTE   SKD             ;SKIP TAPE MARK TO LEOT
 6005 043575     000                    .BYTE   NULPAT          ;NO DATA NEEDED
 6006 043576  000062                    .WORD   50.             ;SKIP 50 TAPE MARKS
 6007 043600  000001                    .WORD   1               ;DO IT ONE TIME
 6008
 6009 043602     070            T2SPO:  .BYTE   SPO             ;SPACE OBJECTS
 6010 043603     000                    .BYTE   NULPAT
 6011 043604  000001                    .WORD   1
 6012 043606  000001                    .WORD   1
 6013
 6014                                   .EVEN
 6015 043610                            ENDTST
      043610                    L10016:
      043610  104401                    TRAP    C$ETST
 6016
```

```
                                .SBTTL  TEST 3: Complex Write/Read Test

                                ;++
                                ;This test rewinds the tape, and executes the following sequence:
                                ;
                                ;       1.  Write 1000 records,
                                ;       2.  Write a file mark,
                                ;       3.  Repeat 1 and 2 until EOT is reached,
                                ;       4.  Write 2 file marks (LEOT),
                                ;       5.  Rewind,
                                ;       6.  Read 1000 records,
                                ;       7.  Read 1 record (should see unexpected tape mark)
                                ;       8.  Repeat 6 and 7 until LEOT.
                                ;
                                ;# of records (N), and record size will  be  randomly  selected.   This
                                ;sequence  will  permit  hardware  retries, if not user disabled.  This
                                ;test will run until EOT, LEOT or fatal error is  detected.   All  data
                                ;patterns including random data will be used in this test.
                                ;--
043612                                  BGNTST
043612                          T3::

043612  005737  003524        START3: TST     UDROP                   ;HAVE ALL UNITS BEEN DROPPED ?
043616  001014                          BNE     5$                      ;GO START THE TEST
043620                                  PRINTF  #BYPASS,L$TEST          ;PRINT THE TEST BYPASSED MESSAGE
043620  013746  002114                  MOV     L$TEST,-(SP)
043624  012746  021001                  MOV     #BYPASS,-(SP)
043630  012746  000002                  MOV     #2,-(SP)
043634  010600                          MOV     SP,R0
043636  104417                          TRAP    C$PNTF
043640  062706  000006                  ADD     #6,SP
043644  000137  044220                  JMP     T3EXIT                  ;GET OUT IF NONE LEFT TO TEST

043650  105737  002212        5$:     TSTB    CLOCK                   ;IS THE CLOCK ENABLED
043654  001421                          BEQ     G03                     ;NO, THEN CAN'T PRINT TIME
043656                                  PRINTF  #TIME,<B,HOURS>,<B,MINUTE>,<B,SECOND>,
043656  005046                          CLR     -(SP)
043660  153716  002215                  BISB    SECOND,(SP)
043664  005046                          CLR     -(SP)
043666  153716  002214                  BISB    MINUTE,(SP)
043672  005046                          CLR     -(SP)
043674  153716  002213                  BISB    HOURS,(SP)
043700  012746  020044                  MOV     #TIME,-(SP)
043704  012746  000004                  MOV     #4,-(SP)
043710  010600                          MOV     SP,R0
043712  104417                          TRAP    C$PNTF
043714  062706  000012                  ADD     #12,SP

043720  004737  033706        G03:    JSR     PC,PATCLR               ;MAKE SURE WE START WITH PATTERN 1
043724  004737  033556                JSR     PC,SDSTUP               ;RESET THE RANDOM SEEDS
043730  004737  033456                JSR     PC,CLREOT               ;CLEAR ALL EOT INDICATIONS

043734  005037  003440                CLR     TSTMSK                  ;ALLOW NO ERRORS
043740  005737  003524                TST     UDROP                   ;HAVE ALL UNITS BEEN DROPPED ?
043744  001525                          BEQ     T3EXIT                  ;GET OUT IF NONE LEFT TO TEST

043746  012705  044230                MOV     #T3REW,R5               ;SET UP TO DO REWIND
```

```
 6057 043752  004737  021240              JSR     PC,SCHED        ;GO ISSUE TO ALL DRIVES
 6058 043756  005737  003524              TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
 6059 043762  001516                      BEQ     T3EXIT          ;GET OUT IF NONE LEFT TO TEST
 6060
 6061 043764  012705  044236        5$:   MOV     #T3WRT,R5       ;SET UP A WRITE ITERATION
 6062 043770  004737  021240              JSR     PC,SCHED        ;GO DO IT ON ALL DRIVES
 6063 043774  005737  003524              TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
 6064 044000  001507                      BEQ     T3EXIT          ;GET OUT IF NONE LEFT TO TEST
 6065 044002  023737  003526  003524      CMP     UEOT,UDROP      ;ARE ALL UNITS AT EOT ?
 6066 044010  001413                      BEQ     10$             ;YES, WRITE ONE MORE REC AND LEOT
 6067
 6068 044012  012705  044244              MOV     #T3WTM,R5       ;SET UP TO WRITE A TAPE MARK
 6069 044016  004737  021240              JSR     PC,SCHED        ;GO DO IT ON ALL DRIVES
 6070 044022  005737  003524              TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
 6071 044026  001474                      BEQ     T3EXIT          ;GET OUT IF NONE LEFT TO TEST
 6072 044030  023737  003526  003524      CMP     UEOT,UDROP      ;ARE ALL UNITS AT EOT ?
 6073 044036  001352                      BNE     5$              ;NO, KEEP WRITING
 6074
 6075 044040  012737  000004  010560  10$:  MOV     #4,LOOPS        ;SET UP TO DO 4 TAPE MARKS
 6076 044046  004737  033456        15$:  JSR     PC,CLREOT       ;CLEAR THE EOT INDICATORS
 6077 044052  012705  044244              MOV     #T3WTM,R5       ;SET UP TO WRITE A TAPE MARK
 6078 044056  004737  021240              JSR     PC,SCHED        ;GO DO IT ON ALL DRIVES
 6079 044062  005737  003524              TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
 6080 044066  001454                      BEQ     T3EXIT          ;GET OUT IF NONE LEFT TO TEST
 6081 044070  005337  010560              DEC     LOOPS           ;SUBTRACT 1 FROM THE TAPE MARK COUNT
 6082 044074  001364                      BNE     15$             ;KEEP GOING TIL THEY'RE ALL WRITTEN
 6083
 6084 044076  004737  033456              JSR     PC,CLREOT       ;CLEAR THE EOT INDICATORS
 6085 044102  012705  044230              MOV     #T3REW,R5       ;SET UP TO REWIND ALL DRIVES
 6086 044106  004737  021240              JSR     PC,SCHED        ;GO DO IT
 6087 044112  005737  003524              TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
 6088 044116  001440                      BEQ     T3EXIT          ;GET OUT IF NONE LEFT TO TEST
 6089 044120  004737  033706              JSR     PC,PATCLR       ;START AT PATTERN 1
 6090 044124  004737  033556              JSR     PC,SDSTUP       ;RESET THE RANDOM SEEDS
 6091
 6092 044130  012705  044252        20$:  MOV     #T3RD,R5        ;SET UP TO READ AN ITERATION SET
 6093 044134  004737  021240              JSR     PC,SCHED        ;GO ISSUE TO ALL DRIVES
 6094 044140  005737  003524              TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
 6095 044144  001425                      BEQ     T3EXIT          ;GET OUT IF NONE LEFT TO TEST
 6096 044146  023737  003526  003524      CMP     UEOT,UDROP      ;ALL UNITS AT EOT ?
 6097 044154  001413                      BEQ     EX3REW          ;YES, GO REWIND ALL DRIVES
 6098
 6099 044156  012705  044260              MOV     #T3SPO,R5       ;SPACE 1 OBJECT (TAPE MARK)
 6100 044162  004737  021240              JSR     PC,SCHED        ;GO DO IT AN ALL DRIVES
 6101 044166  005737  003524              TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
 6102 044172  001412                      BEQ     T3EXIT          ;GET OUT IF NONE LEFT TO TEST
 6103 044174  023737  003526  003524      CMP     UEOT,UDROP      ;ALL UNITS AT EOT ?
 6104 044202  001352                      BNE     20$             ;NO, KEEP READING
 6105
 6106 044204  004737  033456  EX3REW:     JSR     PC,CLREOT       ;CLEAR THE EOT INDICATORS
 6107 044210  012705  044230              MOV     #T3REW,R5       ;SET UP TO REWIND ALL DRIVES
 6108 044214  004737  021240              JSR     PC,SCHED        ;GO DO IT
 6109
 6110 044220  004737  033632  T3EXIT:     JSR     PC,SDSAVE       ;RESET THE RANDOM SEEDS
 6111 044224                      EXIT    TST
      044224  104432                      TRAP    C$EXIT
      044226  000040                      .WORD   L10017-.
```

```
   6112
```

```
 6114 044230     160                T3REW:  .BYTE   REW             ;REWIND
 6115 044231     000                        .BYTE   NULPAT
 6116 044232  000000                        .WORD   0
 6117 044234  000001                        .WORD   1
 6118
 6119 044236     020                T3WRT:  .BYTE   WR              ;WRITE RECORDS
 6120 044237     200                        .BYTE   ALLPAT
 6121 044240  000000                        .WORD   RNDBYT
 6122 044242  000000                        .WORD   RNDITR
 6123
 6124 044244     100                T3WTM:  .BYTE   WTM             ;WRITE TAPE MARK
 6125 044245     000                        .BYTE   NULPAT
 6126 044246  000000                        .WORD   0
 6127 044250  000001                        .WORD   1
 6128
 6129 044252     010                T3RD:   .BYTE   RD              ;READ RECORDS
 6130 044253     200                        .BYTE   ALLPAT
 6131 044254  000000                        .WORD   RNDBYT
 6132 044256  000000                        .WORD   RNDITR
 6133
 6134 044260     070                T3SPO:  .BYTE   SPO             ;SPACE OBJECT (TAPE MARK)
 6135 044261     000                        .BYTE   NULPAT
 6136 044262  000001                        .WORD   1
 6137 044264  000001                        .WORD   1
 6138
 6139                                       .EVEN
 6140 044266                                ENDTST
      044266                        L10017:
      044266  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.
                                ;--
044270                                  BGNTST
044270                          T4::
044270  105737  002234                  TSTB    T3ONLY                  ;CHECK THE TEST 3 ONLY FLAG
044274  001414                          BEQ     START4                  ;BRANCH IF IT IS CLEAR
044276                                  PRINTF  #BYPASS,L$TEST          ;PRINT THE TEST BYPASSED MESSAGE
044276  013746  002114                  MOV     L$TEST,-(SP)
044302  012746  021001                  MOV     #BYPASS,-(SP)
044306  012746  000002                  MOV     #2,-(SP)
044312  010600                          MOV     SP,R0
044314  104417                          TRAP    C$PNTF
044316  062706  000006                  ADD     #6,SP
044322  000137  044620                  JMP     T4EXIT                  ;GET OUT

044326  005737  003524          START4: TST     UDROP                   ;HAVE ALL UNITS BEEN DROPPED ?
044332  001014                          BNE     5$                      ;GO START THE TEST
044334                                  PRINTF  #BYPASS,L$TEST          ;PRINT THE TEST BYPASSED MESSAGE
044334  013746  002114                  MOV     L$TEST,-(SP)
044340  012746  021001                  MOV     #BYPASS,-(SP)
044344  012746  000002                  MOV     #2,-(SP)
044350  010600                          MOV     SP,R0
044352  104417                          TRAP    C$PNTF
044354  062706  000006                  ADD     #6,SP
044360  000137  044620                  JMP     T4EXIT                  ;GET OUT IF NONE LEFT TO TEST

044364  105737  002212          5$:     TSTB    CLOCK                   ;IS THE CLOCK ENABLED
044370  001421                          BEQ     G04                     ;NO, THEN CAN'T PRINT TIME
044372                                  PRINTF  #TIME,<B,HOURS>,<B,MINUTE>,<B,SECOND>,
044372  005046                          CLR     -(SP)
044374  153716  002215                  BISB    SECOND,(SP)
044400  005046                          CLR     -(SP)
044402  153716  002214                  BISB    MINUTE,(SP)
044406  005046                          CLR     -(SP)
044410  153716  002213                  BISB    HOURS,(SP)
044414  012746  020044                  MOV     #TIME,-(SP)
044420  012746  000004                  MOV     #4,-(SP)
044424  010600                          MOV     SP,R0
044426  104417                          TRAP    C$PNTF
044430  062706  000012                  ADD     #12,SP

044434  004737  033706          G04:    JSR     PC,PATCLR               ;
044440  004737  033556                  JSR     PC,SDSTUP               ;SET UP THE RANDOM SEEDS
044444  004737  033456                  JSR     PC,CLREOT               ;CLEAR THE EOT FLAG
044450  005037  003440                  CLR     TSTMSK                  ;NO ALLOWABLE ERRORS

044454  012705  044624                  MOV     #T4REW,R5               ;POINT R5 TO THE REWIND TABLE
044460  004737  021240                  JSR     PC,SCHED                ;GO START THE TEST
044464  005737  003524                  TST     UDROP                   ;HAVE ALL UNITS BEEN DROPPED ?
044470  001453                          BEQ     T4EXIT                  ;GET OUT IF NONE LEFT TO TEST
```

```
 6175 044472  012705  044632          5$:     MOV     #T4WRT,R5       ;POINT R5 TO THE TEST TABLE
 6176 044476  004737  021240                  JSR     PC,SCHED        ;GO START THE TEST
 6177 044502  005737  003524                  TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
 6178 044506  001444                          BEQ     T4EXIT          ;GET OUT IF NONE LEFT TO TEST
 6179 044510  023737  003526  003524          CMP     UEOT,UDROP      ;ARE THEY ALL AT EOT ?
 6180 044516  001413                          BEQ     10$             ;BRANCH IF IT IS
 6181
 6182 044520  012705  044640                  MOV     #T4WTM,R5       ;POINT R5 TO THE TEST TABLE
 6183 044524  004737  021240                  JSR     PC,SCHED        ;GO START THE TEST
 6184 044530  005737  003524                  TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
 6185 044534  001431                          BEQ     T4EXIT          ;GET OUT IF NONE LEFT TO TEST
 6186 044536  023737  003526  003524          CMP     UEOT,UDROP      ;ARE THEY ALL AT EOT ?
 6187 044544  001352                          BNE     5$              ;BRANCH IF NOT
 6188
 6189 044546  012737  000004  010560  10$:    MOV     #4,LOOPS        ;SET UP TO DO 4 TAPE MARKS
 6190 044554  004737  033456          15$:    JSR     PC,CLREOT       ;CLEAR THE EOT INDICATORS
 6191 044560  012705  044244                  MOV     #T3WTM,R5       ;SET UP TO WRITE A TAPE MARK
 6192 044564  004737  021240                  JSR     PC,SCHED        ;GO DO IT ON ALL DRIVES
 6193 044570  005737  003524                  TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
 6194 044574  001611                          BEQ     T3EXIT          ;GET OUT IF NONE LEFT TO TEST
 6195 044576  005337  010560                  DEC     LOOPS           ;SUBTRACT 1 FROM THE TAPE MARK COUNT
 6196 044602  001364                          BNE     15$             ;KEEP GOING TIL THEY'RE ALL WRITTEN
 6197
 6198 044604  012705  044624                  MOV     #T4REW,R5       ;POINT R5 TO THE TEST TABLE
 6199 044610  004737  033456                  JSR     PC,CLREOT       ;
 6200 044614  004737  021240                  JSR     PC,SCHED        ;GO REWIND ALL UNITS
 6201 044620                  T4EXIT: EXIT    TST
      044620  104432                  TRAP    C$EXIT
      044622  000024                  .WORD   L10020-.
 6202
 6203 044624     160          T4REW:  .BYTE   REW             ;REWIND
 6204 044625     000                  .BYTE   NULPAT
 6205 044626  000000                  .WORD   0
 6206 044630  000001                  .WORD   1
 6207
 6208 044632     020          T4WRT:  .BYTE   WR              ;WRITE RECORDS
 6209 044633     200                  .BYTE   ALLPAT
 6210 044634  010000                  .WORD   4096.
 6211 044636  001750                  .WORD   1000.
 6212
 6213 044640     100          T4WTM:  .BYTE   WTM             ;WRITE TAPE MARK
 6214 044641     000                  .BYTE   NULPAT
 6215 044642  000000                  .WORD   0
 6216 044644  000001                  .WORD   1
 6217                                 .EVEN
 6218 044646                          ENDTST
      044646                  L10020:
      044646  104401                  TRAP    C$ETST
 6219
```

```
 6221                                   .SBTTL  TEST 5: Read Unknown Tape
 6222
 6223                                   ;++
 6224                                   ;This test will rewind a tape, then read until EOT, LEOT or fatal error
 6225                                   ;is  encountered.  This  test will keep track of the number of records
 6226                                   ;and files read.  If a fatal  error  is  encountered,  a  message  will
 6227                                   ;report  it,  the  tape  on  the  unit  will  be  rewound, and the unit
 6228                                   ;prevented from executing further read operations.
 6229                                   ;--
 6230 044650                                   BGNTST
      044650
 6231 044650  105737  002234           T5::    TSTB    T3ONLY                  ;CHECK THE TEST 3 ONLY FLAG
 6232 044654  001414                           BEQ     START5                  ;BRANCH IF IT IS CLEAR
 6233 044656                                   PRINTF  #BYPASS,L$TEST          ;PRINT THE TEST BYPASSED MESSAGE
      044656  013746  002114                   MOV     L$TEST,-(SP)
      044662  012746  021001                   MOV     #BYPASS,-(SP)
      044666  012746  000002                   MOV     #2,-(SP)
      044672  010600                           MOV     SP,R0
      044674  104417                           TRAP    C$PNTF
      044676  062706  000006                   ADD     #6,SP
 6234 044702  000137  045146                   JMP     T5EXIT                  ;GET OUT
 6235
 6236 044706  005737  003524           START5: TST     UDROP                   ;HAVE ALL UNITS BEEN DROPPED ?
 6237 044712  001014                           BNE     5$                      ;GO START THE TEST
 6238 044714                                   PRINTF  #BYPASS,L$TEST          ;PRINT THE TEST BYPASSED MESSAGE
      044714  013746  002114                   MOV     L$TEST,-(SP)
      044720  012746  021001                   MOV     #BYPASS,-(SP)
      044724  012746  000002                   MOV     #2,-(SP)
      044730  010600                           MOV     SP,R0
      044732  104417                           TRAP    C$PNTF
      044734  062706  000006                   ADD     #6,SP
 6239 044740  000137  045146                   JMP     T5EXIT                  ;GET OUT IF NONE LEFT TO TEST
 6240
 6241 044744  105737  002212           5$:     TSTB    CLOCK                   ;IS THE CLOCK ENABLED
 6242 044750  001421                           BEQ     GO5                     ;NO, THEN CAN'T PRINT TIME
 6243 044752                                   PRINTF  #TIME,<B,HOURS>,<B,MINUTE>,<B,SECOND>,
      044752  005046                           CLR     -(SP)
      044754  153716  002215                   BISB    SECOND,(SP)
      044760  005046                           CLR     -(SP)
      044762  153716  002214                   BISB    MINUTE,(SP)
      044766  005046                           CLR     -(SP)
      044770  153716  002213                   BISB    HOURS,(SP)
      044774  012746  020044                   MOV     #TIME,-(SP)
      045000  012746  000004                   MOV     #4,-(SP)
      045004  010600                           MOV     SP,R0
      045006  104417                           TRAP    C$PNTF
      045010  062706  000012                   ADD     #12,SP
 6244
 6245 045014  004737  033706           GO5:    JSR     PC,PATCLR               ;MAKE SURE WE START WITH PATTERN 1
 6246 045020  004737  033556                   JSR     PC,SDSTUP               ;SET UP THE RANDOM SEEDS
 6247 045024  004737  033456                   JSR     PC,CLREOT               ;CLEAR THE EOT FLAG
 6248
 6249 045030  132737  000001  002236           BITB    #BIT0,DMPBUF            ;ARE WE DUMPING ALL RECORDS?
 6250 045036  001403                           BEQ     1$                      ;NO - BRANCH
 6251 045040  012737  000001  045164           MOV     #1,T5RD+4               ;CHANGE ITER COUNT TO 1
 6252
 6253 045046  005037  003440           1$:     CLR     TSTMSK                  ;NO ALLOWABLE ERRORS
```

```
 6254 045052  012705  045152                MOV     #T5REW,R5               ;POINT R5 TO THE REWIND TABLE
 6255 045056  004737  021240                JSR     PC,SCHED                ;GO START THE TEST
 6256 045062  005737  003524                TST     UDROP                   ;HAVE ALL UNITS BEEN DROPPED ?
 6257 045066  001427                        BEQ     T5EXIT                  ;GET OUT IF NONE LEFT TO TEST
 6258
 6259 045070  012737  000012  003440        MOV     #TMB!RDTB,TSTMSK        ;TAPE MARKS AND TRUNC. RECORDS OK
 6260 045076  012705  045160        5$:     MOV     #T5RD,R5                ;POINT R5 TO THE TEST TABLE
 6261 045102  004737  021240                JSR     PC,SCHED                ;GO START THE TEST
 6262 045106  005737  003524                TST     UDROP                   ;HAVE ALL UNITS BEEN DROPPED ?
 6263 045112  001415                        BEQ     T5EXIT                  ;GET OUT IF NONE LEFT TO TEST
 6264 045114  023737  003526  003524        CMP     UEOT,UDROP              ;ARE THEY ALL AT EOT ?
 6265 045122  001365                        BNE     5$                      ;BRANCH IF THEY ARE NOT
 6266
 6267 045124  004737  033456        10$:    JSR     PC,CLREOT               ;
 6268 045130  012705  045152                MOV     #T5REW,R5               ;POINT R5 TO THE REWIND TABLE
 6269 045134  004737  021240                JSR     PC,SCHED                ;GO REWIND ALL UNITS
 6270 045140  012737  001751  045164        MOV     #1001.,T5RD+4           ;RESTORE ITER COUNT
 6271 045146                        T5EXIT: EXIT    TST
      045146  104432                        TRAP    C$EXIT
      045150  000016                        .WORD   L10021-.
 6272
 6273 045152     160                T5REW:  .BYTE   REW                     ;REWIND
 6274 045153     000                        .BYTE   NULPAT
 6275 045154  000000                        .WORD   0
 6276 045156  000001                        .WORD   1
 6277
 6278 045160     010                T5RD:   .BYTE   RD                      ;READ RECORDS
 6279 045161     200                        .BYTE   ALLPAT
 6280 045162  010000                        .WORD   4096.
 6281 045164  001751                        .WORD   1001.
 6282
 6283                                        .EVEN
 6284 045166                                ENDTST
      045166                        L10021:
      045166  104401                        TRAP    C$ETST
```

```
                                .SBTTL  TEST 6: Start/Stop Write/Read Test

                                ;++
                                ;This test rewinds the tape, and executes the following sequence:
                                ;
                                ;       1.  Write 1300 records one at a time,
                                ;       2.  Write 2 file marks (LEOT),
                                ;       3.  Rewind,
                                ;       4.  Read 1300 records one at a time,
                                ;       5.  Skip to LEOT.
                                ;       6.  Rewind,
                                ;
                                ;This sequence  will  permit  hardware  retries, if not user disabled.
                                ;This test will run until exhaustion of the command count or fatal error
                                ;is  detected.   All  data patterns including random data will be used
                                ;in this test.
                                ;--
045170                                  BGNTST
045170                          T6::
045170  105737  002234                  TSTB    T3ONLY                  ;CHECK THE TEST 3 ONLY FLAG
045174  001414                          BEQ     START6                  ;BRANCH IF IT IS CLEAR
045176                                  PRINTF  #BYPASS,L$TEST          ;PRINT THE TEST BYPASSED MESSAGE
045176  013746  002114                  MOV     L$TEST,-(SP)
045202  012746  021001                  MOV     #BYPASS,-(SP)
045206  012746  000002                  MOV     #2,-(SP)
045212  010600                          MOV     SP,R0
045214  104417                          TRAP    C$PNTF
045216  062706  000006                  ADD     #6,SP
045222  000137  045576                  JMP     T6EXIT                  ;GET OUT

045226  005737  003524          START6: TST     UDROP                   ;HAVE ALL UNITS BEEN DROPPED ?
045232  001014                          BNE     5$                      ;GO START THE TEST
045234                                  PRINTF  #BYPASS,L$TEST          ;PRINT THE TEST BYPASSED MESSAGE
045234  013746  002114                  MOV     L$TEST,-(SP)
045240  012746  021001                  MOV     #BYPASS,-(SP)
045244  012746  000002                  MOV     #2,-(SP)
045250  010600                          MOV     SP,R0
045252  104417                          TRAP    C$PNTF
045254  062706  000006                  ADD     #6,SP
045260  000137  045576                  JMP     T6EXIT                  ;GET OUT IF NONE LEFT TO TEST

045264  105737  002212          5$:     TSTB    CLOCK                   ;IS THE CLOCK ENABLED
045270  001421                          BEQ     G06                     ;NO, THEN CAN'T PRINT TIME
045272                                  PRINTF  #TIME,<B,HOURS>,<B,MINUTE>,<B,SECOND>,
045272  005046                          CLR     -(SP)
045274  153716  002215                  BISB    SECOND,(SP)
045300  005046                          CLR     -(SP)
045302  153716  002214                  BISB    MINUTE,(SP)
045306  005046                          CLR     -(SP)
045310  153716  002213                  BISB    HOURS,(SP)
045314  012746  020044                  MOV     #TIME,-(SP)
045320  012746  000004                  MOV     #4,-(SP)
045324  010600                          MOV     SP,R0
045326  104417                          TRAP    C$PNTF
045330  062706  000012                  ADD     #12,SP

045334  004737  033706          G06:    JSR     PC,PATCLR               ;MAKE SURE WE START WITH PATTERN 1
```

```
 6319 045340  004737  033556                JSR     PC,SDSTUP       ;RESET THE RANDOM SEEDS
 6320 045344  004737  033456                JSR     PC,CLREOT       ;CLEAR ALL EOT INDICATIONS
 6321
 6322 045350  005037  003440                CLR     TSTMSK          ;ALLOW NO ERRORS
 6323 045354  005737  003524                TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
 6324 045360  001506                        BEQ     T6EXIT          ;GET OUT IF NONE LEFT TO TEST
 6325
 6326 045362  012705  045606                MOV     #T6REW,R5       ;SET UP TO DO REWIND
 6327 045366  004737  021240                JSR     PC,SCHED        ;GO ISSUE TO ALL DRIVES
 6328 045372  005737  003524                TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
 6329 045376  001477                        BEQ     T6EXIT          ;GET OUT IF NONE LEFT TO TEST
 6330 045400  012737  002424  003404        MOV     #1300.,COUNT    ;STEP UP THE WRITE ITERATION COUNT
 6331
 6332 045406  012705  045614        5$:     MOV     #T6WRT,R5       ;SET UP A WRITE ITERATION
 6333 045412  004737  021240                JSR     PC,SCHED        ;GO DO IT ON ALL DRIVES
 6334 045416  005737  003524                TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
 6335 045422  001465                        BEQ     T6EXIT          ;GET OUT IF NONE LEFT TO TEST
 6336 045424  005337  003404                DEC     COUNT           ;SUBTRACT 1 FROM THE ITERATION COUNT
 6337 045430  001366                        BNE     5$              ;MORE COMMANDS TO DO, KEEP GOING
 6338
 6339 045432  012705  045622                MOV     #T6WTM,R5       ;SET UP TO WRITE A TAPE MARK
 6340 045436  004737  021240                JSR     PC,SCHED        ;GO DO IT ON ALL DRIVES
 6341 045442  005737  003524                TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
 6342 045446  001453                        BEQ     T6EXIT          ;GET OUT IF NONE LEFT TO TEST
 6343
 6344 045450  012705  045606                MOV     #T6REW,R5       ;SET UP TO REWIND ALL DRIVES
 6345 045454  004737  021240                JSR     PC,SCHED        ;GO DO IT
 6346 045460  005737  003524                TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
 6347 045464  001444                        BEQ     T6EXIT          ;GET OUT IF NONE LEFT TO TEST
 6348
 6349 045466  004737  033706                JSR     PC,PATCLR       ;START AT PATTERN 1
 6350 045472  004737  033556                JSR     PC,SDSTUP       ;RESET THE RANDOM SEEDS
 6351 045476  012737  002424  003404        MOV     #1300.,COUNT    ;STEP UP THE WRITE ITERATION COUNT
 6352
 6353 045504  012705  045630        10$:    MOV     #T6RD,R5        ;SET UP TO READ AN ITERATION SET
 6354 045510  004737  021240                JSR     PC,SCHED        ;GO DO IT ON ALL DRIVES
 6355 045514  005737  003524                TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
 6356 045520  001426                        BEQ     T6EXIT          ;GET OUT IF NONE LEFT TO TEST
 6357 045522  005337  003404                DEC     COUNT           ;SUBTRACT 1 FROM THE ITERATION COUNT
 6358 045526  001366                        BNE     10$             ;MORE COMMANDS TO DO, KEEP GOING
 6359
 6360 045530  052737  000001  003440        BIS     #LEDB,TSTMSK    ;SET UP TO ALLOW LEOT DETECTED
 6361 045536  012705  045636                MOV     #T6SKD,R5       ;SKIP TO LEOT
 6362 045542  004737  021240                JSR     PC,SCHED        ;GO DO IT AN ALL DRIVES
 6363 045546  042737  000001  003440        BIC     #LEDB,TSTMSK    ;DISALLOW LEOT DETECTED
 6364 045554  005737  003524                TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
 6365 045560  001406                        BEQ     T6EXIT          ;GET OUT IF NONE LEFT TO TEST
 6366
 6367 045562  004737  033456                JSR     PC,CLREOT       ;CLEAR THE EOT INDICATORS
 6368 045566  012705  045606                MOV     #T6REW,R5       ;SET UP TO REWIND ALL DRIVES
 6369 045572  004737  021240                JSR     PC,SCHED        ;GO DO IT
 6370
 6371 045576  004737  033632        T6EXIT: JSR     PC,SDSAVE       ;RESET THE RANDOM SEEDS
 6372 045602                                EXIT    TST
      045602  104432                        TRAP    C$EXIT
      045604  000040                        .WORD   L10022-.
 6373
```

```
 6375 045606     160                T6REW:  .BYTE   REW                     ;REWIND
 6376 045607     000                        .BYTE   NULPAT
 6377 045610  000000                        .WORD   0
 6378 045612  000001                        .WORD   1.
 6379
 6380 045614     020                T6WRT:  .BYTE   WR                      ;WRITE RECORDS
 6381 045615     200                        .BYTE   ALLPAT
 6382 045616  020000                        .WORD   8192.
 6383 045620  000001                        .WORD   1.
 6384
 6385 045622     100                T6WTM:  .BYTE   WTM                     ;WRITE TAPE MARK
 6386 045623     000                        .BYTE   NULPAT
 6387 045624  000000                        .WORD   0
 6388 045626  000002                        .WORD   2.
 6389
 6390 045630     010                T6RD:   .BYTE   RD                      ;READ RECORDS
 6391 045631     200                        .BYTE   ALLPAT
 6392 045632  020000                        .WORD   8192.
 6393 045634  000001                        .WORD   1.
 6394
 6395 045636     062                T6SKD:  .BYTE   SKD                     ;SKIP TO LEOT
 6396 045637     000                        .BYTE   NULPAT
 6397 045640  000001                        .WORD   1
 6398 045642  000001                        .WORD   1
 6399
 6400                                       .EVEN
 6401 045644                                ENDTST
      045644                        L10022:
      045644  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.
                                ;--
045646                                  BGNTST
045646                          T7::
045646  105737  002234                  TSTB    T3ONLY                  ;CHECK THE TEST 3 ONLY FLAG
045652  001414                          BEQ     START7                  ;BRANCH IF IT IS CLEAR
045654                                  PRINTF  #BYPASS,L$TEST          ;PRINT THE TEST BYPASSED MESSAGE
045654  013746  002114                  MOV     L$TEST,-(SP)
045660  012746  021001                  MOV     #BYPASS,-(SP)
045664  012746  000002                  MOV     #2,-(SP)
045670  010600                          MOV     SP,R0
045672  104417                          TRAP    C$PNTF
045674  062706  000006                  ADD     #6,SP
045700  000137  046222                  JMP     T7EXIT                  ;GET OUT

045704  005737  003524          START7: TST     UDROP                   ;HAVE ALL UNITS BEEN DROPPED ?
045710  001014                          BNE     5$                      ;GO START THE TEST
045712                                  PRINTF  #BYPASS,L$TEST          ;PRINT THE TEST BYPASSED MESSAGE
045712  013746  002114                  MOV     L$TEST,-(SP)
045716  012746  021001                  MOV     #BYPASS,-(SP)
045722  012746  000002                  MOV     #2,-(SP)
045726  010600                          MOV     SP,R0
045730  104417                          TRAP    C$PNTF
045732  062706  000006                  ADD     #6,SP
045736  000137  046222                  JMP     T7EXIT                  ;GET OUT IF NONE LEFT TO TEST

045742  105737  002212          5$:     TSTB    CLOCK                   ;IS THE CLOCK ENABLED
045746  001421                          BEQ     G07                     ;NO, THEN CAN'T PRINT TIME
045750                                  PRINTF  #TIME,<B,HOURS>,<B,MINUTE>,<B,SECOND>,
045750  005046                          CLR     -(SP)
045752  153716  002215                  BISB    SECOND,(SP)
045756  005046                          CLR     -(SP)
045760  153716  002214                  BISB    MINUTE,(SP)
045764  005046                          CLR     -(SP)
045766  153716  002213                  BISB    HOURS,(SP)
045772  012746  020044                  MOV     #TIME,-(SP)
045776  012746  000004                  MOV     #4,-(SP)
046002  010600                          MOV     SP,R0
046004  104417                          TRAP    C$PNTF
046006  062706  000012                  ADD     #12,SP

046012  005037  003410          G07:    CLR     BRCNT                   ; CLEAR THE BRANCH COUNTER
046016  012705  002232                  MOV     #T7TBL,R5               ;POINT R5 TO TEST 7 TABLE
046022  005037  003440                  CLR     TSTMSK                  ;NO ALLOWABLE ERRORS
046026  052737  000001  003440          BIS     #LEDB,TSTMSK            ;SET UP TO ALLOW LEOT DETECTED

046034  004737  033556          10$:    JSR     PC,SDSTUP               ;SET UP THE RANDOM SEEDS
046040  004737  033706                  JSR     PC,PATCLR               ;USE THE SAME PATTERN
```

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6436 046044  004737  033456              JSR     PC,CLREOT       ;CLEAR THE EOT FLAG
6437 046050  062705  000006              ADD     #TSTSTP,R5      ;MOVE R5 TO THE NEXT TEST TABLE
6438 046054  122765  177777  000000      CMPB    #-1,CMD(R5)     ;IS IT AN END OF SEQUENCE COMMAND ?
6439 046062  001457                      BEQ     T7EXIT          ;GET OUT IF IT IS
6440 046064  122765  000310  000000      CMPB    #310,CMD(R5)    ;IS IT A DELAY COMMAND ?
6441 046072  001011                      BNE     40$             ;NO KEEP GOING
6442 046074  016501  000002              MOV     ITMCNT(R5),R1   ;PUT THE DELAY VARIABLE IN R1
6443
6444 046100  013702  002116      20$:    MOV     L$DLY,R2        ;GET THE PROGRAM DELAY VARIABLE
6445 046104  005302              30$:    DEC     R2              ;DECREMENT R2
6446 046106  001376                      BNE     30$             ;KEEP GOING TILL ZERO
6447 046110  005301                      DEC     R1              ;DECREMENT R1
6448 046112  001372                      BNE     20$             ;RESET R2 AND GO TILL R1 IS ZERO
6449 046114  000747                      BR      10$             ;GET THE NEXT COMMAND
6450
6451 046116  122765  000300  000000  40$:    CMPB    #300,CMD(R5)    ;IS IT A BRANCH COMMAND ?
6452 046124  001031                      BNE     80$             ;NO, GO ON
6453 046126  032737  000001  003516      BIT     #T7BRFL,PCFLAG  ; HAVE WE ALREADY LOAD THE BRANCH COUNT ?
6454 046134  001006                      BNE     50$             ; YES, DON'T OVER WRITE IT
6455 046136  052737  000001  003516      BIS     #T7BRFL,PCFLAG  ; REMEMBER THAT YOUR IN A LOOP
6456 046144  016537  000004  003410      MOV     ITRCNT(R5),BRCNT ; ITERATION COUNT TO BRANCH COUNT
6457
6458 046152  005337  003410      50$:    DEC     BRCNT           ; HAVE WE BRANCHED THE REQUIRED TIMES ?
6459 046156  001004                      BNE     60$             ; NO, CONTINUE LOOPING
6460 046160  042737  000001  003516      BIC     #T7BRFL,PCFLAG  ; CLEAR THE BRANCH FLAG
6461 046166  000722                      BR      10$             ; GET NEXT COMMAND
6462 046170  016501  000002      60$:    MOV     ITMCNT(R5),R1   ;PUT THE COMMAND NUMBER IN R1
6463 046174  012705  002232              MOV     #T7TBL,R5       ;POINT R5 TO TEST 7 TABLE
6464
6465 046200  062705  000006      70$:    ADD     #TSTSTP,R5      ;START STEPPING R5 TO THE COMMAND
6466 046204  005301                      DEC     R1              ;IS THIS THE RIGHT PLACE ?
6467 046206  001374                      BNE     70$             ;NO, KEEP GOING
6468
6469 046210  004737  021240      80$:    JSR     PC,SCHED        ;GO START THE TEST
6470 046214  005737  003524              TST     UDROP           ;HAVE ALL UNITS BEEN DROPPED ?
6471 046220  001305                      BNE     10$             ;NO, KEEP TESTING
6472 046222  004737  033632      T7EXIT: JSR     PC,SDSAVE       ;SAVE THE RANDOM SEEDS
6473 046226                      EXIT    TST
     046226  104432                      TRAP    C$EXIT
     046230  000002                      .WORD   L10023-.
6474
6475
6476                             .EVEN
6477
6478 046232                      ENDTST
     046232                  L10023:
     046232  104401                      TRAP    C$ETST
6479
6480 046234                      ENDMOD
6481
```

```
 6484
 6486                                   .TITLE PARAMETER CODING
 6497
 6498                                   .SBTTL  HARDWARE PARAMETER CODING SECTION
 6526
 6527 046234                                   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 046234                                   BGNHRD
      046234  000032                           .WORD L10024-L$HARD/2
      046236                           L$HARD::
 6539
 6540 046236                                   GPRMA   TKIPAD,0,0,160002,177564,YES
      046236  C00031                          .WORD   T$CODE
      046240  046262                          .WORD   TKIPAD
      046242  160002                          .WORD   T$LOLIM
      046244  177564                          .WORD   T$HILIM
 6541 046246                                   GPRMD   TKUNT,2,0,777,0,251,YES
      046246  001032                          .WORD   T$CODE
      046250  046277                          .WORD   TKUNT
      046252  000777                          .WORD   777
      046254  000000                          .WORD   T$LOLIM
      046256  000251                          .WORD   T$HILIM
 6542
 6543 046260                                   EXIT HRD
      046260  021004                          .WORD   T$CODE
 6544
 6545
 6546 046262     124     113     111  TKIPAD: .ASCIZ  ?TKIP ADDRESS?
 6547 046277     124     057     115  TKUNT:  .ASCIZ  ?T/MSCP UNIT NUMBER?
 6548                                   .EVEN
 6549 046322                                   ENDHRD
                                               .EVEN
      046322                           L10024:
```

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                                .SBTTL  SOFTWARE PARAMETER CODING SECTION

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

046322                                  BGNSFT
046322  001107                          .WORD L10025-L$SOFT/2
046324                          L$SOFT::

046324                                  GPRML   ECLK,0,1,YES
046324  000130                          .WORD   T$CODE
046326  047210                          .WORD   ECLK
046330  000001                          .WORD   1
046332                                  XFERF   5$
046332  013044                          .WORD   T$CODE
046334                                  GPRMD   HOUR,0,D,177400,0,24.,YES
046334  000052                          .WORD   T$CODE
046336  047241                          .WORD   HOUR
046340  177400                          .WORD   177400
046342  000000                          .WORD   T$LOLIM
046344  000030                          .WORD   T$HILIM
046346                                  GPRMD   MINT,2,D,000377,0,60.,YES
046346  001052                          .WORD   T$CODE
046350  047323                          .WORD   MINT
046352  000377                          .WORD   000377
046354  000000                          .WORD   T$LOLIM
046356  000074                          .WORD   T$HILIM

046360                          5$:     GPRML   CTPA,4,400,YES
046360  002130                          .WORD   T$CODE
046362  047370                          .WORD   CTPA
046364  000400                          .WORD   400
046366                                  XFERF   10$
046366  012044                          .WORD   T$CODE
046370                                  GPRML   SERR,6,1,YES
046370  003130                          .WORD   T$CODE
046372  047425                          .WORD   SERR
046374  000001                          .WORD   1
046376                                  GPRML   SERC,6,400,YES
046376  003130                          .WORD   T$CODE
046400  047471                          .WORD   SERC
046402  000400                          .WORD   400
046404                                  GPRML   PADD,10,1,YES
046404  004130                          .WORD   T$CODE
046406  047533                          .WORD   PADD
046410  000001                          .WORD   1

046412                          10$:    GPRML   PRPA,10,400,YES
046412  004130                          .WORD   T$CODE
046414  047562                          .WORD   PRPA
046416  000400                          .WORD   400
```

```
6576 046420                                     XFERF   15$
     046420  024044                             .WORD   T$CODE
6577 046422                                     GPRML   SOER,12,1,YES
     046422  005130                             .WORD   T$CODE
     046424  047615                             .WORD   SOER
     046426  000001                             .WORD   1
6578 046430                                     XFERT   11$
     046430  004024                             .WORD   T$CODE
6579 046432                                     GPRML   SRER,12,400,YES
     046432  005130                             .WORD   T$CODE
     046434  047660                             .WORD   SRER
     046436  000400                             .WORD   400
6580 046440                             11$:    GPRML   CLMD,14,1,YES
     046440  006130                             .WORD   T$CODE
     046442  047717                             .WORD   CLMD
     046444  000001                             .WORD   1
6581 046446                                     GPRML   MDTB,14,400,YES
     046446  006130                             .WORD   T$CODE
     046450  047766                             .WORD   MDTB
     046452  000400                             .WORD   400
6582 046454                                     GPRML   NOCL,16,1,YES
     046454  007130                             .WORD   T$CODE
     046456  050026                             .WORD   NOCL
     046460  000001                             .WORD   1
6583 046462                                     GPRML   PDMP,16,400,YES
     046462  007130                             .WORD   T$CODE
     046464  050071                             .WORD   PDMP
     046466  000400                             .WORD   400
6584
6585 046470                             15$:    GPRML   TSPA,20,1,YES
     046470  010130                             .WORD   T$CODE
     046472  050134                             .WORD   TSPA
     046474  000001                             .WORD   1
6586 046476                                     XFERF   20$
     046476  023044                             .WORD   T$CODE
6587 046500                                     GPRMD   PATE,20,0,177400,0,7,YES
     046500  010032                             .WORD   T$CODE
     046502  050163                             .WORD   PATE
     046504  177400                             .WORD   177400
     046506  000000                             .WORD   T$LOLIM
     046510  000007                             .WORD   T$HILIM
6588 046512                                     GPRML   T3ON,22,1,YES
     046512  011130                             .WORD   T$CODE
     046514  050201                             .WORD   T3ON
     046516  000001                             .WORD   1
6589 046520                                     GPRML   T5CP,22,400,YES
     046520  011130                             .WORD   T$CODE
     046522  050222                             .WORD   T5CP
     046524  000400                             .WORD   400
6590 046526                                     GPRML   BDMP,24,1,YES
     046526  012130                             .WORD   T$CODE
     046530  050262                             .WORD   BDMP
     046532  000001                             .WORD   1
6591 046534                                     GPRML   CHGF,24,400,YES
     046534  012130                             .WORD   T$CODE
     046536  050326                             .WORD   CHGF
     046540  000400                             .WORD   400
```

```
6592 046542                                    XFERT   25$
     046542  002024                            .WORD   T$CODE
6593 046544                            20$:    XFER    SFTEX1
     046544  076004                            .WORD   T$CODE
6594
6595 046546                            25$:    GPRMD   CMD1,26,0,000377,0,377,YES
     046546  013032                            .WORD   T$CODE
     046550  050470                            .WORD   CMD1
     046552  000377                            .WORD   000377
     046554  000000                            .WORD   T$LOLIM
     046556  000377                            .WORD   T$HILIM
6596 046560                                    GPRMD   DPAT,26,0,177400,0,7,YES
     046560  013032                            .WORD   T$CODE
     046562  050362                            .WORD   DPAT
     046564  177400                            .WORD   177400
     046566  000000                            .WORD   T$LOLIM
     046570  000007                            .WORD   T$HILIM
6597 046572                                    GPRMD   ICNT,30,D,177777,0,MAXBUF,YES
     046572  014052                            .WORD   T$CODE
     046574  050401                            .WORD   ICNT
     046576  177777                            .WORD   177777
     046600  000000                            .WORD   T$LOLIM
     046602  020000                            .WORD   T$HILIM
6598 046604                                    GPRMD   ITER,32,D,177777,0,65000,YES
     046604  015052                            .WORD   T$CODE
     046606  050443                            .WORD   ITER
     046610  177777                            .WORD   177777
     046612  000000                            .WORD   T$LOLIM
     046614  065000                            .WORD   T$HILIM
6599
6600 046616                                    GPRMD   CMD2,34,0,000377,0,377,YES
     046616  016032                            .WORD   T$CODE
     046620  050476                            .WORD   CMD2
     046622  000377                            .WORD   000377
     046624  000000                            .WORD   T$LOLIM
     046626  000377                            .WORD   T$HILIM
6601 046630                                    GPRMD   DPAT,34,0,177400,0,7,YES
     046630  016032                            .WORD   T$CODE
     046632  050362                            .WORD   DPAT
     046634  177400                            .WORD   177400
     046636  000000                            .WORD   T$LOLIM
     046640  000007                            .WORD   T$HILIM
6602 046642                                    GPRMD   ICNT,36,D,177777,0,MAXBUF,YES
     046642  017052                            .WORD   T$CODE
     046644  050401                            .WORD   ICNT
     046646  177777                            .WORD   177777
     046650  000000                            .WORD   T$LOLIM
     046652  020000                            .WORD   T$HILIM
6603 046654                                    GPRMD   ITER,40,D,177777,0,65000,YES
     046654  020052                            .WORD   T$CODE
     046656  050443                            .WORD   ITER
     046660  177777                            .WORD   177777
     046662  000000                            .WORD   T$LOLIM
     046664  065000                            .WORD   T$HILIM
6604
6605 046666                                    GPRMD   CMD3,42,0,000377,0,377,YES
     046666  021032                            .WORD   T$CODE
```

```
                046670  050504                          .WORD   CMD3
                046672  000377                          .WORD   000377
                046674  000000                          .WORD   T$LOLIM
                046676  000377                          .WORD   T$HILIM
          6606  046700                                  GPRMD   DPAT,42,0,177400,0,7,YES
                046700  021032                          .WORD   T$CODE
                046702  050362                          .WORD   DPAT
                046704  177400                          .WORD   177400
                046706  000000                          .WORD   T$LOLIM
                046710  000007                          .WORD   T$HILIM
          6607  046712                                  GPRMD   ICNT,44,D,177777,0,MAXBUF,YES
                046712  022052                          .WORD   T$CODE
                046714  050401                          .WORD   ICNT
                046716  177777                          .WORD   177777
                046720  000000                          .WORD   T$LOLIM
                046722  020000                          .WORD   T$HILIM
          6608  046724                                  GPRMD   ITER,46,D,177777,0,65000,YES
                046724  023052                          .WORD   T$CODE
                046726  050443                          .WORD   ITER
                046730  177777                          .WORD   177777
                046732  000000                          .WORD   T$LOLIM
                046734  065000                          .WORD   T$HILIM
          6609  046736                                  XFER    CONT1
                046736  002004                          .WORD   T$CODE
          6610
          6611  046740                        SFTEX1:   XFER    SFTEX2
                046740  076004                          .WORD   T$CODE
          6612
          6613  046742                        CONT1:    GPRMD   CMD4,50,0,000377,0,377,YES
                046742  024032                          .WORD   T$CODE
                046744  050512                          .WORD   CMD4
                046746  000377                          .WORD   000377
                046750  000000                          .WORD   T$LOLIM
                046752  000377                          .WORD   T$HILIM
          6614  046754                                  GPRMD   DPAT,50,0,177400,0,7,YES
                046754  024032                          .WORD   T$CODE
                046756  050362                          .WORD   DPAT
                046760  177400                          .WORD   177400
                046762  000000                          .WORD   T$LOLIM
                046764  000007                          .WORD   T$HILIM
          6615  046766                                  GPRMD   ICNT,52,D,177777,0,MAXBUF,YES
                046766  025052                          .WORD   T$CODE
                046770  050401                          .WORD   ICNT
                046772  177777                          .WORD   177777
                046774  000000                          .WORD   T$LOLIM
                046776  020000                          .WORD   T$HILIM
          6616  047000                                  GPRMD   ITER,54,D,177777,0,65000,YES
                047000  026052                          .WORD   T$CODE
                047002  050443                          .WORD   ITER
                047004  177777                          .WORD   177777
                047006  000000                          .WORD   T$LOLIM
                047010  065000                          .WORD   T$HILIM
          6617
          6618  047012                                  GPRMD   CMD5,56,0,000377,0,377,YES
                047012  027032                          .WORD   T$CODE
                047014  050520                          .WORD   CMD5
                047016  000377                          .WORD   000377
```

```
                047020  000000                  .WORD   T$LOLIM
                047022  000377                  .WORD   T$HILIM
        6619    047024                          GPRMD   DPAT,56,0,177400,0,7,YES
                047024  027032                  .WORD   T$CODE
                047026  050362                  .WORD   DPAT
                047030  177400                  .WORD   177400
                047032  000000                  .WORD   T$LOLIM
                047034  000007                  .WORD   T$HILIM
        6620    047036                          GPRMD   ICNT,60,D,177777,0,MAXBUF,YES
                047036  030052                  .WORD   T$CODE
                047040  050401                  .WORD   ICNT
                047042  177777                  .WORD   177777
                047044  000000                  .WORD   T$LOLIM
                047046  020000                  .WORD   T$HILIM
        6621    047050                          GPRMD   ITER,62,D,177777,0,65000,YES
                047050  031052                  .WORD   T$CODE
                047052  050443                  .WORD   ITER
                047054  177777                  .WORD   177777
                047056  000000                  .WORD   T$LOLIM
                047060  065000                  .WORD   T$HILIM
        6622
        6623    047062                          GPRMD   CMD6,64,0,000377,0,377,YES
                047062  032032                  .WORD   T$CODE
                047064  050526                  .WORD   CMD6
                047066  000377                  .WORD   000377
                047070  000000                  .WORD   T$LOLIM
                047072  000377                  .WORD   T$HILIM
        6624    047074                          GPRMD   DPAT,64,0,177400,0,7,YES
                047074  032032                  .WORD   T$CODE
                047076  050362                  .WORD   DPAT
                047100  177400                  .WORD   177400
                047102  000000                  .WORD   T$LOLIM
                047104  000007                  .WORD   T$HILIM
        6625    047106                          GPRMD   ICNT,66,D,177777,0,MAXBUF,YES
                047106  033052                  .WORD   T$CODE
                047110  050401                  .WORD   ICNT
                047112  177777                  .WORD   177777
                047114  000000                  .WORD   T$LOLIM
                047116  020000                  .WORD   T$HILIM
        6626    047120                          GPRMD   ITER,70,D,177777,0,65000,YES
                047120  034052                  .WORD   T$CODE
                047122  050443                  .WORD   ITER
                047124  177777                  .WORD   177777
                047126  000000                  .WORD   T$LOLIM
                047130  065000                  .WORD   T$HILIM
        6627    047132                          XFER    CONT2
                047132  002004                  .WORD   T$CODE
        6628
        6629    047134          SFTEX2: XFER    SFTEX3
                047134  025004                  .WORD   T$CODE
        6630
        6631    047136          CONT2:  GPRMD   CMD7,72,0,000377,0,377,YES
                047136  035032                  .WORD   T$CODE
                047140  050534                  .WORD   CMD7
                047142  000377                  .WORD   000377
                047144  000000                  .WORD   T$LOLIM
                047146  000377                  .WORD   T$HILIM
```

```
6632 047150                                        GPRMD   DPAT,72,0,177400,0,7,YES
     047150  035032                                .WORD   T$CODE
     047152  050362                                .WORD   DPAT
     047154  177400                                .WORD   177400
     047156  000000                                .WORD   T$LOLIM
     047160  000007                                .WORD   T$HILIM
6633 047162                                        GPRMD   ICNT,74,D,177777,0,MAXBUF,YES
     047162  036052                                .WORD   T$CODE
     047164  050401                                .WORD   ICNT
     047166  177777                                .WORD   177777
     047170  000000                                .WORD   T$LOLIM
     047172  020000                                .WORD   T$HILIM
6634 047174                                        GPRMD   ITER,76,D,177777,0,65000,YES
     047174  037052                                .WORD   T$CODE
     047176  050443                                .WORD   ITER
     047200  177777                                .WORD   177777
     047202  000000                                .WORD   T$LOLIM
     047204  065000                                .WORD   T$HILIM
6635
6636 047206                              SFTEX3:   XFER    SFTEX4
     047206  070004                                .WORD   T$CODE
6637
6638 047210     105     116     101     ECLK:     .ASCIZ  /ENABLE TIME OF DAY CLOCK/
6639 047241     040     111     116     HOUR:     .ASCIZ  / INPUT HOUR IN 24 HOUR FORMAT (OMIT LEADING ZERO)/
6640 047323     040     111     116     MINT:     .ASCIZ  / INPUT MINUTES (OMIT LEADING ZERO)/
6641                                               .EVEN
6642
6643 047366                              SFTEX4:   XFER    SFTEX5
     047366  075004                                .WORD   T$CODE
6644
6645 047370     103     110     101     CTPA:     .ASCIZ  /CHANGE CONTROLLER PARAMETERS/
6646 047425     040     105     116     SERR:     .ASCIZ  / ENABLE CONTROLLER ERROR CORRECTION/
6647 047471     040     105     116     SERC:     .ASCIZ  / ENABLE CONTROLLER ERROR RECOVERY/
6648 047533     040     105     116     PADD:     .ASCIZ  / ENABLE PAD BLOCKING/
6649                                               .EVEN
6650
6651 047560                              SFTEX5:   XFER    SFTEX6
     047560  102004                                .WORD   T$CODE
6652
6653 047562     103     110     101     PRPA:     .ASCIZ  /CHANGE PRINTING PARAMETERS/
6654 047615     040     105     116     SOER:     .ASCIZ  / ENABLE SOFT ERROR REPORT PRINTING/
6655 047660     040     040     105     SRER:     .ASCIZ  /  ENABLE READ SOFT ERRORS ONLY/
6656 047717     040     105     116     CLMD:     .ASCIZ  / ENABLE CLEAR MEDIA TABLE EVERY PASS/
6657                                               .EVEN
6658
6659 047764                              SFTEX6:   XFER    SFTEX7
     047764  063004                                .WORD   T$CODE
6660
6661 047766     040     105     116     MDTB:     .ASCIZ  / ENABLE PRINTING OF MEDIA TABLE/
6662 050026     040     105     116     NOCL:     .ASCIZ  / ENABLE CLEAR STATS ON FATAL ERROR/
6663 050071     040     105     116     PDMP:     .ASCIZ  / ENABLE VARIABLES DUMP ON ERROR/
6664                                               .EVEN
6665
6666 050132                              SFTEX7:   XFER    SFTEX8
     050132  113004                                .WORD   T$CODE
6667
6668 050134     103     110     101     TSPA:     .ASCIZ  /CHANGE TEST PARAMETERS/
```

```
 6669 050163   040   104   101  PATE:    .ASCIZ  / DATA PATTERN/
 6670 050201   040   122   125  T3ON:    .ASCIZ  / RUN TEST 3 ONLY/
 6671 050222   040   105   116  T5CP:    .ASCIZ  / ENABLE DATA COMPARES IN TEST 5/
 6672 050262   040   105   116  BDMP:    .ASCIZ  / ENABLE PRINT READ BUFFER IN TEST 5/
 6673 050326   040   103   110  CHGF:    .ASCIZ  / CHANGE COMMAND SEQUENCE/
 6674                               .EVEN
 6675
 6676 050360                      SFTEX8:  XFER    SFTEX9
      050360 043004                       .WORD   T$CODE
 6677
 6678 050362   040   040   104  DPAT:    .ASCIZ  /  DATA PATTERN/
 6679 050401   040   040   111  ICNT:    .ASCIZ  /  ITEM COUNT (BYTE,RECORD,OBJECT)/
 6680 050443   040   040   111  ITER:    .ASCIZ  /  ITERATION COUNT/
 6681                               .EVEN
 6682
 6683 050466                      SFTEX9:  XFER    SFTEXT
      050466 026004                       .WORD   T$CODE
 6684
 6685 050470   103   115   104  CMD1:    .ASCIZ  "CMD/1"
 6686 050476   103   115   104  CMD2:    .ASCIZ  "CMD/2"
 6687 050504   103   115   104  CMD3:    .ASCIZ  "CMD/3"
 6688 050512   103   115   104  CMD4:    .ASCIZ  "CMD/4"
 6689 050520   103   115   104  CMD5:    .ASCIZ  "CMD/5"
 6690 050526   103   115   104  CMD6:    .ASCIZ  "CMD/6"
 6691 050534   103   115   104  CMD7:    .ASCIZ  "CMD/7"
 6692                               .EVEN
 6693
 6694 050542                      SFTEXT:
 6695 050542                              ENDSFT
                                          .EVEN
      050542                      L10025:
 6696
 6703
 6704 050542                              ENDMOD
 6705
 6706 050542                              .BLKW   4
 6707 050552                      RDBUF::         .BLKW   10000   ;READ BUFFER
 6708 070552                      WRTBUF::        .BLKW   10000   ;WRITE BUFFER
 6709
 6710 110552                      MEDIAS::        .BLKW   1296.   ;MEDIA STATISTICS TABLE
 6711
 6712 115612                      PATCH::         .BLKW   50      ;PATCH SPACE
 6713
 6714
 6715 115732                      LASTAD
                                          .EVEN
      115732  115746                      .WORD T$FREE
      115734  000004                      .WORD T$SIZE
      115736                      L$LAST::
 6716
 6717 115736                              BGNSETUP        1       ;NUMBER OF P-TABLES
 6718 115736                              BGNPTAB
      115736  000000                      .WORD   0
      115740  000002                      .WORD   L10030-./2-1
      115742                      L10026:
 6719 115742  174500                              .WORD   174500  ;IP ADDRESS
 6720 115744  000000                              .WORD   0       ;UNIT NUMBER
```

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6721 115746                              ENDPTAB
     115746                    L10030:
6722 115746                              ENDSETUP
6723        000001                       .END
```

Symbol table

```
ABO    = 000200 G      BYPASS  021001 G      CMR    = 000031 G      C$GETW= 000027      DRBSTP= 000104 G
ABOER    011525        BYTADD  003446 G      CMSTSV  010550 G       C$GMAN= 000043      DRERFL= 000010 G
ABOR     025346        BYTCNT  022124 G      CNTEL   013145         C$GPHR= 000042      DRINUS  003350 G
ABORT  = 000004 G      BYTES   003416 G      CNTER   011674         C$GPRI= 000040      DROP   = 000010 G
ABOT     010662 G      CDRECV  023710 G      CNTERL  011172         C$INIT= 000011      DROPIT= 000400 G
ACC    = 000040 G      CDREN0  010312 G      CNTFLG  010562 G       C$INLP= 000020      DROPPD= 000104 G
ACCESS   024522        CDREN1  010376 G      CNTHI   010554 G       C$MANI= 000050      DROPUN  040442 G
ACR    = 000041 G      CDREN2  010462 G      CNTLEL  013172         C$MAP  = 000102      DRSPB0  004032 G
ADJUST   027142        CDREN3  010546 G      CNTLER  011132         C$MEM  = 000031      DRSPB1  005072 G
ADR    = 000020 G      CDSRG0  010272 G      CNTT    010762 G       C$MMU  = 000103      DRSPB2  006132 G
ALLPAT= 000200 G       CDSRG1  010356 G      CNUSAV= 000014 G       C$MSG  = 000023      DRSPB3  007172 G
ASSEMB= 000010         CDSRG2  010442 G      COLSAV= 000016 G       C$OPNR= 000034       DRVEL   013125
AVALAB   025026        CDSRG3  010526 G      COMEXI  025700         C$OPNW= 000104       DRVER   011715
AVB    = 000001 G      CF.ATN= 000200 G      CONID  = 177777 G      C$PNTB= 000014       DRVERL  011162
AVL    = 000130 G      CF.MSC= 000100 G      CONTPA  002217 G       C$PNTF= 000017       DRVT    010772 G
AVLB   = 000040 G      CF.OTH= 000040 G      CONTRV  020532 G       C$PNTS= 000016       DSPSTP= 000004 G
AVLER    011556        CF.THS= 000020 G      CONT1   046742         C$PNTX= 000015       DSRNG0  010226 G
AVLT     010702 G      CHGF    050326        CONT2   047136         C$PUTB= 000072       DSRNG1  010312 G
AVU    = 000134 G      CHGFLG  002237 G      CORDMP  033734         C$PUTW= 000073       DSRNG2  010376 G
BADEL    013233        CHODAT  024502        COREL   012627         C$QIO  = 000377       DSRNG3  010462 G
BADER    011643        CLMD    047717        CORERL  011232         C$RDBU= 000007       DSTEL   013103
BADERL   011142        CLOCK   002212 G      COUNT   003404 G       C$REFG= 000047       DTCPER= 000070 G
BDMP     050262        CLREOT  033456 G      COUNTS  020202 G       C$REL  = 000077       DUMP    020347 G
BITO   = 000001 G      CLRMED  002226 G      CPRIEX  014350         C$RESE= 000033       DUMPKT  003344 G
BIT00  = 000001 G      CLSDRV  023444 G      CRD    = 177776 G      C$REVI= 000004       DUMP1   020430 G
BIT01  = 000002 G      CMD    = 000000 G     CRDLIM  010571 G       C$RFLA= 000021       DUMP2   020471 G
BIT02  = 000004 G      CMDASC  011322 G      CTPA    047370         C$RPT  = 000025       ECBEL   013001
BIT03  = 000010 G      CMDBF1  003566 G      C$AU   = 000052        C$SEFG= 000046       ECBERL  011272
BIT04  = 000020 G      CMDBF2  003636 G      C$AUTO= 000061         C$SPRI= 000041       ECCBC  = 000036 G
BIT05  = 000040 G      CMDBF3  003706 G      C$BRK  = 000022        C$SVEC= 000037       ECCDC  = 000026 G
BIT06  = 000100 G      CMDBF4  003756 G      C$BSEG= 000004         C$TOME= 000076       ECCFLG= 000100 G
BIT07  = 000200 G      CMDBLD  022002 G      C$BSUB= 000002         DATAEL  031424       ECCTC  = 000030 G
BIT08  = 000400 G      CMDCNT  003400 G      C$CLCK= 000062         DATBL   003472 G     ECDEL   012663
BIT09  = 001000 G      CMDER   011502        C$CLEA= 000012         DATER   011630       ECDERL  011312
BIT1   = 000002 G      CMDLST= 000001 G      C$CLOS= 000035         DATPAT= 000001 G     ECLK    047210
BIT10  = 002000 G      CMDONE= 000200 G      C$CLP1= 000006         DATT    010742 G     ECTEL   012707
BIT11  = 004000 G      CMDSEQ= 000006 G      C$CPBF= 000074         DAY     020125 G     ECTERL  011302
BIT12  = 010000 G      CMDSSV= 000012 G      C$CPME= 000075         DAYS    003564 G     EC1COR= 000050 G
BIT13  = 020000 G      CMDT    010652 G      C$CVEC= 000036         DCBEND  004032 G     EC2COR= 000052 G
BIT14  = 040000 G      CMDTBL  024366        C$DCLN= 000044         DCBSTP= 000050 G     EDCEXT  031232
BIT15  = 100000 G      CMD1    050470        C$DODU= 000051         DCB3SP= 000170 G     EDLEXT  032030
BIT2   = 000004 G      CMD2    050476        C$DRPT= 000024         DCMDBF  003572 G     EF.CON= 000036 G
BIT3   = 000010 G      CMD3    050504        C$DU   = 000053        DCMPER  012507       EF.EOT= 000010 G
BIT4   = 000020 G      CMD4    050512        C$EDIT= 000000         DCMPT   011112 G     EF.LOG= 000040 G
BIT5   = 000040 G      CMD5    050520        C$ERDF= 000055         DEVERR  013272 G     EF.NEW= 000035 G
BIT6   = 000100 G      CMD6    050526        C$ERHR= 000056         DEVEXT  014400       EF.PWR= 000034 G
BIT7   = 000200 G      CMD7    050534        C$ERRO= 000060         DEVFAT= 000001 G     EF.RES= 000037 G
BIT8   = 000400 G      CMLSER  012213        C$ERSF= 000054         DFPTBL  002204 G     EF.SEX= 000020 G
BIT9   = 001000 G      CMMDSQ  021406 G      C$ERSO= 000057         DIAGMC= 000000       EF.STA= 000040 G
BOE    = 000400 G      CMP    = 000030 G     C$ESCA= 000010         DMPBUF  002236 G     ELTEXT  032156
BOTER    011751        CMPDAT  032552 G      C$ESEG= 000005         DMPFLG  002231 G     ENDPAT= 000010 G
BOTT     011012 G      CMPEL   013030        C$ESUB= 000003         DPAT    050362       EOT    = 000004 G
BRCNT    003410 G      CMPER   012464        C$ETST= 000001         DQCMD   027662 G     EOTBIT= 000002 G
BUFADR   003422 G      CMPERL  011152        C$EXIT= 000032         DRBEN0  005072 G     EOTPR  = 000010 G
BUFDMP   034066        CMPERR  003444 G      C$FREQ= 000101         DRBEN1  006132 G     ERASE   024750
BUFDSC   025616        CMPPRI  014210        C$FRME= 000100         DRBEN2  007172 G     ERASGP  025006
BUFOFF= 000012 G       CMPT    010732 G      C$GETB= 000026         DRBEN3  010232 G     ERG    = 000120 G
```

Symbol table

```
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  030304 G
ERRDEI  030774 G
ERRDEL  031236 G
ERREXT  031014
ERRLOG= 040000 G
ERRMSG  013266 G
ERRNBR  013264 G
ERRTLY  032036 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   031142
ETLLY   032120 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  027316
EXC2A3  027340
EXC3A4  027362
EXC4A1  027404
EXIT    025722
EXTCLN  040434
EXTINT  040332
EXTSRT  032514
EX3REW  044204
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$TEST= 000001
GCMDST  025400
GCS    = 000210 G
GCSCFL= 000020 G
GCSEXT  027314
GCSHDL  026530 G
GCSREF  010552 G
GCSRFL= 000040 G
GO     = 000001 G
GO1     041060
GO2     043262
GO3     043720
GO4     044434
GO5     045014
GO6     045334
GO7     046012
GUNSTA  025440
GUS    = 000220 G
G$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    047241
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    050401
IDONE   026502
IDU    = 000040 G
IER    = 020000 G
ILCMD   025604
ILLCMD= 000007 G
ILOOP   026350
IMM    = 000200 G
IMMBIT= 000003 G
INIT    025342
INITER  012400
INITIT  040336 G
INT    = 000170 G
INTDON= 000001 G
INTERR= 000006 G
INTTBL  026520
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  037742
ITER    050443
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$JMP  = 000167
KWCSR  = 177546 G
KWHDL   021100 G
LEDB   = 000001 G
LEDER   012105
LEDT    011072 G
LEOTFL= 000030 G
LF.CON= 000100 G
LF.SNR= 000001 G
LF.SUC= 000200 G
LGPEL   013057
LGPERL  011202
LGSTAT  027720 G
LINE    020527 G
LOBYTE= 177776 G
LOE    = 040000 G
LOHEX   003552 G
LOOP    026340
LOOPS   010560 G
LOT    = 000010 G
LSTENT= 000134 G
LUNFLG= 000026 G
LUNSTP= 000172 G
LUN0    002314 G
LUN1    002506 G
LUN2    002700 G
LUN3    003072 G
L$ACP   002110 G
L$APT   002036 G
L$AU    040706 G
L$AUT   002070 G
L$AUTO  040370 G
L$CCP   002106 G
L$CLEA  040372 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    040700 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  046236 G
L$HIME  002120 G
L$HPCP  002016 G
L$HPTP  002022 G
L$HW    002204 G
L$ICP   002104 G
L$INIT  037004 G
L$LADP  002026 G
L$LAST  115736 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   034210 G
L$SOFT  046324 G
L$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  037002
L10010  040366
L10011  040370
L10012  040440
L10013  040704
L10014  040712
L10015  043114
L10016  043610
L10017  044266
L10020  044646
L10021  045166
L10022  045644
L10023  046232
L10024  046322
L10025  050542
L10026  115742
L10030  115746
MAXBUF= 020000 G
MAXITR= 003720 G
MDTB    047766
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  110552 G
MEDTBL  002227 G
MINBUF= 000024 G
MINITR= 000144 G
MINLIM  010570 G
MINT    047323
MINUTE  002214 G
MISSEQ= 000005 G
MSCPVR= 000000 G
MSGEXT  015670
MSGLEN= 177774 G
MSKTST  030762
MTBLOV= 000040 G
N     = 000004 G
NCLK    017770 G
NCLKFL= 000002 G
NOCL    050026
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  037202
NURESP= 100000 G
OBCTHD  023276 G
OBJECT  003520 G
OBJFDH= 000036 G
OBJFDL= 000034 G
OBOFFH= 000006 G
OBOFFL= 000004 G
OCTHEX  033370 G
ODDFLG= 000020 G
OFLER   011541
OFLT    010672 G
OLDBLK= 000152 G
OLDTRK= 000154 G
OLD1    026646
OLD2    026726
OLD3    027006
OLD4    027066
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    047533
PADING  002222 G
PASCNT  003522 G
PATCH   115612 G
PATCLR  033706
PATE    050163
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    050071
PDRECV  026106 G
PHB   = 000002 G
PKPRNT  015476
PNT   = 001000 G
POLER   012045
POLT    011052 G
PORTER  012266
PRI   = 002000 G
PRIERR  032536 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    047562
PRTCLR  026230 G
PRTDRV  025730 G
PRTEXT  031724
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   050552 G
RDBYT1= 000110 G
RDBYT2= 000112 G
RDBYT3= 000114 G
RDBYT4= 000116 G
RDERL   031560
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
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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  027426 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  033632 G
SDSTUP  033556 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    047471
SERCOR  002221 G
SEREXC= 000002 G
SERR    047425
SERREC  002220 G
SEXB   = 000004 G
SEXER   012063
SEXT    011062 G
SFPTBL  002212 G
SFTEXT  050542
SFTEX1  046740
SFTEX2  047134
SFTEX3  047206
SFTEX4  047366
SFTEX5  047560
SFTEX6  047764
SFTEX7  050132
SFTEX8  050360
SFTEX9  050466
SKD    = 000062 G
SKP    = 000060 G
SKPTMK  024610
SKR    = 000061 G
SLTUSE= 000010 G
SOER    047615
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    047660
SRTBL   031720
START   037044
START1  040752
START2  043154
START3  043612
START4  044326
START5  044706
START6  045226
START7  045704
STATER  012445
STATUS= 000004 G
STAT0   035464
STAT1   035467
STAT10  036222
STAT11  036272
STAT12  036344
STAT13  036405
STAT14  036430
STAT15  036453
STAT16  036525
STAT17  036577
STAT18  036647
STAT2   035533
STAT3   035600
STAT4   035660
STAT5   035705
STAT6   035752
STAT7   036024
STAT8   036071
STAT9   036143
STFPCK  024164 G
STINIT  037004 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.TM = 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$LSYM= 010000
S1     = 004000 G
S1READ= 000040 G
S1WRIT= 000044 G
S2READ= 000042 G
S2WRIT= 000046 G
TBLBTM= 000132 G
TBLEND= 003472 G
TBLFUL  036716 G
TBLOFF  003544 G
TBLSRT  032162 G
TBLTOP= 000130 G
TCNTFL= 000004 G
TESTPA  002232 G
TF.BLK= 000010 G
TF.GCR= 000004 G
TF.PE = 000002 G
TF.800= 000001 G
TIME    020044 G
TIMER   010556 G
TIMERR  012312
TKERR   026474
TKINIT= 111400 G
TKIP   = 000000 G
TKIPAD  046262
TKSA   = 000002 G
TKUNIT= 000004 G
TKUNT   046277
TMB    = 000010 G
TMCNT   003550 G
TMER    011771
TMT     011022 G
TRK    = 000000 G
TSPA    050134
TSTMSK  003440 G
TSTSTP= 000006 G
T$ARGC= 000004
T$CODE= 026004
T$ERRN= 000000
T$EXCP= 000000
T$FLAG= 000041
T$FREE= 115746
T$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      040714 G
T1EXIT  042624
T1LEOT  042644
T1ONL   042630
T1RD1   043050
T1RD2   043056
T1RD3   043064
T1RD4   043072
T1RD5   043100
T1RD6   043106
T1REW   042636
T1SKD   042776
T1SKP   042660
T1SKP1  042754
T1SKP2  042762
T1SKR   042666
T1SKR1  042724
T1SPC1  042674
T1SPC2  042702
T1SPC3  042710
T1SPO1  042716
T1SPO2  042732
T1SPO3  042740
T1SPR1  042746
T1SPR2  042770
T1WR1   043004
T1WR2   043012
T1WR3   043020
T1WR4   043026
T1WR5   043034
T1WR6   043042
T1WTM   042652
T2      043116 G
T2END  = 004716 G
T2EXIT  043534
T2LEOT  043560
T2RD    043566
T2REW   043544
T2SKD   043574
T2SPO   043602
T2WRT   043552
T3      043612 G
T3EXIT  044220
T3ON    050201
T3ONLY  002234 G
T3RD    044252
T3REW   044230
T3SPO   044260
T3WRT   044236
T3WTM   044244
T4      044270 G
T4EXIT  044620
T4REW   044624
T4WRT   044632
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Symbol table

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T4WTM   044640          T7CMD2  002246          UF.RMV= 000200 G        URDSRG= 000162 G        WR    = 000020 G
T5      044650 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    050222          T7CMD5  002270          UF.WPH= 020000 G        URSPBF= 000156 G        WRBYT3= 000124 G
T5EXIT  045146          T7CMD6  002276          UF.WPS= 010000 G        UWEEL   012760          WRBYT4= 000126 G
T5RD    045160          T7CMD7  002304          UNDROP= 000032 G        UWEERL  011242          WRERL   031504
T5REW   045152          T7END   002312          UNDRUN= 000072 G        U1OFF = 005040 G        WRITE   024462
T6      045170 G        T7EXIT  046222          UNITRV  020662 G        U2OFF = 002420 G        WRKMSK  003442 G
T6EXIT  045576          T7TBL   002232 G        UNJAM   033242 G        U3OFF = 001540 G        WRTBUF  070552 G
T6RD    045630          UAM   = 000200 G        UNLBIT= 000004 G        U4OFF = 001210 G        WTAPMK  024722
T6REW   045606          UCDEND= 000170 G        UNTEOT  020256 G        WDSTEL  011222          WTM   = 000100 G
T6SKD   045636          UCDSRG= 000166 G        UNTLOT  020312 G        WMSPOS= 000100 G        XFERST= 000010 G
T6WRT   045614          UDRNER  012541          UNTSTP= 000002 G        WPRB  = 000020 G        X$ALWA= 000000
T6WTM   045622          UDROP   003524 G        UNTTBL  003360 G        WPRBIT= 000005 G        X$FALS= 000040
T7      045646 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.  115746    000   (RW,I,GBL,ABS,OVR)
        000000    001   (RW,I,LCL,REL,CON)
Errors detected:  0

*** Assembler statistics


Work  file  reads: 331
Work  file writes: 328
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: 00:10:26.01
CZTKBA.BIN,CZTKBA.LST/-SP=SVC40R.MLB/ML,CZTKBA
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