

TSV05

TSV05 DATA REL  
CVTSEBO

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AH-T179B-MC  
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The main body of the image contains a grid of 120 small, illegible data plots or charts arranged in 10 rows and 12 columns. Each plot appears to be a technical drawing or a data visualization, but the text and figures within them are too small to read. The plots are arranged in a regular grid pattern across the page.

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IDENTIFICATION  
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PRODUCT CODE: AC-T1788-MC  
PRODUCT NAME: CVTSEBO TSV05 DATA RELIABILITY  
PRODUCT DATE: 25-APR-82  
MAINTAINER: CSS/PPG DIAGNOSTICS  
AUTHOR: DICK GORDON

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DEC	DECUS	DECTAPE	

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1.0 GENERAL INFORMATION

1.1 PROGRAM ABSTRACT

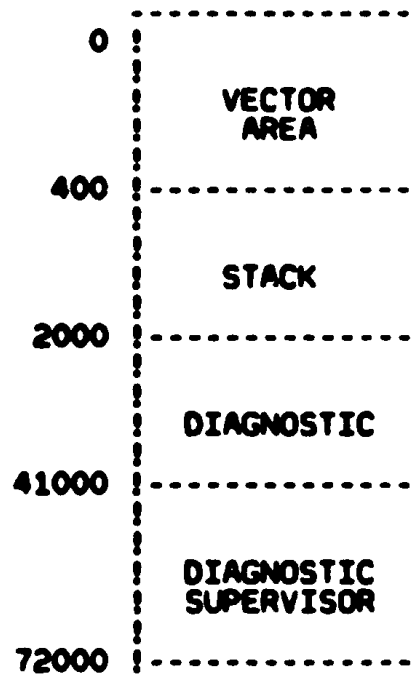
1.1.1 FUNCTIONAL DESCRIPTION

THIS PROGRAM CAN BE USED AS A BASIC FUNCTION TEST, A DATA RELIABILITY TEST, OR A COMPATIBILITY TEST.

1.1.2 STRUCTURE OF PROGRAM

THIS DIAGNOSTIC IS A SINGLE PROGRAM FROM THE STANDPOINT OF THE DIAGNOSTIC USER, BUT IT CONTAINS A CONTROL MODULE RELEASED INDEPENDENTLY AS A DIAGNOSTIC SUPERVISOR.

1.1.3 MEMORY MAP





276 OPERATIONAL ONES.  
 277  
 278 ALGORITHM  
 279  
 280 A WRITE RETRY SUBROUTINE IS CALLED BY THE RECOVERABLE ERROR SUBROUTINE WHICH IS  
 281 ENTERED UPON DETECTION OF A WRITE RECOVERABLE ERROR.  
 282 THE WRITE RETRY SUBROUTINE ATTEMPTS TO REWRITE THE RECORD IN SAME SPOT ON TAPE  
 283 4 TIMES.  
 284  
 285 IF ALL 4 REPEATS ARE GOOD, THE RECORD IS CONSIDERED AS RECOVERED AND  
 286 A RECOVERABLE WRITE ERROR IS LOGGED AT THAT RECORD NUMBER.  
 287  
 288 IF ANY OF THE 4 REWRITE ATTEMPTS FAIL, THE ROUTINE WILL ERASE THE BAD RECORD, AND LO  
 G SUSPECTED  
 289 BAD SPOT AT THAT RECORD NUMBER, THE ROUTINE WILL THEN ATTEMPT TO  
 290 WRITE THE RECORD AGAIN 3 INCHES FURTHER DOWN TAPE AND  
 291 RETRY THIS SEQUENCE 4 TIMES, FOR UP TO 4 REPEATS EACH.  
 292  
 293 IF A RECORD CANNOT BE WRITTEN WITHOUT RECOVERABLE ERRORS AFTER 4 RETRIES,  
 294 THEN THE ROUTINE WILL ERASE THE RECORD AND REPORT RETRY FAILED ON BAD SPOT.  
 295  
 296 THE RECOVERABLE ERROR SUBROUTINE THEN CONTINUES TO CALL THE WRITE  
 297 RETRY SUBROUTINE, WHICH REISSUES THE GROUP OF 4 RETRIES,  
 298 UNTIL THE RECORD IS RECOVERED OR 20 BAD SPOTS HAVE BEEN LOGGED .  
 299  
 300 TWENTY (20) BAD SPOTS MAXIMUM ARE ALLOWED PER BOT TO EOT PASS OF TAPE.  
 301 WHEN 20 BAD SPOTS HAVE BEEN LOGGED, WHETHER ON THE SAME RECORD NUMBER OR NOT,  
 302 TAPE IS CONSIDERED DEFECTIVE; A BAD TAPE OVERFLOW MESSAGE IS PRINTED  
 303 AND THE UNIT IS REWOUND, THEN DROPPED.  
 304  
 305 DURING THE RECOVERY PROCESS, IT IS NECESSARY TO PERFORM SEVERAL TAPE  
 306 POSITIONING OPERATIONS: SPACE REVERSE, ERASE. IF A POSITION ERROR  
 307 IS DETECTED IN THE STATUS WORD DURING THOSE OPERATIONS, THEN THE RECOVERY ATTEMPT IS  
 ABORTED.  
 308 AN APPROPRIATE UNRECOVERABLE ERROR MESSAGE IS PRINTED AND THE UNIT IS DROPPED.  
 309  
 310 ALL BADLY WRITTEN RECORDS LOGGED WITH RECOVERABLE ERRORS ARE ERASED  
 311 UNTIL RECOVERED, INCLUDING THE RECORD AT THE 20TH BAD SPOT,  
 312 SO THAT ALL RECORDS LEFT ON TAPE ARE KNOWN GOOD WRITTEN RECORDS.  
 313  
 314 BAD SPOTS ARE ERASED WITH ERASE GAPS FROM 3 TO 12 INCHES PER RETRY GROUP.  
 315 UP TO 20 FEET OF ERASE GAP COULD RESULT WHEN RETRYING TO RECOVER  
 316 A SINGLE RECORD.  
 317 THAT LONG S.ETCH OF BAD TAPE WOULD THEN BE LOGGED WITH 20  
 318 BAD SPOTS AT SAME RECORD NUMBER AND THE TAPE CONSIDERED DEFECTIVE.  
 319  
 320 BAD SPOTS REPORTS  
 321  
 322 IF THE PRINTING OF RECOVERABLE ERRORS IS ENABLED, THE BAD SPOTS ON TAPE ARE  
 323 IDENTIFIED AS THEY ARE DETECTED. SINCE THE BAD RECORDS ARE ERASED UNTIL RECOVERED,  
 324 THE BAD SPOT ACTUALLY PRECEDES THE RECORD NUMBER THAT IDENTIFIES IT.  
 325 THE NUMBER OF REPEATS AND RETRIES ATTEMPTED IS PRINTED, FROM WHICH THE  
 326 LENGTH OF ERASE GAPS CAN BE DETERMINED: APPROXIMATELY 3 INCHES PER RETRY.  
 327  
 328 THE STATISTICAL REPORT PRINTED AT THE END OF TEST 2 OR UPON A "PRINT" REQUEST,  
 329 CONTAINS A SUMMARY OF THE BAD SPOTS LOGGED ON THE CURRENT PASS OF TAPE.  
 330 IN THAT REPORT, ALL COUNTS ARE CUMULATIVE FROM PASS TO PASS, EXCEPT FOR  
 331 THE NUMBER OF BAD SPOTS; IT RELATES TO A "BOT TO EOT TAPE PASS" ONLY.  
 332 FOR THIS PURPOSE, A "TAPE PASS" IS A WRITE PASS FROM BOT TO EOT, OR FROM

333  
334  
LL THE TESTS REQUESTED

BOT TO WHERE THE DIAGNOSTIC IS HALTED BEFORE REACHING EOT.  
DON'T CONFUSE THIS WITH A PASS BY THE SUPERVISOR WHICH IS DEFINED AS A RUN THROUGH A  
ON ALL UNITS SELECTED. THOSE PASSES ARE IDENTIFIED AS "PASS" AND "EOP".

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THE NUMBER OF WRITE RETRIES, CUMULATIVE FROM PASS TO PASS, IS A GLOBAL  
COUNT OF HOW MANY TIMES THE GROUP OF 4 RETRIES HAS BEEN CALLED.

THE NUMBER OF WRITE RECOVERABLE ERRORS EXCLUDES BAD TAPE SPOTS  
AND REFLECTS THE SPECIFICATIONS OF THE HARDWARE UNDER TEST.

TO CLEAR CUMULATIVE COUNTS, ANSWER 'Y' TO: CLEAR COUNTERS (L) Y ?.  
THE BAD TAPE SPOTS COUNT IS THEN CLEARED WHEN WRITING THE TAPE FROM BOT.

IF TEST 2 IS HALTED, THEN RESTARTED OR CONTINUED, THE RECORD COUNT  
IS RESET TO ZERO AND THE BAD SPOT ID SHALL FOLLOW THAT RESET COUNT.

SINCE ALL WRITTEN RECORDS ARE KNOWN GOOD, THE READ ERRORS CAN  
BE ATTRIBUTED TO TRANSIENT NOISE, TRANSIENT ELECTRICAL MALFUNCTIONS,  
OR CONTAMINANTS ON TAPE AS OPPOSED TO TAPE DEFECTS.

THE SAME RECORDS MUST BE WRITTEN FROM TAPE PASS TO TAPE PASS  
FOR THE BAD SPOTS ID TO REMAIN CONSISTENT IN THOSE TAPE PASSES.

EXAMPLE OF A PRINT OUT FOR A BAD SPOT ON TAPE:

```
CVTSE SFT ERR 00009 ON UNIT 00 TST 002 SUB 000 PC: 012100
RECOVERABLE ERROR
WRT CMD FAILED - UNIT 0 PASS: 1 RECORD: 6
PREVIOUS CMD WAS WRT
CNDPKT TSBA RFC TSSR TCC
100205 002406 000000 100210 4
026600
000000
003107
XST0 XST1 XST2 XST3 XST4
000350 000002 100400 000000 000000
SUSPECT BAD SPOT AFTER 1 RETRY, 2 REPEAT
SUSPECT BAD SPOT AFTER 2 RETRY, 1 REPEAT
SUSPECT BAD SPOT AFTER 3 RETRY, 1 REPEAT
SUSPECT BAD SPOT AFTER 4 RETRY, 3 REPEAT
RETRY FAILED ON BAD SPOT...ERASED!
SUSPECT BAD SPOT AFTER 1 RETRY, 1 REPEAT
SUSPECT BAD SPOT AFTER 2 RETRY, 1 REPEAT
```

```
CVTSE SFT ERR 00009 ON UNIT 00 TST 002 SUB 000 PC: 012100
RECOVERABLE ERROR
WRT CMD FAILED - UNIT 0 PASS: 1 RECORD:10210
PREVIOUS CMD WAS WRT
CNDPKT TSBA RFC TSSR TCC
100205 002406 000000 100210 4
026600
000000
004000
XST0 XST1 XST2 XST3 XST4
000350 000002 100010 000000 000000
RECOVERED ON RETRY # 1
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UNIT 0 PASS: 1 RECORD:10210  
 BYTES WRITTEN 0,272,279,691  
 BYTES READ REV 0,301,123,654  
 BYTES READ REV 0,301,120,381

	WRT	RDR	RDF
RECOVERABLE ERRORS	1	0	0
UNRECOVERABLE ERRORS	0	0	0
WRITE RETRIES	3		

2 BAD SPOTS THIS TAPE PASS PRECEDING RECORD #:

SPEC COND	HARD	FATAL	COMPARE
2	0	0	0

DR>

THIS EXAMPLE SHOWS:

RECORD 6 RECOVERED ON 2ND RETRY GROUP  
 THE 2 BAD SPOTS RESIDE IN A 18 INCH ERASE GAP BETWEEN RECORDS 5 AND 6  
 RECORD 10210 RECOVERED ON 1ST RETRY OF 4 GOOD REPEATS  
 3 WRITE GROUP RETRIES ATTEMPTED, RESULTING IN:  
 1 RECOVERABLE WRT ERR FROM RECORD 10210  
 2 BAD SPOTS BETWEEN RECORDS 5 AND 6

#### 1.1.4.3.2 OPERATIONAL WRITE-ERROR-RECOVERY ALGORITHM

WHEN THIS ALGORITHM IS SELECTED, THE TSV05 WRITE RETRY COMMAND IS ISSUED UP TO 16 TIMES OR UNTIL RECORD IS RECOVERED, ON A WRITE RECOVERABLE ERROR. THE WRITE RETRY COMMAND CONSISTS OF A SPACE REVERSE OVER THE BAD RECORD, THEN AN ERASE OF 3 INCHES OF TAPE AND REWRITE OF THE RECORD. THAT COMPOSITE COMMAND DOES NOT ALLOW THE DETECTION OF BAD SPOTS ON TAPE. THEREFORE NO BAD TAPE SPOTS STATUS IS PRINTED.

IF RECORD CANNOT BE RECOVERED AFTER 16 WRITE RETRY COMMANDS, A RETRY LIMIT EXCEEDED IS FLAGGED AND UNIT IS DROPPED.

#### 1.1.4.4 DIAGNOSTIC TIMING ADJUSTMENT

A NUMBER OF SUPERVISOR TIMING DELAY MACROS, KNOWN AS WATCH DOG DELAYS, ARE CALLED BY THE DIAGNOSTIC TO WAIT FOR VARIOUS COMMANDS COMPLETION. THESE DELAYS ARE NOT CALIBRATED AND SIMPLY EXPANDS INTO AN INLINE NESTED LOOP PAIR. THE COUNT FOR THE OUTER LOOP COMES FROM THE VARIABLE ARGUMENT SUPPLIED BY THE DELAY CALLS. THE COUNT FOR THE INNER LOOP COMES FROM THE FIXED "HEADER" ELEMENT "LIDLY". AS THE DIAGNOSTIC IS RUN ON DIFFERENT CPU'S, THESE DELAYS WILL VARY IN LENGTH WITH MEMORY SPEED.

IF TIME-OUT OCCURS WHEN NO APPARENT MALFUNCTIONS IN THE TAPE UNIT IS EVIDENT, ALL TIMINGS OF THE DIAGNOSTIC MAY BE ADJUSTED TO MATCH MEMORY SPEED AND NOT RESULT IN TIME-OUTS, BY PATCHING

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THAT FIXED DELAY ELEMENT "L#DLY".

A PRESET COUNT OF 500 RESIDES AT "L#DLY" IN LOCATION 2116 OF THE  
"HEADER" SECTION.

## 1.2 SYSTEM REQUIREMENTS

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### 1.2.1 HARDWARE REQUIREMENTS

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PDP-11/23 PROCESSOR WITH 32K OR MORE OF MEMORY  
CONSOLE DEVICE (VT52,LA36,ETC.)  
PROGRAM LOAD DEVICE  
TSV05/TS05

### 1.2.2 SOFTWARE REQUIREMENTS

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DIAGNOSTIC SUPERVISOR

## 1.3 RELATED DOCUMENTS AND STANDARDS

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DIGITAL EQUIPMENT CORPORATION DOCUMENTS:

1. CIQPMAO XXDP. PROGRAMMER'S MANUAL; DOCUMENT NUMBER AC-S296A-AC  
DATE: 14 JULY 1980.
2. TSV05 TRANSPORT SUBSYSTEM USER'S GUIDE; DOCUMENT NUMBER EK-TSV05-UG-001  
DATE: AUGUST 1982
3. TSV05 TRANSPORT SUBSYSTEM TECHNICAL MANUAL; DOCUMENT NUMBER EK-TSV05-TM-001  
DATE: AUGUST 1982
4. TSV05 TRANSPORT SUBSYSTEM INSTALLATION MANUAL; DOCUMENT NUMBER EK-TSV05-IN-001  
DATE: AUGUST 1982

## 1.4 DIAGNOSTIC HIERARCHY PREREQUISITES

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ORDER OF HOST CPU DIAGNOSTIC USAGE:

- 1) CONTROL LOGIC PROGRAM - ALL TESTS.  
(VTSA,VTSB,VTSC,VTSD)
- 2) DATA RELIABILITY PROGRAM:
  - A) BASIC FUNCTION TEST.
  - B) DATA RELIABILITY TEST.

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1.5 ASSUMPTIONS

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THE HARDWARE OTHER THAN THE SUBSYSTEM BEING TESTED IS ASSUMED TO WORK PROPERLY. FALSE ERRORS MAY BE REPORTED IF THE PROCESSOR, MEMORY, ETC., DO NOT FUNCTION PROPERLY.  
VTSA, VTSB, VTSC, AND VTSD HAVE ALL SUCESSFULLY RUN WITHOUT ERRORS.

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## 2.0 OPERATING INSTRUCTIONS

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

### COMMANDS

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

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

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

### OPERATOR COMMANDS

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THE TSV05 DIAGNOSTIC IS A PDP-11/23 DIAGNOSTIC SUPERVISOR COMPATIBLE  
PROGRAM. ALL LOADING AND RUNTIME INSTRUCTIONS CAN BE REFERENCED IN THE  
PDP-11 PROGRAMMER'S MANUAL "CIGPHAO XXDP+ PROGRAMMERS MANUAL, NUMBER  
AC-S296A-AC. THE USER ENTRY IS IN QUOTES.

### BOOT THE DIAGNOSTIC XXDP MEDIA

```
CHMDLBO XXDP+ DL MONITOR 28K
BOOTED VIA UNIT 0
ENTER DATE (DD-MMM-YR): " ENTER DATE OR JUST <CR> "
RESTART ADDRESS: 153726
50 HZ? N " <CR> "
LSI? N " Y<CR> "
THIS IS XXDP+. TYPE "H" OR "H/L" FOR DETAILS
R VTSEA0
VTSEA0BINDRS LOADED
DIAG. RUN-TIME SERVICES REV D. APR 79
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CVTSE-A-0  
TSV05 DATA RELIABILITY  
UNIT IS TSV05

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

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

EXAMPLE OF SWITCH USAGE:

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

THE EFFECT OF THIS COMMAND WILL BE: 1) TESTS 1 THROUGH 5 WILL BE EXECUTED, 2) ALL UNITS WILL BE TESTED 1000 TIMES AND 3) THE END OF PASS MESSAGES WILL BE PRINTED AFTER EACH 100 PASSES ONLY. A SWITCH CAN BE RECOGNIZED BY THE FIRST THREE CHARACTERS. YOU MAY, FOR EXAMPLE, TYPE "/TES:1-5" INSTEAD OF "/TESTS:1-5".

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

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

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## FLAGS

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

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

\*ERROR MESSAGES ARE DESCRIBED IN SECTION 3.1

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

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

## 2.1 HARDWARE PARAMETERS

-----  
 ON A "N" RESPONSE TO "CHANGE HW?", THE DIAG SHALL RUN ASSUMING ONE UNIT AT TSOB = 172520 WITH A VECTOR = 224 AND DRIVE=0.

ON A "Y" RESPONSE TO "CHANGE HW?" QUESTION, THEN THE FOLLOWING QUESTIONS WILL BE ASKED ON A START COMMAND. THE VALUE LOCATED TO THE LEFT OF THE QUESTION MARK IS THE DEFAULT VALUE THAT WILL BE TAKEN ON A CARRIAGE RETURN RESPONSE.

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TSDB ADDRESS (0) 172520 ?

VECTOR (0) 224 ?

SELECT DRIVE 0-1 (0) ?

THE VALIDITY OF THESE PARAMETERS CAN BE CHECKED BEFORE RUNNING THE TESTS BY SETTING THE FLAG "ADR" ON A STA, RES OR CON COMMAND. THE SO CALLED AUTO DROP CODE SHALL THEN BE EXECUTED AFTER THE INIT CODE AND BEFORE THE HARDWARE TESTS ARE RUN. THAT CODE FIRST TESTS THE ADDRESS OF THE TSDB(S). IF NO RESPONSE, IT DROPS THE UNIT(S) IMMEDIATELY WITH THE FOLLOWING MESSAGE:

BUS TRAP AT XXXXXX ( XXXXXX = TSDB AD )  
INTERFACE BAD OR NOT SET TO ABOVE ADDRESS.

ON A RESPONSE FROM THE INTERFACE, THE UNITS THAT ARE NOT READY OR NOT ON-LINE ARE DROPPED IMMEDIATELY. THE HARDWARE TESTS SHALL THEN BE RUN ON RESPONDING UNITS.

IF THE "ADR" FLAG IS NOT SET, THE READY AND OFF-LINE STATUS OF THE DRIVE IS CHECKED. A MESSAGE SHALL BE PRINTED EVERY SO OFTEN TO WARN THE OPERATOR OF DRIVES BEING NOT READY OR OFF-LINE. THESE DRIVES SHALL BE DROPPED AFTER A REASONABLE AMOUNT OF TIME.

## 2.2 SOFTWARE PARAMETERS

-----

THE FOLLOWING QUESTIONS ARE ASKED WHEN ONE ANSWERS YES TO THE CHANGE SOFTWARE QUESTION ON A START, RESTART, OR CONTINUE. THEY ALLOW FLEXABILITY IN THE WAY THE PROGRAM BEHAVES.

CLEAR COUNTERS (L) Y ?

RESET RANDOM VARIABLES (L) N ?

PRINT RECOVERABLE ERRORS (L) N ?

HALT AFTER EACH CMD (L) N ?

INHIBIT RECOVERY (L) N ?

BAD TAPE SPOT DETECTION (L) Y ?

DISABLE INTERRUPTS (L) N ?

INHIBIT RFC ERROR REPORTS (L) N ?

CHANGE CMD SEQUENCE (L) N ? (SEE NOTE1:)

DEFAULT SWITCH SETTINGS (L) Y ?

100IPS (L) N ?

WRITE BUFFERING (L) N ?

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READ BUFFERING (L) N ?

ANSWERING NO TO THE DEFAULT SWITCH QUESTION WILL CAUSE THE 100 IPS QUESTION TO BE ASKED.

ANSWERING YES TO THE 100 IPS QUESTION WILL INHIBIT THE LAST TWO QUESTIONS.

ANSWERING NO TO THE 100 IPS QUESTION WILL CAUSE THE WRITE BUFFERING QUESTION TO BE ASKED.

ANSWERING YES TO THE WRITE BUFFERING QUESTION WILL INHIBIT THE LAST QUESTION.

ANSWERING NO TO THE WRITE BUFFERING QUESTION WILL CAUSE THE READ BUFFERING QUESTION TO BE ASKED.

NOTE1: THIS QUESTION SHOULD BE ANSWERED (N) UNLESS AN OPERATOR SELECTED SEQUENCE IS TO BE EXECUTED. IF THIS QUESTION WAS ANSWERED Y, THE FOLLOWING QUESTIONS MUST BE ANSWERED OR DEFAULTED WITH A <CR> ONLY:

CHARACTERISTICS CODE (O) 40 ?	(0,20,40,200)	(OCTAL)
CMD/2 (D) 13 ?	(1-27)	(DECIMAL)
BRF COUNT (D) 1 ?	(1-2K)	(DECIMAL)
# OF OPERATIONS (D) 1 ?	(1-32K)	(DECIMAL)
PATTERN (D) 7 ?	(0-8)	(DECIMAL)
CMD/3 (D) 4 ?	(1-27)	(DECIMAL)
BRF COUNT (D) 2048 ?	(1-2K)	(DECIMAL)
# OF OPERATIONS (D) 32000 ?	(1-32K)	(DECIMAL)
PATTERN (D) 7 ?	(0-8)	(DECIMAL)
CMD/4 (D) 3 ?	(1-27)	(DECIMAL)
BRF COUNT (D) 2048 ?	(1-2K)	(DECIMAL)
# OF OPERATIONS (D) 32000 ?	(1-32K)	(DECIMAL)
PATTERN (D) 7 ?	(0-8)	(DECIMAL)
CMD/5 (D) 2 ?	(1-27)	(DECIMAL)
BRF COUNT (D) 2048 ?	(1-2K)	(DECIMAL)
# OF OPERATIONS (D) 32000 ?	(1-32K)	(DECIMAL)
PATTERN (D) 7 ?	(0-8)	(DECIMAL)
CMD/6 (D) 13 ?	(1-27)	(DECIMAL)
BRF COUNT (D) 1 ?	(1-2K)	(DECIMAL)
# OF OPERATIONS (D) 1 ?	(1-32K)	(DECIMAL)
PATTERN (D) 7 ?	(0-8)	(DECIMAL)
CMD/7 (D) 27 ?	(1-27)	(DECIMAL)
BRF COUNT (D) 2048 ?	(1-2K)	(DECIMAL)
# OF OPERATIONS (D) 32000 ?	(1-32K)	(DECIMAL)
PATTERN (D) 7 ?	(0-8)	(DECIMAL)
CMD/8 (D) 27 ?	(1-27)	(DECIMAL)
BRF COUNT (D) 2048 ?	(1-2K)	(DECIMAL)
# OF OPERATIONS (D) 32000 ?	(1-32K)	(DECIMAL)
PATTERN (D) 7 ?	(0-8)	(DECIMAL)

NOTE: THE PROGRAM AUTOMATICALLY INSERTS A CHARACTERISTIC CODE OF 40 AS THE FIRST COMMAND IN THE SEQUENCE TABLE. IF A DIFFERENT CHARACTERISTIC IS DESIRED, THE OPERATOR SHOULD



ENTER THAT CHARACTERISTIC CODE. A TOTAL OF 7 COMMANDS MAY BE ENTERED IN ADDITION TO THE SET CHARACTERISTICS COMMAND. IF THE OPERATOR WISHES TO USE LESS THAN 7 COMMANDS, AN END COMMAND MUST BE ENTERED AND THEN A CONTROL Z (↑Z) CAN BE ENTERED TO TERMINATE SOFTWARE DIALOGUE.

### 2.2.1 COMMAND LIST FOR USE IN SOFTWARE DIALOGUE.

CODE	COMMAND	DESCRIPTION
1	DRI	DRIVE INITIATE.
2	RDF	READ FORWARD.
3	RDR	READ REVERSE.
4	WRT	WRITE.
5	WTV	WRITE/VERIFY. IE. WRITE N RECORDS; READ REVERSE AND CHECK N RECORDS OF DATA; READ FORWARD AND CHECK N RECORDS.
6	SRF	SPACE RECORDS FORWARD.
7	SRR	SPACE RECORDS REVERSE.
8	RNR	READ NEXT REVERSE, IE. SPACE FWD, READ REV.
9	RNF	READ NEXT FORWARD, IE. READ FWD, SPACE REV.
10	RPF	READ PREVIOUS FWD, IE. SPACE REV, READ FWD.
11	RPR	READ PREVIOUS REV, IE. READ REV, SPACE FWD.
12	WRR	WRITE RETRY.
13	RWD	REWIND.
14	MBR	MESSAGE BUFFER RELEASE.
15	WTH	WRITE TAPE MARK.
16	WTR	WRITE TAPE MARK RETRY.
17	SFF	SPACE FILES FORWARD.
18	SFR	SPACE FILES REVERSE.
19	GES	GET EXTENDED STATUS.
20	ERS	ERASE 3 INCHES OF TAPE.
21	UNL	UNLOAD.
22	CLN	CLEAN TAPE
23	SCH	SET DEVICE CHARACTERISTIC. WHERE BRF=200, 40, 20, 0. 200 = ENABLE SKIP TAPE MARKS STOP (STOP AT LOGICAL EOT) 40 = ENABLE ATTENTION INTERRUPTS. 20 = ENABLE MESSAGE BUFFER RELEASE INTERRUPTS. SEE TSV05/TS05 PROGRAMMING SPECIFICATION FOR DESCRIPTION.
25	JMP	JUMP TO THE NTH COMMAND IN THE COMMAND SEQUENCE TABLE, WHERE N IS DEFINED IN THE BRF FIELD. THE NUMBER OF JUMPS IS ENTERED IN THE # OF OPERATIONS FIELD
26	DLY	DELAY "N" MILLISECONDS WHERE N IS DEFINED IN THE # OF OPERATIONS.
27	END	END OF COMMAND SEQUENCE.

### 2.2.2 DATA PATTERN LIST FOR USE IN SOFTWARE DIALOGUE.

PATTERN #	DESCRIPTION.
0	INCREMENTING PATTERN. 0 - 377.
1	ALL "1"'S PATTERN.
2	ALL "0"'S PATTERN.
3	"1" BIT WALKING FROM R TO L IN A FIELD OF "0"'S.
4	"0" BIT WALKING FROM R TO L IF A FIELD OF "1"'S.
5	ALTERNATING "1" AND "0" BITS WITH ALTERNATE BYTES COMPLIMENTED.
6	ALTERNATING BYTES OF 000 AND 377.

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E2

CVTSEBO TSV05 DATA RELIABILITY MACRO M1113 30-NOV-83 10:17

SEQ 017

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RANDOM DATA PATTERN.  
NO PATTERN GENERATION.

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2.3 EXAMPLES OF SOFTWARE DIALOGUE

CHANGE HW (L) ?  
#UNITS (D) ?  
TSDB ADDRESS (O) 172520 ?  
VECTOR (O) 224 ?  
SELECT DRIVE 0-1 (O) ?

IN ADDITION, ON A START, RESTART OR CONTINUE THE SUPERVISOR REQUESTS CHANGES TO THE SOFTWARE OPERATING PARAMETERS, AS FOLLOWS:

CHANGE SW (L) ?

2.3.1 BASIC FUNCTION AND DATA RELIABILITY WITH ALL ERROR REPORTING ENABLED

- A) RECEIVE PROMPT (DR>)
- B) ENTER STA/TES:1-2<CR>
- C) ANSWER HARDWARE QUESTIONS.
- D) PROCEED WITH THE FOLLOWING DIALOGUE:

CHANGE SW (L) ? Y<CR>

CLEAR COUNTERS (L) N ? Y<CR>

RESET RANDOM VARIABLES (L) N ? <CR>

PRINT RECOVERABLE ERRORS (L) N ? Y<CR>

HALT AFTER EACH CMD (L) N ? <CR>

INHIBIT RECOVERY (L) N ? <CR>

BAD TAPE SPOT DETECTION (L) Y ? <CR>

DISABLE INTERRUPTS (L) N ? <CR>

INHIBIT RFC ERROR REPORT (L) N ? <CR>

CHANGE CMD SEQUENCE (L) N ? <CR>

DEFAULT SWITCH SETTINGS (L) Y ? <CR>

2.3.2 TO SET UP A SCOPE LOOP FOR A FAILURE IN BASIC FUNCTIONS.

- A) RECEIVE PROMPT (DR>)
- B) ENTER STA/TES:1/FLA:LOE:IER:ISR:IDU<CR>
- C) ANSWER HARDWARE QUESTIONS.
- D) PROCEED WITH THE FOLLOWING DIALOGUE:

CHANGE SW (L) ? Y<CR>

CLEAR COUNTERS (L) N ? Y<CR>

RESET RANDOM VARIABLES (L) N ? N<CR>

PRINT RECOVERABLE ERRORS (L) N ? N<CR>

HALT AFTER EACH CMD (L) N ? N<CR>

INHIBIT RECOVERY (L) N ? N<CR>

BAD TAPE SPOT DETECTION (L) Y ? N<CR>

DISABLE INTERRUPTS (L) N ? N<CR>

```

918          INHIBIT RFC ERROR REPORT (L) N ?          Y<CR>
919          CHANGE CMD SEQUENCE (L) N ?              N<CR>
920          DEFAULT SWITCH SETTINGS (L) Y ?          <CR>
921
922

```

### 2.3.3 TO SET UP A SCOPE LOOP FOR A FAILURE IN DATA RELIABILITY

- A) RECEIVE PROMPT (DR>)  
 B) ENTER STA/TES:5/FLA:IER:ISR:IDU/EOP:1000<CR>  
 C) ANSWER HARDWARE QUESTIONS.  
 D) PROCEED WITH THE FOLLOWING DIALOGUE:

```

930          CHANGE SW (L) ?                          Y<CR>
931          CLEAR COUNTERS (L) N ?                   Y<CR>
932          RESET RANDOM VARIABLES (L) N ?           N<CR>
933          PRINT RECOVERABLE ERRORS (L) N ?         N<CR>
934          HALT AFTER EACH CMD (L) N ?              N<CR>
935          INHIBIT RECOVERY (L) N ?                 N<CR>
936          BAD TAPE SPOT DETECTION (L) Y ?          N<CR>
937          DISABLE INTERRUPTS (L) N ?               Y<CR>
938          INHIBIT RFC ERROR REPORT (L) N ?         Y<CR>
939          CHANGE CMD SEQUENCE (L) N ?              Y<CR>
940          CHARACTERISTICS CODE (O) 40 ?            40<CR>
941          CMD/2 (D) 5 ?                             13<CR>      (REWIND)
942          BRP COUNT (D) 2048 ?                     1<CR>
943          # OF OPERATIONS (D) 10 ?                  1<CR>
944          PATTERN (D) 7 ?                           1<CR>
945          CMD/3 (D) 5 ?                             4<CR>      (WRITE)
946          BRP (D) 2048 ?                           1000<CR>
947          # OF OPERATIONS (D) 10 ?                 10000<CR>
948          PATTERN (D) 7 ?                           1<CR>
949          CMD/4 (D) 5 ?                             27<CR>      (END)
950          BRP (D) 2048 ?                            <+Z>

```

## 2.4 EXECUTION TIMES

-----

### 2.4.1 SYSTEM CONFIGURATION

-----

```

PDP11/23
MOS MEMORY
LA36
T 5/TS05

```

### 2.4.2 TEST EXECUTION TIMES (2400 FT. TAPE)

-----

```

TEST 1 - BASIC FUNCTIONS - 30 SECONDS PER PASS.
TEST 2 - DATA RELIABILITY - 45 MINUTES PER PASS.
TEST 3 - WRITE COMPATABILITY - 20 MINUTES PER PASS.
TEST 4 - READ COMPATABILITY - 20 MINUTES PER PASS.
TEST 5 - RANDOM/OPERATOR SELECTED SEQUENCE -20 MINUTES PER PASS.

```

NOTE: ALL EXECUTION TIMES ARE SHOWN FOR ONE DRIVE OPERATION.

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### 3.0 ERROR INFORMATION

-----

#### 3.1 ERROR REPORTING

-----

ALL ERROR REPORTS EXCEPT FOR ERRORS #1 AND #17 INCLUDE A DUMP OF THE FOLLOWING INFORMATION:

ERROR #, TEST #, SUBTEST #, PROGRAM COUNTER, UNIT #, COMMAND, PREVIOUS COMMAND, PASS COUNT, # OF RECORDS FROM BOT, RECORD READ COUNT, THE COMMAND PACKET, TSSR, TCC, TSBA, RFC, AND THE EXTENDED STATUS REGISTERS (SEE 2.3.14.1 FOR LIST OF COMMANDS).

#### STANDARD ERROR REPORT FORMAT:

```
CVTSE SFT ERR XXXXX TST XXX SUB XXX PC: XXXXXX
(ASCII ERROR MESSAGE)
XXX CMD FAILED - UNIT X PASS: XXXXX RECORD: XXXXX
PREVIOUS CMD WAS XXX ▲ RECORD READ: XXXXX ▲
CMDPKT TSBA RFC TSSR TCC
XXXXXX XXXXXX XXXXXX XXXXXX X
XXXXXX
XXXXXX
XXXXXX
XST0 XST1 XST2 XST3 XST4
XXXXXX XXXXXX XXXXXX XXXXXX XXXXXX
```

#### ▲ CAUTION ▲

INTERPRET THAT "RECORD READ" COUNT WITH CAUTION. IF VERY DIFFERENT FROM RECORD COUNT TRACKED BY THE DIAGNOSTIC, TAPE POSITION IS NOT NECESSARELY LOST. ERRORS IN READING THAT RECORD MIGHT HAVE CAUSED RECORD COUNT TO BE ERRONEOUSLY READ FROM TAPE. IN TEST 2, IF DIAGNOSTIC IS RESTARTED OR CONTINUED, RECORD COUNT IS RESET TO ZERO ALTHOUGH THE TAPE IS NOT REWOUND. THIS IS NECESSARY BECAUSE THERE IS NO ACCURATE WAY TO DETERMINE ON WHAT RECORD COUNT OF WHICH UNIT THE DIAGNOSTIC WAS HALTED BEFORE RESTARTING OR CONTINUING. IT IS SUGGESTED THAT A "PRINT" BE REQUESTED WHEN HALTING DIAG TO GET A PRINT OF THE RECORD COUNT WHEN HALTED.

#### EXAMPLE OF AN ERROR REPORT:

```
CVTSE SFT ERR 00009 TST 002 SUB 000 PC: 010606
RECOVERABLE ERROR
WRT CMD FAILED - UNIT 2 PASS: 2 RECORD: 254
PREVIOUS CMD WAS WRT
CMDPKT TSBA RFC TSSR TCC
100005 002324 000000 100210 4
051766
000000
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XST0	XST1	XST2	XST3	XST4
000350	000002	100004	000000	040055

3.1.1 ERROR #1 - COMMAND PACKET ADDRESS NOT ON A MODULO 4 BOUNDARY:

IF THIS ERROR IS REPORTED, THE PROGRAM DID NOT LOAD PROPERLY. THIS IS A SYSTEM FATAL ERROR AND THE PROGRAM MUST BE RELOADED TO CORRECT IT.

3.1.2 ERROR #2 - TS05 NOT READY:

BEFORE ANY COMMAND IS ISSUED TO THE TS05, THE SUBSYSTEM READY BIT IN THE TSSR IS CHECKED. IF THE SSR IS NOT SET, THE PROGRAM REPORTS THE NOT READY ERROR. THIS IS A FATAL DEVICE ERROR AND THE DEVICE WILL BE DROPPED FROM THE TEST SEQUENCE UNLESS THE IDU OPTION IS USED.

3.1.3 ERROR #3 - NO RESPONSE ERROR:

ONCE THE TSDB IS LOADED, THE TS05 HAS ONE MILLISECOND TO RESPOND OR THE PROGRAM REPORTS A NO RESPONSE ERROR. THIS IS A FATAL DEVICE ERROR AND THE DEVICE WILL BE DROPPED FROM THE TEST SEQUENCE UNLESS THE IDU OPTION IS USED.

3.1.4 ERROR #4 - NO INTERRUPT ERROR:

COMMAND WAS ISSUED AND NO INTERRUPT RECEIVED. THE PROGRAM REPORTS THAT NO INTERRUPT OCCURRED. THIS IS A FATAL DEVICE ERROR AND THE DEVICE WILL BE DROPPED FROM THE TEST CYCLE UNLESS THE IDU OPTION IS USED.

3.1.5 SPECIAL CONDITION ERRORS:

IF, DURING EXECUTION, AN INCIDENT OCCURS FORCING THE TSSR SPECIAL CONDITION BIT TO SET, THE PROGRAM WILL SELECT ONE OF 8 ERROR HANDLING ROUTINES, DEPENDING ON THE TERMINATION CLASS CODE.

THE TERMINATION CLASS CODES IN THE TSSR ARE PROCESSED AS FOLLOWS WHEN SPECIAL CONDITION IS SET:

3.1.5.1 ERROR #5 - TERMINATION CLASS CODE 0, UNDEFINED SPECIAL CONDITION

THE ERROR IS REPORTED, A HARD ERROR IS LOGGED AND THE PROGRAM PROCEEDS NORMALLY.

3.1.5.2 ERROR #6 - TERMINATION CLASS CODE 1, ATTENTION CONDITION

THIS TCC INDICATES THAT THE DRIVE HAS UNDERGONE A STATUS CHANGE

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SUCH AS GOING OFFLINE OR COMING ONLINE. THIS IS A FATAL DEVICE ERROR AND THE DEVICE WILL BE DROPPED FROM THE TEST CYCLE UNLESS THE IDU OPTION IS USED.

### 3.1.5.3 ERROR #7 - TERMINATION CLASS CODE 2, TAPE STATUS ALERT

A STATUS CONDITION HAS BEEN ENCOUNTERED THAT MAY HAVE SIGNIFICANCE TO THE PROGRAM. BITS OF INTEREST INCLUDE TMK, RLS, LET, RLL, EOT. ACTION TAKEN DEPENDS ON THE TEST BEING EXECUTED. IF THE CONDITION IS UNEXPECTED, THE ERROR IS REPORTED AND A HARD ERROR IS LOGGED. THE PROGRAM PROCEEDS NORMALLY.

### 3.1.5.4 ERROR #8 - TERMINATION CLASS CODE 3, FUNCTION REJECT

THE SPECIFIED FUNCTION WAS NOT INITIATED. BITS OF INTEREST ARE RMR, OFL, VCK, BOT, ILC, WLE, ILA, AND NBA. THIS IS A FATAL DEVICE ERROR AND THE DEVICE WILL BE DROPPED FROM THE TEST CYCLE UNLESS THE IDU OPTION IS USED.

### 3.1.5.5 ERROR #9 - TERMINATION CLASS CODE 4, RECOVERABLE ERROR

TAPE POSITION IS ONE RECORD BEYOND WHAT ITS POSITION WAS WHEN THE FUNCTION WAS INITIATED. RECOVERY PROCEDURE IS TO LOG THE ERROR AND ISSUE THE APPROPRIATE RETRY COMMAND. IF RETRY LIMIT IS REACHED BEFORE THE ERROR IS RECOVERED, RETRY LIMIT EXCEEDED IS REPORTED AS DESCRIBED IN ERROR #14 BELOW.

### 3.1.5.6 ERROR #10 - TERMINATION CLASS CODE 5, RECOVERABLE ERROR

TAPE POSITION HAS NOT CHANGED. RECOVERY PROCEDURE IS TO LOG THE ERROR AND RE-ISSUE THE ORIGINAL COMMAND. IF RETRY LIMIT IS REACHED BEFORE THE ERROR IS RECOVERED, RETRY LIMIT EXCEEDED IS REPORTED AS DESCRIBED IN ERROR #14 BELOW.

### 3.1.5.7 ERROR #11 - TERMINATION CLASS CODE 6, UNRECOVERABLE ERROR

TAPE POSITION HAS BEEN LOST. THE ONLY VALID RECOVERY PROCEDURE IS TO REWIND AND START OVER AT BOT UNLESS THE TAPE HAS LABELS OR SEQUENCE NUMBERS. IF DENSITY CHECK IS SET THIS DIAGNOSTIC WILL REWIND AND RETRY THE COMMAND, OTHERWISE THIS IS A FATAL DEVICE ERROR AND THE DEVICE WILL BE DROPPED FROM THE TEST CYCLE UNLESS THE IDU OPTION IS USED.

### 3.1.5.8 ERROR #12 - TERMINATION CLASS CODE 7, FATAL SUBSYSTEM ERROR

THE SUBSYSTEM IS INCAPABLE OF PROPERLY PERFORMING COMMANDS OR AT LEAST ITS INTEGRITY IS SERIOUSLY QUESTIONABLE. REFER TO THE FATAL CLASS CODE FIELD IN THE TSSR REGISTER FOR ADDITIONAL INFORMATION ON THE TYPE OF FATAL ERROR. THE DEVICE WILL BE DROPPED FROM THE TEST CYCLE UNLESS THE IDU OPTION IS USED.

1146 3.1.6 ERROR #13 - RFC NON-ZERO ERROR:  
 1147  
 1148 IF, AFTER EXECUTION, THE RESIDUAL FRAME COUNT IS NON-ZERO, THE  
 1149 ERROR IS REPORTED AND A HARD ERROR IS LOGGED. THE PROGRAM THEN  
 1150 PROCEEDS NORMALLY. THE REPORTING AND LOGGING OF THESE ERRORS  
 1151 IS OPTIONAL.  
 1152  
 1153 3.1.7 ERROR #14 - RETRY LIMIT EXCEEDED:  
 1154  
 1155 ON A WRITE COMMAND THIS IS A FATAL DEVICE ERROR AND THE DEVICE  
 1156 WILL BE DROPPED FROM THE TEST CYCLE UNLESS THE IDU OPTION IS USED.  
 1157  
 1158 ON A READ COMMAND THIS ERROR IS LOGGED AS A HARD ERROR AND  
 1159 THE PROGRAM PROCEEDS NORMALLY.  
 1160  
 1161 3.1.8 ERROR #15 - TOO MANY INTERRUPTS:  
 1162  
 1163 IF MORE THAN ONE INTERRUPT OCCURS PER COMMAND, THIS ERROR IS REPORTED.  
 1164 THIS IS A FATAL DEVICE ERROR AND THE DEVICE WILL BE DROPPED FROM  
 1165 THE TEST CYCLE UNLESS THE IDU OPTION IS USED.  
 1166  
 1167 3.1.9 ERROR #16 - CAPSTAN RUNAWAY:  
 1168  
 1169 CAPSTAN DID NOT STOP WITHIN ACCEPTABLE WINDOW AFTER LAST  
 1170 COMMAND. THE PROGRAM WILL ISSUE A GET STATUS COMMAND BEFORE REPORTING  
 1171 THE ERROR SO THAT THE DEAD TRACK FIELD IN EXTENDED STATUS REGISTER 2  
 1172 WILL CONTAIN THE TACH COUNT WHEN THE TAPE STOPPED.  
 1173 THIS IS A FATAL DEVICE ERROR AND THE DEVICE WILL BE DROPPED FROM  
 1174 THE TEST CYCLE UNLESS THE IDU OPTION IS USED.  
 1175  
 1176 3.1.10 ERROR #17 - DATA COMPARE ERROR:  
 1177  
 1178 IF A DATA VALIDATION ERROR OCCURS DURING A WRITE/VERIFY COMMAND,  
 1179 THE PROGRAM PRINTS WHAT THE DATA SHOULD HAVE BEEN AND WHAT THE  
 1180 DATA WAS, AND PRINTS THE BYTE AND RECORD NUMBER THE ERROR OCCURRED  
 1181 ON. ONLY THE FIRST 10 BYTES IN ERROR PER RECORD ARE PRINTED.  
 1182 THE TOTAL # OF BYTES IN ERROR PER RECORD IS ALSO PRINTED. A  
 1183 HARD ERROR IS LOGGED AND THE PROGRAM PROCEEDS NORMALLY.  
 1184  
 1185 3.2 ERROR HALTS  
 1186 -----  
 1187  
 1188 ERROR HALTS ARE SUPPORTED PER DESCRIBED IN THE PREVIOUS SECTION  
 1189 WITH /FLAG:HOE. THERE ARE NO OTHER HALTS.  
 1190  
 1191 4.0 PERFORMANCE REPORT  
 1192 -----  
 1193  
 1194 UNIT X PASS:XXXXX RECORD:XXXXX  
 1195 BYTES WRITTEN XXX,XXX,XXX,XXX  
 1196 BYTES READ REV XXX,XXX,XXX,XXX  
 1197 BYTES READ FWD XXX,XXX,XXX,XXX  
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♦ SPACE 7 RECORDS REVERSE.

SUBTEST 7 - WRITE RETRY.  
♦ REWIND.  
♦ WRITE DATA.  
♦ WRITE RETRY.

SUBTEST 8 - READ REV RETRY.  
♦ READ REVERSE.  
♦ READ NEXT REVERSE.  
♦ READ NEXT FORWARD.

SUBTEST 9 - READ FWD RETRY.  
♦ READ FORWARD.  
♦ READ PREVIOUS FORWARD.  
♦ READ PREVIOUS REVERSE.

SUBTEST 10 - CLEAN.  
♦ CLEAN.  
♦ REWIND.

SUBTEST 11 - WRITE/VERIFY SWAPPED DATA BYTES.  
♦ WRITE/VERIFY EVEN LENGTH (RECORD 1).  
♦ WRITE/VERIFY ODD LENGTH (RECORD 2).  
♦ SET DATA BYTE SWAP.  
♦ WRITE/VERIFY EVEN LENGTH (RECORD 3).  
♦ WRITE/VERIFY ODD LENGTH (RECORD 4).  
♦ CLEAR DATA BYTE SWAP.

SUBTEST 12 - READ SWAPPED DATA BYTES.  
♦ READ REV RECORD 4.  
♦ READ REV RECORD 3.  
♦ SET DATA BYTE SWAP.  
♦ READ REV RECORD 2.  
♦ READ REV RECORD 1.  
♦ READ FWD RECORD 1.  
♦ READ FWD RECORD 2.  
♦ CLEAR DATA BYTE SWAP.  
♦ READ FWD RECORD 3.  
♦ READ FWD RECORD 4.

1301 5.2 TEST 2 - DATA RELIABILITY.  
 1302  
 1303 1. THE TAPE IS INITIATED WITH THE FOLLOWING COMMANDS:  
 1304 SET CHARACTERISTIC 40  
 1305 REWIND  
 1306 WRITE 64 RECORDS OF RANDOM LENGTH AND DATA  
 1307 2. WRITE AND READ COMMANDS ARE SELECTED AT RANDOM AND ARE  
 1308 EXECUTED A RANDOM NUMBER OF TIMES WITH RANDOM  
 1309 LENGTHS AND RANDOM PATTERN UNTIL END OF TAPE IS REACHED.  
 1310 3. AT THE END OF EACH PASS, A REWIND COMMAND IS ISSUED AND  
 1311 A PERFORMANCE REPORT IS PRINTED.  
 1312  
 1313 NOTE: IF A RESTART COMMAND IS USED TO INITIATE  
 1314 TEST 1, THE INITIAL REWIND COMMAND IS NOT ISSUED.  
 1315  
 1316  
 1317 5.3 TEST 3 - WRITE COMPATABILITY/WRITE UTILITY.  
 1318 REWINDS AND WRITES RECORDS OF RANDOM LENGTHS  
 1319 AND RANDOM DATA FROM BOT TO EOT.  
 1320  
 1321  
 1322 5.4 TEST 4 - READ COMPATABILITY/READ UTILITY.  
 1323 REWINDS AND READS ENTIRE TAPE, FORWARD AND REVERSE.  
 1324  
 1325  
 1326 5.5 TEST 5 - RANDOM/OPERATOR SELECTED COMMAND SEQUENCE.  
 1327 A DEFAULT SEQUENCE OF REWIND/WRITE/READ REV/READ FWD/REWIND  
 1328 OF ENTIRE TAPE IS EXECUTED WITH RANDOM PATTERN  
 1329 AND RECORD LENGTH OF 2048 BYTES. OPERATOR CAN ENTER  
 1330 SEQUENCE OF COMMANDS UP TO SEVEN IF THEY DON'T WANT  
 1331 DEFAULT SEQUENCE.  
 1332  
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 1335  
 1336 6.0 DEVICE INFORMATION TABLES  
 1337 -----  
 1338  
 1339 6.1 GENERAL  
 1340 -----  
 1341  
 1342 THE TS05 TAPE SUBSYSTEM CONSISTS OF A TSV05 Q-BUS  
 1343 CONTROLLER CONNECTED TO A TS05 DRIVE. FROM A SOFTWARE VIEWPOINT  
 1344 THIS CONFIGURATION IS UNIQUE (FOR A Q-BUS DEVICE) IN A NUMBER  
 1345 OF WAYS:  
 1346  
 1347 A. ONLY ONE REGISTER MAY BE WRITTEN - TSDB (TAPE SYSTEM  
 1348 DATA BUFFER).  
 1349  
 1350 B. TWO REGISTERS MAY BE READ - TSSR AND TSBA (TAPE SYSTEM STATUS  
 1351 REGISTER AND TAPE SYSTEM BUS ADDRESS REGISTER).  
 1352  
 1353 C. COMMANDS ARE NOT WRITTEN TO THE DRIVE; RATHER, COMMAND  
 1354 POINTERS ARE WRITTEN WHICH POINT TO COMMAND PACKETS SOME-  
 1355 WHERE IN CPU MEMORY. THE COMMAND POINTER IS USED BY  
 1356 THE TS05 SUBSYSTEM TO FETCH THE WORD(S) WITHIN THE COMMAND  
 1357 PACKET. THE WORDS WITHIN THE COMMAND PACKET ARE:

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1. COMMAND WORD
  2. LOW ORDER BUFFER ADDRESS
  3. HIGH ORDER BUFFER ADDRESS
  4. BYTE COUNT
- D. THE TSSR CONTAINS ALL THE INFORMATION WHICH WILL BE NECESSARY TO DETERMINE WHETHER;
1. THE DRIVE IS READY TO ACCEPT ANOTHER COMMAND,
  2. THE PREVIOUS COMMAND WAS EXECUTED WITHOUT ERROR.
- IF EITHER OF THE ABOVE CONDITIONS IS UNTRUE AT "JOB DONE" OR "COMMAND INITIATION" TIME, IT MAY BE NECESSARY TO GET THE EXTENDED STATUS REGISTERS TO DETERMINE WHAT ACTION IS TO BE TAKEN AND/OR LOG THE ERROR INFORMATION.
- E. EXTENDED STATUS REGISTERS ARE NOT READ DIRECTLY FROM DRIVE REGISTERS, RATHER, A "GET STATUS" COMMAND IS ISSUED WHICH WILL CAUSE THE TSO5 TO TRANSFER EXTENDED STATUS INFORMATION TO THE MEMORY AREA POINTED TO BY THE BUFFER ADDRESS OF THE "GET STATUS" COMMAND. THERE ARE FIVE EXTENDED STATUS REGISTERS. SEE .3.
- F. THE TSDB MUST BE WRITTEN WITH A DATO INSTRUCTION TO PROPERLY WRITE THE COMMAND POINTER. A DATOB WILL CAUSE A MAINTENANCE FUNCTION. A DATO TO THE TSSR WILL CAUSE SUBSYSTEM INIT.
- G. COMMAND PACKETS MUST RESIDE ON DIVIDE BY FOUR MEMORY BOUNDARIES (AS OPPOSED TO DIVIDE BY 2 OR WORD BOUNDARIES) .



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6.2 Q-BUS INTERFACE SPECIFICATIONS  
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TSV05/ TS05 -----	INT. VECTOR -----	UNIBUS ADDRESS -----	REGISTER -----
FIRST	224	772520 772522	TSBA/TS08 TSSR

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6.3 BIT DEFINITIONS FOR TSV05/TS05 REGISTERS

6.3.1 TSV05/TS05 REGISTER SUMMARY

	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00	
(R/O) TSBA	!A15!	!A14!	!A13!	!A12!	!A11!	!A10!	!A09!	!A08!	!A07!	!A06!	!A05!	!A04!	!A03!	!A02!	!A01!	!A00!	
(W/O) TSDB	!P15!	!P14!	!P13!	!P12!	!P11!	!P10!	!P09!	!P08!	!P07!	!P06!	!P05!	!P04!	!P03!	!P02!	!P17!	!P16!	
(R/O) TSSR	!SC!	!0!	!SCE!	!RMR!	!NXH!	!NBA!	!A17!	!A16!	!SSR!	!OFL!	!FC1!	!FC0!	!TC2!	!TC1!	!TC0!	!0!	
(W/O) TSDBX	!BT!	!0!	!0!	!0!	!P21!	!P20!	!P19!	!P18!	(TSDBX EXISTS ONLY WHEN ENABLED BY THE EXTENDED FEATURES SWITCH ON THE M7196)								
XST0	!TMK!	!RLS!	!LET!	!RL!	!M.E!	!NEF!	!ILC!	!ILA!	!MOT!	!ONL!	!IE!	!VCK!	!PED!	!MLK!	!BOT!	!EOT!	
XST1	!DLT!	!0!	!COR!	!0!	!0!	!0!	!0!	!RBP!	!0!	!0!	!0!	!0!	!0!	!0!	!UNC!	!0!	
XST2	!OPM!	!RCE!	!0!	!0!	!0!	!MCF!	!0!	!0!	!RL7!	!RL6!	!RL5!	!RL4!	!RL3!	!RL2!	!RL1!	!RL0!	
XST3	MICRO DIAGNOSTIC ERROR CODE									!0!	!OPI!	!REV!	!TRF!	!DCK!	!0!	!0!	!RIB!
XST4	!HSP!	!RCE!	!0!	!0!	!0!	!0!	!0!	!0!	WRITE RETRY COUNT								

TERMINATION CLASS CODES (TSSR TC0-TC2):

- 0 - NORMAL TERMINATION
- 1 - ATTENTION CONDITION
- 2 - TAPE STATUS ALERT
- 3 - FUNCTION REJECT
- 4 - RECOVERABLE ERROR - TAPE POSITION = ONE RECORD  
DOWN TAPE FROM START OF FUNCTION
- 5 - RECOVERABLE ERROR - TAPE NOT MOVED
- 6 - UNRECOVERABLE ERROR - TAPE POSITION LOST
- 7 - FATAL CONTROLLER ERROR

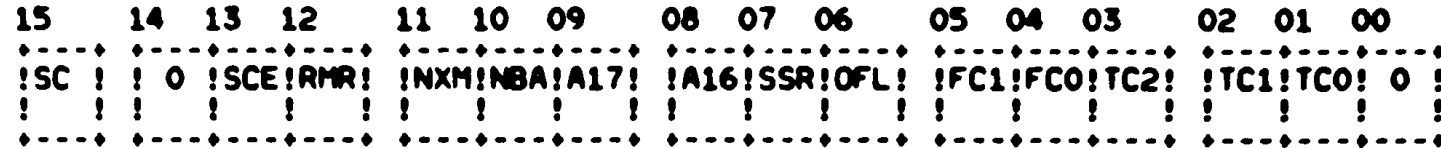
FATAL CLASS CODES (TSSR FC0-FC1):

- 0 - MICRO DIAGNOSTIC FAILURE. SEE ERROR CODE BYTE (XST3) FOR FAILED FUNCTION.
- 1 - RESERVED
- 2 - NOT USED
- 3 - RESERVED FOR FUTURE USE ALWAYS READ AS A 0

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6.3.2 TSV05 STATUS REGISTER (TSSR)

Q-BUS ADDRESS + 2 - READ ONLY



BIT	NAME	TCC	DEFINITION
15	SC	S	SPECIAL CONDITION. WHEN SET, INDICATES THAT THE LAST COMMAND DID NOT COMPLETE WITHOUT INCIDENT. SPECIFICALLY, EITHER AN ERROR WAS DETECTED OR AN EXCEPTION CONDITION OCCURRED. EXCEPTION CONDITIONS CAN BE TAPE MARKS ON READ COMMANDS, REVERSE MOTION AND AT BOT, EOT WHILE WRITING, ETC. MAY ALSO BE SET BY THE ERROR BITS CONTAINED IN THE TSSR REGISTER: SCE, RMR, AND NXM. THE TERMINATION CLASS BITS ARE SOMETHING OTHER THAN 0 (UNLESS RMR IS THE ONLY ERROR - SEE RMR).
14	-	-	RESERVED (ALWAYS A 0)
13	SCE	FC0	SANITY CHECK ERROR-SETS WHEN THE CONTROLLER DETECTS AN ABNORMAL CONDITION WITHIN ITSELF DURING EXECUTION OF IT'S FUNCTIONS AND THE PROBLEM IS SERIOUS ENOUGH THAT A MESSAGE PACKET IS NOT STORED.
12	RMR	S	REGISTER MODIFICATION REFUSED. SET BY THE TSV05 WHEN A COMMAND POINTER IS LOADED INTO TSOB AND SUB-SYSTEM READY (SSR) IS NOT SET. NOTE THAT THIS BIT CAUSES SPECIAL CONDITION BUT NO TERMINATION CLASS (IN FACT, THE TSO5 NEVER SEES THIS ERROR) BECAUSE ON A SYSTEM WITH NO BUGS, THIS BIT MAY COME UP ON AN ATTENTION MESSAGE. IF ATTNS ARE NOT ENABLED, THIS BIT COMING UP IS AN INDICATION OF EITHER A FATAL CONTROLLER ERROR OR A SOFTWARE BUG.
11	NXM	4/5	NON-EXISTENT MEMORY. SET BY THE TSV05 WHEN TRYING TO TRANSFER TO OR FROM A MEMORY LOCATION WHICH DOES NOT EXIST. MAY OCCUR WHEN FETCHING THE COMMAND PACKET, FETCHING OR STORING DATA, OR STORING THE MESSAGE PACKET.
10	NBA	S	NEED BUFFER ADDRESS. WHEN SET, INDICATES THAT THE TSO5 NEEDS A MESSAGE BUFFER ADDRESS. THIS BIT IS CLEARED DURING THE SET CHARACTERISTICS

1518				COMMAND (IF A GOOD ADDRESS WAS GIVEN).
1519				
1520	09	A17	S	BUS ADDRESS BIT 17. A17 AND A16 (BIT 08) TRACK
1521				THE VALUES OF BITS 17 AND 16 OF THE TSBA
1522				REGISTER. LOADED FROM TSDB BITS 01-00 WHEN TSDB
1523				IS WRITTEN.
1524				
1525	08	A16	S	BUS ADDRESS BIT 16. SEE A17 (BIT 09).
1526				
1527	07	SSR	S	SUB-SYSTEM READY. WHEN SET, INDICATES THAT THE
1528				TSV05/TS05 SUBSYSTEM IS NOT BUSY AND IS READY TO
1529				ACCEPT A NEW COMMAND POINTER.
1530				
1531	06	OFL	S,1,3	OFF-LINE. WHEN SET, INDICATES THAT THE TS05 IS
1532				OFF-LINE AND UNAVAILABLE FOR ANY TAPE MOTION
1533				COMMANDS. THIS BIT CAN CAUSE A TERMINATION CLASS
1534				OF 1 (ON ATTN INTERRUPT) OR 3 (RESULTS IN NEF).
1535				
1536	05	FC1	7	FATAL TERMINATION CLASS 01. FC1 AND FC0 (BIT
1537				04) ARE USED TO INDICATE THE TYPE OF FATAL
1538				ERROR WHICH HAS OCCURRED ON THE TS05. THESE
1539				BITS ARE VALID ONLY WHEN SC IS SET AND THE
1540				TERMINATION CLASS CODE BITS ARE ALL SET (111).
1541				
1542	04	FC0	7	FATAL TERMINATION CLASS 00. SEE FC1 (BIT 05).
1543				
1544	03	TC2	S	TERMINATION CLASS BIT 02. THIS BIT, ALONG WITH
1545				THE TC1 AND TC0 BITS, ACT AS AN OFFSET VALUE
1546				WHENEVER AN ERROR OR EXCEPTION CONDITION OCCURS
1547				ON A COMMAND. EACH OF THE EIGHT POSSIBLE
1548				VALUES OF THIS FIELD REPRESENT A PARTICULAR
1549				CLASS OF ERRORS OR EXCEPTIONS. THE CONDITIONS
1550				IN EACH CLASS HAVE SIMILAR SIGNIFICANCE AND, AS
1551				APPLICABLE, RECOVERY PROCEDURES. THE CODE
1552				PROVIDED IN THIS FIELD IS EXPECTED TO BE
1553				UTILIZED AS AN OFFSET INTO A DISPATCH TABLE FOR
1554				HANDLING OF THE CONDITION.
1555				
1556	02	TC1	S	TERMINATION CLASS BIT 01. SEE TC2 (BIT 03).
1557				
1558	01	TC0	S	TERMINATION CLASS BIT 00. SEE TC2 (BIT 03).
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1560	00	-	-	NOT USED. (ALWAYS A 0)
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Q-BUS ADDRESS + 2 - WRITE ONLY

SUBSYSTEM INITIALIZE

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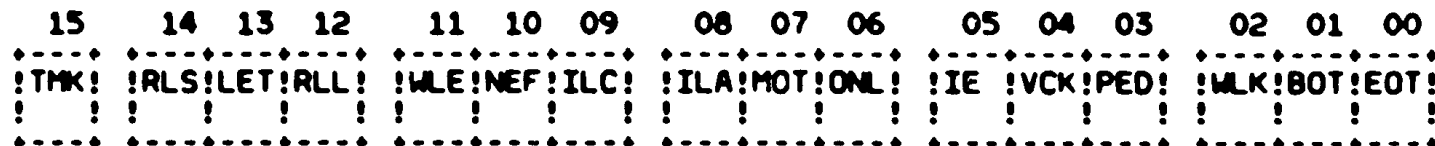
6.3.2.1 TSV05 EXTENDED DATA BUFFER REGISTER (TSDBX)



(TSDBX EXISTS ONLY WHEN ENABLED BY THE EXTENDED FEATURES SWITCH ON THE M7196)

BIT	NAME	TCC	DEFINITION
15	BT	-	BOOT COMMAND BIT. WHEN WRITTEN TO A 1, WITH SSR=1, CAUSES THE TAPE TO BE REWOUND TO BOT, THE FIRST TAPE RECORD TO BE SKIPPED, AND THE SECOND RECORD TO BE LOADED INTO CPU MEMORY SPACE STARTING AT LOCATION 0.
14-12			RESERVED (ALWAYS A 0)
11-08	P<21:18>		COMMAND POINTER BITS 21-18. WHEN THE TSDBX IS WRITTEN AND SSR=1, THE DATA IS LOADED INTO BITS 21-18 OF THE INTERNAL TSBA REGISTER.
07-00			RESERVED (ALWAYS A 0)

6.3.3 EXTENDED STATUS REGISTER 0 (XSTAT0)



BIT	NAME	TCC	DEFINITION
15	TMK	S,2	TAPE MARK DETECTED. SET WHENEVER A TAPE MARK WAS DETECTED DURING A READ, SPACE, OR SKIP COMMAND AND AS A RESULT OF THE WRITE TAPE MARK OR WITE TAPE MARK RETRY COMMANDS.
14	RLS	2	RECORD LENGTH SHORT. THIS BIT INDICATES THAT EITHER THE RECORD'S LENGTH WAS SHORTER THAN THE BYTE COUNT ON READ OPERATIONS, A SPACE RECORD OPERATION ENCOUNTERED A TAPE MARK OR BOT BEFORE THE POSITION COUNT WAS EXHAUSTED, OR A SKIP TAPE MARKS COMMAND WAS TERMINATED BY ENCOUNTERING BOT OR A DOUBLE TAPE MARK (IF THAT OPERATIONAL MODE IS ENABLED, SEE LET) PRIOR TO EXHAUSTING THE POSITION COUNTER.

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13	LET	2	LOGICAL END OF TAPE. SET ONLY ON THE SKIP TAPE MARKS COMMAND WHEN EITHER TWO CONTIGUOUS TAPE MARKS ARE DETECTED OR WHEN MOVING OFF OF BOT AND THE FIRST RECORD ENCOUNTERED IS A TAPE MARK. THE SETTING OF THIS BIT WILL NOT OCCUR UNLESS THIS MODE OF TERMINATION IS ENABLED THROUGH USE OF THE SET CHARACTERISTICS COMMAND.
12	RLL	2	RECORD LENGTH LONG. WHEN SET, THIS BIT INDICATES THAT THE RECORD READ WAS LONGER THAN THE BYTE COUNT SPECIFIED.
11	WLE	3,6	WRITE LOCK ERROR. WHEN SET, INDICATES THAT A WRITE OPERATION WAS ISSUED BUT THE MOUNTED TAPE DID NOT CONTAIN A WRITE ENABLE RING OR THE WRT LOCK SWITCH ACTIVATED DURING THE OPERATION.
10	NEF	3	NON-EXECUTABLE FUNCTION. WHEN SET, INDICATES THAT THE COMMAND COULD NOT BE EXECUTED DUE TO ONE OF THE FOLLOWING CONDITIONS: <ul style="list-style-type: none"><li>- THE COMMAND SPECIFIED REVERSE TAPE DIRECTION BUT THE TAPE WAS ALREADY POSITIONED AT BOT.</li><li>- THE ISSUING OF ANY MOTION COMMAND EXCEPT</li></ul>

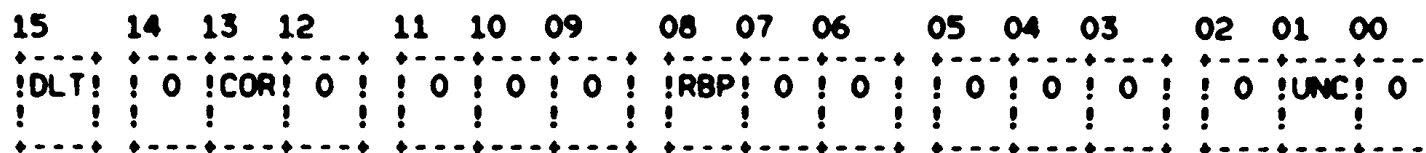
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WHEN THE VOLUME CHECK BIT IS SET.  
- ANY COMMAND, EXCEPT GET STATUS OR DRIVE INITIALIZE, WHEN THE TS05 IS OFF-LINE.  
- ANY WRITE COMMAND WHEN THE TAPE DOES NOT CONTAIN A WRITE ENABLE RING (WRITE LOCK STATUS - WLS).

09	ILC	3	ILLEGAL COMMAND. SET WHEN A COMMAND IS ISSUED AND EITHER ITS COMMAND FIELD OR ITS COMMAND MODE FIELD CONTAINS CODES WHICH ARE NOT SUPPORTED BY THE TS05.
08	ILA	3	ILLEGAL ADDRESS. (MORE THAN 18 BITS OR ODD WHEN AN EVEN ADDRESS IS REQUIRED.)
07	MOT	S	TAPE IS MOVING.
06	ONL	S	ON LINE. WHEN SET, INDICATES THAT THE TS05 IS ON-LINE AND OPERABLE.
05	IE	S	INTERRUPT ENABLE. REFLECTS THE STATE OF THE INTERRUPT ENABLE BIT SUPPLIED ON THE LAST COMMAND.
04	VCK	S	VOLUME CHECK. WHEN SET, INDICATES THAT THE DRIVE HAS BEEN EITHER POWERED DOWN OR TURNED OFF-LINE. CLEARED BY THE CLEAR VOLUME CHECK (CVC) BIT IN THE COMMAND HEADER WORD. THIS BIT CAN CAUSE A TERMINATION CLASS OF 3.
03	PED	S	PHASE ENCODED DRIVE. ALWAYS SET, INDICATES THAT THE TS05 IS CAPABLE OF READING AND WRITING ONLY 1600 BPI PHASE ENCODED DATA.
02	WLK	S,3	WRITE LOCKED. WHEN SET, INDICATES THAT THE MOUNTED REEL OF TAPE DOES NOT HAVE A WRITE-ENABLE RING INSTALLED. THE TAPE IS, THEREFORE, WRITE PROTECTED.
01	BOT	S,3	BEGINNING OF TAPE. WHEN SET, INDICATES THAT THE TAPE IS POSITIONED AT THE LOAD POINT AS DENOTED BY THE BOT REFLECTIVE STRIP ON THE TAPE.
00	EOT	S,2	END OF TAPE. THIS BIT IS SET WHENEVER THE TAPE IS POSITIONED AT OR BEYOND THE END OF TAPE REFLECTIVE STRIP.

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6.3.4 EXTENDED STATUS REGISTER 1 (XSTAT1)

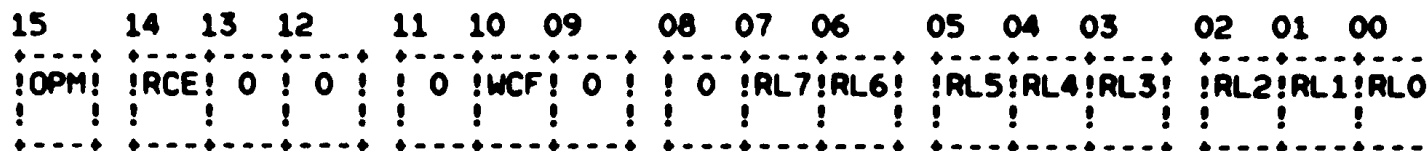


BIT	NAME	TCC	DEFINITION
15	DLT	4	DATA LATE. SET WHEN THE FIFO IS FULL ON A READ OR EMPTY ON A WRITE. THESE CONDITIONS OCCUR WHENEVER THE Q-BUS LATENCY EXCEEDS THE DATA TRANSFER RATE OF THE TLOS.
14	-	-	NOT USED. (ALWAYS A 0)
13	COR	5	CORRECTABLE DATA. CORRECTABLE DATA ERROR HAS BEEN ENCOUNTERED.
12-09			RESERVED (ALWAYS A 0)
08	RPB	4	READ BUS PARITY ERROR. SET WHEN CONTROLLER DETECTS A PARITY ERROR ON THE READ DATA LINES OF THE TRANSPORT BUS.
07-02 & 00			RESERVED (ALWAYS A 0)
01	UNC	4	UNCORRECTABLE DATA ERROR.



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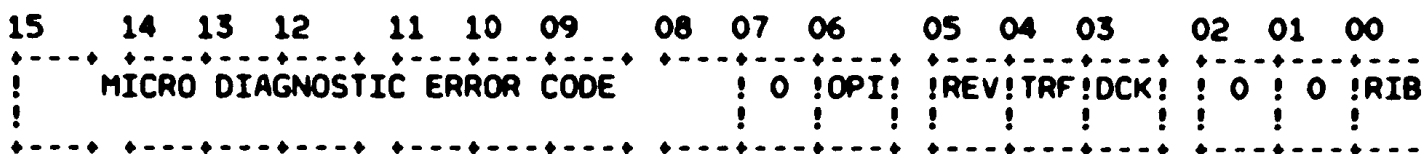
6.3.5 EXTENDED STATUS REGISTER 2 (XSTAT2)  
-----



BIT	NAME	TCC	DEFINITION
15	OPM	S	OPERATION IN PROGRESS. (TAPE MOVING)
14	RCE	7,F2	RAM CHECKSUM ERROR. CAUSES FATAL CLASS 2 BECAUSE THE ERROR MIGHT HAVE OCCURRED DURING THE TRANSMISSION OF THE MESSAGE PACKET.
13-11			RESERVED (ALWAYS A 0)
10	WCF	7	WRITE CLOCK FAILURE. SET DURING A WRITE TO INDICATE THAT THE FIFO IS NOT BEING EMPTIED BY THE TRANSPORT.
09-08			RESERVED (ALWAYS A 0)
07-00	RL	-	REVISION LEVEL.
	7-0		

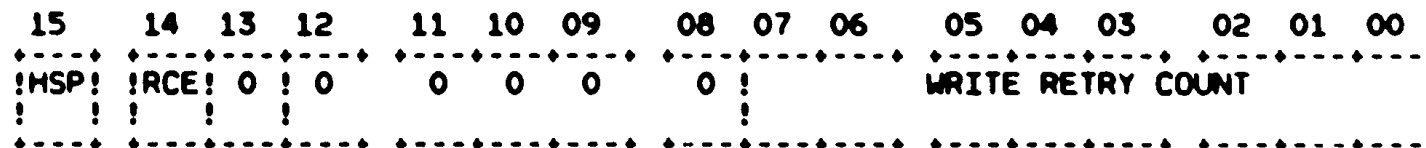
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6.3.6 EXTENDED STATUS REGISTER 3 (XSTAT3)



BIT	NAME	TCC	DEFINITION
15 TO 08			MICRO DIAGNOSTIC ERROR CODE. (SEE LIST OF CODES BELOW).
07			RESERVED (ALWAYS A 0)
06	OPI	6	OPERATION INCOMPLETE. SET WHEN A READ, SPACE, OR SKIP OPERATION HAS MOVED 25 FEET OF TAPE WITHOUT DETECTING ANY DATA ON THE TAPE.
05	REV	S	DIRECTION OF CURRENT OPERATION WAS REVERSE (BUT IS 0 IF REWIND OR FORWARD)
04	-	-	RESERVED (ALWAYS A 0)
03	DCK	S.6	DENSITY CHECK. SET WHEN A PE IDENTIFICATION BURST (IDB) WAS NOT DETECTED WHEN MOVING OFF OF BOT.
02-01			RESERVED (ALWAYS A 0)
00	RIB	2	REVERSE INTO BOT. A READ, SPACE, OR SKIP COMMAND ALREADY IN PROGRESS HAS ENCOUNTERED THE BOT MARKER WHEN MOVING TAPE IN THE REVERSE DIRECTION. TAPE MOTION WILL BE HALTED AT BOT.

6.3.7 EXTENDED STATUS REGISTER 4 (XSTAT4)



BIT	NAME	TCC	DEFINITION
-----	------	-----	------------

1829	15	HSP	S	HIGH SPEED. WHEN SET, INDICATES THAT THE TRANSPORT IS OPERATING IN HIGH SPEED MODE.(100IPS) WHEN CLEAR, THE TRANSPORT IS OPERATING IN LOW SPEED MODE.(25IPS)
1830				
1831				
1832				
1833	14	RCE	6	RETRY COUNT EXCEEDED. WHEN SET, INDICATES THAT THE CONTROLLER WAS BUFFERING WRITE DATA AND COULD NOT SUCCESSFULLY OUTPUT THE BUFFERED RECORD WITHIN THE SPECIFIED NUMBER OF RETRIES. CAUSES TAPE POSITION LOST TERMINATION.
1834				
1835				
1836				
1837				
1838	13-8		-	RESERVED (ALWAYS A 0)
1839				
1840	7-0	WRC	S	WRITE RECOUNT COUNT STATISTIC. THIS FIELD INDICATES, WHEN THE CONTROLLER IS BUFFERING WRITE DATA RECORDS, THE TOTAL NUMBER OF CONTROLLER INITIATED RETRIES PERFORMED IN ORDER TO WRITE THE PREVIOUS BUFFERED RECORD. THIS COUNT IS CLEARED AFTER IT IS DISPLAYED.
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## 7.0 DIAGNOSTIC HISTORY

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- REVISION A - MAR 1982
- MODIFIED CZTSHC FROM TS11 FOR TSV05
- REVISION B - APR 1983
- UPDATED THE DIAGNOSTIC TO SUPPLY THE CORRECT RECORD NUMBER DURING EXECUTION OF TEST #2.
- REF: CHMIELECKI TO MITCHELL "TSV05 DATA RELIABILITY PROBLEM"; 21-JAN-83.

```

1
13 .TITLE PROGRAM HEADER AND TABLES
14 .SBTTL PROGRAM HEADER
43
45 000000 .ENABL ABS,AMA
46 002000 002000 . BGNMOD 2000
48 002000
49
50
51 ;**
52 ; THE PROGRAM HEADER IS THE INTERFACE BETWEEN
53 ; THE DIAGNOSTIC PROGRAM AND THE SUPERVISOR.
54 ;--
55 002000 POINTER BGNRPT,BGNSW,BGNSFT,BGNAU,BGNDU
56
64
65 002000 HEADER CVTSE,B,0,5000,1
002000 L$NAME:: ;DIAGNOSTIC NAME
002000 103 .ASCII /C/
002001 126 .ASCII /V/
002002 124 .ASCII /T/
002003 123 .ASCII /S/
002004 105 .ASCII /E/
002005 000 .BYTE 0
002006 000 .BYTE 0
002007 000 .BYTE 0
002010 L$REV:: ;REVISION LEVEL
002010 102 .ASCII /B/
002011 L$DEPO:: ;0
002011 060 .ASCII /O/
002012 L$UNIT:: ;NUMBER OF UNITS
002012 000000 .WORD 0
002014 L$TIML:: ;LONGEST TEST TIME
002014 005000 .WORD 5000
002016 L$HPCP:: ;POINTER TO H.W. QUES.
002016 027754 .WORD L$HARD
002020 L$SPCP:: ;POINTER TO S.W. QUES.
002020 030062 .WORD L$SOFT
002022 L$HPTP:: ;PTR. TO DEF. H.W. PTABLE
002022 002174 .WORD L$HW
002024 L$SPTP:: ;PTR. TO S.W. PTABLE
002024 002204 .WORD L$SW
002026 L$LADP:: ;DIAG. END ADDRESS
002026 032004 .WORD L$LAST
002030 L$STA:: ;RESERVED FOR APT STATS
002030 000000 .WORD 0
002032 L$CO::
002032 000000 .WORD 0
002034 L$DTYP:: ;DIAGNOSTIC TYPE
002034 000001 .WORD 1
002036 L$APT:: ;APT EXPANSION
002036 000000 .WORD 0
002040 L$DTP:: ;PTR. TO DISPATCH TABLE
002040 002124 .WORD L$DISPATCH
002042 L$PRIO:: ;DIAGNOSTIC RUN PRIORITY
002042 000000 .WORD 0
002044 L$ENVI:: ;FLAGS DESCRIBE HOW IT WAS SETUP

```

PROGRAM HEADER AND TABLES  
PROGRAM HEADER

MACRO M1113 30-NOV-83 10:17

SEQ 040

002044	000000			.WORD	0
002046		L#EXP1::	; EXPANSION WORD	.WORD	0
002046	000000			.WORD	0
002050		L#MREV::	; SVC REV AND EDIT #	.BYTE	C#REVISION
002050	003			.BYTE	C#EDIT
002051	003				
002052		L#EF::	; DIAG. EVENT FLAG	.WORD	0
002052	000000			.WORD	0
002054	000000				
002056		L#SPC::		.WORD	0
002056	000000			.WORD	0
002060		L#DEVP::	; POINTER TO DEVICE TYPE LIST	.WORD	L#DVTYP
002060	002164				
002062		L#REPP::	; PTR. TO REPORT CODE	.WORD	L#RPT
002062	017570				
002064		L#EXP4::		.WORD	0
002064	000000			.WORD	0
002066		L#EXP5::		.WORD	0
002066	000000			.WORD	0
002070		L#AUT::	; PTR. TO ADD UNIT CODE	.WORD	L#AU
002070	024052				
002072		L#DUT::	; PTR. TO DROP UNIT CODE	.WORD	L#DU
002072	024000				
002074		L#LUN::	; LUN FOR EXERCISERS TO FILL	.WORD	0
002074	000000			.WORD	0
002076		L#DESP::	; POINTER TO DIAG. DESCRIPTION	.WORD	L#DESC
002076	002136				
002100		L#LOAD::	; GENERATE SPECIAL AUTOLOAD EMT	EMT	E#LOAD
002100	104035				
002102		L#ETP::	; POINTER TO ERRtbl	.WORD	0
002102	000000			.WORD	0
002104		L#ICP::	; PTR. TO INIT CODE	.WORD	L#INIT
002104	021324				
002106		L#CCP::	; PTR. TO CLEAN-UP CODE	.WORD	L#CLEAN
002106	023736				
002110		L#ACP::	; PTR. TO AUTO CODE	.WORD	L#AUTO
002110	023314				
002112		L#PRT::	; PTR. TO PROTECT TABLE	.WORD	L#PROT
002112	021316				
002114		L#TEST::	; TEST NUMBER	.WORD	0
002114	000000			.WORD	0
002116		L#DLY::	; DELAY COUNT	.WORD	0
002116	000000			.WORD	0
002120		L#HIME::	; PTR. TO HIGH MEM	.WORD	0
002120	000000			.WORD	0
66					
72		.SBTTL	DISPATCH TABLE		
73					
74		;			
75		;	THE DISPATCH TABLE CONTAINS THE STARTING ADDRESS OF EACH TEST.		
76		;	IT IS USED BY THE SUPERVISOR TO DISPATCH TO EACH TEST.		
77		;			
78					
79			DISPATCH 5		
002122				.WORD	5
002122	000005				
002124		L#DISPATCH::		.WORD	T1
002124	024156				



002204		L1SW::		
002204		SFPTBL::		
120				
127	002204	001	CLRFLG:: .BYTE	1 ;CLEAR COUNTERS FLAG.
128	002205	000	RRANV:: .BYTE	0 ;RESET RANDOM VARIABLES EACH PASS FLAG.
129	002206	000	MAE:: .BYTE	0 ;HALT AFTER EACH COMMAND FLAG.
130	002207	000	ERCVER:: .BYTE	0 ;ENABLE RECOVERABLE ERROR PRINTS FLAG.
131	002210	001	BADTSW:: .BYTE	1 ;BAD TAPE SWITCH TO REWRITE ON SAME SPOT & DETECT BAD TAPE
132	002211	000		0 ;SPARE
133	002212	000	DINT:: .BYTE	0 ;DISABLE INTERRUPTS FLAG.
134	002213	000	IREC:: .BYTE	0 ;INHIBIT ERROR RECOVERY FLAG.
135	002214	000	CHGFLG:: .BYTE	0 ;CHANGE CMD SEQ TABLE FLAG.
136	002215	000		0 ;SPARE.
137	002216	000	PIRE:: .BYTE	0 ;INHIBIT RESIDUAL FRAMECOUNT ERROR REPORT FLAG.
138	002217	000		0 ;SPARE.
139	002220	000040	CHAR:: CH.EAI	CHARACTERISTICS CODE (DEFAULT = 40).
140	002222	000015	CMDD:: .WORD	13. ;COMMAND 2 (DEFAULT = REWIND).
141	002224	000001		1 ;BYTE COUNT
142	002226	000001		1 ;NUMBER OF OPERATIONS
143	002230	000007		RANP ;PATTERN
144	002232	000004		4 ;COMMAND 3 (DEFAULT = WRITE)
145	002234	004000		DATCNT ;BYTE COUNT (DEFAULT = MAX BUFFER SIZE).
146	002236	076400		32000. ;NUMBER OF OPERATIONS (DEFAULT = 32000).
147	002240	000007		RANP ;PATTERN (DEFAULT = RANDOM).
148	002242	000003		3 ;COMMAND 4 (DEFAULT = READ REV).
149	002244	004000		DATCNT ;BYTE COUNT (DEFAULT = MAX BUFFER SIZE).
150	002246	076400		32000. ;NUMBER OF OPERATIONS (DEFAULT = 32,000).
151	002250	000007		RANP ;PATTERN (DEFAULT = RANDOM).
152	002252	000002		2 ;COMMAND 5 (DEFAULT = READ FWD).
153	002254	004000		DATCNT ;BYTE COUNT (DEFAULT = MAX BUFFER SIZE).
154	002256	076400		32000. ;NUMBER OF OPERATIONS (DEFAULT = 32,000).
155	002260	000007		RANP ;PATTERN (DEFAULT = RANDOM).
156	002262	000015		13. ;COMMAND 6 (DEFAULT = REWIND).
157	002264	000001		1 ;BYTE COUNT
158	002266	000001		1 ;NUMBER OF OPERATIONS
159	002270	000007		RANP ;PATTERN
160	002272	000033		27. ;END OF CMD SEQ TABLE CODE (DEF) OR CMD 7
161	002274	004000		DATCNT ;BYTE COUNT (DEFAULT = MAX BUFFER SIZE).
162	002276	076400		32000. ;NUMBER OF OPERATIONS (DEFAULT = 32000).
163	002300	000007		RANP ;PATTERN (DEFAULT = RANDOM).
164	002302	000033		27. ;END OF CMD SEQ TABLE CODE (DEF) OR CMD 8
165	002304	004000		DATCNT ;BYTE COUNT (DEFAULT = MAX BUFFER SIZE).
166	002306	076400		32000. ;NUMBER OF OPERATIONS (DEFAULT = 32000).
167	002310	000007		RANP ;PATTERN (DEFAULT = RANDOM).
168	002312	000001	TS1MD:: .WORD	1 ;DEFAULT SWITCH SETTING
169	002314	000000	RDBUF:: .WORD	0 ;ENABLE READ BUFFERING
170	002316	000000	WTBUF:: .WORD	0 ;ENABLE WRITE BUFFERING
171	002320	000000	HSSW:: .WORD	0 ;RUN AT 100IPS SWITCH
172	002322	000000	EXTFEA:: .WORD	0 ;EXTENDED FEATURES SOFTWARE SW 0=OFF;1=ON
173	002324	000000	BENBSW:: .WORD	0 ;BUFFER ENABLE SOFTWARE SW 0=OFF;1=ON
174				
175	002326		ENDSW	
176	002326		L10001:	
177	002326		ENDMOD	

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.TITLE GLOBAL AREAS  
.SBTTL GLOBAL EQUATES SECTION

BGNMOD

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

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

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

! PRIORITY LEVEL DEFINITIONS

000340	PRI07--	340
000300	PRI06--	300



GLOBAL AREAS MACRO M1113 30-NOV-83 10:17  
 GLOBAL EQUATES SECTION

SEQ 044

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

;  
 ; REGISTER USAGE.

;  
 ; R0 - PASSES PARAMETERS TO/FROM DIAGNOSTIC SUPERVISOR.  
 ; R1 - COMMAND SEQUENCE TABLE POINTER.  
 ; R2 - GENERAL PURPOSE REGISTER.  
 ; R3 - GENERAL PURPOSE REGISTER.  
 ; R4 - GENERAL PURPOSE REGISTER.  
 ; R5 - CURRENT LOGICAL DEVICE NUMBER X 2.  
 ; R6 - STACK POINTER.  
 ; R7 - PROGRAM COUNTER.

;  
 ;THE FOLLOWING ARE BIT DEFINITIONS FOR THE TSSR REGISTERS.

100000 TS.SC==100000 ;SPECIAL CONDITION BIT.  
 040000 TS.UPE==40000 ;UNIBUS PARITY ERROR  
 020000 TS.SPE==20000 ;SERIAL BUS PARITY ERROR.  
 010000 TS.RMR==10000 ;REGISTER MODIFICATION REFUSED.  
 004000 TS.NXM==4000 ;NON-EXISTENT MEMORY.  
 002000 TS.NBA==2000 ;NEED BUFFER ADDRESS.  
 001000 TS.A17==1000 ;BUS ADDRESS BIT 17.  
 000400 TS.A16==400 ;BUS ADDRESS BIT 16.  
 000200 TS.SSR==200 ;UNIT READY BIT.  
 000100 TS.OFL==100 ;OFF LINE.  
 177717 TSC.FCC==177717 ;FATAL CLASS CODE MASK.  
 177761 TSC.TCC==177761 ;TERMINATION CLASS CODE MASK.

;  
 ;THE FOLLOWING ARE BIT DEFINITIONS FOR THE COMMAND WORD

100000 ACK.C==100000 ;ACKNOWLEDGE BIT  
 040000 CVC.C==40000 ;CLEAR VOLUME CHECK.  
 020000 OPP.C==20000 ;OPPOSITE BIT  
 010000 SWB.C==10000 ;SWAP BYTE BIT

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GLOBAL AREASSEQ  
GLOBAL EQUATES SECTION

SEQMACRO M1113 30-NOV-83 10:17

SEQ 045

```

251      004000      MOD.C3==4000      ;MODE BIT 3
252      004000      BRFC==4000      ;BYTE/RECORD/FILE COUNT FLAG BIT. NOT USED
253      ;BY TS05 BUT USED INTERNALLY BY THIS PROGRAM ONLY.
254      002000      MOD.C2==2000      ;MODE BIT 2
255      001000      MOD.C1==1000      ;MODE BIT 1
256      000400      MOD.C0==400      ;MODE BIT 0
257      000200      IE.C==200      ;INTERRUPT ENABLE
258      000100      FMT.C1==100      ;FORMAT BIT 1
259      000100      VFY.C==100      ;WRITE VERIFY FLAG BIT. INTERNAL USE ONLY.
260      ;NOT USED BY TS05.
261      000040      FMT.C0==40      ;FORMAT BIT 0.
262      000040      JMP.C==40      ;JUMP BIT-TO DIRECT THIS PROGRAM TO JUMP TO
263      ;A CERTAIN LOCATION IN THE COMMAND SEQUENCE
264      ;TABLE. INTERNAL USE ONLY.
265      000020      CMD.C4==20      ;COMMAND BIT 4
266      000020      DLY.C==20      ;INSERT DELAY. INTERNAL USE ONLY.
267      000010      CMD.C3==10      ;COMMAND BIT 3
268      000004      CMD.C2==4      ;COMMAND BIT 2
269      000002      CMD.C1==2      ;COMMAND BIT 1
270      000001      CMD.C0==1      ;COMMAND BIT 0
271
272      ;BIT DEFINITIONS FOR DEVICE CHARACTERISTICS.
273
274      000200      CH.ESS==200      ;ENABLE SKIP TAPE MARKS STOP (STOP AT LOGICAL EOT).
275      000040      CH.EAI==40      ;ENABLE ATTENTION INTERRUPTS.
276      000020      CH.ERI==20      ;ENABLE MESSAGE BUFFER RELEASE INTERRUPTS.
277      000040      DFTSCH==CH.EAI      ;DEFAULT CHARACTERISTICS CODE.
278
279      ;BIT DEFINITIONS FOR EXTENDED CONTROL WORD
280
281      000040      EF.HSS==40      ;ENABLE HIGH SPEED SELECT
282      000030      EF.RWB==30      ;ENABLE BOTH READ & WRITE BUFFERING
283      000020      EF.RBO==20      ;ENABLE READ BUFFERING ONLY
284
285      ;THE FOLLOWING INDICATES THE RELATIVE POSITIONS OF THE STATUS WORDS
286      ;IN THE MESSAGE BUFFER.
287
288      000004      MS.RFC==4      ;RESIDUAL FRAME COUNT.
289      000006      MS.XS0==6      ;EXT STATUS REG 0
290      000010      MS.XS1==10      ;EXT STATUS REG 1
291      000012      MS.XS2==12      ;EXT STATUS REG 2
292      000014      MS.XS3==14      ;EXT STATUS REG 3
293      000016      MS.XS4==16      ;EXT STATUS REG 4
294
295      ;THE FOLLOWING ARE BIT DEFINITIONS FOR EXTENDED STATUS REGISTER 0.
296
297      100000      XO.TMK==100000      ;TAPE MARK.
298      040000      XO.RLS==40000      ;RECORD LENGTH SHORT.
299      020000      XO.LET==20000      ;LOGICAL EOT.
300      010000      XO.RLL==10000      ;RECORD LENGTH LONG.
301      000100      XO.ONL==100      ;ON LINE BIT.
302      000004      XO.WLK==4      ;WRITE LOCK BIT
303      000002      XO.BOT==2      ;BOT BIT.
304      000001      XO.EOT==1      ;EOT BIT.
305
306      ;THE FOLLOWING ARE BIT DEFINITIONS FOR EXTENDED STATUS REGISTER 2.
307

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308      100000      X2.OPM==100000      ;OPERATION IN PROGRESS, TAPE MOVING
309      000200      X2.EFE==200      ;EXTENDED FEATURES ENABLED
310      000100      X2.BFE==100      ;BUFFERING ENABLED
311
312      ;THE FOLLOWING ARE BIT DEFINITIONS FOR EXTENDED STATUS REGISTER 3.
313
314      000010      X3.DCK==10      ;DENSITY CHECK.
315      157400      X3.RNY==157400    ;CAPSTAN RUNAWAY UDIAG ERROR CODE.
316
317      ;THE FOLLOWING ARE BIT DEFINITIONS FOR EXTENDED STATUS REGISTER 4.
318
319      100000      X4.HSS==100000    ;HIGH SPEED SWITCH INDICATING 100IPS
320      040000      X4.RCE== 40000    ;RETRY COUNT EXCEEDED
321
322
323      ;THE FOLLOWING DEFINITIONS SHOW THE RELATIVE POSITIONS OF THE COMMAND
324      ;PACKET ENTRIES.
325
326      000000      CP.CMD==0      ;CMDPKT.0==TS05 COMMAND.
327      000002      CP.ADL==2      ;CMDPKT.2==BUFFER ADDRESS LOW.
328      000004      CP.ADH==4      ;CMDPKT.4==BUFFER ADDRESS HIGH.
329      000006      CP.CNT==6      ;CKDPKT.6==BYTE/FILE/RECORD COUNT
330
331      ;MISCELLANEOUS DEFINITIONS.
332
333      000340      INTPRI==PRI07    ;PRIORITY TO BE USED IN INTERRUPT STATE.
334      000012      SCHCNT==12      ;ARBITRARY BYTE LENGTH FOR CHARACTERISTIC
335      ;BUFFER LENGTH. (EVEN #)
336      000020      MSGCNT==20      ;MESSAGE BUFFER LENGTH IN BYTES. (EVEN #)
337      000020      DIACNT==20      ;DIAGNOSTIC COMMAND BUFFER EXTENT.
338      004000      DATCNT==2048.    ;MAXIMUM RECORD LENGTH IN BYTES.
339      ;THIS COUNT SHOULD BE A MULTIPLE OF 256 TO INSURE
340      ;PROPER READ/WRITE BUFFER ALLOCATION BY THE SUPER.
341      177740      RNOPSC==177740   ;RANDOM # OF OPERATIONS MASK.
342      000007      RANP==7          ;CODE TO SELECT RANDOM PATTERN.
343      000020      RRECL==16.       ;READ RECOVERY ATTEMPT LIMIT.
344      000020      WRECL==16.       ;WRITE RECOVERY ATTEMPT LIMIT.
345      153624      RANBC==153624    ;CONSTANT USED TO RESET RANDOM # GENERATOR BASE.
346      032561      RANSC==32561     ;CONSTANT USED TO RESET RANDOM # SAVE LOCATION.
347      177774      NINUSE==177774   ;NOT IN USE CODE FOR DEVICE STATE TABLE.
348      177740      NCMD.C==ACK.C!CVC.C!OPP.C!SWB.C!MOD.C3!MOD.C2!MOD.C1!MOD.CO!IE.C!FMT.C1!FMT.CO
349      ;NOT "COMMAND" BITS.
350
351      ;THE FOLLOWING DEFINES THE COMMAND WORD FOR EACH TS05 COMMAND.
352
353      100013      DRI==  ACK.C!CMD.C3!CMD.C1!CMD.CO
354      ;DRIVE INIT.
355
356      104001      RDF==  ACK.C!BRF.C!CMD.CO
357      ;READ FORWARD
358
359      104401      RDR==  ACK.C!BRF.C!MOD.CO!CMD.CO
360      ;READ REVERSE
361
362      104005      WRT==  ACK.C!BRF.C!CMD.CO!CMD.C2
363      ;WRITE COMMAND
364

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365	104105	WTV==	ACK.C!BRF.C!VFY.C!CMD.CO!CMD.C2 ;WRITE VERIFY
366			
367			
368	104010	SRF==	ACK.C!BRF.C!CMD.C3 ;SPACE RECORD FORWARD
369			
370			
371	104410	SRR==	ACK.C!BRF.C!MOD.CO!CMD.C3 ;SPACE RECORD REVERSE
372			
373			
374	105401	RNR==	ACK.C!BRF.C!MOD.C1!MOD.CO!CMD.CO ;READ REV RETRY1 - REREAD NEXT REVERSE, IE. SPACE FWD, READ REVERSE
375			
376			
377	125401	RNF==	ACK.C!BRF.C!OPP.C!MOD.C1!MOD.CO!CMD.CO ;READ REV RETRY2 - REREAD NEXT FORWARD, IE. READ FORWARD, SPACE REVERSE
378			
379			
380	105001	RPF==	ACK.C!BRF.C!MOD.C1!CMD.CO ;READ FWD RETRY1 - REREAD PREVIOUS FORWARD, IE. SPACE REVERSE, READ FORWARD
381			
382			
383	125001	RPR==	ACK.C!BRF.C!OPP.C!MOD.C1!CMD.CO ;READ FWD RETRY2 - REREAD PREVIOUS REVERSE, IE. READ REVERSE, SPACE FORWARD
384			
385			
386	105005	WRR==	ACK.C!MOD.C1!BRF.C!CMD.C2!CMD.CO ;WRITE RETRY
387			
388			
389	102010	RWD==	ACK.C!MOD.C2!CMD.C3 ;REWIND COMMAND
390			
391			
392	100012	MBR==	ACK.C!CMD.C3!CMD.C1 ;MESSAGE BUFFER RELEASE
393			
394			
395	100011	WTM==	ACK.C!CMD.C3!CMD.CO ;WRITE TAPE MARK.
396			
397			
398	101011	WTR==	ACK.C!MOD.C1!CMD.C3!CMD.CO ;WRITE TAPE MARK RETRY.
399			
400			
401	105010	SFF==	ACK.C!BRF.C!MOD.C1!CMD.C3 ;SPACE FILE FORWARD
402			
403			
404	105410	SFR==	ACK.C!BRF.C!MOD.CO!MOD.C1!CMD.C3 ;SPACE FILE REVERSE
405			
406			
407	100017	GES==	ACK.C!CMD.CO!CMD.C1!CMD.C2!CMD.C3 ;GET EXTENDED STATUS
408			
409			
410	100411	ERS==	ACK.C!MOD.CO!CMD.C3!CMD.CO ;ERASE 3 INCHES OF TAPE
411			
412			
413	100412	UNL==	ACK.C!MOD.CO!CMD.C3!CMD.C1 ;UNLOAD COMMAND
414			
415			
416	101012	CLN==	ACK.C!MOD.C1!CMD.C3!CMD.C1 ;ERASE TAPE.
417			
418			
419	140004	SCH==	ACK.C!CVC.C!CMD.C2 ;SET DEVICE CHARACTERISTICS.
420			
421	140006	WSM==	ACK.C!CVC.C!CMD.C2!CMD.C1 ;WRITE SUB-SYS MEM



```

479                                     ;8TH WORD:: XSTAT4
480                                     ;
481                                     ; MESSAGE PACKETS.
482 002374 MSGPK0:: .BLKW 8.                ;MESSAGE PACKET FOR DEVICE #0
483 002414 MSGPK1:: .BLKW 8.                ;MESSAGE PACKET FOR DEVICE #1
484 002434 MSGPK2:: .BLKW 8.                ;MESSAGE PACKET FOR DEVICE #2
485 002454 MSGPK3:: .BLKW 8.                ;MESSAGE PACKET FOR DEVICE #3
486
487                                     ; SET CHARACTERISTIC BLOCK.
488
489 002474 002374 SCHBK:: MSGPK0            ;1ST WORD:: MSGPKT ADDR LO(SET UP BY EXECUTE ROUTINE).
490 002476 000000 0                        ;2ND WORD:: MSGPKT ADDR HI.
491 002500 000020 MSGCNT                    ;3RD WORD:: MSG BUFFER LENGTH (BYTES)
492 002502 000040 CH.EAI                    ;4TH WORD:: CHARACTERISTICS WORD(SET BY SETUP ROUTINE).
493 002504 000000 0                        ;5TH WORD:: MSP & BUFFER CONTROL ON EXT'D FEATURES
494
495                                     ;
496                                     ; WRITE SUB-SYSTEM MEMORY CHARACTERISTIC BLOCK.
497
498 002506 000000 WSMBK:: 0                  ;1ST WORD:: SEL 0
499 002510 000000 0                        ;2ND WORD:: SEL 2
500 002512 000000 0                        ;3RD WORD:: SEL 4
501
502                                     ; TS05 REGISTER ADDRESSES.
503
504 002514 TSDB:: .BLKW 4                    ;TS05 DATA BUFFER ADDRESSES.
505 002524 TSSR:: .BLKW 4                    ;TS05 STATUS REGISTER ADDRESSES.
506 002534 TSVCT:: .BLKW 4                  ;TS05 VECTOR ADDRESSES.
507 002514 TSBA==TSDB                       ;DATA BUFFER ADDRESS REGISTER.
508
509                                     ;
510                                     ; ADDRESSES OF MESSAGE PACKETS.
511
512 002544 002374 MSGPKA:: MSGPK0           ;DEVICE 0.
513 002546 002414 MSGPK1                   ;DEVICE 1.
514 002550 002434 MSGPK2                   ;DEVICE 2.
515 002552 002454 MSGPK3                   ;DEVICE 3.
516
517                                     ;
518                                     ; ADDRESSES OF INTERRUPT HANDLING ROUTINES.
519 002554 010034 TSSINT:: TSSIN0           ;DEVICE 0.
520 002556 010042 TSSIN1                   ;DEVICE 1.
521 002560 010050 TSSIN2                   ;DEVICE 2.
522 002562 010056 TSSIN3                   ;DEVICE 3.
523
524                                     ;
525                                     ; TS05 CODE LEVELS, WILL BE STORED AFTER SCH CMD IN BASIC FUNCTION TEST
526 002564 000000 TSSCL:: 0                 ;DEVICE 0
527 002566 000000 0                        ;DEVICE 1
528 002570 000000 0                        ;DEVICE 2
529 002572 000000 0                        ;DEVICE 3
530
531                                     ;
532                                     ; TS05 EXT. FEA & BUF. ENA SW'S, WILL BE STORED AFTER SCH CMD IN BASIC FUNCTION TEST
533 002574 000000 TSSSW:: 0                 ;DEVICE 0
534 002576 000000 0                        ;DEVICE 1
535 002600 000000 0                        ;DEVICE 2

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536 002602 000000          0          ;DEVICE 3
537
538          ;          UNIT NUMBERS OF ALL DEVICES BEING TESTED(1-4).
539          ;          WHEN DEVICE IS NOT IN USE, IT,S LOCATION WILL = -3.
540          ;          RS WILL ALWAYS CONTAIN THE PRESENT LOGICAL UNIT NUMBER X 2.
541
542 002604 177774          DEVTBL:: .WORD  NINUSE
543 002606 177774          .WORD  NINUSE
544 002610 177774          .WORD  NINUSE
545 002612 177774          .WORD  NINUSE
546 002614 177774          .WORD  END
547
548
549          ;          BAD TAPE TABLE POINTER: USED BY WRITE RETRY ROUTINE
550          ;          "WRTY" TO LOG BAD TAPE SPOTS ON UNITS UNDER TEST
551
552 002616 003046          BTADDR:: BT0
553 002620 003120          BT1
554 002622 003172          BT2
555 002624 003244          BT3
556          ;          COUNTER AREA.
557
558          002626          CNTBGN=.
559 002626          WRBC:: .BLKW  20          ;BYTES WRITTEN.
560 002666          RRBC:: .BLKW  20          ;BYTES READ REV.
561 002726          RFBC:: .BLKW  20          ;BYTES READ FWD.
562 002766          WRREC:: .BLKW  4          ;RECOVERABLE WRITE ERRORS.
563 002776          WRUNR:: .BLKW  4          ;UNRECOVERABLE WRITE ERRORS.
564 003006          RRREC:: .BLKW  4          ;RECOVERABLE READ REV ERRORS.
565 003016          RRUNR:: .BLKW  4          ;UNRECOVERABLE READ REV ERRORS.
566 003026          RFREC:: .BLKW  4          ;RECOVERABLE READ FWD ERRORS.
567 003036          RFUNR:: .BLKW  4          ;UNRECOVERABLE READ FWD ERRORS.
568 003046          BT0:: .BLKW  21.          ;UNIT 0 BAT TAPE SPOTS LOG
569 003120          BT1:: .BLKW  21.          ;UNIT 1 BAT TAPE SPOTS LOG
570 003172          BT2:: .BLKW  21.          ;UNIT 2 BAT TAPE SPOTS LOG
571 003244          BT3:: .BLKW  21.          ;UNIT 3 BAT TAPE SPOTS LOG
572 003316          WRTYCT:: .BLKW  4          ;WRITE RETRY COUNTER
573 003326          PASCNT:: .BLKW  4          ;PASS COUNT.
574 003336          SCCNT:: .BLKW  4          ;SPECIAL CONDITION COUNT.
575 003346          VFYCNT:: .BLKW  4          ;COUNT OF TS05 DATA COMPARE ERRORS.
576 003356          HROCNT:: .BLKW  4          ;COUNT OF HARD ERRORS.
577 003366          FTLCNT:: .BLKW  4          ;COUNT OF FATAL ERRORS.
578          003376          CNTEND=.          ;END OF STATICTICAL COUNTERS.
579 003376          RECCNT:: .BLKW  4          ;NUMBER OF RECORDS FROM BOT: CLEARED ON REWIND
580          ;AND WHEN RESTARTING OR CONTINUING TEST 2.
581          000550          CNTLEN= CNTEND-CNTBGN          ;LENGTH OF STATISTICAL COUNTER AREA.
582
583
584          ;          THE FOLLOWING ARE THE DEFINITIONS OF VARIABLES
585          ;          USED BY THE PROGRAM.
586
587 003406 000000          DATAWT:: .WORD  0          ;WRITE BUFFER ADDRESS.
588          003406          DIABLK= DATAWT          ;WRITE BUFFER ALSO USED FOR DIAG CMD.
589 003410 000000          DATARD:: .WORD  0          ;READ BUFFER ADDRESS.
590 003412 000000          NCNT:: .WORD  0          ;STORAGE FOR VALUE OF N.
591 003414 000000          NCNT1:: .WORD  0          ;TEMP STORAGE FOR VALUE OF N.
592 003416 000000          BRFCNT:: .WORD  0          ;STORAGE FOR BPCR VALUE.

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```

593 003420 177777 CMDWRD:: .WORD END ;CONTAINS COMMAND WORD BEING EXECUTED PRESENTLY.
594 003422 177777 CHDSAV:: .WORD END ;SAVE LOCATION FOR CMD WORD DURING ERROR RECOVERY
595 003424 177777 PCMDWD:: .WORD END ;CONTAINS PREVIOUS COMMAND WORD.
596 003426 000000 CMDLG:: .WORD 0 ;CURRENT COMMAND LOGGING CODE.
597 003430 000000 LENMSK:: .WORD 0 ;RANDOM WRITE LENGTH MASK, TO BE SET UP BY TESTS
598 003432 153624 RANB:: .WORD 153624 ;RANDOM # GENERATOR BASE.
599 003434 032561 RANS:: .WORD 32561 ;RANDOM # SAVE LOCATION.
600 003436 000000 TIME1:: .WORD 0 ;TIME COUNT 1.
601 003440 000000 TIME2:: .WORD 0 ;TIME COUNT 2.
602 003442 000000 JLOOP:: .WORD 0 ;JMP COMMAND LOOP COUNT.
603 003444 000000 JLOC:: .WORD 0 ;JMP COMMAND LOCATION COUNT.
604 003446 000000 PATERN:: .WORD 0 ;PATTERN SELECT CODE.
605 003450 000000 CTCC:: .WORD 0 ;CURRENT TERMINATION CLASS CODE.
606 003452 000000 RSSAVE:: .WORD 0 ;LOCATION FOR SAVING CURRENT DEVICE POINTER.
607 003454 000000 TSSREG:: .WORD 0 ;CURRENT STATUS REGISTER.
608 003456 000000 WTMFLG:: .WORD 0 ;WRITE TAPE MARK FLAG
609
610 ; ERROR FLAG AREA, THESE FLAGS ARE CLEARED DURING INITIALIZATION AND
611 ; AFTER EACH COMMAND IS COMPLETED.
612
613 003460 BGNFLG=.
614 003460 000000 RETRYC:: .WORD 0 ;# OF RECOVERY ATTEMPTS EXECUTED.
615 003462 000 RPTCNT:: .BYTE 0 ;WRITE REPEAT ON SAME SPOT CNTR: 4 PER WRITE RETRY
616 003463 000 WRTYFG:: .BYTE 0 ;WRITE RETRY ON SAME SPOT IN PROGRESS FLAG
617 003464 000 WRTYER:: .BYTE 0 ;WRITE RETRY ON SAME SPOT ERROR FLAG
618 003465 000 RECLOG:: .BYTE 0 ;RECORD COUNT HAS BEEN UPDATED FOR THIS RECORD.
619 003466 000 ERLOG:: .BYTE 0 ;DATA BYTES AND ERRORS HAVE BEEN LOGGED FOR THIS RECORD.
620 003467 000 RWERR:: .BYTE 0 ;READ/WRITE ERROR HAS OCCURED.
621 003470 000 UNREC:: .BYTE 0 ;UNRECOVERABLE ERROR HAS OCCURED.
622 003471 000 ERRREC:: .BYTE 0 ;ERROR RECOVERY MODE.
623 .EVEN
624 003472 ENDERF=.
625
626 ;
627 ; ADDITIONAL FLAGS, THESE FLAGS ARE CLEARED DURING INITIALIZATION.
628
629 003472 INTFLG:: .BLKW 4 ;INTERRUPT OCCURRED FLAGS FOR EACH DEVICE.
630 003502 EOTFLG:: .BLKW 4 ;EOT/BOT FLAGS FOR EACH DEVICE (XSTATO).
631 003512 000000 BTPT:: .WORD 0 ;BAD TAPE SPOT POINTER TO BTO-BT3 VIA BTADDR
632 003514 000 EXPBOT:: .BYTE 0 ;BOT IS EXPECTED, DO NOT ABORT ON BOT/FUNC RTI.
633 003515 000 RANDOM:: .BYTE 0 ;RANDOM EVERYTHING FLAG.
634 003516 000 VFYFLG:: .BYTE 0 ;SET DURING WRITE/VERIFY COMMAND.
635 003517 000 RPTFLG:: .BYTE 0 ;PERFORMANCE REPORT HAS BEEN REQUESTED.
636 003520 000 SWBFLG:: .BYTE 0 ;ENABLES SWAP BYTE FUNCTION WHEN NOT EQUAL TO ZERO.
637 003521 000 IRE:: .BYTE 0 ;INHIBIT RESIDUAL FRAME COUNT ERROR REPORT.
638 003522 000 DROPED:: .BYTE 0 ;CURRENT UNIT HAS BEEN DROPPED
639 003523 000 T1SWB:: .BYTE 0 ;TEST1 SWAP BYTES FLAG
640 003524 000 ALLEOT:: .BYTE 0 ;ALL UNITS @ EOT FLAG
641 003525 000 ERSFLG:: .BYTE 0 ;ERASE FLAG: DO ERASE AFTER A SPACE REV TO DELETE
642 ;BADLY WRITTEN RECORD. 1 TO 4 ERASES LEAVING
643 ;A 3 TO 12 INCH GAP MAY RESULT.
644 .EVEN
645 003526 ENDFLG=.
646
647 ;
648 ; ADDITIONAL FLAGS, THESE FLAGS ARE CLEARED ONLY AFTER BEING CHECKED.
649 003526 000 STAF LG:: .BYTE 0 ;START FLAG - SET BY INIT CODE IF STARTING.

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GLOBAL AREAS  
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SEQ 052

```

650 003527 000 PWRFLG:: .BYTE 0 ;POWER FAILURE FLAG - SET ONLY DURING INIT.
651 003530 000 TRAPD4:: .BYTE 0 ;TRAPED AT 4 FLAG
652 003531 000 MISCFG:: .BYTE 0 ;MISCELLANEOUS FLAG
653 003532 000000 TSUNT:: .WORD 0 ;NUMBER OF THE UNIT UNDER TEST PLUS HSSP&BUF
654 003534 000000 TSNP:: .WORD 0 ;FOR PRINT OUT UNIT # ONLY
655
656 ; OPERATOR FLAG SETTINGS PASSED BY DIAG. SUPERVISOR IN A 16 BIT WORD
657 ; SEE GLOBAL EQUATES SECTION FOR FLAG BIT LIST
658
659 003536 000000 OPFLAG:: .WORD 0 ;READ ONLY OPERATOR FLAG WORD
660 .EVEN
661
662 ;THE FOLLOWING IS THE COMMAND SEQUENCE TABLE. THE TABLE
663 ;HAS DEFAULT VALUES AT PROGRAM LOAD AS SHOWN. THESE VALUES
664 ;CAN BE UPDATED BY A TEST OR BY OPERATOR INPUT.
665
666 003540 140004 CMDSEQ:: .WORD SCH ;SET CHARACTERISTICS.
667 003542 000040 .WORD CH.EAI
668 003544 000001 .WORD 1
669 003546 000000 .WORD 0
670 003550 102010 CMDSE2:: .WORD RWD ;REWIND.
671 003552 000001 .WORD 1 ;BYTE COUNT.
672 003554 000001 .WORD 1 ;ONCE.
673 003556 000007 .WORD RANP ;PATTERN.
674 003560 104005 .WORD WRT ;WRITE.
675 003562 004000 .WORD DATCNT ;MAX BUFFER LENGTH.
676 003564 076400 .WORD 32000. ;32,000 RECORDS.
677 003566 000007 .WORD RANP ;RANDOM PATTERN.
678 003570 104401 .WORD RDR ;READ REV.
679 003572 004000 .WORD DATCNT ;MAX BUFFER LENGTH.
680 003574 076400 .WORD 32000. ;32,000 RECORDS
681 003576 000007 .WORD RANP ;RANDOM PATTERN.
682 003600 104001 .WORD RDF ;READ FWD.
683 003602 004000 .WORD DATCNT ;MAX BUFFER LENGTH.
684 003604 076400 .WORD 32000. ;32,000 RECORDS.
685 003606 000007 .WORD RANP ;RANDOM PATTERN.
686 003610 102010 .WORD RWD ;REWIND.
687 003612 000001 .WORD 1 ;BYTE COUNT.
688 003614 000001 .WORD 1 ;ONCE.
689 003616 000007 .WORD RANP ;PATTERN.
690 003620 .BLKW 40. ;EXTENSION TO DOUBLE BUFFER SIZE
691 003740 177777 SEQEND:: .WORD END ;SOFT END OF SEQUENCE TABLE.
692 003742 177777 .WORD END
693 003744 177777 .WORD END
694 003746 177777 .WORD END
695 003750 177777 .WORD END ;HARD END OF SEQUENCE TABLE.
696
697 ;THE FOLLOWING IS THE TS05 COMMAND TABLE
698 003752 100013 CMDTBL:: .WORD DRI ;DRIVE INIT.
699 003754 104001 .WORD RDF ;READ FORWARD.
700 003756 104401 .WORD RDR ;READ REVERSE.
701 003760 104005 .WORD WRT ;WRITE
702 003762 104105 .WORD WTV ;WRITE/VERIFY. (WRITE ALL RECORDS, RDR AND
703 ;CHECK DATA ON ALL RECORDS, RDF AND
704 ;CHECK DATA ON ALL RECORDS.)
705 003764 104010 .WORD SRF ;SPACE "N" RECORDS FORWARD.
706 003766 104410 .WORD SRR ;SPACE "N" RECORDS REVERSE.

```

707 003770 105401  
708 003772 125401  
709 003774 105001  
710 003776 125001  
711 004000 105005  
712 004002 102010  
713 004004 100012  
714 004006 100011  
715 004010 101011  
716 004012 105010  
717 004014 105410  
718 004016 100017  
719 004020 100411  
720 004022 100412  
721 004024 101012  
722 004026 140004  
723 004030 100006  
724 004032 000040  
725 004034 000020  
726 004036 177777

.WORD RNR  
.WORD RNF  
.WORD RPF  
.WORD RPR  
.WORD WRR  
.WORD RWD  
.WORD MBR  
.WORD WTM  
.WORD WTR  
.WORD SFF  
.WORD SFR  
.WORD GES  
.WORD ERS  
.WORD UNL  
.WORD CLN  
.WORD SCH  
.WORD DIA  
.WORD JMP  
.WORD DLY  
.WORD END

!READ NEXT REVERSE. I.E., SPACE FWD, READ REVERSE.  
!READ NEXT FORWARD, I.E., READ FORWARD, SPACE REVERSE.  
!READ PREVIOUS FORWARD. I.E., SPACE REVERSE, READ FORWARD  
!READ PREVIOUS REVERSE. I.E., READ REVERSE, SPACE FORWARD  
!WRITE RETRY.  
!REWIND.  
!MESSAGE BUFFER RELEASE  
!WRITE TAPE MARK  
!WRITE TAPE MARK RETRY.  
!SPACE "N" FILES FORWARD.  
!SPACE "N" FILES REVERSE.  
!GET EXTENDED STATUS.  
!ERASE 3 INCHES OF TAPE.  
!REWIND AND UNLOAD.  
!CLEAR TAPE.  
!SET CHARACTERISTICS.  
!DIAGNOSTIC COMMAND.  
!JUMP TO THE NTH COMMAND IN THE SEQUENCE.  
!DELAY "N" MS.  
!END OF COMMAND TABLE

! THE FOLLOWING TABLE CONTAINS THE ASCII FOR EACH COMMAND.

727  
728  
729  
730 004040 104 122 111  
731 004043 122 104 106  
732 004046 122 104 122  
733 004051 127 122 124  
734 004054 127 124 126  
735  
736 004057 123 122 106  
737 004062 123 122 122  
738 004065 122 116 122  
739 004070 122 116 106  
740 004073 122 120 106  
741 004076 122 120 122  
742 004101 127 122 122  
743 004104 122 127 104  
744 004107 115 102 122  
745 004112 127 124 115  
746 004115 127 124 122  
747 004120 123 106 106  
748 004123 123 106 122  
749 004126 107 105 123  
750 004131 105 122 123  
751 004134 125 116 114  
752 004137 103 114 116  
753 004142 123 103 110  
754  
755 004145 104 111 101  
756  
757  
758 004150 112 115 120  
759  
760  
761 004153 104 114 131  
762  
763 004156 105 116 104

CMDASC:: .ASCII /DRI/  
.ASCII /RDF/  
.ASCII /RDR/  
.ASCII /WRT/  
.ASCII /WTV/  
.ASCII /SRF/  
.ASCII /SRR/  
.ASCII /RNR/  
.ASCII /RNF/  
.ASCII /RPF/  
.ASCII /RPR/  
.ASCII /WRR/  
.ASCII /RWD/  
.ASCII /MBR/  
.ASCII /WTM/  
.ASCII /WTR/  
.ASCII /SFF/  
.ASCII /SFR/  
.ASCII /GES/  
.ASCII /ERS/  
.ASCII /UNL/  
.ASCII /CLN/  
.ASCII /SCH/  
.ASCII /DIA/  
.ASCII /JMP/  
.ASCII /DLY/  
.ASCII /END/

!DRIVE INIT.  
!READ FORWARD.  
!READ REVERSE.  
!WRITE  
!WRITE/VERIFY. (WRITE ALL RECORDS, RDR AND CHECK DATA  
!ON ALL RECORDS, RDF AND CHECK DATA ON ALL RECORDS.)  
!SPACE "N" RECORDS FORWARD.  
!SPACE "N" RECORDS REVERSE.  
!READ NEXT REVERSE. I.E., SPACE FWD READ REVERSE.  
!READ NEXT FORWARD, I.E., READ FORWARD, SPACE REVERSE.  
!READ PREVIOUS FORWARD. I.E., SPACE REVERSE, READ FORWARD  
!READ PREVIOUS REVERSE. I.E., READ REVERSE, SPACE FORWARD  
!WRITE RETRY.  
!REWIND.  
!MESSAGE BUFFER RELEASE  
!WRITE TAPE MARK  
!WRITE TAPE MARK RETRY.  
!SPACE "N" FILES FORWARD.  
!SPACE "N" FILES REVERSE.  
!GET EXTENDED STATUS.  
!ERASE 3 INCHES OF TAPE.  
!REWIND AND UNLOAD.  
!CLEAN TAPE.  
!SET CHARACTERISTICS. WHERE BRF=200, 40, 20, 0.  
!SEE TSV05/TS05 PROGRAMMING SPECIFICATION FOR DESCRIPTION.  
!DIAGNOSTICS. SEE TSV05/TS05 PROGRAMMING SPECIFICATION  
!FOR DESCRIPTION. ODT MUST BE USED TO LOAD DIAGNOSTIC DATA  
!INTO THE WRITE BUFFER BEFORE THIS CMD IS ISSUED.  
!JUMP TO THE NTH COMMAND IN THE COMMAND  
!SEQUENCE TABLE, WHERE N IS DEFINED IN  
!THE # OF OPERATIONS.  
!DELAY "N" MS, WHERE N IS DEFINED IN  
!THE # OF OPERATIONS.  
!END OF COMMAND SEQUENCE.

```

764          .EVEN
765
766
767
768          .SBTTL GLOBAL TEXT SECTION
769
770          ;**
771          ; THE GLOBAL TEXT SECTION CONTAINS FORMAT STATEMENTS,
772          ; MESSAGES, AND ASCII INFORMATION THAT ARE USED IN
773          ; MORE THAN ONE TEST.
774          ;--
775
776
777
778          ;
779          ; FORMAT STATEMENTS USED IN PRINT CALLS
780          ;
781
782          .MLIST BEX
783
784          045 116 045 CODELM:: .ASCIZ /%#AUNIT #D1#A TSV05 CODE LEVEL #03#N#N/
785          045 116 045 SWSET:: .ASCIZ /%#AUNIT #D1#A TSV05 SWITCH SETTINGS #03#N#N/
786          .EVEN
787
788          130 130 130 HALTH:: .ASCIZ /XXX CMD - TYPE <CR> TO CONTINUE/
789          103 115 104 CHDPKM:: .ASCIZ /CMD PACKET ADR NOT ON MODULO 4 BOUNDARY: RELOAD!/
790          .EVEN
791
792          104 101 124 WTVERR:: .ASCIZ /DATA COMPARE ERROR/
793          104 117 040 TOERM:: .ASCIZ /NO TSV05 RESPONSE/
794          104 116 104 SCERM:: .ASCIZ /UNDEFINED SPEC COND/
795          122 106 103 RFCERM:: .ASCIZ /RFC NON ZERO/
796          124 123 126 NSSRM:: .ASCIZ /TSV05 NOT READY/
797          122 105 124 RLEXM:: .ASCIZ /RETRY LIMIT EXCEEDED/
798          104 122 111 ATTNM:: .ASCIZ /DRIVE OFF LINE/
799          106 125 116 FUNRM:: .ASCIZ /FUNCTION REJECT/
800          106 101 124 FATSM:: .ASCIZ /FATAL SUBSYSTEM ERROR/
801          116 117 040 NOINTM:: .ASCIZ /NO INTERRUPT/
802          124 101 120 TSAM:: .ASCIZ /TAPE STATUS ALERT/
803          124 117 117 TOOMM:: .ASCIZ /TOO MANY INTERRUPTS/
804          103 101 120 RNYM:: .ASCIZ /CAPSTAN RUNAWAY-GET STATUS RESULTS:/
805          122 105 103 RERM:: .ASCIZ /RECOVERABLE ERROR/
806          125 116 122 URERM:: .ASCIZ /UNRECOVERABLE ERROR/
807          045 116 045 DROPM:: .ASCIZ /%#ADROPPED UNIT #D1#N/
808          045 116 045 AUDRPM:: .ASCIZ /%#AALL UNITS DROPPED#N#N/
809          045 116 045 AUDRUN:: .ASCIZ /%#ADIAGNOSTIC ONLY SUPPORTS ONE CONTROLLER#N#N/
810          045 116 045 DTAER2:: .ASCIZ "%#A#BYTE:#D4#S2#A#AS:#B#S2#AS/B:#B#N"
811          045 104 064 DTAER3:: .ASCIZ "%D4#A BYTES IN ERROR OUT OF #D4#N"
812          045 101 116 DTAER4:: .ASCIZ /%#AND DATA READ#N/
813          045 101 122 DTAER5:: .ASCIZ /%#ARECORD TOO LONG: >#D4#A BYTES#N/
814          045 101 122 NURTY1:: .ASCIZ /%#ARECOVERED ON RETRY #D2#N/
815          045 101 104 OFLINM:: .ASCIZ /%#ADRIVE #D1#A OFF LINE#N/
816          045 101 107 GETSTM:: .ASCIZ /%#AGET STATUS CMD RESULTS:#N/
817          045 116 045 NODEV:: .ASCII /%#ABUS TRAP AT #D6#N/
818          045 101 111 .ASCIZ /%#AINTERFACE BAD OR TSOB NOT SET TO ABOVE ADDRESS#N/
819          040 052 052 UNIMLK: .ASCIZ / *****TAPE IS WRITE-LOCKED AND WILL CAUSE ERRORS*****/
820          045 116 000 CRLF:: .ASCIZ /#N/
821          045 116 045 CRLFSP:: .ASCIZ /%#S7/
822          .LIST BEX
823          .EVEN
824
825
826

```

```

827      .SBTTL GLOBAL ERROR REPORT SECTION
828
829      ;**
830      ; THE GLOBAL ERROR REPORT SECTION CONTAINS THE PRINTB AND PRINTX CALLS
831      ; THAT ARE USED IN MORE THAN ONE TEST. IT ALSO INCLUDES THE ASCII MESSAGES
832      ; THAT ARE USED BY THE PRINTB AND PRINTX CALLS..
833      ;--
834
835
836      BGNMSG DTAERM
837      DTAERM:;
838      DATERM:;PRINTB @STAER1,TSNP,PASCNT(R5),RECCNT(R5)
839
840      005752 016546 003376      MOV      RECCNT(R5),-(SP)
841      005756 016546 003326      MOV      PASCNT(R5),-(SP)
842      005762 016746 175546      MOV      TSNP, -(SP)
843      005766 012746 006436      MOV      @STAER1, -(SP)
844      005772 012746 000004      MOV      @4, -(SP)
845      005776 010600      MOV      SP,R0
846      006000 104414      TRAP    C#PNTB
847      006002 062706 000012      ADD     @12,SP
848
849      006006      PRINTB @STAER7
850
851      006006 012746 006530      MOV      @STAER7, -(SP)
852      006012 012746 000001      MOV      @1, -(SP)
853      006016 010600      MOV      SP,R0
854      006020 104414      TRAP    C#PNTB
855      006022 062706 000004      ADD     @4,SP
856
857      006026      MOV      R2,RECREC      ;SAVE R2
858      006032      MOV      R3,TIME1      ;SAVE R3
859      006036      MOV      R4,TIME2      ;SAVE R4
860      006042      JSR      PC,RECTAP      ;RETRIEVE RECORD READ
861      006046      MOV      RECREC,R2      ;RESTORE R2
862      006052      MOV      R3,RECREC      ;SAVE RECORD READ
863      006056      MOV      TIME1,R3      ;RESTORE R3
864      006062      MOV      TIME2,R4      ;RESTORE R4
865      006066      PRINTB @STAER6,RECREC ;PRINT RECORD READ
866
867      006066 016746 000774      MOV      RECREC, -(SP)
868      006072 012746 006562      MOV      @STAER6, -(SP)
869      006076 012746 000002      MOV      @2, -(SP)
870      006102 010600      MOV      SP,R0
871      006104 104414      TRAP    C#PNTB
872      006106 062706 000006      ADD     @6,SP
873
874      006112      EXIT      MSG
875
876      006112 000167      .WORD   J#JMP
877      006114 000000      .WORD   L10002-2-.
878
879      .EVEN
880
881      006116      ENDMSG
882      L10002:
883      006116 104423      TRAP    C#MSG
884
885
886      BGNMSG STAERM
887      STAERM:;
888      STAERM:;PRINTB @STAER1,TSNP,PASCNT(R5),RECCNT(R5)
889
890      006120 016546 003376      MOV      RECCNT(R5),-(SP)
891      006124 016546 003326      MOV      PASCNT(R5),-(SP)
892      006130 016746 175400      MOV      TSNP, -(SP)
893      006134 012746 006436      MOV      @STAER1, -(SP)
    
```

GLOBAL AREAS MACRO M1113 30-NOV-83 10:17  
GLOBAL ERROR REPORT SECTION

SEQ 056

	006140	012746	000004				MOV	#4,-(SP)
	006144	010600					MOV	SP,R0
	006146	104414					TRAP	C#PNTB
	006150	062706	000012				ADD	#12,SP
860	006154			PRINTB	#STAER7			
	006154	012746	006530				MOV	#STAER7,-(SP)
	006160	012746	000001				MOV	#1,-(SP)
	006164	010600					MOV	SP,R0
	006166	104414					TRAP	C#PNTB
	006170	062706	000004				ADD	#4,SP
861	006174	016702	174130	MOV	CMDPKT,R2			
862	006200	042702	177740	BIC	#177740,R2			
863	006204	005302		DEC	R2			;IF CMD IS A READ
864	006206	005702		TST	R2			
865	006210	001016		BNE	50000#			
866	006212	004767	001646	JSR	PC,RECTAP			;THEN RETRIEVE
867	006216	010367	001642	MOV	R3,RECTAP			;AND
868	006222			PRINTB	#STAER6,RECRED			;TYPE RECORD READ
	006222	016746	000640				MOV	RECRED,-(SP)
	006226	012746	006562				MOV	#STAER6,-(SP)
	006232	012746	000002				MOV	#2,-(SP)
	006236	010600					MOV	SP,R0
	006240	104414					TRAP	C#PNTB
	006242	062706	000006				ADD	#6,SP
869	006246			50000#:	PRINTX	#STAER2		
	006246	012746	006616				MOV	#STAER2,-(SP)
	006252	012746	000001				MOV	#1,-(SP)
	006256	010600					MOV	SP,R0
	006260	104415					TRAP	C#PNTX
	006262	062706	000004				ADD	#4,SP
870	006266			PRINTX	#STAER3,CMDPKT,@TSDB(R5),MSGPKT*MS.RFC,TSSREG,CTCC			
	006266	016746	175156				MOV	CTCC,-(SP)
	006272	016746	175156				MOV	TSSREG,-(SP)
	006276	016746	174056				MOV	MSGPKT*MS.RFC,-(SP)
	006302	017546	002514				MOV	@TSDB(R5),-(SP)
	006306	016746	174016				MOV	CMDPKT,-(SP)
	006312	012746	006675				MOV	#STAER3,-(SP)
	006316	012746	000006				MOV	#6,-(SP)
	006322	010600					MOV	SP,R0
	006324	104415					TRAP	C#PNTX
	006326	062706	000016				ADD	#16,SP
871	006332			PRINTX	#STAER4,CMDPKT*2,CMDPKT*4,CMDPKT*6			
	006332	016746	174000				MOV	CMDPKT*6,-(SP)
	006336	016746	173772				MOV	CMDPKT*4,-(SP)
	006342	016746	173764				MOV	CMDPKT*2,-(SP)
	006346	012746	006733				MOV	#STAER4,-(SP)
	006352	012746	000004				MOV	#4,-(SP)
	006356	010600					MOV	SP,R0
	006360	104415					TRAP	C#PNTX
	006362	062706	000012				ADD	#12,SP
872	006366			PRINTX	#STAER5,MSGPKT*MS.XS0,MSGPKT*MS.XS1,MSGPKT*MS.XS2,MSGPKT*MS.XS3,MSGPKT*MS.XS			
	006366	016746	174000				MOV	MSGPKT*MS.XS4,-(SP)
	006372	016746	173772				MOV	MSGPKT*MS.XS3,-(SP)
	006376	016746	173764				MOV	MSGPKT*MS.XS2,-(SP)
	006402	016746	173756				MOV	MSGPKT*MS.XS1,-(SP)
	006406	016746	173750				MOV	MSGPKT*MS.XS0,-(SP)
	006412	012746	006753				MOV	#STAER5,-(SP)

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GLOBAL ERROR REPORT SECTION

SEQ 057

```

006416 012746 000006
006422 010600
006424 104415
006426 062706 000016
873 006432          EXIT   MSG
006432 000167
006434 000432
874
875
876 006436      045      101      130  STAER1: .MLIST BEX
      .ASCIZ  /#AXXX CMD FAILED - UNIT #D1#S3#APASS:#D5#S3#ARECORD:#D5#N/
877      .EVEN
878 006530      045      101      120  STAER7: .ASCIZ  /#APREVIOUS CMD WAS XXX /
879 006562      045      123      061  STAER6: .ASCIZ  /#S11#A* RECORD READ:#D5#A */
880 006616      045      116      045  STAER2: .ASCIZ  /#N#ACMDPKT#S2#ATSBA#S4#ARFC#S5#ATSSR#S3#ATCC#N/
881 006675      045      117      066  STAER3: .ASCIZ  /#O6#S2#O6#S2#O6#S2#O6#S2#D1#N/
882 006733      045      117      066  STAER4: .ASCII  /#O6#N/
883 006740      045      117      066  .ASCII  /#O6#N/
884 006745      045      117      066  .ASCIZ  /#O6#N/
885 006753      045      101      130  STAER5: .ASCII  /#AXST0#S4#AXST1#S4#AXST2#S4#AXST3#S4#AXST4#N/
886 007027      045      117      066  .ASCIZ  /#O6#S2#O6#S2#O6#S2#O6#S2#O6#N/
887      .LIST BEX
888      .EVEN
889 007066 000000  RECRED: .WORD  0          ;RECORD READ FROM TAPE
890
891 007070          ENDMSG
007070          L10003:
007070 104423          TRAP   C#MSG
892
893      .SBTTL GLOBAL SUBROUTINES SECTION
894
895      ;**
896      ; THE GLOBAL SUBROUTINES SECTION CONTAINS THE SUBROUTINES
897      ; THAT ARE USED IN MORE THAN ONE TEST.
898      ;--
899
900
901
902
903      ;*
904      ; ROUTINE TO DO A SOFT INITIALIZE OF THE CONTROLLER
905      ; BY WRITING INTO THE TSSR REGISTER. AFTER THE INIT,
906      ; THE TSSR REGISTER IS TESTED FOR ERRORS. ANY ERRORS
907      ; DETECTED SHOULD BE TREATED AS DEVICE FATAL ERRORS.
908      ;
909      ; INPUTS:
910      ;
911      ;     R5      CURRENT UNIT NUMBER
912      ;
913      ;
914      ; OUTPUTS:
915      ;
916      ;     R0      CONTENTS OF TSSR, IF ERROR
917      ;     CARRY   SET IF INIT WAS OKAY
918      ;             CLEAR IF FATAL ERROR
919      ;
920      ; CALLING SEQUENCE:
921      ;     JSR     PC,FIRSTU

```

```

922      ;      JSR      PC,SOFINIT
923      ;      BCS      CONTINUE
924      ;      ERRDF      ;REPORT FATAL ERROR
925      ;
926      ;-
927
928 007072      SOFINIT::
929
930 007072 012775 000000 002524      MOV      #0,@TSSR(R5)      ; (SAVREG) SAVE THE REGISTERS
931 007100 004767 003574      JSR      PC,WSSR      ; DO THE INIT.
932 007104 012703 000550      MOV      #360.,R3      ;WAIT FOR UNIT TO BE READY
933 007110 004767 000070 2#:      JSR      PC,WAITF      ; WAIT FOR SSR
934 007114 103416      BCS      3#
935 007116      DELAY      250
          MOV      #250,(PC)+
          .WORD      0
          MOV      L#DLY,(PC)+
          .WORD      0
          DEC      -6(PC)
          BNE      .-4
          DEC      -22(PC)
          BNE      .-20
936 007146 005303      DEC      R3
937 007150 001357      BNE      2#
938 007152 017500 002524 3#:      MOV      @TSSR(R5),R0      ;GET THE TSSR REGISTER
939 007156 010004      MOV      R0,R4      ;TSSR CONTENTS
940 007160 042704 176277      BIC      #+C<TS.A17!TS.A16!TS.OFL>,R4
941 007164 052704 002200      BIS      #TS.SSR!TS.NBA,R4      ;R4 HAS EXPECTED CONTENTS
942 007170 020400      CMP      R4,R0      ;ONLY EXPECTED BITS SET ?
943 007172 001402      BEQ      5#      ;BRANCH IF OKAY
944 007174 000241      CLC      ;CLEAR THE CARRY FOR ERROR
945 007176 000401      BR      10#      ;GO TO EXIT
946 007200 000261 5#:      SEC      ;SET THE CARRY BIT
947 007202 000207 10#:      RTS      PC      ;RETURN TO CALLER
948
949
950      ; SUBROUTINE TO WAIT FOR THE SUBSYSTEM READY FLAG
951
952      ; INPUTS:
953
954      ;      R5      CURRENT UNIT NUMBER
955
956      ;
957      ; OUTPUTS:
958
959      ;      R0      CONTENTS OF LAST TSSR READ
960      ;      CARRY    SET - READY BIT SET
961      ;      CLR      CLR - TIMEOUT WAITING FOR READY
962
963 007204      WAITF:: BREAK      ; DO A SUPVSR BREAK FIRST.
          TRAP      C#BRK
964 007206 012746 005670      MOV      #3000.,-(SP)      ; 300 MSEC TIMER.
965 007212 017500 002524 2#:      MOV      @TSSR(R5),R0      ;READ THE TSSR REGISTER
966 007216 105700      TSTB      R0      ;TEST FOR READY BIT SET
967 007220 100420      BHI      3#      ; EXIT ON STOP FLAG.
968 007222      DELAY      25      ; WAIT
          MOV      #25,(PC)+

```





GLOBAL AREAS MACRO M1113 30-NOV-83 10:17  
GLOBAL SUBROUTINES SECTION

SEQ 060

```

1019 007326 032763 000100 000012      BIT      @X2.BFE,MS.XS2(R3)      ;BUFFER ENABLE SWITCH SET
1020 007334 001402                      BEQ      50#                      ;BR, IF SWITCH NOT SET
1021 007336 005267 172762              INC      BENBSW                    ;SET SOFTWARE SWITCH FOR ENABLED
1022 007342                      50#:
1023 007342 000261                      55#:  SEC                          ;SET CARRY NO TROUBLE
1024 007344 000401                      BR       70#                       ;EXIT
1025 007346 000241                      60#:  CLC                          ;CARRY CLEAR = ERROR
1026 007350 017500 002524              70#:  MOV      @TSSR(R5),R0          ;RETURN TSSR CONTENTS
1027 007354 000207                      RTS      PC                          ;RETURN
1028
1029
1030
1031      ;*
1032      ;ROUTINE TO CHECK WRITE LOCK CONDITION
1033      ;INPUT:
1034      ;
1035      ;      R4      ADDRESS OF COMMAND PACKET
1036      ;      R5      CURRENT UNIT NUMBER
1037      ;
1038      ;-
1039 007356      WLKCHK:
1040 007356 010475 002514              10#:  MOV      R4,@TSD8(R5)            ;SEND OUT COMMAND
1041 007362 004767 177616              JSR      PC,WAITF                  ;WAIT FOR SSR
1042 007366 103401                      BCS     40#                        ;BR, IF SSR IS SET AND OK
1043 007370 000420                      BR      60#                        ;BR IF TROUBLE CARRY = CLEAR
1044 007372 005724                      40#:  TST      (R4)+                  ;STEP IT
1045 007374 011402                      MOV     (R4),R2                    ;POINT TO WRT CHARA DATA PACKET
1046 007376 011203                      MOV     (R2),R3                    ;GET ADDRESS OF MESSAGE BUFFER
1047 007400 032763 000004 000006      BIT     @X0.WLK,MS.XS0(R3)        ;IS UNIT WRITE LOCKED?
1048 007406 001407                      BEQ     55#                        ;NO, PROCEED WITH TESTING
1049 007410                      ERRHRD 1,UNIWLK                    ;TAPE IS WRITE LOCKED
1050      ;
1051      ;
1052      ;
1053      ;
1054      ;
1055      ;
1056      ;
1057      ;
1058      ;
1059      ;
1060      ;*
1061      ;ROUTINE TO ISSUE A WRITE CHARACTERISTICS COMMAND
1062      ;INPUT:
1063      ;
1064      ;
1065      ;      R4      ADDRESS OF COMMAND PACKET
1066      ;      R5      CURRENT UNIT NUMBER
1067      ;      REQUIRES A CALL TO SOFINIT BE DONE PREVIOUSLY
1068      ;
1069      ;OUTPUT:
1070      ;
1071      ;      R0      TSSR CONTENTS

```

```

TRAP      C$ERHRD
.WORD     1
.WORD     UNIWLK
.WORD     0

```

```

1072          ; CARRY SET - WRITE CHARACTERISTICS COMMAND OK
1073          ; CLR - WRITE CHARACTERISTICS FAILED
1074          ;
1075          ;IMPLICIT OUTPUT:
1076          ;
1077          ;
1078          ;
1079          ;SIDE EFFECTS:
1080          ;
1081          ;
1082          ;-
1083
1084 007436      WRTCHR::
1085 007436 010475 002514 10#: MOV R4, @TSD8(R5) ; SEND OUT COMMAND
1086 007442 004767 177536      JSR PC, WAITF ; WAIT FOR SSR
1087 007446 103401          BCS 50# ; BR, IF SSR IS SET AND OK
1088 007450 000402          BR 60# ; BR IF TROUBLE CARRY = CLEAR
1089 007452
1090 007452 000261          SEC ; SET CARRY NO TROUBLE
1091 007454 000401          BR 70# ; EXIT
1092 007456 000241          60#: CLC ; CARRY CLEAR = ERROR
1093 007460 017500 002524 70#: MOV @TSSR(R5), R0 ; RETURN TSSR CONTENTS
1094 007464 000207          RTS PC ; RETURN
1095
1096
1097          ;*
1098          ;
1099          ;ROUTINE TO DO SET UP OF RUNNING CONDITIONS
1100          ;
1101          ;INPUTS:
1102          ;
1103          ; R5 CURRENT UNIT NUMBER
1104          ;
1105          ;
1106          ;OUTPUTS:
1107          ;
1108          ;
1109          ;CALLING SEQUENCE:
1110          ; JSR PC, FIRSTU
1111          ; JSR PC, SOFINIT
1112          ; BCS CONTINUE
1113          ; ERRDF ;REPORT FATAL ERROR
1114          ; JSR PC, MDSET
1115          ;
1116          ;-
1117
1118 007466      MDSET:: BREAK ; DO A SUPVSR BREAK FIRST.
1119 007466 104422          ; TRAP C#BRK
1120 007470 004767 000272      JSR PC, SETDEF ; RESTORE DEFAULT
1121 007474 004767 177656      JSR PC, WLKCHK ; CHECK WRITE LOCK
1122 007500 103416          BCS 1# ; C=1 IS O.K.
1123 007502          DELAY 1 ; WAIT
1124          ;
1125          ;
1126          ;
1127          ;
1128          ;
1129          ;
1130          ;
1131          ;
1132          ;
1133          ;
1134          ;
1135          ;
1136          ;
1137          ;
1138          ;
1139          ;
1140          ;
1141          ;
1142          ;
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1177          ;
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1184          ;
1185          ;
1186          ;
1187          ;
1188          ;
1189          ;
1190          ;
1191          ;
1192          ;
1193          ;
1194          ;
1195          ;
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GLOBAL AREAS MACRO M1113 30-NOV-83 10:17  
 GLOBAL SUBROUTINES SECTION

SEQ 063

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1175 007732 012767 002506 172372      MOV      #WSMBK,CMDPKT+CP.ADL      ;MSG BUF ADDR
1176 007740 012767 000006 172370      MOV      #6,CMDPKT+CP.CNT         ;BYTE COUNT
1177 007746 012767 100010 172532      MOV      #100010,WSMBK           ;INVERT THE SWITCH
1178 007754 012704 002330              MOV      #CMDPKT,R4              ;
1179 007760 004767 177452              JSR      PC,WRTCHR               ;DO IT
1180 007764 000207                      RTS      PC                       ;RETURN
1181
1182
1183      ; SUBROUTINE TO SETUP DEFAULT SET CHAR CMD
1184      ;
1185      ; INPUTS:
1186      ;
1187      ;
1188      ;
1189      ; OUTPUTS:
1190      ;
1191      ;      R4      ADDRESS OF COMMAND PACKET
1192
1193 007766      SETDEF::
1194 007766 012701 140004      MOV      #SCH,R1                 ;WRITE CHAR CMD
1195 007772 010167 172332      MOV      R1,CMDPKT+CP.CMD        ;SET UP COMMAND
1196 007776 012767 002474 172326      MOV      #SCHBK,CMDPKT+CP.ADL    ;SET UP ADR LO TO POINT TO MSG BUF(MSGPKO)
1197 010004 012767 000012 172324      MOV      #SCHCNT,CMDPKT+CP.CNT   ;SET BUFFER EXTENT
1198 010012 012767 000040 172462      MOV      #DFTSCH,SCHBK+6         ;STORE CHARACTERISTIC CODE IN SCH BLOCK.
1199 010020 016767 173506 172456      MOV      TSUNT,SCHBK+10          ;UNIT #
1200 010026 012704 002330      MOV      #CMDPKT,R4             ;ADDRESS OF CMD PACKET
1201 010032 000207                      RTS      PC                       ;RETURN
1202
1203
1204      ;      MODULES TO HANDLE TS05 INTERRUPTS.
1205
1206
1207 010034      BGNSRV  TS5IN0
1208 010034      TS5IN0::
1209 010034 005267 173432      INC      INTFLG                  ;SET INTERRUPT OCCURRED FLAG.
1210 010040      ENDSRV
1211 010040      L10004:
1212                                RTI
1213
1214 010042      BGNSRV  TS5IN1
1215 010042      TS5IN1::
1216 010042 005267 173426      INC      INTFLG+2                ;SET INTERRUPT OCCURRED FLAG.
1217 010046      ENDSRV
1218 010046      L10005:
1219                                RTI
1220
1221 010050      BGNSRV  TS5IN2
1222 010050      TS5IN2::
1223 010050 005267 173422      INC      INTFLG+4                ;SET INTERRUPT OCCURRED FLAG.
1224 010054      ENDSRV
1225 010054      L10006:
1226                                RTI
1227
1228 010056      BGNSRV  TS5IN3
1229 010056      TS5IN3::
1230 010056 005267 173416      INC      INTFLG+6                ;SET INTERRUPT OCCURRED FLAG.
1231 010062      ENDSRV

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010062          L10007:
010062 000002          RTI
1222
1223          ;
1224          ; SUBROUTINE TO RETRIEVE RECORD COUNT READ FROM TAPE FOR ERROR
1225          ; PRINTS.
1226          ; INPUTS:
1227          ; OUTPUTS: R3 = RECORD COUNT READ
1228          ; REGISTERS: R2, R3, R4
1229          ; CALLS:
1230 010064 032767 000400 173326 RECTAP: BIT #MOD.CO,CMDWRD ;READ REV FETCH
1231 010072 001430          BEQ 50001#
1232 010074 016702 172260          MOV MSGPKT+MS.RFC,R2 ;FIND LAST READ AD.
1233 010100 066702 173304          ADD DATARD,R2
1234 010104 032702 000001          BIT #BIT00,R2 ;ODD AD., REASSEMBLE
1235 010110 001417          BEQ 50002#
1236 010112 005202          INC R2 ;REC COUNT STARTING
1237 010114 111203          MOVB (R2),R3 ;WITH UPPER BYTE FETCH
1238 010116 142703 177400          BICB #177400,R3
1239 010122 000303          SWAB R3
1240 010124 005302          DEC R2 ;LET R2 := R2 - #1 ;LOWER BYTE AD.
1241 010126 105767 173366          TSTB SWBFLG ;IFB SWBFLG NE #0 THEN
1242 010132 001401          BEQ 50003#
1243 010134 005302          DEC R2 ;LET R2 := R2 - #1 ;LOWER BYTE AD. ON SWAP
1244
1245 010136          50003#:
1246 010136 111204          MOVB (R2),R4 ;FETCH LOWER BYTE
1247 010140 142704 177400          BICB #177400,R4
1248 010144 050403          BIS R4,R3
1249 010146 000401          BR 50004#
1250 010150          50002#:
1251 010150 011203          MOV (R2),R3 ;LET R3 := (R2) ;EVEN AD. FETCH
1252 010152          50004#:
1253 010152 000402          BR 50005#
1254 010154          50001#:
1255 010154 017703 173230          MOV @DATARD,R3 ;LET R3 := @DATARD ;READ FWD FETCH
1256
1257 010160          50005#:
1258 010160 000207          RTS PC
1259
1260          ;
1261          ; SUBROUTINE TO STORE A SET CHARACTERISTIC COMMAND AS
1262          ; THE FIRST ENTRY IN THE SEQUENCE TABLE.
1263          ; INPUTS:
1264          ; OUTPUTS:
1265          ; REGISTERS:
1266          ; CALLS:
1267 010162          SETCH::
1268 010162 012701 003540          MOV #CMDSEQ,R1 ;INIT CMD SEQUENCE TABLE POINTER.
1269 010166 012721 140004          MOV #SCH,(R1)+ ;THIS CODE SETS UP A SET CHARACTERISTIC
1270 010172 012721 000040          MOV #DFTSCH,(R1)+ ;COMMAND AS THE FIRST COMMAND IN THE
1271 010176 012721 000001          MOV #1,(R1)+ ;SEQUENCE TABLE.
1272 010202 005721          TST (R1)+ ;SKIP PATTERN LOCATION.
1273 010204 000207          RTS PC
1274
1275          ;
1276          ; SUBROUTINE TO STORE A REWIND COMMAND IN THE SEQUENCE TABLE
1277          ; INPUTS:

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1277      ;      OUTPUTS:
1278      ;      REGISTERS:
1279      ;      CALLS:
1280
1281 010206 012721 102010  SETRW:: MOV    #RWD,(R1)+      ;CMD = REWIND.
1282 010212 012721 000001  MOV    #1,(R1)+      ;BRF.
1283 010216 012721 000001  MOV    #1,(R1)+      ;# OF OPERATIONS.
1284 010222 005721          TST    (R1)+          ;SKIP PATTERN.
1285 010224 000207          RTS     PC              ;RETURN
1286
1287      ;      SUBROUTINE TO EXECUTE ALL COMMANDS IN THE SEQUENCE TABLE ON ALL
1288      ;      DEVICES.
1289      ;      INPUTS:
1290      ;      OUTPUTS:      R2 = TERMINATION INDICATOR (0-END OF TABLE,1-EOT)
1291      ;      REGISTERS:
1292      ;      CALLS:      CMDAC,SETUP,EXSUB,CKHAE,NEXTU,FIRSTU,VFYDAT.
1293
1294 010226 012701 003540  EXALL:: MOV    #CMDSEQ,R1      ;INIT SEQUENCE TABLE POINTER.
1295 010232          50006#      ;
1296 010232 021127 177777  CMP    (R1),#END      ;WHILE THERE ARE CMDS IN THE SEQUENCE TABLE.
1297 010236 001530          BEQ    50007#
1298 010240 004767 000726  JSR    PC,SETUP      ;GO SETUP THE COMMAND BLOCK.
1299 010244          50010#      ; DO A SUPVSR BREAK FIRST.
1300 010244 104422          TRAP    C#BRK
1301 010246 026767 173140 173140  CMP    NCNT,NCNT1    ;WHILE THERE ARE RECORDS REMAINING:
1302 010254 002116          BGE    50011#
1303 010256 004767 000602  JSR    PC,CMDAC      ;STORE CMD ASCII IN ERROR MESSAGE.
1304 010262 105767 173227  TSTB  RANDOM        ;IF IN RANDOM MODE:
1305 010266 001435          BEQ    50012#
1306 010270 026727 173124 104005  CMP    CMDWRD,#WRT   ;IF CMD IS A WRITE THEN:
1307 010276 001031          BNE    50013#
1308 010300 105767 173212  TSTB  VFYFLG        ;IF DATA IS NOT TO BE VERIFIED THEN:
1309 010304 001026          BNE    50014#
1310 010306 066767 173122 173116  ADD    RANB,RANB     ;LET RANB := RANB + RANS ;GENERATE
1311 010314 066767 173112 173112  ADD    RANS,RANS     ;LET RANS := RANS + RANB ;RANDOM
1312 010322 016767 173106 173066  MOV    RANS,BRFCNT   ;LET BRFCNT := RANS ;LENGTH
1313 010330 046767 173074 173060  BIC    LENMSK,BRFCNT ;MASK RANDOM LENGTH.
1314 010336 026727 173054 000022  CMP    BRFCNT,#18.  ;DO NOT ALLOW BYTE COUNT OF LESS THAN 18
1315 010344 002003          BGE    50015#
1316 010346 012767 000022 173042  MOV    #18.,BRFCNT  ;CHANGE COUNT OF 0-17 TO 18.
1317 010354          50015#      ;
1318 010354 016767 173036 171754  MOV    BRFCNT,CMDPKT+CP.CNT ;MOVE BRF TO CMD PACKET.
1319
1320 010362          50014#      ;
1321
1322 010362          50013#      ;
1323
1324 010362          50012#      ;
1325 010362 004767 000136  JSR    PC,EXSUB     ;ISSUE CMD TO ALL,AWAIT INTS,CHECK STATUS.
1326 010366 004767 007106  JSR    PC,CKHAE     ;CHECK HALT AFTER EACH CMD FLAG.
1327 010372 012702 000001  MOV    #1,R2        ;LET R2 := #1 ;SET ALL UNITS AT BOT/EOT.
1328 010376 004767 006500  JSR    PC,FIRSTU    ;FIND FIRST UNIT.
1329
1330 010402          50016#      ;
1331 010402 026527 002604 177777  CMP    DEVTBL(R5),#END ;WHILE THERE ARE MORE UNITS:
1332 010410 001426          BEQ    50017#

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GLOBAL AREAS MACRO M1113 30-NOV-83 10:17  
 GLOBAL SUBROUTINES SECTION

SEQ 066

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1333 010412 032767 000400 173000      BIT      #MOD.CO,CMDWRD      ;IF CMD IS REVERSE THEN:
1334 010420 001406                    BEQ      50020:
1335 010422 032765 000002 003502      BIT      @XO.BOT,EOTFLG(R5) ;IF NOT AT BOT THEN:
1336 010430 001001                    BNE      50021:
1337 010432 005002                    CLR      R2              ;LET R2 := #0 ;CLEAR EOT/BOT FLAG.
1338
1339 010434                    50021:
1340 010434 000411                    BR       50022:          ;ELSE IF CMD IS NOT REVERSE:
1341 010436                    50020:
1342 010436 032765 000001 003502      BIT      @XO.EOT,EOTFLG(R5)
1343 010444 001404                    BEQ      50023:
1344 010446 032767 000001 172744      BIT      #CMD.CO,CMDWRD
1345 010454 001001                    BNE      50024:
1346 010456                    50023:
1347                                ;IF NOT AT EOT OR NOT A MOTION CMD THEN:
1348 010456 005002                    CLR      R2              ;CLEAR EOT/BOT FLAG.
1349
1350 010460                    50024:
1351
1352 010460                    50022:
1353 010460 004767 006464                    JSR      PC,NEXTU        ;FIND NEXT UNIT
1354 010464 000746                    BR       50016:
1355 010466                    50017:
1356 010466 020227 000001                    CMP      R2,#1          ;IF ALL UNIT ARE AT EOT/BOT THEN:
1357 010472 001001                    BNE      50025:
1358 010474 000412                    BR       EXARTN         ;RETURN WITH R2 = #1.
1359
1360 010476                    50025:
1361 010476 005267 172710                    INC      NCNT           ;LET NCNT := NCNT + #1 ;UPDATE RECORD COUNT.
1362 010502 016767 172712 172714      MOV      CMDWRD,PCMDWD ;SAVE PREVIOUS COMMAND WORD.
1363
1364 010510 000655                    BR       50010:
1365 010512                    50011:
1366 010512 004767 005350                    JSR      PC,VFYDAT      ;IF LAST CMD WAS A WRITE VERIFY, THEN GO
1367                                ;VERIFY THE LAST N RECORDS OF DATA.
1368
1369 010516 000645                    BR       50006:
1370 010520                    50007:
1371 010520 005002                    CLR      R2             ;LET R2 := #0 ;SET NORMAL RETURN INDICATOR.
1372 010522 000207                    EXARTN: RTS PC         ;RETURN.
1373
1374
1375
1376                                ; SUBROUTINE TO ISSUE COMMAND TO ALL DEVICES. WAIT FOR
1377                                ; ALL INTERRUPTS, AND CHECK ALL STATUS.
1378                                ; INPUTS:
1379                                ; OUTPUTS:
1380                                ; REGISTERS:
1381                                ; CALLS:          EXECUTE,GOWAIT,NEXTU,FIRSTU.
1382
1383 010524 004767 006352                    EXSUB:: JSR      PC,FIRSTU ;SET UP FOR FIRST UNIT.
1384 010530                    50026:
1385 010530 026527 002604 177777      CMP      DEVTBL(R5),#END ;WHILE THERE ARE MORE DEVICES:
1386 010536 001465                    BEQ      50027:
1387 010540 032767 000400 172652      BIT      #MOD.CO,CMDWRD ;IF CMD IS REVERSE THEN:
1388 010546 001421                    BEQ      50030:
1389 010550 032765 000002 003502      BIT      @XO.BOT,EOTFLG(R5) ;IF NOT AT BOT

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1390 010556 001014          BNE 50031:
1391 010560 032765 000001 003502 BIT  @X0.EOT,EOTFLG(R5) ;BUT IF AT EOT
1392 010566 001406          BEQ 50032:
1393 010570 105767 172730 TSTB ALLEOT ;AND ALL OTHERS AT EOT
1394 010574 001402          BEQ 50033:
1395 010576 004767 001252 JSR  PC.EXCUTE ;THEN EXECUTE REV CMD
1396                                     ;IF NOT ALL AT EOT, FREEZE UNIT(S) AT EOT
1397 010602          50033:
1398 010602 000402          BR 50034: ;IF NOT AT BOT AND
1399 010604          50032:
1400 010604 004767 001244 JSR  PC.EXCUTE ;NOT AT EOT, EXEC REV CMD
1401
1402 010610          50034:
1403
1404 010610          50031:
1405 010610 000435          BR 50035: ;ELSE IF CMD IS NOT REVERSE:
1406 010612          50030:
1407 010612 026727 172610 000002 CMP  CMDLG,#2
1408 010620 001011          BNE 50036:
1409 010622 032765 000002 003502 BIT  @X0.BOT,EOTFLG(R5)
1410 010630 001405          BEQ 50036:
1411                                     ;CLEAR BAD SPOT COUNTS WHEN WRITING FROM BOT
1412 010632 016567 002616 172652 MOV  BTADDR(R5),BTPT ;LET BTPT := BTADDR(R5)
1413 010640 005077 172646 CLR  @BTPT ;LET @BTPT := #0
1414
1415 010644          50036:
1416 010644 032765 000001 003502 BIT  @X0.EOT,EOTFLG(R5)
1417 010652 001404          BEQ 50037:
1418 010654 032767 000001 172536 BIT  @CMD.CO,CMDWRD
1419 010662 001003          BNE 50040:
1420 010664          50037:
1421                                     ;IF NOT AT EOT OR NOT A MOTION CMD THEN:
1422 010664 004767 001164 JSR  PC.EXCUTE ;ISSUE CMD TO TS05
1423
1424 010670 000405          BR 50041:
1425 010672          50040:
1426 010672 105767 172626 TSTB ALLEOT ;IFB ALLEOT NE #0 THEN
1427 010676 001402          BEQ 50042:
1428 010700 004767 001150 JSR  PC.EXCUTE
1429
1430 010704          50042:
1431
1432 010704          50041:
1433
1434 010704          50035:
1435 010704 004767 006240 JSR  PC.NEXTU ;FIND NEXT UNIT IN TEST CYCLE.
1436
1437 010710 000707          BR 50026:
1438 010712          50027:
1439 010712 105767 172601 TSTB RPTFLG ;IF REPORT HAS BEEN REQUESTED THEN:
1440 010716 001403          BEQ 50043:
1441 010720 105067 172573 CLR  RPTFLG ;CLR THE FLAG,
1442 010724 104424          DORPT ;PRINT THE PERFORMANCE REPORT. TRAP C:DRPT
1443 010726          50043:
1444 010726 004767 006150 JSR  PC.FIRSTU ;SET UP FOR FIRST UNIT.
1445 010732          50044:

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GLOBAL AREAS MACRO M1113 30-NOV-83 10:17  
GLOBAL SUBROUTINES SECTION

SEQ 069

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1503 011064 016704 172330 CMDAC:: MOV CMDWRD,R4,LET R4 := CMDWRD ;R4 = CMD BINARY.
1504 011070 004767 000042 JSR PC,GCMDA ;GET CMD ASCII.
1505 011074 112367 175340 MOV (R3)+,STAER1+2 ;MOVE CMD ASCII
1506 011100 112367 175335 MOV (R3)+,STAER1+3 ;
1507 011104 111367 175332 MOV (R3),STAER1+4 ;INTO MSG.
1508 011110 016704 172310 MOV PCMDWD,R4 ;R4 = PREVIOUS CMD BINARY.
1509 011114 004767 000016 JSR PC,GCMDA ;GET CMD ASCII.
1510 011120 112367 175430 MOV (R3)+,STAER7+24 ;MOVE CMD ASCII
1511 011124 112367 175425 MOV (R3)+,STAER7+25 ;
1512 011130 111367 175422 MOV (R3),STAER7+26 ;INTO MSG.
1513 011134 000207 RTS PC ;RETURN. GO EXECUTE NEXT FUNCTION.
1514
1515
1516 ; SUBROUTINE TO FIND THE ASCII EQUIVALENT OF THE COMMAND IN R4.
1517 ; ADDRESS OF ASCII 1ST WORD IS RETURNED IN R3.
1518 ; INPUTS: R4 = PRESENT COMMAND WORD.
1519 ; OUTPUTS: R3 = ADDRESS OF PRESENT COMMAND ASCII.
1520 ; REGISTERS:
1521 ; CALLS:
1522
1523 011136 005003 GCMDA:: CLR R3,LET R3 := #0 ;INIT CMD TBL POINTER.
1524 011140 500601: CMP CMDTBL(R3),R4 ;UNTIL CURRENT CMD IS FOUND:
1525 011140 026304 003752 BEQ 500611
1526 011144 001403 ADD #2,R3 ;LET R3 := R3 + #2 ;SEARCH CMD TABLE.
1527 011146 062703 000002 BR 500601
1528 011152 000772
1529 011154 500611: MOV R3,R4 ;LET R4 := R3
1530 011154 010304 ASR R3 ;POINT TO ASCII FOR THAT COMMAND
1531 011156 006203 NOP
1532 011160 000240 ADD R4,R3
1533 011162 060403 ADD #CMDASC,R3
1534 011164 062703 004040 RTS PC ;RETURN.
1535 011170 000207
1536
1537 ; THIS SUBROUTINE LOADS THE TS05 COMMAND PACKET FROM ONE
1538 ; ENTRY IN THE SEQUENCE TABLE.
1539 ; INPUTS:
1540 ; OUTPUTS:
1541 ; REGISTERS: R2, R3.
1542 ; CALLS: GENPAT.
1543
1544 011172 005067 172230 SETUP:: CLR CMDLG ;CLR CMD LOGGING CODE(DISABLES LOGGING)
1545 011176 012167 171126 MOV (R1)+,CMDPKT ;LOAD THE COMMAND WORD.
1546 011202 011167 171130 MOV (R1),CMDPKT+CP.CNT ;LOAD THE BYTE/RECORD/FILE COUNT.
1547 011206 011167 172204 MOV (R1),BRFCNT ;SAVE BRF FOR THIS COMMAND.
1548 011212 016702 171112 MOV CMDPKT,R2 ;GET CMD.
1549 011216 042702 177740 BIC #NLMD.C,R2 ;CLR ALL BUT CMD BITS.
1550 011222 010203 MOV R2,R3 ;SAVE IT TWICE.
1551 011224 162703 000010 SUB #CMD.C3,R3 ;POSITION COMMAND?
1552 011230 001003 BNE 21 ;BR IF NOT.
1553 011232 011167 171074 MOV (R1),CMDPKT+2 ;MOVE BPCR IN 2ND PKT WORD FOR POSITION CMD.
1554 011236 000464 BR 31
1555 011240 026727 171064 100011 21: CMP CMDPKT,#WTH ;IF CMD IS A WRITE TAPE MARK THEN:
1556 011246 001003 BNE 500621 ;
1557 011250 012767 000002 172150 MOV #2,CMDLG ;WTH LOGGING CODE IS 2.
1558
1559 011256 500621:

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1617
1618
1619
1620
1621
1622
1623
1624
1625 011556 016703 171664
1626 011562 006303
1627 011564 016704 171626
1628 011570 005204
1629 011572 042704 000001
1630 011576 162704 000002
1631 011602 016702 171600
1632 011606 062702 000002
1633 011612 004773 011620
1634 011616 000207
1635
1636
1637
1638
1639 011620 011642
1640 011622 011700
1641 011624 011720
1642 011626 011730
1643 011630 011754
1644 011632 011766
1645 011634 012000
1646 011636 012020
1647 011640 012052
1648
1649
1650
1651 011642 012703 000400
1652 011646 162704 000002
1653 011652 100411
1654 011654 010322
1655 011656 062703 001002
1656 011662 020327 001000
1657 011666 001002
1658 011670 012703 000400
1659
1660 011674
1661 011674 000764
1662
1663 011676 000207
1664
1665
1666
1667 011700 012703 177777
1668 011704 162704 000002
1669 011710 100402
1670 011712 010322
1671 011714 000773
1672
1673 011716 000207

```

```

; THIS SUBROUTINE SETS UP AND CALLS THE APPROPRIATE SUBROUTINE TO GENERATE
; THE DESIRED PATTERN FOR THE WRITE AND WRITE/VERIFY COMMANDS.
; INPUTS:
; OUTPUTS:
; REGISTERS: R2, R3, R4.
; CALLS: PATRO - PATR7

GENPAT: MOV PATERN,R3 ;SETUP PATTERN ROUTINE POINTER
        ASL R3
        MOV BRFCNT,R4 ;SET LENGTH OF WRITE BFR
        INC R4
        BIC #1,R4 ;ROUNDED UP TO NEXT WORD
        SUB #2,R4 ;WITH FIRST WORD RESERVED
        MOV DATAW,R2 ;FOR RECORD COUNT
        ADD #2,R2
        JSR PC,@PATTBL(R3) ;GO GENERATE THE APPROPRIATE PATTERN.
        RTS PC ;RETURN TO SETUP SUBROUTINE.

;TS05 WRITE PATTERN LOOKUP TABLE. USED TO JSR TO THE
;CORRECT DATA PATTERN GENERATING ROUTINE.

PATTBL: PATRO
        PATR1
        PATR2
        PATR3
        PATR4
        PATR5
        PATR6
        PATR7
        PATR8

;INCREMENTING PATTERN. 0 - 377.

PATRO: MOV #400,R3;LET R3 := #400
1#: SUB #2,R4;LET R4 := R4 - #2 ;DECREMENT WORD COUNT.
    BMI 2# ;BR IF DONE.
    MOV R3,(R2)+ ;STORE DATA WORD.
    ADD #1002,R3 ;UPDATE PATTERN.
    CMP R3,#1000 ;IF PATTERN HAS WRAPPED AROUND THEN:
    BNE 50070#
    MOV #400,R3 ;INIT THE PATTERN AGAIN.

50070#: BR 1# ;DO IT AGAIN.

2#: RTS PC ;RETURN.

;ALL ONE'S PATTERN.

PATR1: MOV #-1,R3 ;ALL ONES PATTERN;.
ZROPAT: SUB #2,R4 ;DECREMENT BYTE COUNT.
        BMI 1# ;DONE?,BR IF YES.
        MOV R3,(R2)+ ;IF NOT LOAD NEXT BYTE WITH PATTERN.
        BR ZROPAT ;DO IT AGAIN.

1#: RTS PC ;RETURN.

```

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1674
1675                                     ;ALL ZEROES PATTERN.
1676
1677 011720 005003 PATR2:: CLR R3 ;CLR PATTERN REGISTER.
1678 011722 004767 177756 JSR PC,ZROPAT ;GO GENERATE IT.
1679 011726 000207 RTS PC ;RETURN.
1680
1681                                     ;ONE BIT WALKING FROM R TO L IN A FIELD OF ZEROES.
1682
1683 011730 012703 000401 PATR3:: MOV #401,R3 ;INIT PATTERN REGISTER.
1684 011734 162704 000002 WLKZRO: SUB #2,R4;LET R4 := R4 - #2 ;DECREMENT WORD COUNT.
1685 011740 100404 BMI 1# ;BR IF DONE.
1686 011742 010322 MOV R3,(R2)+ ;LOAD DATA.
1687 011744 006303 ASL R3 ;SHIFT PATTERN.
1688 011746 005503 ADC R3 ;ADD CARRY BACK INTO PATTERN.
1689 011750 000771 BR WLKZRO ;DO IT AGAIN.
1690 011752 000207 1#: RTS PC ;RETURN.
1691
1692                                     ;ZERO BIT WALKING FROM R TO L IN A FIELD OF 1'S.
1693
1694 011754 012703 177376 PATR4:: MOV #177376,R3 ;INIT PATTERN REGISTER.
1695 011760 004767 177750 JSR PC,WLKZRO ;GO GENERATE IT.
1696 011764 000207 RTS PC ;RETURN.
1697
1698                                     ;ALTERNATING ONE AND ZERO BITS WITH ALTERNATE BYTES
1699                                     ;COMPLEMENTED.
1700
1701 011766 012703 125125 PATR5:: MOV #125125,R3 ;INIT PATTERN REGISTER.
1702 011772 004767 177706 JSR PC,ZROPAT ;GO GENERATE IT.
1703 011776 000207 RTS PC ;RETURN.
1704
1705                                     ;ALTERNATING BYTES OF 000 AND 377.
1706
1707 012000 012703 177400 PATR6:: MOV #177400,R3 ;INIT PATTERN REGISTER.
1708 012004 162704 000002 1#: SUB #2,R4 ;DECREMENT WORD COUNT.
1709 012010 100402 BMI 2# ;BR IF DONE.
1710 012012 010322 MOV R3,(R2)+ ;LOAD DATA.
1711 012014 000773 BR 1# ;DO IT AGAIN.
1712 012016 000207 2#: RTS PC ;RETURN.
1713
1714                                     ;RANDOM PATTERN GENERATOR
1715
1716 012020 162704 000002 PATR7:: SUB #2,R4 ;DECREMENT WORD COUNT
1717 012024 100411 BMI GIT ;BR IF DONE.
1718 012026 066767 171402 171376 ADD RANS,RANB ;GET NEW #.
1719 012034 066767 171372 171372 ADD RANB,RANS ;SAVE #.
1720 012042 016722 171366 MOV RANS,(R2)+ ;CONTINUE.
1721 012046 000764 BR PATR7 ;RETURN
1722 012050 000207 GIT: RTS PC
1723
1724                                     ; NO PATTERN GENERATION.
1725
1726 012052 000207 PATR8:: RTS PC ;RETURN.
1727
1728                                     ; THIS SUBROUTINE INITIATES TS05 COMMAND EXECUTION
1729                                     ; AND CHECKS FOR TS05 RESPONSE.
1730                                     ; INPUTS:

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1731      ;      OUTPUTS:
1732      ;      REGISTERS:      R2, R3.
1733      ;      CALLS:      DROPU, MOVMSG, FIRSTU, NEXTU, WSSR.
1734
1735 012054 012767 177777 171354 EXCUTE:: MOV      @-1,TIME1      ;INIT TIMEOUT COUNTER.
1736 012062      50071@: ;REPEAT      ;WAIT -
1737 012062 005367 171350      DEC      TIME1      ;UPDATE TIMEOUT COUNTER.
1738 012066 005767 171344      TST      TIME1      ;IF TIMED OUT:
1739 012072 001011      BNE      50072@
1740 012074 004767 000634      JSR      PC,MOVMSG      ;MOVE CURRENT PACKET MSG.
1741 012100      ERRDF      2,NSSRM,STAERM      ;REPORT TS05 NOT READY
      012100 104455
      012102 000002
      012104 004536
      012106 006120
1742 012110 004767 005064      JSR      PC,DROPU      ;DROP THE UNIT.
1743 012114 000522      BR      EXCRTN      ;RETURN.
1744
1745 012116      50072@:
1746 012116 032775 000200 002524      BIT      @TS.SSR,@TSSR(R5)      ;WAIT UNTIL DEVICE IS READY.
1747 012124 001756      BEQ      50071@
1748 012126 026727 171266 140004      CMP      CMDWRD,@SCH      ;IF WE ARE DOING A SET CHAR CMD THEN:
1749 012134 001022      BNE      50073@
1750 012136 010567 171310      MOV      R5,RSSAVE      ;SAVE CURRENT DEVICE POINTER.
1751 012142 004767 004734      JSR      PC,FIRSTU      ;FIND FIRST UNIT.
1752 012146      50074@:
1753 012146 026527 002604 177777      CMP      DEVTBL(R5),@END      ;WHILE DEVTBL(R5) NE @END DO
1754 012154 001405      BEQ      50075@
1755 012156 004767 000516      JSR      PC,WSSR      ;WAIT FOR UNIT READY OR TIME OUT.
1756 012162 004767 004762      JSR      PC,NEXTU      ;FIND NEXT UNIT.
1757
1758 012166 000767      BR      50074@
1759 012170      50075@:
1760 012170 016705 171256      MOV      RSSAVE,R5      ;RESTORE CURRENT DEVICE POINTER.
1761 012174 016567 002544 170272      MOV      MSGPKA(R5),SCHBK      ;SET UP ADR OF MSG PKT IN SCH BLOCK.
1762
1763 012202      50073@:
1764 012202 016503 002544      MOV      MSGPKA(R5),R3      ;ADR OF THIS UNIT'S MSG PACKET.
1765 012206 005002      CLR      R2      ;CLR COUNTER.
1766 012210      50076@:
1767 012210 020227 000020      CMP      R2,@MSGCNT      ;WHILE THERE ARE MORE LOCATIONS:
1768 012214 001405      BEQ      50077@
1769 012216 012723 177777      MOV      @-1,(R3)      ;INIT THE MSG PACKET WITH ALL 1'S
1770 012222 062702 000002      ADD      @2,R2      ;UPDATE COUNTER.
1771
1772 012226 000770      BR      50076@
1773 012230      50077@:
1774 012230 105767 167756      TSTB     DINT      ;ARE INTERRUPTS DISABLED.
1775 012234 001023      BNE      1@      ;BR IF YES.
1776 012236 126527 003472 000001      CMPB     INTFLG(R5),@1      ;IF MORE THAN ONE INTERRUPT HAS OCCURED:
1777 012244 003412      BLE      50100@
1778 012246 017567 002524 171200      MOV      @TSSR(R5),TSSREG      ;FREEZE THE CURRENT STATUS REG FOR PRINT
1779 012254      ERRDF      15,TOOMM,STAERM      ;REPORT TOO MANY INTERRUPTS.
      012254 104455
      012256 000017
      012260 004727
      012262 006120
      TRAP      C@ERDF
      .WORD     15
      .WORD     TOOMM
      .WORD     STAERM

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1780 012264 004767 004710      JSR    PC,DROPU      ;DROP THE UNIT
1781 012270 000434              BR      EXCRTN      ;RETURN - UNIT HAS BEEN DROPPED.
1782
1783 012272                    50100$:
1784 012272 005065 003472      CLR    INTFLG(R5)   ;CLR INTERRUPT FLAG FOR THIS DEV.
1785 012276 052767 000200 170024  BIS    #IE.C,CMDPKT ;SET INT ENABLE BIT.
1786 012304 105767 171161 1$:  TSTB  ERRREC,IFB ERRREC EQ #0 THEN ;IF NOT RETRYING
1787 012310 001005              BNE    50101$
1788 012312 005265 003376      INC    RECCNT(R5)   ;LET RECCNT(R5) := RECCNT(R5) + #1
1789 012316 016577 003376 171062  MOV    RECCNT(R5),@DATAWT ;THEN UPDATE REC COUNT TO WRITE IT ON TAPE
1790
1791 012324                    50101$:
1792 012324 012775 002330 002514  MOV    #CMDPKT,@TSDB(R5) ;LOAD TSDB WITH CMDPKT ADDRESS
1793                                ;THIS INITIATES COMMAND EXECUTION.
1794 012332 032775 000200 002524  BIT    #TS.SSR,@TSSR(R5) ;IF READY DID NOT DROP THEN:
1795 012340 001410              BEQ    50102$
1796 012342 004767 000366      JSR    PC,MOVMSG    ;MOVE CURRENT MESSAGE PACKET TO COMMON.
1797 012346                    ERRDF  3,TOERM,STAERM ;REPORT NO TS05 RESPONSE.
                                TRAP    C#ERDF
                                .WORD   3
                                .WORD   TOERM
                                .WORD   STAERM
1798 012356 004767 004616      JSR    PC,DROPU      ;DROP THE UNIT
1799
1800 012362                    50102$:
1801 012362 000207      EXCRTN: RTS    PC      ;RETURN.
1802
1803                                ; THIS SUBROUTINE WAITS FOR THE TS05 INTERRUPT OR DONE BIT TO SET AND ALLOWS THE
1804                                ; OPERATOR TO TRANSFER CONPOL TO THE SUPERVISOR.
1805                                ; UPON APPEARANCE OF THE INTERRUPT OR DONE, CHECK TSSR FOR STATUS ERRORS,
1806                                ; LOG BYTES AND ERRORS AND PERFORM ERROR RECOVERY IF NECESSARY.
1807                                ; INPUTS:
1808                                ; OUTPUTS:
1809                                ; REGISTERS:      R2, R3.
1810                                ; CALLS:          DROPU, MOVMSG, RECUD, CHKERR, LOG, CLRERR.
1811
1812 012364 012767 177777 171044  GOWAIT:; MOV    #-1,TIME1 ;INIT TIME OUT COUNTER.
1813 012372                    50103$: ;REPEAT ;REPEAT UNTIL INTERRUPT OCCURES:
1814 012372                    BREAK  ;GO TO THE SUPER TO ALLOW TTY INPUT.
                                TRAP    C#BRK
1815 012374 104422              CMP    CMDWRD,@RWD    ;IF COMMAND WAS REWIND THEN:
1816 012402 001014              BNE    50104$
1817 012404                    DELAY  10. ;WAIT EXTRA MSECS EACH LOOP.
                                MOV     #10.,(PC)+
                                .WORD   0
                                MOV     L#DLY,(PC)+
                                .WORD   0
                                DEC     -6(PC)
                                BNE     -.4
                                DEC     -22(PC)
                                BNE     -.20
1818 012434                    50104$:
1819 012434 026727 170760 105010  CMP    CMDWRD,#SFF ;IF CMDWRD EQ #SFF OR CMDWRD EQ #SFR THEN
1820 012442 001404              BEQ    50105$
1821 012444 026727 170750 105410  CMP    CMDWRD,#SFR
1822 012452 001014              BNE    50106$
1823 012454                    50105$:

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GLOBAL AREAS MACRO M1113 30-NOV-83 10:17  
GLOBAL SUBROUTINES SECTION

SEQ 075

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1824 012454          DELAY 12.          ;ADD DELAY FOR SPACE TAPE MARK COMMANDS
      012454 012727 000014          MOV      #12..(PC)+
      012460 000000          .WORD    0
      012462 016727 167430          MOV      L#DLY,(PC)+
      012466 000000          .WORD    0
      012470 005367 177772          DEC      -6(PC)
      012474 001375          BNE      -.4
      012476 005367 177756          DEC      -22(PC)
      012502 001367          BNE      .-20
1825 012504          50106#:
1826 012504 105767 167502          TSTB   DINT          ;IF INTERRUPTS ARE ENABLED.
1827 012510 001003          BNE   50107#
1828 012512 016502 003472          MOV   INTFLG(R5),R2 ;FETCH INTERRUPT OCCURRED FLAG.
1829
1830 012516 000406          BR    50110#
1831 012520          50107#:
1832 012520 012703 000200          MOV   #TS.SSR,R3    ;SET UP A MASK FOR THE DONE BIT.
1833 012524 005103          COM   R3
1834 012526 017502 002524          MOV   @TSSR(R5),R2 ;FETCH DONE BIT.
1835 012532 040302          BIC   R3,R2
1836
1837 012534          50110#:
1838 012534 005367 170676          DEC   TIME1        ;UPDATE TIMEOUT COUNTER.
1839 012540 005702          TST   R2           ;REPEAT UNTIL INTERRUPT OR READY OCCURES.
1840 012542 001003          BNE   50111#
1841 012544 005767 170666          TST   TIME1
1842 012550 001310          BNE   50103#
1843 012552          50111#:
1844 012552 005767 170660          TST   TIME1        ;IF TIME OUT HAS OCCURRED:
1845 012556 001022          BNE   50112#
1846 012560 016577 003376 170620          MOV   RECCNT(R5),@DATAWT
1847 012566 005377 170614          DEC   @DATAWT
1848 012572 004767 000136          JSR   PC,MOVMSG    ;MOVE CURRENT MSG PACKET TO COMMON AREA.
1849 012576          ERRDF 4,NOINTM,STAERM ;REPORT NO INTERRUPT.
      012576 104455          TRAP   C#ERDF
      012600 000004          .WORD 4
      012602 004670          .WORD NOINTM
      012604 006120          .WORD STAERM
1850 012606 004767 004366          JSR   PC,DROPU     ;DROP THE UNIT.
1851 012612 012703 003472          MOV   #ENDERF,R3  ;LET R3 := #ENDERF
1852 012616 004767 000042          JSR   PC,CLRERR   ;CLEAR ALL ERROR FLAGS
1853
1854 012622 000417          BR    50113#
1855 012624          50112#:
1856 012624 004767 000104          JSR   PC,MOVMSG    ;MOVE CURRENT MSG. PACKET TO COMMON AREA.
1857 012630 004767 000164          JSR   PC,RECU     ;UPDATE THE RECORD COUNT.
1858 012634 004767 000350          JSR   PC,CHKERR   ;CHECK FOR STATUS ERRORS.
1859 012640 105767 170617          TSTB  WRTYFG      ;IFB WRTYFG EQ #0 THEN
1860 012644 001006          BNE   50114#
1861 012646 004767 002714          JSR   PC,LOG      ;LOG BYTES AND ERRORS.
1862 012652 012703 003472          MOV   #ENDERF,R3 ;LET R3 := #ENDERF
1863 012656 004767 000002          JSR   PC,CLRERR   ;CLEAR ALL ERROR FLAGS
1864
1865 012662          50114#:
1866
1867 012662          50113#:
1868 012662 000207          RTS   PC          ;RETURN IF DONE.

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1869
1870      ;      SUBROUTINE TO CLEAR FLAGS.
1871      ;      INPUTS:          R3 = LWA TO BE CLEARED * 2.
1872      ;      OUTPUTS:
1873      ;      REGISTERS:       R2
1874      ;      CALLS:
1875
1876 012664 012702 003460 CLRERR:  MOV    #BGNFLG,R2      ;LET R2 := #BGNFLG
1877 012670 50115:  ;REPEAT
1878 012670 005022      CLR    (R2)+      ;LET (R2)+ := #0
1879 012672 020203      CMP    R2,R3      ;UNTIL R2 EQ R3
1880 012674 001375      BNE    50115:
1881 012676 000207      RTS    PC
1882
1883
1884      ;      SUBROUTINE TO WAIT UNTIL CURRENT UNIT IS READY OR UNTIL TIME OUT.
1885      ;      INPUTS:
1886      ;      OUTPUTS:
1887      ;      REGISTERS:
1888      ;      CALLS:
1889
1890 012700 WSSR:  MOV    #-1,TIME1      ;INIT TIMEOUT COUNTER.
1891 012700 012767 177777 170530 50116:  ;REPEAT UNTIL DEV READY OR TIMEOUT:
1892 012706      BREAK      ;BREAK TO THE SUPERVISOR.
1893 012706 104422      TRAP    C#BRK
1894 012710 005367 170522      DEC    TIME1      ;UPDATE TIMEOUT COUNTER.
1895 012714 032775 000200 002524 BIT    #TS.SSR,#TSSR(R5) ;UNTIL #TS.SSR SETIN #TSSR(R5) OR TIME1 EQ #0
1896 012722 001003      BNE    50117:
1897 012724 005767 170506      TST    TIME1
1898 012730 001366      BNE    50116:
1899 012732 50117:
1900 012732 000207      RTS    PC      ;RETURN.
1901
1902
1903
1904      ;      SUBROUTINE TO MOVE THE CURRENT MESSAGE PACKET TO THE COMMON AREA AND
1905      ;      TO UPDATE THE CURRENT TERMINATION CLASS CODE.
1906      ;      INPUTS:
1907      ;      OUTPUTS:
1908      ;      REGISTERS:       R2, R3.
1909      ;      CALLS:
1910
1911 012734 017567 002524 170512 MOVMSG: MOV    #TSSR(R5),TSSREG      ;FREEZE THE STATUS REG CONTENTS
1912 012742 016702 170506      MOV    TSSREG,R2      ;EXTRACT THE TERMINATION CLASS CODE.
1913 012746 042702 177761      BIC    #TSC.TCC,R2
1914 012752 010267 170472      MOV    R2,CTCC      ;AND SAVE IT
1915 012756 006267 170466      ASR    CTCC
1916 012762 016503 002544      MOV    MSGPKA(R5),R3      ;ADR OF THIS DEVICE'S MSG.
1917 012766 005002      CLR    R2      ;CLR COUNTER.
1918 012770 50120:
1919 012770 020227 000020      CMP    R2,#MSGCNT      ;WHILE THERE ARE MORE LOCATIONS:
1920 012774 001405      BEQ    50121:
1921 012776 012362 002354      MOV    (R3)+,MSGPKT(R2) ;MOVE MSG TO COMMON AREA.
1922 013002 062702 000002      ADD    #2,R2      ;UPDATE COUNTER.
1923
1924 013006 000770      BR    50120:

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 GLOBAL SUBROUTINES SECTION

SEQ 077

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1925 013010
1926 013010 016767 167346 170464 501210: MOV MSGPKT+MS.XSO,EOTFLG ;MOVE XSTATO TO EOT FLAG.
1927 013016 000207 RTS PC
1928
1929 ; SUBROUTINE TO ADJUST THE RECORD COUNT.
1930 ; INPUTS:
1931 ; OUTPUTS:
1932 ; REGISTERS:
1933 ; CALLS:
1934
1935 013020 105767 170441 RECUD:: TSTB RECLG ;IF RECORD HAS NOT BEEN LOGGED:
1936 013024 001070 BNE 501220
1937 013026 005365 003376 DEC RECCNT(R5) ;LET RECCNT(R5) := RECCNT(R5) - #1
1938 013032 032767 000001 170410 BIT #BITO,CTCC ;IF TAPE MOVED
1939 013040 001057 BNE 501230
1940 013042 032767 100000 167316 BIT #X2.OPM,MSGPKT+MS.XS2
1941 013050 001453 BEQ 501230
1942 013052 105267 170407 INCB RECLG ;SET RECORD LOGGED.
1943 013056 026727 170336 102010 CMP CMDWRD,#RWD ;IF THIS IS A REWIND CMD:
1944 013064 001003 BNE 501240
1945 013066 005065 003376 CLR RECCNT(R5) ;CLEAR RECORD COUNT.
1946
1947 013072 000442 BR 501250
1948 013074
1949 013074 032767 004000 170316 501240: BIT #BRF.C,CMDWRD ;IF BRF USED, UPDATE RECORD COUNT.
1950 013102 001436 BEQ 501260
1951 013104 032767 000400 170306 BIT #MOD.CO,CMDWRD ;IF A FORWARD CMD:
1952 013112 001007 BNE 501270
1953 013114 032767 000400 170302 BIT #MOD.CO,PCMDWD ;IF PREV CMD WAS A FWD ALSO:
1954 013122 001002 BNE 501300
1955 013124 005265 003376 INC RECCNT(R5) ;INCREMENT RECORD COUNT.
1956
1957 013130 501300:
1958 ;IF REVERSE CMD:
1959 013130 000423 BR 501310
1960 013132
1961 013132 032767 000400 170264 501270: BIT #MOD.CO,PCMDWD ;IF PREVIOUS CMD WAS A REV ALSO:
1962 013140 001417 BEQ 501320
1963 013142 032765 000002 003502 BIT #X0.BOT,EOTFLG(R5) ;WHEN NOT AT BOT THEN
1964 013150 001013 BNE 501330
1965 013152 105767 170313 TSTB ERRREC ;CHECK THE ERROR RETRY INDICATOR
1966 013156 001406 BEQ 20 ;BR, IF WE ARE NOT NOW IN ERROR RETRY
1967 013160 105767 170332 TSTB VFYFLG ;CHECK THE WRITE VERIFY INDICATOR
1968 013164 001403 BEQ 20 ;BR, IF WE ARE NOT IN WRT/VFY MODE
1969 013166 105767 170273 TSTB RECLG ;CHECK IF THIS RECORD HAS BEEN COUNTED
1970 013172 001002 BNE 100 ;BR, IF HAVE ALREADY BUMPED RECORD CNTR.
1971 013174 005365 003376 20: DEC RECCNT(R5) ;DECREMENT RECORD COUNT.
1972 013200 100:
1973
1974 013200 501330:
1975
1976 013200 501320:
1977
1978 013200 501310:
1979
1980
1981 013200 501260:

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1982
1983 013200          50125#:
1984
1985 013200          50123#:
1986 013200 016577 003376 170200 MOV      RECCNT(R5),@DATAWT      ;LET @DATAWT := RECCNT(R5)
1987
1988 013206          50122#:
1989 013206 000207      RTS      PC              ;RETURN.
1990
1991      ;      THIS IS THE ERROR CHECK SUBROUTINE.  AFTER INTERRUPT THIS
1992      ;      SUBROUTINE IS CALLED TO CHECK THE TS05 STATUS.
1993      ;      IF SPECIAL COND IS SET THEN THE TCC HANDLING SUBROUTINE IS ENTERED.
1994      ;      IF THE RFC IS NON ZERO FOR A COMMAND REQUIRING A BPCR,
1995      ;      THEN AN ERROR RFC IS REPORTED.
1996      ;      INPUTS:
1997      ;      OUTPUTS:
1998      ;      REGISTERS:      R2, R4.
1999      ;      CALLS:      TCC0-TCC7.
2000
2001 013210 032767 100000 170236 CHKERR: BIT      @TS.SC,TSSREG      ;IF SPECIAL COND STATUS IS SET THEN:
2002 013216 001441      BEQ      50134#
2003 013220 026727 170224 000002      CMP      CTCC,#2      ;IF TCC IS NOT 2 THEN:
2004 013226 001405      BEQ      50135#
2005 013230 105767 170235      TSTB     ERRREC      ;IF NOT IN ERROR RECOVERY:
2006 013234 001002      BNE      50136#
2007 013236 005265 003336      INC      SCCNT(R5)      ;INC SC COUNTER.
2008
2009 013242          50136#:
2010
2011 013242          50135#:
2012 013242 032767 004000 170204      BIT      @TS.NXM,TSSREG      ;WHEN NON-EXISTANT MEMO
2013 013250 001004      BNE      50137#
2014 013252 032767 040000 170174      BIT      @TS.UPE,TSSREG
2015 013260 001412      BEQ      50140#
2016 013262          50137#:
2017 013262 032767 100000 167076      BIT      @X2.OPM,MSGPKT+MS.XS2      ;AND TAPE NOT MOVED
2018 013270 001003      BNE      50141#
2019 013272 012702 000005      MOV      @5,R2      ;SET TCC5 INDEX
2020
2021 013276 000402      BR      50142#
2022 013300          50141#:
2023 013300 012702 000004      MOVL     @4,R2      ;TAPE MOVED, SET TCC4 INDEX
2024
2025 013304          50142#:
2026
2027 013304 000402      BR      50143#
2028 013306          50140#:
2029 013306 016702 170136      MOV      CTCC,R2      ;SET DETECTED TCC INDEX
2030
2031 013312          50143#:
2032 013312 006302      ASL      R2      ;CURRENT TCC X 2.
2033 013314 004772 013414      JSR      PC,@TCCRA(R2) ;GO TO THE TCC HANDLING SUBROUTINE.
2034
2035 013320 000426      BR      50144#
2036 013322          50134#:
2037 013322 032767 004000 170070      BIT      @BRF.C,CMDWRD      ;IF BRF IS USED IN THIS CMD THEN:
2038 013330 001422      BEQ      50145#

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2039 013332 005767 167022      TST      MSGPKT*MS.RFC      ;IF THERE IS AN RFC THEN:
2040 013336 001417              BEQ      501460
2041 013340 105767 170151      TSTB     RANDOM      ;IFB RANDOM EQ #0 ORB VFYFLG NE #0 THEN
2042 013344 001403              BEQ      501470
2043 013346 105767 170144      TSTB     VFYFLG
2044 013352 001411              BEQ      501500
2045 013354              501470:
2046
2047 013354 105767 170141      TSTB     IRE      ;IF NOT IN RANDOM OR IF CMD IS WTV:
2048 013360 001006              BNE      501510      ;IF RFC ERROR REPORTS ARE ALLOWED:
2049 013362 005265 003356      INC      HRDCNT(R5)      ;UPDATE HARD ERROR COUNT
2050 013366              ERRMRD   13,RFCERM,STAERM ;REPORT RFC ERROR
                TRAP      C1ERMRD
                .WORD     13
                .WORD     RFCERM
                .WORD     STAERM
2051
2052 013376              501510:
2053
2054 013376              501500:
2055
2056 013376              501460:
2057
2058 013376              501450:
2059
2060 013376              501440:
2061 013376 105767 170065      TSTB     RWERR      ;IF A READ/WRITE ERROR HAS OCCURRED THEN:
2062 013402 001403              BEQ      501520
2063 013404 016767 170012 166716  MOV      CMDSAV,CMDBPKT ;RESTORE CMD PACKET AFTER ERROR RECOV.
2064
2065 013412              501520:
2066 013412 000207      RTS      PC      ;RETURN.
2067
2068      ; ADDRESSES OF TCC HANDLING ROUTINES FOR TERMINATION CLASS CODES 0 - 7.
2069
2070 013414 013434      TCCRA:  TCC0
2071 013416 013452      TCC1
2072 013420 013470      TCC2
2073 013422 013600      TCC3
2074 013424 013616      TCC4
2075 013426 014232      TCC5
2076 013430 014330      TCC6
2077 013432 014472      TCC7
2078
2079      ; SUBROUTINE TO HANDLE TERMINATION CLASS CODE 0, UNDEFINED SPECIAL
2080      ; CONDITION ERROR.
2081      ; INPUTS:
2082      ; OUTPUTS:
2083      ; REGISTERS:
2084      ; CALLS:
2085
2086 013434 005265 003356      TCC0:  INC      HRDCNT(R5)      ;UPDATE HARD ERROR COUNT.
2087 013440              ERRMRD   5,SCERM,STAERM ;REPORT SPECIAL CONDITION ERROR.
                TRAP      C1ERMRD
                .WORD     5
                .WORD     SCERM
                .WORD     STAERM

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2088 013450 000207          RTS PC                      ;RETURN.
2089
2090
2091          ;          SUBROUTINE TO HANDLE TERMINATION CLASS CODE 1, ATTENTION CONDITION.
2092          ;          THIS TCC INDICATES THAT THE DRIVE HAS UNDERGONE A STATUS CHANGE
2093          ;          SUCH AS GOING OFFLINE OR COMING ONLINE.
2094          ;          INPUTS:
2095          ;          OUTPUTS:
2096          ;          REGISTERS:      R2,R4
2097          ;          CALLS:          DROPU
2098
2099 013452          TCC1::  ERRDF  6,ATTNM,STAERM          ;REPORT ATTENTION-UNIT OFF LINE.
          013452          104455          TRAP          C:ERRDF
          013454          000006          .WORD          6
          013456          064603          .WORD          ATTNM
          013460          006120          .WORD          STAERM
2100 013462 004767 003512    JSR      PC,DROPU          ;DROP THE UNIT.
2101 013466 000207          RTS      PC                      ;RETURN.
2102
2103          ;          SUBROUTINE TO HANDLE TERMINATION CLASS CODE 2, TAPE STATUS ALERT.
2104          ;          A STATUS CONDITION HAS BEEN ENCOUNTERED THAT MAY HAVE SIGNIFICANCE
2105          ;          TO THE PROGRAM. BITS OF INTEREST INCLUDE THK, RLS, LET, RLL, BOT, EOT.
2106          ;          INPUTS:
2107          ;          OUTPUTS:
2108          ;          REGISTERS:
2109          ;          CALLS:
2110
2111 013470 032767 000002 166664  TCC2::  BIT      @X0.BOT,MSGPKT*MS.X50
2112 013476 001404          BEQ      501530
2113 013500 105767 170010    TSTB    EXPBOT
2114 013504 001401          BEQ      501530
2115
2116 013506 000433          BR       TC2RTN          ;IF AT BOT AND BOT IS EXPECTED:
          ;RETURN-TCC2 CAUSED BY EXPECTED BOT.
2117
2118 013510          501530:
2119 013510 032767 170002 166644  BIT      @X0.RLS!X0.RLL!X0.THK!X0.LET!X0.BOT,MSGPKT*MS.X50
2120          ;IF @X0.RLS!X0.RLL!X0.THK!X0.LET!X0.BOT SETIN MSGPKT*MS.X50 THEN
2121
2122 013516 001427          BEQ      501540
2123
2124 013520 105767 167771    TSTB    RANDOM          ;IF TCC2 CAUSED BY ANYTHING BUT EOT:
          ;IFB RANDOM EQ #0 ORB VFYFLG NE #0 THEN
2125 013524 001403          BEQ      501550
2126 013526 105767 167764    TSTB    VFYFLG
2127 013532 001421          BEQ      501560
2128 013534          501550:
2129
2130 013534 105767 167761    TSTB    IRE          ;IF NOT IN RANDOM OR IF CMD IS WTV:
          ;IF RFC ERROR REPORTS ARE ALLOWED:
2131 013540 001016          BNE     501570
          ;IF WE ARE IN ERROR RECOVERY THEN:
2132 013542 105767 167723    TSTB    ERRREC
2133 013546 001403          BEQ     501600
          ;SET UNRECOVERABLE FLAG FOR LOG.
2134 013550 105267 167714    INCB    UNREC          ;ELSE - IF NOT IN ERROR RECOVERY:
2135
2136 013554 000402          BR      501610
2137 013556          501600:
2138 013556 005265 003336    INC     SCCNT(R5)      ;INCREMENT THE SPEC COND COUNTER.
2139
2140 013562          501610:

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SEQ 081

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2141 013562 005265 003356      INC      HRDCNT(R5)      ;UPDATE HARD ERROR COUNT.
2142 013566      EPRHRD      7,TSAM,STAERM      ;REPORT TAPE STATUS ALERT.
      013566      104456      TRAP      C#ERHRD
      013570      000007      .WORD      7
      013572      004705      .WORD      TSAM
      013574      006120      .WORD      STAERM

2143
2144 013576      50157#;
2145
2146 013576      50156#;
2147
2148 013576      50154#;
2149
2150 013576 000207      TC2RTN:   RTS      PC      ;RETURN.
2151
2152
2153      ;      SUBROUTINE TO HANDLE TERMINATION CLASS CODE 3, FUNCTION REJECT.
2154      ;      THE SPECIFIED FUNCTION WAS NOT INITIATED. BITS OF INTEREST ARE
2155      ;      RMR, OFL, VCK, BOT, ILC, WLE, ILA, AND NBA.
2156      ;      INPUTS:
2157      ;      OUTPUTS:
2158      ;      REGISTERS:      R2,R4
2159      ;      CALLS:      DROPU
2160
2161 013600      TCC3::  ERRDF      8,FUNRM,STAERM      ;REPORT FUNCTION REJECT.
      013600      104455      TRAP      C#ERRDF
      013602      000010      .WORD      8
      013604      004622      .WORD      FUNRM
      013606      006120      .WORD      STAERM

2162 013610 004767 003364      JSR      PC,DROPU      ;DROP THE UNIT.
2163 013614 000207      RTS      PC      ;RETURN.
2164
2165      ;      SUBROUTINE TO HANDLE TERMINATION CLASS CODE 4, RECOVERABLE ERROR.
2166      ;      TAPE POSITION IS ONE RECORD BEYOND WHAT ITS POSITION WAS WHEN
2167      ;      THE FUNCTION WAS INITIATED. RECOVERY PROCEDURE IS TO LOG THE
2168      ;      ERROR AND ISSUE THE APPROPRIATE RETRY COMMAND.
2169      ;      2 WRITE-ERROR-RECOVERY ALGORITHMS CAN BE SELECTED:
2170      ;      THE FIRST ONE, VIA BADTSW SWITCH, DOES DETECT BAD SPOTS ON TAPE.
2171      ;      IT CALLS A WRITE RETRY SUBR UNTIL THE RECORD IS RECOVERED
2172      ;      OR 20 BAD SPOTS HAVE BEEN LOGGED. ON REACHING 20 BAD
2173      ;      SPOTS LOGGED, A BAD TAPE OVERFLOW MSG IS PRINTED AND THE
2174      ;      UNIT DROPPED.
2175      ;      THE SECOND ALGORITHM ISSUES THE TS05 WRITE RETRY COMMAND
2176      ;      UP TO 16 TIMES BEFORE DROPPING THE UNIT OR PROCEEDING
2177      ;      WITH THE NEXT RECORD ON RECOVERY.
2178      ;      INPUTS:
2179      ;      OUTPUTS:
2180      ;      REGISTERS:      R2,R4.
2181      ;      CALLS:      RTLE, EXCUTE, GOWAIT, DROPU, WRTY
2182
2183 013616 026727 167604 000002 TCC4::  CMP      CMDLG,#2      ;IF CMDLG EQ #2 ANDB BADTSW NE #0 THEN
2184 013624 001125      BNE      50162#
2185 013626 105767 166356      TSTB     BADTSW
2186 013632 001522      BEQ      50162#
2187 013634 105767 167631      TSTB     ERRREC      ;IFB ERRREC EQ #0 ANDB ERCVER NE #0 THEN
2188 013640 001007      BNE      50163#
2189 013642 105767 166341      TSTB     ERCVER

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SEQ 082

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2190 013646 001404          BEQ      50163#
2191 013650          ERRSOFT 9,RERM,STAERM ;
      013650 104457
      013652 000011          TRAP    C#ERSOFT
      013654 005017          .WORD  9
      013656 006120          .WORD  RERM
                                   .WORD  STALRM
2192
2193 013660          50163#;
2194 013660 105767 166327  TSTB   IREC      ;IFB IREC EQ #0 THEN
2195 013664 001102          BNE    50164#
2196 013666 105267 167577  INCB   ERRREC    ;RETRY FLAG FOR EXECUTE SUBR; DON'T UPDATE REC CN
2197 013672 105267 167566  INCB   WRTYER    ;REWRITE ERROR FLAG FOR WRTY SUBR
2198 013676 105767 167561  TSTB   WRTYFG    ;FIRST RETRY ON THIS RECORD; SUBSEQUENT
2199 013702 001072          BNE    50165#
2200
      ;RETRIES WITH TCC4 ERRORS BY-PASS THIS SECTION
2201 013704 016767 167510 001174  MOV    CMDWRD,WTYWRD ;SAVE WRITE COMMAND PACKET
2202 013712 016767 166412 001164  MOV    CMDPKT,WTYCMD
2203 013720 016767 166412 001162  MOV    CMDPKT,CP.CNT,WTYBRF
2204 013726 105267 167535  INCB   RWERR     ;LOG SUBR FLAG; COUNT WRT ERRORS
2205 013732 105267 167525  INCB   WRTYFG    ;RETRY IN PROGRESS FLAG
2206
2207 013736          50166#;
2208 013736 005265 003316  INC    WRTYCT(R5) ;COUNT GLOBAL WRITE RETRIES
2209 013742 005067 167512  CLR    RETRYC    ;CLEAR # OF RETRIES PER RECORD
2210 013746 105067 167510  CLRB  RPTCNT     ;CLEAR # OF REPEATS
2211 013752 004767 000660  JSR    PC,WRTY   ;CALL WRITE RETRY
2212 013756 105767 167502  TSTB   WRTYER    ;REPEAT RETRIES ON SAME RECORD
2213 013762 001404          BEQ    50167#
2214 013764 027727 167522 000050  CMP    #BTPT,#40.
2215 013772 103761          BLO    50166#
2216 013774          50167#;
2217
      ;UNTIL RECOVERED OR 20 BAD SPOTS
2218 013774 027727 167512 000050  CMP    #BTPT,#40. ;WHEN 20 BAD SPOTS LOGGED
2219 014002 103423          BLO    50170#
2220 014004          PRINTB #BTMSG2 ;PRINT BAD TAPE OVERFLOW MSG
      014004 012746 015177          MOV    #BTMSG2,-(SP)
      014010 012746 000001          MOV    #1,-(SP)
      014014 010600          MOV    SP,RO
      014016 104414          TRAP  C#PNTB
      014020 062706 000004          ADD   #4,SP
2221 014024 004767 001266  JSR    PC,BORERS ;ERASE BAD RECORD
2222 014030 005365 003376  DEC    RECCNT(R5)
2223 014034 004767 003140  JSR    PC,DROPU  ;DROP UNIT
2224 014040 005065 003376  CLR    RECCNT(R5)
2225 014044 012775 002350 002514  MOV    #RWCPK,#TSD8(R5) ;REWIND UNIT
2226
2227 014052          50170#;
2228 014052 105067 167405  CLRB  WRTYFG    ;RETRY COMPLETE FLAG
2229 014056 105267 167447  INCB  MISCFG    ;DO NOT HALT ON THIS CMD FLG
2230 014062 016767 001020 167334  MOV    WTYWRD,PCMDWD ;RESTORE ORIGINAL WRT CMD AFTER RECOVERY
2231
2232 014070          50165#;
2233
2234 014070 000402          BR    50171#
2235 014072          50164#;
2236 014072 105267 167372  INCB  UNREC     ;LET UNREC :B= UNREC * #1 ;
2237

```

```

2238 014076          501710:
2239
2240 014076 000454          BR      501720
2241 014100          501620:
2242 014100 004767 000404      JSR      PC,RTLE          ;CHECK FOR RETRY LIMIT EXCEEDED.
2243 014104 026727 167316 000002      CMP      CMDLG,#2          ;IF READ CMD THEN:
2244 014112 003411          BLE      501730
2245 014114 012702 000020      MOV      @RRECL,R2          ;R2=READ RETRY COUNT LIMIT / 2
2246 014120 006202          ASR      R2
2247 014122 026702 167332      CMP      RETRYC,R2          ;IF RETRY COUNT IS MORE THAN HALF LIMIT:
2248 014126 002403          BLT      501740
2249 014130 052767 020000 166172      BIS      @OPP.C,CMDPKT          ;SET OPPOSITE BIT FOR RETRY2.
2250
2251 014136          501740:
2252
2253 014136          501730:
2254 014136 005767 167316      TST      RETRYC          ;IF THIS IS THE ORIGINAL ERROR THEN:
2255 014142 001007          BNE      501750
2256 014144 105767 166037      TSTB     ERVER
2257 014150 001404          BEQ      501750
2258 014152          ERISOFT 9,RERM,STAERM ;REPORT RECOVERABLE ERROR
2259 014152 104457          TRAP     C#ERSOFT
2260 014154 000011          .WORD   9
2261 014156 005017          .WORD   RERM
2262 014160 006120          .WORD   STAERM
2263 014162          ;PROVIDED OPERATOR HAS ENABLED THE REPORT
2264 014162 005267 167272          501750:
2265 014166 052767 001000 166134      INC      RETRYC          ;UPDATE RETRY COUNT.
2266 014174 105767 166013          BIS      @MOD.C1,CMDPKT ;SET RETRY BIT IN CMD PACKET.
2267 014200 001011          TSTB     IREC          ;IF ERROR RECOVERY ENABLED:
2268 014202 105267 167263          BNE      501760
2269 014206 012602          INCB     ERRREC          ;SET ERROR RECOVERY FLAG.
2270 014210 012602          MOV      (SP)+,R2          ;POP 2 RTN ADRS FROM STACK.
2271 014212 004767 175636          MOV      (SP)+,R2
2272 014216 000167 176142          JSR      PC,EXECUTE
2273 014222 000402          JMP      GOWAIT          ;GO EXECUTE THE RETRY COMMAND.
2274 014224          ;GO WAIT FOR INTERRUPT + CHECK STATUS.
2275 014230          ;ELSE IF ERROR RECOVERY IS NOT ENABLED:
2276 014224 105267 167240          501760:
2277 014230          INCB     UNREC          ;SET UNRECOVERABLE ERROR FLAG.
2278 014230 000207          501770:
2279 014230          RTS     PC          ;RETURN
2280          ;
2281          ; SUBROUTINE TO HANDLE TERMINATION CLASS CODE 5, RECOVERABLE ERROR.
2282          ; TAPE POSITION HAS NOT CHANGED. RECOVERY PROCEDURE IS TO LOG THE
2283          ; ERROR AND RE-ISSUE THE ORIGINAL COMMAND.
2284          ; INPUTS:
2285          ; OUTPUTS:
2286          ; REGISTERS:      R2,R4.
2287          ; CALLS:      RTLE, EXECUTE, GOWAIT, DROPU.
2288 014232 004767 000252          TCC5:  JSR      PC,RTLE          ;CHECK FOR RETRY LIMIT EXCEEDED
2289 014236 005767 167216          TST      RETRYC          ;IF THIS IS THE ORIGINAL ERROR THEN:
2290 014242 001004          BNE      502000
    
```



GLOBAL AREAS MACRO M1113 30-NOV-83 10:17  
 GLOBAL SUBROUTINES SECTION

SEQ 084

```

2291 014244 ERRSOF 10,RERM,STAERM ;REPORT RECOVERABLE ERROR.
      014244 104457
      014246 000012 TRAP C#ERSOFT
      014250 005017 .WORD 10
      014252 006120 .WORD RERM
      014252 006120 .WORD STAERM
2292 014254
2293 014254 005267 167200 50200: INC RETRYC ;UPDATE RETRY COUNTER.
2294 014260 105767 165727 TSTB IREC ;IF ERROR RECOVERY IS ENABLED:
2295 014264 001016 BNE 50201:
2296 014266 105267 167177 INCB ERRREC ;SET ERROR RECOVERY FLAG.
2297 014272 005265 003376 INC REC CNT(R5) ;UPDATE REC COUNT
2298 014276 016577 003376 167102 MOV REC CNT(R5),@DATAWT ;AND INSERT IT INTO WRT BFR
2299 014304 012602 MOV (SP)+,R2 ;POP 2 RTN ADRS FROM STACK.
2300 014306 012602 MOV (SP)+,R2
2301 014310 004767 175540 JSR PC,EXCUTE ;GO RE-ISSUE THE COMMAND.
2302 014314 000167 176044 JMP GOWAIT ;GO WAIT FOR INTERRUPT * CHECK STATUS.
2303 ;ELSE IF ERROR RECOVERY IS NOT ENABLED:
2304 014320 000402 BR 50202:
2305 014322
2306 014322 105267 167142 50201: INCB UNREC ;SET UNRECOVERABLE ERROR FLAG.
2307
2308 014326
2309 014326 000207 50202: RTS PC ;RETURN.
2310
2311
2312 ; SUBROUTINE TO HANDLE TERMINATION CLASS CODE 6, UNRECOVERABLE ERROR.
2313 ; TAPE POSITION HAS BEEN LOST. THE ONLY VALID RECOVERY PROCEDURE
2314 ; IS TO REWIND AND START OVER AT BOT UNLESS THE TAPE HAS LABELS OR
2315 ; SEQUENCE NUMBERS. THIS DIAGNOSTIC WILL REWIND AND RETRY THE
2316 ; COMMAND ONLY IF DENSITY CHECK IS SET, OTHERWISE THE UNIT WILL BE
2317 ; DROPPED FROM THE TEST SEQUENCE.
2318 ; INPUTS:
2319 ; OUTPUTS:
2320 ; REGISTERS: R2, R4
2321 ; CALLS: RTLE, WSSR, EXCUTE, GOWAIT, DROPU
2322
2323 014330 036767 163454 166032 TCC6: BIT X3.DCK,MSGPKT+MS.XS3;IF X3.DCK NOTSETIN MSGPKT+MS.XS3 THEN
2324 014336 001016 BNE 50203:
2325 ;IF THERE IS NO DENSITY CHECK THEN:
2326 014340 005767 167062 TST CMDLG ;IF CMD IS A READ OR WRITE THEN:
2327 014344 001404 BEQ 50204:
2328 014346 105267 167115 INCB RWERR ;SET RD/WR ERROR FLAG.
2329 014352 105267 167112 INCB UNREC ;SET UNRECOVERABLE ERROR FLAG.
2330
2331 014356
2332 014356 50204: ERROF 11,URERM,STAERM ;REPORT UNRECOVERABLE ERROR.
      014356 104455 TRAP C#ERDF
      014360 000013 .WORD 11
      014362 005041 .WORD URERM
      014364 006120 .WORD STAERM
2333 014366 004767 002606 JSR PC,DROPU ;REPORT ERROR * DROP UNIT.
2334 ;ELSE-IF THERE IS DENSITY CHECK:
2335 014372 000436 BR 50205:
2336 014374
2337 014374 004767 000110 50203: JSR PC,RTLE ;CHECK FOR RETRY LIMIT EXCEEDED.
2338 014400 005767 167054 TST RETRYC ;IF THIS IS THE ORIGINAL ERROR THEN:
2339 014404 001004 BNE 50206:

```

```

2340 014406 ERRSOF 11,URERM,STAERM ;REPORT DENSITY CHECK ERROR
      014406 104457 TRAP C#ERSOFT
      014410 000013 .WORD 11
      014412 005041 .WORD URERM
      014414 006120 .WORD STAERM

2341
2342 014416 50206: INC RETRYC ;UPDATE RETRY COUNT.
2343 014416 005267 167036 TSTB IRE ;IF ERROR RECOVERY IS ENABLED THEN:
2344 014422 105767 167073 BNE 50207:
2345 014426 001016 INCB ERRREC ;SET ERROR RECOVERY FLAG.
2346 014430 105267 167035 MOV @RWCPK,@TSDB(R5) ;ISSUE A REWIND COMMAND.
2347 014434 012775 002350 002514 JSR PC,WSSR ;WAIT FOR SUBSYSTEM READY.
2348 014442 004767 176232 MOV (SP)+,R2 ;POP 2 RTN ADRS FROM STACK.
2349 014446 012602 MOV (SP)+,R2
2350 014450 012602 JSR PC,EXCUTE ;REISSUE THE COMMAND.
2351 014452 004767 175376 JMP GOWAIT ;WAIT FOR INTERRUPT
2352 014456 000167 175702 BR 50210: ;ELSE-IF ERR REC DISABLED:
2353
2354 014462 000402 50207: INCB UNREC ;SET UNRECOVERABLE ERROR FLAG.
2355 014464
2356 014464 105267 167000 50210:
2357
2358 014470 50205:
2359
2360 014470 50205: RTS PC ;RETURN
2361 014470 000207
2362
2363 ; SUBROUTINE TO HANDLE TERMINATION CLASS CODE 7, FATAL SUBSYSTEM
2364 ; ERROR. THE SUBSYSTEM IS INCAPABLE OF PROPERLY PERFORMING
2365 ; COMMANDS OR AT LEAST ITS INTEGRITY IS SERIOUSLY QUESTIONABLE.
2366 ; REFER TO THE FATAL CLASS CODE FIELD IN THE TSSR REGISTER FOR
2367 ; ADDITIONAL INFORMATION ON THE TYPE OF FATAL ERROR.
2368 ; INPUTS:
2369 ; OUTPUTS:
2370 ; REGISTERS: R2, R4
2371 ; CALLS:
2372
2373 014472 TCC7:: ERRDF 12,FATSM,STAERM ;REPORT FATAL SUBSYSTEM ERROR.
      014472 104455 TRAP C#ERDF
      014474 000014 .WORD 12
      014476 004642 .WORD FATSM
      014500 006120 .WORD STAERM

2374 014502 004767 002472 JSR PC,DROPU ;DROP THE UNIT.
2375 014506 000207 RTS PC ;RETURN.
2376
2377
2378 ; SUBROUTINE TO CHECK FOR RETRY LIMIT EXCEEDED. PRINTS ERROR MESSAGE
2379 ; IF EXCEEDED AND DROP UNIT UNLESS COMMAND IS A READ.
2380 ; INPUTS:
2381 ; OUTPUTS:
2382 ; REGISTERS: R2, R4.
2383 ; CALLS: DROPU
2384
2385 014510 005767 166712 RTLE:: TST CMDLG ;IF CMD IS NOT A READ OR WRITE THEN:
2386 014514 001010 BNE 50211:
2387 014516 000000 ERRDF 11,URERM,STAERM ;REPORT UNRECOVERABLE ERROR.
      014516 104455 TRAP C#ERDF

```

GLOBAL AREAS MACRO M1113 30-NOV-83 10:17  
 GLOBAL SUBROUTINES SECTION

SEQ 086

```

014520 000013
014522 005041 .WORD 11
014524 006120 .WORD URERM
2388 014526 004767 002446 JSR PC,DROPU ;DROP THE UNIT.
2389 014532 012602 MOV (SP)+,R2 ;POP RTN ADRS FROM STACK.
2390 014534 000437 BR RTLRTN ;AND RETURN.
2391
2392 014536
2393 014536 105267 166725 50211#: INCB RWERR ;SET READ/WRITE ERROR FLAG.
2394 014542 026727 166660 000002 CMP CMDLG,#2 ;IF CMD IS A WRT OR WTM:
2395 014550 001016 BNE 50212#
2396 014552 026727 166702 000020 CMP RETRYC,#WRECL ;IF RETRY COUNT HAS REACHED LIMIT:
2397 014560 001011 BNE 50213#
2398 014562 105267 166702 INCB UNREC ;SET UNRECOVERABLE FLAG
2399 014566 ERRDF 14,RLEXM,STAERM ;REPORT RETRY LIMIT EXCEEDED.
014566 104455 TRAP C#ERDF
014570 000016 .WORD 14
014572 004556 .WORD RLEXM
014574 006120 .WORD STAERM
2400 014576 004767 002376 JSR PC,DROPU ;DROP THE UNIT.
2401 014602 012602 MOV (SP)+,R2 ;POP 2 RTN ADRS FROM STACK.
2402 014604 50213#: ;ELSE - CMD IS A READ:
2403
2404 014604 000413 BR 50214#
2405 014606 50212#:
2406 014606 026727 166646 000020 CMP RETRYC,#RRECL ;IF RETRY COUNT HAS REACHED LIMIT:
2407 014614 001007 BNE 50215#
2408 014616 105267 166646 INCB UNREC ;SET UNRECOVERABLE FLAG
2409 014622 ERRHRD 14,RLEXM,STAERM ;REPORT RECOVERABLE ERROR.
014622 104456 TRAP C#ERHRD
014624 000016 .WORD 14
014626 004556 .WORD RLEXM
014630 006120 .WORD STAERM
2410 014632 012602 MOV (SP)+,R2 ;POP 2 RTN ADRS FROM STACK.
2411 014634 50215#:
2412
2413 014634 50214#:
2414 014634 000207 RTLRTN: RTS PC ;RETURN
2415
2416 ; SUBR TO REWRITE A BAD, BUT RECOVERABLE WRITTEN RECORD.
2417 ; REWRITE RECORD ON SAME SPOT; REPEAT 4 TIMES.
2418 ; IF ALL 4 REPEATS GOOD, RECORD IS RECOVERED
2419 ; AND A RECOVERABLE WRITE ERROR IS LOGGED.
2420 ; IF ANY OF 4 REPEATS BAD, ERASE BAD RECORD, LOG SUSPECTED
2421 ; BAD SPOT, RETRY AGAIN. RETRY 4 TIMES, UP TO 4 REPEATS EACH.
2422 ; IF RECORD NOT GOOD AFTER 4 RETRIES, ERASE IT, EXIT WITH
2423 ; ERROR FLAG WRTYER SET, PRINTING RETRY FAILED.
2424 ; THIS ALL SCHEME IS REENTERED 20 TIMES MAX, IE 20 BAD
2425 ; SPOTS MAX ARE ALLOWED.
2426 ;
2427 ; INPUTS:
2428 ; OUTPUTS:
2429 ; REGISTERS: R3,R4
2430 ; CALLS: BORERS, REWRT
2431
2432 014636 WRTY:: ;BEGIN RETRY ;REPEAT
2433

```



2483	015046	105767	166412	TSTB	WRTYER	;IFB WRTYER NE #0 THEN		
2484	015052	001413		BEQ	50230#			
2485	015054	105767	165127	TSTB	ERCVER	;IFB ERCVER NE #0 THEN		
2486	015060	001410		BEQ	50231#			
2487	015062			PRINTB	#BTMSG3	;PRINT RETRY FAILED		
	015062	012746	015247				MOV	#BTMSG3,-(SP)
	015066	012746	000001				MOV	#1,-(SP)
	015072	010600					MOV	SP,R0
	015074	104414					TRAP	C#PNTB
	015076	062706	000004				ADD	#4,SP
2488								
2489	015102				50231#:			
2490								
2491	015102				50230#:			
2492	015102	000207			RTS	PC		
2493								
2494	015104	000000		WTYCMD:	.WORD	0		;STORAGE FOR WRITE CMD WHILE RETRYING
2495	015106	000000		WTYWRD:	.WORD	0		;STORAGE FOR WRITE CMD WORD WHILE RETRYING
2496	015110	000000		WTYBRF:	.WORD	0		;STORAGE FOR WRITE BPCR WHILE RETRYING
2497								
2498	015112	045	101	123	BTMSG1:	.ASCIZ	/#ASUSPECT BAD SPOT AFTER #D1#A RETRY, #D1#A REPEAT#N/	
	015115	125	123	120				
	015120	105	103	124				
	015123	040	102	101				
	015126	104	040	123				
	015131	120	117	124				
	015134	040	101	106				
	015137	124	105	122				
	015142	040	045	104				
	015145	061	045	101				
	015150	040	122	105				
	015153	124	122	131				
	015156	054	040	045				
	015161	104	061	045				
	015164	101	040	122				
	015167	105	120	105				
	015172	101	124	045				
	015175	116	000					
2499	015177	045	116	045	BTMSG2:	.ASCIZ	/#N#ABAD TAPE OVERFLOW: CHANGE TAPE!#N#N/	
	015202	101	102	101				
	015205	104	040	124				
	015210	101	120	105				
	015213	040	117	126				
	015216	105	122	106				
	015221	114	117	127				
	015224	072	040	103				
	015227	110	101	116				
	015232	107	105	040				
	015235	124	101	120				
	015240	105	041	045				
	015243	116	045	116				
	015246	000						
2500	015247	045	101	122	BTMSG3:	.ASCIZ	/#ARETRY FAILED ON BAD SPOT...ERASED!#N/	
	015252	105	124	122				
	015255	131	040	106				
	015260	101	111	114				
	015263	105	104	040				

015266	117	116	040
015271	102	101	104
015274	040	123	120
015277	117	124	056
015302	056	056	105
015305	122	101	123
015310	105	104	041
015313	045	116	000

2501  
2502  
2503  
2504  
2505  
2506  
2507  
2508  
2509

.EVEN

```

; SUBR TO BACSPACE ONE RECORD
; IF THE ERASE FLAG IS SET, THEN ERASE THAT RECORD
; INPUTS:      ERSFLG 1 = DO ERASE
; OUTPUTS:
; REGISTERS:
; CALLS:      EXECUTE, GOWAIT, CKHAE

```

2510	015316	016767	166076	166100
2511	015324	012767	104410	166066
2512	015332	016767	166062	164770
2513	015340	042767	004000	164762
2514	015346	016767	164756	166046
2515	015354	012767	000001	164750
2516	015362	005067	166040	
2517	015366	004767	173472	
2518	015372	004767	174456	
2519	015376	004767	174762	
2520	015402	004767	002072	
2521	015406	105767	166113	
2522	015412	001426		
2523	015414	016767	166000	166002
2524	015422	012767	100411	165770
2525	015430	016767	165764	164672
2526	015436	016767	164666	165756
2527	015444	004767	173414	
2528	015450	004767	174400	
2529	015454	004767	174704	
2530	015460	004767	002014	
2531	015464	105067	166035	

```

BORERS:  MOV    CMDWRD,PCMDWD    ;SET COMMAND TO SPACE REV
          MOV    #SRR,CMDWRD    ;LET CMDWRD := #SRR
          MOV    CMDWRD,CMDPKT  ;LET CMDPKT := CMDWRD CLR.BY #BRF.C
          BIC    #BRF.C,CMDPKT
          MOV    CMDPKT,CMSAV    ;LET CMSAV := CMDPKT
          MOV    #1,CMDPKT+CP.ADL ;LET CMDPKT+CP.ADL := #1
          CLR    CMDLG          ;LET CMDLG := #0
          JSR   PC,CMDAC
          JSR   PC,EXECUTE
          JSR   PC,GOWAIT
          JSR   PC,CKHAE
          TSTB  ERSFLG          ;WHEN ERASE FLAG IS SET, DO ERASE
          BEQ   502324
          MOV    CMDWRD,PCMDWD    ;LET PCMDWD := CMDWRD
          MOV    #ERS,CMDWRD    ;LET CMDWRD := #ERS
          MOV    CMDWRD,CMDPKT  ;LET CMDPKT := CMDWRD
          MOV    CMDPKT,CMSAV    ;LET CMSAV := CMDPKT
          JSR   PC,CMDAC
          JSR   PC,EXECUTE
          JSR   PC,GOWAIT
          JSR   PC,CKHAE
          CLRB  ERSFLG          ;LET ERSFLG := #0

```

2532  
2533 015470  
2534 015470 000207  
2535  
2536

```

502324:  RTS    PC

```

2537

```

; SUBR TO REWRITE A BADLY WRITTEN RECORD

```

2538	015472	016767	165722	165724
2539	015500	016767	177402	165712
2540	015506	016767	177372	164614
2541	015514	016767	164610	165700
2542	015522	016767	165660	164602
2543	015530	016767	177354	164600
2544	015536	012767	000002	165662
2545	015544	004767	173314	
2546	015550	004767	174300	
2547	015554	004767	174604	
2548	015560	004767	001714	
2549	015564	000207		

```

REWRT:  MOV    CMDWRD,PCMDWD    ;RESTORE WRITE COMMAND PACKET
          MOV    WTYWRD,CMDWRD  ;LET CMDWRD := WTYWRD
          MOV    WTYCMD,CMDPKT  ;LET CMDPKT := WTYCMD
          MOV    CMDPKT,CMSAV    ;LET CMSAV := CMDPKT
          MOV    DATAWT,CMDPKT+CP.ADL ;LET CMDPKT+CP.ADL := DATAWT
          MOV    WTYBRF,CMDPKT+CP.CNT ;LET CMDPKT+CP.CNT := WTYBRF
          MOV    #2,CMDLG        ;LET CMDLG := #2
          JSR   PC,CMDAC
          JSR   PC,EXECUTE        ;RE-WRITE RECORD
          JSR   PC,GOWAIT
          JSR   PC,CKHAE
          RTS    PC

```

```

2550
2551      ; SUBROUTINE TO LOG BYTES READ/WITTEN.
2552      ; ALSO UPDATES READ/WRITE ERROR COUNTERS.
2553      ; INPUTS:
2554      ; OUTPUTS:
2555      ; REGISTERS:      R2, R3, R4.
2556      ; CALLS:
2557
2558 015566 105767 165674 LOG::  TSTB  ERLOG      ;IF DATA AND ERRORS HAVE NOT BEEN LOGGED THEN:
2559 015572 001126      BNE   50233#
2560 015574 105267 165666      INCB  ERLOG      ;SET LOG DONE FLAG.
2561 015600 016704 165622      MOV   CMDLG,R4   ;GET CURRENT CMD LOGGING CODE.
2562 015604 005704      TST   R4        ;IF THERE IS A CODE THEN:
2563 015606 001520      BEQ   50234#
2564 015610 162704 000002      SUB   #2,R4     ;ADJUST THE CODE FOR TABLE INDEX.
2565 015614 010502      MOV   R5,R2     ;R2 = ADR OF BYTE COUNT LSW.
2566 015616 066402 016052      ADD   BINC(R4),R2
2567 015622 062702 002626      ADD   #CNTBGN,R2
2568 015626 066712 165564      ADD   BRFCNT,(R2) ;ADD BRFCNT TO LSW.
2569 015632 026767 164522 165556  CMP   MSGPKT+MS.RFC,BRFCNT ;IF THE RFC IS LOWER OR THE SAME AS BRFC THEN
2570 015640 101002      BHI   50235#
2571 015642 166712 164512      SUB   MSGPKT+MS.RFC,(R2) ;SUBTRACT RFC FROM EXPECTED BRFC.
2572
2573 015646      50235#:
2574 015646 010203      MOV   R2,R3     ;R3 = ADR OF 2ND WORD.
2575 015650 062703 000010      ADD   #10,R3
2576
2577 015654      50236#: ;WHILE (R2) GT #999. DO
2578 015654 021227 001747      CMP   (R2),#999.
2579 015660 003404      BLE   50237#
2580 015662 162712 001750      SUB   #1000.,(R2) ;UPDATE BYTE COUNT
2581 015666 005213      INC   (R3)      ;LET (R3) := (R3) + #1 ;2ND WORD.
2582
2583 015670 000771      BR    50236#
2584 015672      50237#:
2585 015672 010302      MOV   R3,R2     ;LET R2 := R3 + #10 ;R2 = ADR OF 3RD WORD.
2586 015674 062702 000010      ADD   #10,R2
2587 015700      50240#: ;WHILE (R3) GT #999. DO
2588 015700 021327 001747      CMP   (R3),#999.
2589 015704 003404      BLE   50241#
2590 015706 162713 001750      SUB   #1000.,(R3) ;UPDATE BYTE COUNT
2591 015712 005212      INC   (R2)      ;LET (R2) := (R2) + #1 ;3RD WORD.
2592
2593 015714 000771      BR    50240#
2594 015716      50241#:
2595 015716 010203      MOV   R2,R3     ;LET R3 := R2 + #10 ;R3 = ADR OF 4TH WORD.
2596 015720 062703 000010      ADD   #10,R3
2597 015724      50242#: ;WHILE (R2) GT #999. DO
2598 015724 021227 001747      CMP   (R2),#999.
2599 015730 003404      BLE   50243#
2600 015732 162712 001750      SUB   #1000.,(R2) ;UPDATE BYTE COUNT
2601 015736 005213      INC   (R3)      ;LET (R3) := (R3) + #1 ;4TH WORD.
2602
2603 015740 000771      BR    50242#
2604 015742      50243#:
2605 015742 105767 165521      TSTB  RWERR     ;IF R/W ERROR, UPDATE ERROR COUNT.
2606 015746 001440      BEQ   50244#

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```

2607 015750 010502      MOV      R5,R2              ;R2 = ADR OF COUNTER.
2608 015752 066402 016060  ADD      EINC(R4),R2
2609 015756 062702 002766  ADD      @WRREC,R2
2610 015762 105767 165502  TSTB    UNREC              ;IS THE ERROR UNRECOVERABLE?
2611 015766 001404      BEQ      50245#
2612 015770 062702 000010  ADD      @10,R2            ;YES, POINT TO NEXT COUNTER.
2613 015774 005212      INC      (R2)              ;UPDATE THE ERROR COUNTER
2614                                     ;ELSE - IF ERROR IS RECOVERABLE:
2615 015776 000424      BR       50246#
2616 016000 50245#      BR       50246#
2617 016000 005212      INC      (R2)              ;UPDATE THE ERROR COUNTER
2618 016002 105767 164205  TSTB    IREC              ;IF ERROR RECOVERY IS ENABLED:
2619 016006 001020      BNE     50247#
2620 016010 105767 165506  TSTB    DROPED            ;IF UNIT HAS NOT BEEN DROPPED:
2621 016014 001015      BNE     50250#
2622 016016 105767 164165  TSTB    ERCVER
2623 016022 001412      BEQ     50250#
2624 016024      PRINTB @NURTY1,RETRYC    ;PRINT # OF RETRIES TO RECOVER
                                MOV      RETRYC,-(SP)
                                MOV      @NURTY1,-(SP)
                                MOV      @2,-(SP)
                                MOV      SP,RO
                                TRAP    C#PNTB
                                ADD     @6,SP
2625                                     ;PROVIDED PRINT HAS BEEN ENABLED
2626 016050 50250#      ;
2627                                     ;
2628 016050 50247#      ;
2629                                     ;
2630                                     ;
2631 016050 50246#      ;
2632                                     ;
2633 016050 50244#      ;
2634                                     ;
2635 016050 50234#      ;
2636                                     ;
2637 016050 50233#      ;
2638 016050 000207      RTS      PC
2639                                     ;
2640                                     ;
2641 016052 000000      ; INDEXES TO BYTE COUNTERS.
2642 016054 000040      BINC:    0                  ;WRITE.
2643 016056 000100      40          ;READ REV.
2644                                     100         ;READ FWD.
2645                                     ; INDEXES TO READ/WRITE ERROR COUNTERS.
2646 016060 000000      EINC:    0                  ;WRITE.
2647 016062 000020      20          ;READ REV.
2648                                     40          ;READ FWD.
2649                                     ;
2650                                     ; IF A WRITE/VERIFY COMMAND IS ISSUED, CONTROL IS THEN
2651                                     ; TRANSFERRED TO THIS SUBROUTINE TO READ REVERSE, CHECK DATA,
2652                                     ; READ FORWARD, CHECK DATA, THEN CONTINUE TO NEXT COMMAND.
2653                                     ; INPUTS:
2654                                     ; OUTPUTS:
2655                                     ; REGISTERS:
2656                                     ; CALLS:          VFEXC.
2657 016066 105767 165424  VFYDAT::TSTB  VFYFLG      ;IF DATA IS TO BE VERIFIED:

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2658 016072 001426          BEQ      502511
2659 016074 016767 165320 165322      MOV      CMDWRD,PCMDWD      ;SAVE THE PREVIOUS COMMAND WORD.
2660 016102 012767 104401 165310      MOV      @RDR,CMDWRD      ;COMMAND IS READ REV.
2661 016110 012767 000004 165310      MOV      #4,CMDLG          ;SET UP CMD LOGGING INDEX.
2662 016116 004767 000030          JSR      PC,VFEXC          ;GO READ ALL THE RECORDS REV.
2663 016122 016767 165272 165274      MOV      CMDWRD,PCMDWD      ;SAVE THE PREVIOUS COMMAND WORD.
2664 016130 012767 104001 165262      MOV      @RDF,CMDWRD      ;COMMAND IS READ FWD.
2665 016136 012767 000006 165262      MOV      #6,CMDLG          ;SET UP CMD LOGGING INDEX.
2666 016144 004767 000002          JSR      PC,VFEXC          ;GO READ ALL RECORDS FWD.
2667
2668 016150          502511:
2669 016150 000207          RTS      PC      ;RETURN.
2670
2671
2672
2673
2674          ;
2675          ; SUBROUTINE TO EXECUTE THE READ AND VERIFY, FORWARD OR REVERSE.
2676          ;
2677          ; INPUTS:
2678          ;
2679          ; OUTPUTS:
2680          ;
2681          ; REGISTERS:      R2
2682          ;
2683          ; CALLS:      CMDAC, FIRSTU, VFISU, NEXTU, CKMAE.
2684
2685
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**VFEXC::** MOV CMDWRD,CMDPKT ;COMMAND PACKET = READ REV OR FWD.  
BIC @BRF.C,CMDPKT  
TSTB SWBFLG ;IF BYTES ARE TO BE SWAPPED:  
BEQ 502521  
BIS @SWB.C,CMDPKT ;SET SWAB BIT IN CMD PACKET.

**502521:** MOV CMDPKT,CMDSAV ;SAVE COMMAND PACKET 1ST WORD.  
MOV DATARD,CMDPKT.CP.ADL ;SAVE BUFFER START ADDRESS.  
CLR NCNT ;CLEAR NUMBER OF OPERATIONS.

**502531:** ;WHILE NCNT LT NCNT1 DO ;WHILE THERE ARE RECORDS REMAINING:  
CMP NCNT,NCNT1  
BGE 502541  
JSR PC,CMDAC ;STORE CMD ASCII IN ERROR MSG.  
JSR PC,FIRSTU ;SET UP FOR FIRST UNIT.

**502551:** ;WHILE DEVTBL(R5) NE #END DO ;WHILE THERE ARE DEVICES REMAINING:  
CMP DEVTBL(R5),#END  
BEQ 502561  
BIT @MOD.CO,CMDWRD ;IF CMD IS REVERSE THEN:  
BEQ 502571  
BIT @X0.BOT,EOTFLG(R5) ;IF NOT AT BOT  
BNE 502601 ;BUT IF AT EOT  
BIT @X0.EOT,EOTFLG(R5)  
BEQ 502611 ;AND ALL OTHERS AT EOT  
TSTB ALLEOT  
BEQ 502621 ;THEN READ VERIFY  
JSR PC,VFISU ;IF NOT ALL AT EOT, FREEZE UNIT(S)

**502621:**  
  
;IF NOT AT BOT AND

**502631:** BR 502631

**502611:** JSR PC,VFISU ;NOT AT EOT, READ VFY

```

2715 016322          502630:
2716
2717 016322          502600:
2718 016322 000412          BR      502640          ;ELSE IF CMD IS NOT REVERSE:
2719 016324          502570:
2720 016324 032765 000001 003502          BIT      @X0.EOT,EOTFLG(R5)
2721 016332 001404          BEQ      502650
2722 016334 032767 000001 165056          BIT      @CMD.CO,CMDWRD
2723 016342 001002          BNE      502660
2724 016344          502650:
2725
2726 016344 004767 000030          JSR      PC,VFISU          ;IF NOT AT EOT OR NOT A MOTION CMD THEN:
2727
2728 016350          502660:
2729
2730 016350          502640:
2731 016350 004767 000574          JSR      PC,NEXTU          ;GO FIND THE NEXT UNIT.
2732
2733 016354 000732          BR      502550
2734 016356          502560:
2735 016356 004767 001116          JSR      PC,CKHAE          ;CHECK FOR HALT AFTER EACH CMD.
2736 016362 005267 165024          INC      NCNT          ;UPDATE THE RECORD COUNT.
2737 016366 016767 165026 165030          MOV      CMDWRD,PCMDWD          ;SAVE PREVIOUS COMMAND WORD.
2738
2739 016374 000712          BR      502530
2740 016376          502540:
2741 016376 000207          RTS      PC          ;RETURN.
2742
2743          ; SUBROUTINE TO ISSUE COMMAND, AWAIT INTERRUPT,
2744          ; CHECK STATUS, CHECK DATA.
2745          ; INPUTS:
2746          ; OUTPUTS:
2747          ; REGISTERS:      R2
2748          ; CALLS:      EXECUTE, GOWAIT, CKDATA.
2749
2750 016400 016702 165004          VFISU:: MOV      DATARD,R2          ;INIT READ BUFFER POINTER.
2751 016404 062702 000010          ADD      @B.,R2
2752 016410          502670:          ;WHILE R2 NE DATARD DO          ;UNTIL 8 BYTES HAVE BEEN SET.
2753 016410 020267 164774          CMP      R2,DATARD
2754 016414 001403          BEQ      502700
2755 016416 012742 177777          MOV      @-1,-(R2)          ;INIT READ BUFFER.
2756
2757 016422 000772          BR      502670
2758 016424          502700:
2759 016424 004767 173424          JSR      PC,EXECUTE          ;GO EXECUTE THE COMMAND.
2760 016430 105767 165066          TSTB    DROPED          ;IF UNIT HAS NOT BEEN DROPPED THEN:
2761 016434 001002          BNE      502710
2762 016436 004767 173722          JSR      PC,GOWAIT          ;GO WAIT FOR DONE BIT.
2763
2764 016442          502710:
2765 016442 105767 165054          TSTB    DROPED          ;IF UNIT HAS NOT BEEN DROPPED THEN:
2766 016446 001006          BNE      502720
2767 016450 032765 000002 003502          BIT      @X0.BOT,EOTFLG(R5)          ;WHEN NOT REVERSED INTO BOT, THEN
2768 016456 001002          BNE      502730
2769 016460 004767 000002          JSR      PC,CKDATA          ;GO VERIFY DATA.
2770
2771 016464          502730:

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017050 016746 000024
017054 012746 005275
017060 012746 000003
017064 010600
017066 104414
017070 062706 000010
2852
2853 017074 50306:
2854
2855 017074 50277:
2856
2857 017074 50275:
2858 017074 000207 RTS PC ;OTHERWISE, RETURN.
2859
2860 017076 000000 CKDCNT: .WORD 0 ;# OF BYTES TO BE VERIFIED -1.
2861 017100 000000 CKDFF: .WORD 0 ;# OF BYTES IN ERROR COUNTER.
2862
2863 ; SUBROUTINE TO FIND THE FIRST DEVICE IN THE TEST SEQUENCE.
2864 ;
2865 ; INPUTS:
2866 ; OUTPUTS:
2867 ; REGISTERS:
2868 ; CALLS:
2869 017102 105067 164414 FIRSTU:: CLR B DROPE ;CLR UNIT DROPPED FLAG
2870 017106 005005 CLR R5 ;CLR DEVICE POINTER.
2871 017110 026527 002604 177774 50307: CMP DEVTBL(R5),#NINUSE ;WHILE DEVICES ARE NOT IN USE:
2872 017116 001003 BNE 50310:
2873 017120 062705 000002 ADD #2,R5 ;LET R5 := R5 + #2 ;POINT TO NEXT DEVICE.
2874 017124 000771 BR 50307:
2875 017126 50310:
2876 017126 026527 002604 177777 50310: CMP DEVTBL(R5),#END ;IF ALL UNITS HAVE BEEN DROPPED THEN:
2877 017134 001001 BNE 50311:
2878 017136 104444 DOCLN ;DO CLEAN CODE AND TERMINATE PASS.
2879 017136 TRAP C#DOCLN
2880 017140 50311:
2881 017140 016567 002604 162726 MOV DEVTBL(R5),L#LUN ;SET UNIT # IN "HEADER" FOR ERROR REPORT
2882 017146 000207 RTS PC ;RETURN WITH 1ST DEVICE IN R5.
2883
2884
2885 ; SUBROUTINE TO FIND THE NEXT UNIT IN THE TEST CYCLE.
2886 ;
2887 ; INPUTS:
2888 ; OUTPUTS:
2889 ; REGISTERS:
2890 ; CALLS:
2891 017150 105067 164346 NEXTU:: CLR B DROPE ;CLR UNIT DROPPED FLAG
2892 50312: ;REPEAT
2893 017154 50312: ;REPEAT UNTIL THE NEXT DEVICE IS FOUND.
2894 017154 062705 000002 ADD #2,R5 ;UPDATE DEVICE TABLE POINTER.
2895 017160 026527 002604 177774 CMP DEVTBL(R5),#NINUSE ;UNTIL DEVTBL(R5) NE #NINUSE
2896 017166 001772 BEQ 50312:
2897 017170 016567 002604 162676 MOV DEVTBL(R5),L#LUN ;SET UNIT # IN "HEADER" FOR ERROR REPORT
2898 017176 000207 RTS PC ;RETURN.
2899
2900
2901 ; SUBROUTINE TO DROP A DEVICE FROM THE TEST SEQUENCE.

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2953 017370 000240      NOP
2954 017372 000240      NOP
2955 017374 000240      NOP
2956 017376 105267 164124 INCB  STAF LG      ;SET START FLAG TO ENABLE REWIND.
2957
2958 017402      503221:
2959
2960 017402      503211:
2961 017402 105267 164114 DRORTN: INCB  DROPE D      ;SET UNIT DROPPED FLAG.
2962 017406 000207      RTS  PC          ;RETURN.
2963
2964 017410 000000      DROPN: .WORD  0      ;# OF UNIT TO BE DROPPED
2965
2966      ; SUBROUTINE TO PRINT EXTENDED STATUS REGISTERS.
2967      ; INPUTS:
2968      ; OUTPUTS:
2969      ; REGISTERS:
2970      ; CALLS:
2971
2972 017412      PRXST:: PRINTX #GETSTM
      017412 012746 005507      MOV      #GETSTM, -(SP)
      017416 012746 000001      MOV      #1, -(SP)
      017422 010600      MOV      SP, R0
      017424 104415      TRAP    C#PNTX
      017426 062706 000004      ADD      #4, SP
2973 017432      PRINTX #STAERS,MSGPKT+MS.XS0,MSGPKT+MS.XS1,MSGPKT+MS.XS2,MSGPKT+MS.XS3,MSGPKT+MS.XS
      017432 016746 162734      MOV      MSGPKT+MS.XS4, -(SP)
      017436 016746 162726      MOV      MSGPKT+MS.XS3, -(SP)
      017442 016746 162720      MOV      MSGPKT+MS.XS2, -(SP)
      017446 016746 162712      MOV      MSGPKT+MS.XS1, -(SP)
      017452 016746 162704      MOV      MSGPKT+MS.XS0, -(SP)
      017456 012746 006753      MOV      #STAERS, -(SP)
      017462 012746 000006      MOV      #6, -(SP)
      017466 010600      MOV      SP, R0
      017470 104415      TRAP    C#PNTX
      017472 062706 000016      ADD      #16, SP
2974 017476 000207      RTS  PC
2975
2976      ; SUBROUTINE TO HALT AFTER EACH COMMAND.
2977      ; INPUTS:
2978      ; OUTPUTS:
2979      ; REGISTERS:      R3, R4
2980      ; CALLS:
2981
2982 017500 105767 162502      CKHAE:: TSTB  HAE,IFB HAE NE #0 THEN      ;IF HALT FLAG IS SET:
2983 017504 001430      BEQ      503231
2984 017506 105767 164017      TSTB  MISCFG      ;IFB MISCFG EQ #0 THEN      ;
2985 017512 001023      BNE      503241
2986 017514      MANUAL      ;IS MANUAL INTERVENTION ALLOWED?
      017514 104450      TRAP    C#MANI
2987 017516      BNCOMPLETE CKHRTN      ;BR IF NOT.
      017516 103023      BCC      CKHRTN
2988 017520 016704 163674      MOV      CMDWRD,R4      ;LET R4 := CMDWRD
2989 017524 004767 171406      JSR  PC,GCHDA      ;FETCH ADR OF CMD ASCII.
2990 017530 112367 164552      MOVB  (R3)+,HALTM      ;MOVE CMD ASCII
2991 017534 112367 164547      MOVB  (R3)+,HALTM+1      ;LET HALTM+1 := (R3)+
2992 017540 111367 164544      MOVB  (R3),HALTM+2      ;INTO MESSAGE.

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2993 017544          GMANIL HALTM,TIME1,1,YES ;HALT - WAIT FOR AN OEPATOR INPUT.
      017544 104443          TRAP      C#GMAN
      017546 000404          BR        10000#
      017550 003436          .WORD    TIME1
      017552 000130          .WORD    T#CODE
      017554 004306          .WORD    HALTM
      017556 000001          .WORD    1
      017560          10000#
2994 017560          10000#
2995
2996 017560 000402          BR        50325#
2997 017562          50324#
2998 017562 105067 163743  CLR      MISCFCG ;LET MISCFCG :B= #0
2999
3000 017566          50325#
3001
3002 017566          50323#
3003 017566 000207  CKHRTN: RTS      PC ;RETURN
      .EVEN
3004
3005
3006 017570          ENDMOD
3007
3008
3009          .TITLE MISCELLANEOUS SECTIONS
3010          .SBTTL REPORT CODING SECTION
3011
3012
3013          ;**
3014          ; THE REPORT CODING SECTION CONTAINS THE
3015          ; "PRINTS" CALLS THAT GENERATE STATISTICAL REPORTS.
3016          ;--
3017
3018 017570          BGNRPT
      017570          L#RPT::
3019 017570 010567 163656  MOV      R5,RSSAVE ;SAVE CURRENT DEVICE POINTER.
3020 017574 004767 177302  JSR      PC,FIRSTU ;FIND THE FIRST UNIT.
3021 017600          50326# ;WHILE DEVTBL(R5) NE #END DO ;WHILE THERE ARE MORE DEVICES:
3022 017600 026527 002604 177777  CMP      DEVTBL(R5),#END
3023 017606 001562          BEQ      50327#
3024 017610          PRINTS      #RPT1A,DEVTBL(R5),PASCNT(R5),RECCNT(R5)
      017610 016546 003376          MOV      RECCNT(R5),-(SP)
      017614 016546 003326          MOV      PASCNT(R5),-(SP)
      017620 016546 002604          MOV      DEVTBL(R5),-(SP)
      017624 012746 020432          MOV      #RPT1A, -(SP)
      017630 012746 000004          MOV      #4, -(SP)
      017634 010600          MOV      SP,R0
      017636 104416          TRAP    C#PNTS
      017640 062706 000012          ADD     #12,SP
3025 017644          PRINTS      #RPT1B,WRBC+30(R5),WRBC+20(R5),WRBC+10(R5),WRBC(R5)
      017644 016546 002626          MOV      WRBC(R5),-(SP)
      017650 016546 002636          MOV      WRBC+10(R5),-(SP)
      017654 016546 002646          MOV      WRBC+20(R5),-(SP)
      017660 016546 002656          MOV      WRBC+30(R5),-(SP)
      017664 012746 020507          MOV      #RPT1B, -(SP)
      017670 012746 000005          MOV      #5, -(SP)
      017674 010600          MOV      SP,R0
      017676 104416          TRAP    C#PNTS

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MISCELLANEOUS SECTIONS  
REPORT CODING SECTION

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SEQ 100

3026	017700	062706	000014					ADD	#14,SP
	017704			PRINTS	#RPT1C,RRBC+30(R5),RRBC+20(R5),RRBC+10(R5),RRBC(R5)			MOV	RRBC(R5),-(SP)
	017710	016546	002666					MOV	RRBC+10(R5),-(SP)
	017714	016546	002706					MOV	RRBC+20(R5),-(SP)
	017720	016546	002716					MOV	RRBC+30(R5),-(SP)
	017724	012746	020560					MOV	#RPT1C, -(SP)
	017730	012746	000005					MOV	#5, -(SP)
	017734	010600						MOV	SP,R0
	017736	104416						TRAP	C#PNTS
3027	017740	062706	000014					ADD	#14,SP
	017744			PRINTS	#RPT1D,RFBC+30(R5),RFBC+20(R5),RFBC+10(R5),RFBC(R5)			MOV	RFBC(R5),-(SP)
	017750	016546	002736					MOV	RFBC+10(R5),-(SP)
	017754	016546	002746					MOV	RFBC+20(R5),-(SP)
	017760	016546	002756					MOV	RFBC+30(R5),-(SP)
	017764	012746	020631					MOV	#RPT1D, -(SP)
	017770	012746	000005					MOV	#5, -(SP)
	017774	010600						MOV	SP,R0
	017776	104416						TRAP	C#PNTS
3028	020000	062706	000014					ADD	#14,SP
	020004			PRINTS	#RPT1F,WRREC(R5),RRREC(R5),RFREC(R5)			MOV	RFREC(R5),-(SP)
	020010	016546	003026					MOV	RRREC(R5),-(SP)
	020014	016546	002766					MOV	WRREC(R5),-(SP)
	020020	012746	020735					MOV	#RPT1F, -(SP)
	020024	012746	000004					MOV	#4, -(SP)
	020030	010600						MOV	SP,R0
	020032	104416						TRAP	C#PNTS
3029	020034	062706	000012					ADD	#12,SP
	020040			PRINTS	#RPT1G,WRUNR(R5),RRUNR(R5),RFUNR(R5)			MOV	RFUNR(R5),-(SP)
	020044	016546	003036					MOV	RRUNR(R5),-(SP)
	020050	016546	002776					MOV	WRUNR(R5),-(SP)
	020054	012746	021006					MOV	#RPT1G, -(SP)
	020060	012746	000004					MOV	#4, -(SP)
	020064	010600						MOV	SP,R0
	020066	104416						TRAP	C#PNTS
3030	020070	062706	000012					ADD	#12,SP
3031	020074	105767	162110	TSTB	BADTSW	,IFB BADTSW NE #0 THEN			
3032	020100	001402		BEQ	50330#				
3033	020102	004767	000056	JSR	PC,BTRPT	,GO PRINT BAD TAPE SPOTS WHEN ENABLED			
3034	020106								
3035	020106			50330#:					
	020106	016546	003346	PRINTS	#RPT1I,SCCNT(R5),HRDCNT(R5),FTLCNT(R5),VFYCNT(R5)			MOV	VFYCNT(R5),-(SP)
	020112	016546	003366					MOV	FTLCNT(R5),-(SP)
	020116	016546	003356					MOV	HRDCNT(R5),-(SP)
	020122	016546	003336					MOV	SCCNT(R5),-(SP)
	020126	012746	021203					MOV	#RPT1I, -(SP)
	020132	012746	000005					MOV	#5, -(SP)
	020136	010600						MOV	SP,R0
	020140	104416						TRAP	C#PNTS
3036	020142	062706	000014					ADD	#14,SP
3037	020146	004767	176776	JSR	PC,NEXTU	,FIND THE NEXT UNIT.			
3038	020152	000612		BR	50326#				

MISCELLANEOUS SECTIONS  
REPORT CODING SECTION

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SEQ 101

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3039 020154          503274:
3040 020154 016705 163272      MOV    R5SAVE,R5          ;RESTORE CURRENT DEVICE POINTER.
3041 020160          EXIT    RPT
      020160 000167          .WORD  J$JMP
      020162 001130          .WORD  L10010-2-.

3042
3043      ;
3044      ;   SUBR TO PRINT BAD TAPES SPOTS DURING THE REPORT PRINTS
3045      ;   WRITE RETRIES: CUMULATIVE COUNT
3046      ;   BAD TAPE SPOTS: COUNT PER TAPE PASS ONLY, NOT CUMULATIVE.
3047      ;   COUNT OF RECOVERABLE WRITE ERRORS EXCLUDES BAD TAPE SPOTS.
3048 020164          BTRPT:: PRINTS  #RPT1E,WRTYCT(R5)      ;PRINT GLOBAL WRITE RETRY COUNT
      020164 016546 003316          MOV    WRTYCT(R5),-(SP)
      020170 012746 021057          MOV    #RPT1E,-(SP)
      020174 012746 000002          MOV    #2,-(SP)
      020200 010600          MOV    SP,R0
      020202 104416          TRAP  C$PNTS
      020204 062706 000006          ADD    #6,SP
3049 020210 016567 002616 163274      MOV    BTADDR(R5),BTPT      ;BTPT IS BOTH THE BAD TAPE SPOT COUNTER
3050 020216 017703 163270          MOV    #BTPT,R3          ;AND THE LOGGING INDEX
3051 020222 006203          ASR    R3
3052 020224          PRINTS  #RPT1J,R3      ;PRINT # OF BAD TAPE SPOTS
      020224 010346          MOV    R3,-(SP)
      020226 012746 021107          MOV    #RPT1J,-(SP)
      020232 012746 000002          MOV    #2,-(SP)
      020236 010600          MOV    SP,R0
      020240 104416          TRAP  C$PNTS
      020242 062706 000006          ADD    #6,SP
3053 020246 005703          TST    R3                ;PRINT RECORD # IF BAD SPOTS DETECTED
3054 020250 001457          BEQ    503314
3055 020252 020327 000024          CMP    R3,#20.          ;IF R3 HI #20. THEN
3056 020256 101402          BLOS  503324
3057 020260 012703 000024          MOV    #20.,R3          ;20 BAD SPOTS IS THE LIMIT
3058
3059 020264          503324:
3060 020264          PRINTS  #CRLFSP
      020264 012746 005744          MOV    #CRLFSP,-(SP)
      020270 012746 000001          MOV    #1,-(SP)
      020274 010600          MOV    SP,R0
      020276 104416          TRAP  C$PNTS
      020300 062706 000004          ADD    #4,SP
3061 020304 016704 163202          MOV    BTPT,R4          ;LET R4 := BTPT * #2 ;FETCH A BAD SPOT ID
3062 020310 062704 000002          ADD    #2,R4
3063 020314 005002          CLR    R2                ;R2 = PRINT COUNT PER LINE: 10 MAX
3064 020316          503334: ;REPEAT
3065 020316          PRINTS  #RPT1K,(R4)      ;PRINT A BAD SPOT ID
      020316 011446          MOV    (R4),-(SP)
      020320 012746 021174          MOV    #RPT1K,-(SP)
      020324 012746 000002          MOV    #2,-(SP)
      020330 010600          MOV    SP,R0
      020332 104416          TRAP  C$PNTS
      020334 062706 000006          ADD    #6,SP
3066 020340 005202          INC    R2                ;LET R2 := R2 + #1 ;COUNT PRINTS
3067 020342 062704 000002          ADD    #2,R4          ;LET R4 := R4 + #2 ;NEXT
3068 020346 020227 000012          CMP    R2,#10.        ;IF R2 EQ #10. THEN
3069 020352 001014          BNE  503344
3070 020354          PRINTS  #CRLFSP          ;GO TO NEXT PRINT LINE PAST 10 PRINTS

```

MISCELLANEOUS SECTIONS  
REPORT CODING SECTION

MACRO M1113 30-NOV-83 10:17

SEQ 102

```

020354 012746 005744
020360 012746 000001
020364 010600
020366 104416
020370 062706 000004
3071 020374 162703 000012
3072 020400 162702 000012
3073
3074 020404
3075 020404 020203
3076 020406 001343
3077
3078 020410
3079 020410
020410 012746 005741
020414 012746 000001
020420 010600
020422 104416
020424 062706 000004
3080 020430 000207
3081
3082
3083 020432 045 116 045 RPT1A: .NLIST BEX
3084 020507 045 101 102 RPT1B: .ASCIZ /#N#AUNIT #D1#S3#APASS:#D5#S3#ARECORD:#D5#N/
3085 020560 045 101 102 RPT1C: .ASCIZ /#BYTES WRITTEN #D3#A,#Z3#A,#Z3#A,#Z3#N/
3086 020631 045 101 102 RPT1D: .ASCIZ /#BYTES READ REV #D3#A,#Z3#A,#Z3#A,#Z3#N/
3087 020701 045 123 062 RPT1E: .ASCII /#BYTES READ FWD #D3#A,#Z3#A,#Z3#A,#Z3#N/
3088 020735 045 101 122 RPT1F: .ASCIZ /#S23#AMRT#S4#ARDR#S4#ARDF#N/
3089 021006 045 101 125 RPT1G: .ASCIZ /#ARECOVERABLE ERRORS #D5#S2#D5#S2#D5#N/
3090 021057 045 101 127 RPT1H: .ASCIZ /#UNRECOVERABLE ERRORS #D5#S2#D5#S2#D5#N/
3091 021107 045 116 045 RPT1I: .ASCIZ /#WRITE RETRIES#S0#D5#N/
3092 021174 045 104 065 RPT1J: .ASCIZ /#D2#A BAD SPOTS THIS TAPE PASS PRECEDING RECORD #:/
3093 021203 045 101 123 RPT1K: .ASCIZ /#D5#S1/
3094 021257 045 123 063 RPT1L: .ASCIZ "#ASPEC COND#S3#AHARD#S3#AFATAL#S3#ACOMPARE#N"
3095 .ASCIZ /#S3#D5#S3#D5#S3#D5#S3#D5#N#N/
3096 .LIST BEX
3097 .EVEN
3098 021314
021314 ENDRPT
021314 104425 L10010: TRAP C#RPT

3099
3100 .SBTTL LOAD DEVICE PROTECTION TABLE
3101
3102
3103
3104
3105
3106
3107 021316
021316 BGNPROT
L#PROT::
3108
3109 021316 000000 .WORD 0 ;P-TBL OFFSET OF TSOB
3110 021320 177777 .WORD -1 ;P-TBL OFFSET OF MASS BUS UNIT #: -1 = NOT A MASS BUS DE
3111 021322 177777 .WORD -1 ;P-TBL OFFSET OF DRIVE #: -1 = NONE, THREE DRIVES PER CONTRO
LLER
3112 021324
3113
3114 .SBTTL INITIALIZE SECTION

```

MISCELLANEOUS SECTIONS MACRO M1113 30-NOV-83 10:17  
INITIALIZE SECTION

SEQ 103

```

3115
3116
3117      ;
3118      ; THE INITIALIZE SECTION CONTAINS THE CODING THAT IS PERFORMED
3119      ; AT THE BEGINNING OF EACH PASS.
3120      ;--
3121      021324      BGNINIT
3122      021324      L$INIT::
3123      021324      032727      000003      002330      INIT10: BIT      #BIT0!BIT1,#CMDPKT      ;IF CMD PACKET IS NOT ON MODULO 4 BOUNDRY:
3124      021332      001421      BEQ      50335#
3125      021334      ERRSF      1,CMDPKM      ;PRINT ERROR MSG,
3126      021344      DELAY      200.      ;GO TO SUPERVISOR, WAIT 2 SECONDS.
3127      021374      000753      BR      INIT10      ;
3128
3129      50335#:
3130
3131      021376      105767      160602      TSTB      CLRFLG      ;IF CLR COUNTERS FLAG SET:
3132      021402      001413      BEQ      50336#
3133      021404      105067      160574      CLRB      CLRFLG      ;INIT CLR FLAG.
3134      021410      005002      CLR      R2      ;LET R2 := #0
3135      021412      50337#:      ;WHILE R2 NE #CNTLEN DO
3136      021412      020227      000550      CMP      R2,#CNTLEN
3137      021416      001405      BEQ      50340#
3138      021420      005062      002626      CLR      WRBC(R2)      ;CLR ALL STATISTICAL COUNTERS.
3139      021424      062702      000002      ADD      #2,R2      ;LET R2 := R2 + #2
3140
3141      021430      000770      BR      50337#
3142      021432      50340#:
3143
3144      021432      50336#:
3145
3146      021432      105767      160547      TSTB      RRANV      ;IF RESET RANDOM VARIABLE FLAG IS SET THEN:
3147      021436      001406      BEQ      50341#
3148      021440      012767      153624      161764      MOV      #RANBC,RANB      ;RESET RANDOM BASE #.
3149
3150      021446      012767      032561      161760      MOV      #RANSC,RANS      ;RESET RANDOM SAVE LOCATION.
3151
3152      021454      50341#:
3153      021454      012700      000040      READEF      #EF.START      ;READ START COMMAND EVENT FLAG.
3154      021462      103057      BNCOMPLETE      INIT15      ;BRANCH IF NOT STARTING.
3155      021464      105267      162036      INCB      STAFLG      ;SET START COMMAND FLAG.

```

MISCELLANEOUS SECTIONS MACRO M1113 30-NOV-83 10:17  
INITIALIZE SECTION

SEQ 104

```

3156 021470 012705 000006          MOV    #6,R5    ;LET R5 := #6
3157 021474          50342: ;REPEAT
3158 021474 012765 177774 002604    MOV    #NINUSE,DEVTBL(R5) ;INITIATE UNIT NUMBER TABLE
3159 021502 162705 000002          SUB    #2,R5    ;LET R5 := R5 - #2 ;BY STORING NOT IN USE IN EACH LOCATION.
3160 021506 005705          TST    R5      ;UNTIL R5 EQ #0
3161 021510 001371          BNE    50342#
3162 021512 022767 000001 160272    CMP    #1,L#UNIT ;ONLY ONE UNIT ALLOWED
3163 021520 001425          BEQ    5034#    ;OK
3164 021522          PRINTF #AUDRUN ;TELL THE MAN
          021522 012746 005146          MOV    #AUDRUN,-(SP)
          021526 012746 000001          MOV    #1,-(SP)
          021532 010600          MOV    SP,RO
          021534 104417          TRAP  C#PNTF
          021536 062706 000004          ADD    #4,SP
3165 021542          DELAY 25          ;WAIT
          021542 012727 000025          MOV    #25,(PC)+
          021546 000000          .WORD 0
          021550 016727 160342          MOV    L#DLY,(PC)+
          021554 000000          .WORD 0
          021556 005367 177772          DEC    -6(PC)
          021562 001375          BNE    -4
          021564 005367 177756          DEC    -22(PC)
          021570 001367          BNE    -20
3166 021572          DOCLN          ;ABORT
          021572 104444          TRAP  C#DCLN
3167 021574 016705 160212    5034# : MOV    L#UNIT,R5    ;LET R5 := L#UNIT SHIFT 1
3168 021600 006305          ASL    R5
3169 021602    50343: ;REPEAT          ;STORE ALL UNIT
3170 021602 162705 000002    SUB    #2,R5    ;LET R5 := R5 - #2 ;NUMBERS IN DEVTBL.
3171 021606 010565 002604    MOV    R5,DEVTBL(R5) ;LET DEVTBL(R5) := R5 SHIFT -1
3172 021612 006265 002604    ASR    DEVTBL(R5)
3173 021616 005705          TST    R5      ;UNTIL R5 EQ #0
3174 021620 001370          BNE    50343#
3175
3176 021622    INIT15: READEF #EF.PWR ;HAS THERE BE A POWER FAILURE?
          021622 012700 000034          MOV    #EF.PWR,RO
          021626 104447          TRAP  C#REFG
3177 021630          BNCOMPLETE INIT16 ;BRANCH IF NOT.
          021630 103004          BCC    INIT16
3178 021632 105267 161670          INCB   STAF LG ;IF SO - SET THE START FLAG.
3179 021636 105267 161665          INCB   PWRFLG ;IF SO - SET THE POWER FAIL FLAG.
3180
3181 021642    INIT16: RFLAGS OPFLAG ;READ AND STORE FLAGS SET BY OPERATOR
          021642 104421          TRAP  C#RFLA
          021644 010067 161666          MOV    RO,OPFLAG
3182 021650 005003          CLR    R3      ;LET R3 := #0 ;CLEAR EVENT FLAG
3183 021652 105767 161651          TSTB  PWRFLG ;IF POWER FAIL HAS NOT OCCURRED THEN:
3184 021656 001020          BNE    50344#
3185 021660          READEF #EF.NEW ;UPDATE PASS COUNT WHEN
          021660 012700 000035          MOV    #EF.NEW,RO
          021664 104447          TRAP  C#REFG
3186 021666 103014          BCC    50345# ;SUPERVISOR IS IN NEW PASS
3187 021670 105767 161632          TSTB  STAF LG ;AND DIAG WAS NEITHER STARTED
3188 021674 001010          BNE    50346#
3189 021676          READEF #EF.RES ;NOR
          021676 012700 000037          MOV    #EF.RES,RO
          021702 104447          TRAP  C#REFG

```

MISCELLANEOUS SECTIONS  
INITIALIZE SECTION

MACRO M1113 30-NOV-83 10:17

SEQ 105

```

3190 021704 103402          BCS 503470      ;IFCOND CC THEN ;RESTARTED
3191 021706 005103          COM R3          ;LET R3 := COMP R3 ;DO IT
3192
3193 021710 000401          BR 503500
3194 021712 503470:
3195 021712 005203          INC R3          ;SET 1ST PASS IF NEW PASS AND
3196                                ;RESTARTING
3197 021714 503500:
3198
3199 021714 000401          BR 503510
3200 021716 503460:
3201 021716 005203          INC R3          ;SET 1ST PASS IF NEW PASS AND
3202                                ;STARTING
3203 021720 503510:
3204                                ;DO NOT UPDATE IT ON CONTINUE
3205 021720 503450:
3206                                ;OR ON POWER FAIL
3207 021720 503440:
3208 021720 004767 175156     JSR PC,FIRSTU      ;INIT DEVICE POINTER.
3209 021724 005002          CLR R2          ;LET R2 := #0 ;INIT DEVICE COUNTER.
3210 021726 503520: ;WHILE DEVTBL(R5) NE #END DO
3211 021726 026527 002604 177777 CMP DEVTBL(R5),#END
3212 021734 001456          BEQ 503530
3213 021736 005202          INC R2          ;LET R2 := R2 + #1
3214 021740 010500          MOV R5,R0      ;LET R0 := R5 SHIFT -1
3215 021742 006200          ASR R0
3216 021744 006200          GPHARD R0,R0 ;GET HARDWARE P TABLE FROM SUPER.
3217 021744 104442          TRAP C#GPHRD
3218 021746 103044          BCC 503540      ;IFCOND CS THEN
3219 021750 011065 002514     MOV (R0),TSDB(R5) ;SAVE TSDB ADDRESS.
3220 021760 062765 000002 002524 MOV (R0),TSSR(R5) ;SAVE TSSR ADDRESS.
3221 021766 012065 002534     ADD #2,TSSR(R5)
3222 021772 011065 003532     MOV (R0),TSVCT(R5) ;SAVE INTERRUPT VECTOR ADDRESS.
3223 021776 011067 161532     MOV (R0),TSUNT(R5) ;SAVE NUMBER OF DRIVE
3224 022002 011067 161532     MOV (R0),TSNP ;SAVE FOR PRINT OUT'S
3225 022002 012746 000340     SETVEC TSVCT(R5),TSSINT(R5),#INTPRI
3226 022006 016546 002554     MOV #INTPRI,-(SP)
3227 022012 016546 002534     MOV TSSINT(R5),-(SP)
3228 022016 012746 000003     MOV TSVCT(R5),-(SP)
3229 022022 104437          TRAP C#SVEC
3230 022024 062706 000010     ADD #10,SP
3231 022030 005065 003472     ;SET UP INTERRUPT PROCESSING CONDITIONS.
3232 022034 005703          CLR INTFLG(R5) ;CLEAR INTERRUPT FLAGS.
3233 022036 001410          TST R3          ;ACTUAL PASSCOUNT UPDATE PER R3
3234 022040 005703          REQ 503550
3235 022042 002003          TST R3
3236 022044 005265 003326     BGE 503560      ;IF R3 LT #0 THEN
3237 022050 000403          BR 503570
3238 022052 503560:
3239 022060 012765 000001 003326 MOV #1,PASCNT(R5) ;LET PASCNT(R5) := #1
3240 022060 503570:
3241 022060 503550:

```

MISCELLANEOUS SECTIONS MACRO M1113 30-NOV-83 10:17  
INITIALIZE SECTION

SEQ 106

```

3240
3241 022060
3242 022060 005065 003376      50354: CLR   RECCNT(R5)      ;CLEAR RECORD COUNT
3243 022064 004767 175060      JSR   PC,NEXTU      ;DO IT FOR ALL DEVICES.
3244
3245 022070 000716
3246 022072
3247
3248 022072 005702
3249 022074 001026
3250 022076
3251 022116
3252 022146
3253 022150
3254
3255 022152
3256
3257
3258 022152
3259 022160
3260 022164
3261 022166
3262 022174
3263 022176
3264 022202
3265 022202
3266 022210
3267 022212
3268 022216
3269
3270 022244
3271 022252
3272 022254
3273

012746 005114
012746 000001
010600
104417
062706 000004
012727 000310
000000
016727 157766
000000
005367 177772
1 1375
05367 177756
001367
104422
104444

50360:
SETPRI #PRI00
012700 000000
104441
105767 160027
001033
032767 000020 161342
001027
004767 174700
026527 002604 177777
001421
105067 161312
012746 000340
012746 023730
012746 000004
012746 000003
104437
062706 000010
012767 000001 161164
000404
000167 000622
10:

50354:
CLR   RECCNT(R5)      ;CLEAR RECORD COUNT
JSR   PC,NEXTU      ;DO IT FOR ALL DEVICES.

50353:
BR    50352:

TST   R2
BNE   50360:
PRINTF #AUDRPM

MOV   #AUDRPM,-(SP)
MOV   #1,-(SP)
MOV   SP,R0
TRAP  C#PNTF
ADD   #4,SP

DELAY 200.
;GO TO SUPERVISOR, WAIT 2 SECONDS.
MOV   #200.,(PC).
.WORD 0
MOV   #LDLY,(PC).
.WORD 0
DEC   -6(PC)
BNE   -.4
DEC   -22(PC)
BNE   -.20

BREAK
;GO TO SUPERVISOR, CHECK TTY.
DOCLN
;DO CLEAN CODE + ABORT PASS.

50360:
SETPRI #PRI00
;LOWER CPU PRIORITY TO 0
MOV   #PRI00,R0
TRAP  C#SPRI

TSTB  IREC
BNE   10
BIT   #ADR,OPFLAG
BNE   10
JSR   PC,FIRSTU
;AND AUTO-DROP NOT CALLED, THEN SET UP FOR FIRST
;WHILE THERE ARE MORE DEVICES:

50362:
CMP   DEVTBL(R5),#END
BEQ   10
CLR#  TRAP#4
SETVEC #4,#TRAP4,#INTPRI
;CLEAR TRAP FLAG
;SET VECTOR 4,PRIORITY #6
MOV   #INTPRI,-(SP)
MOV   #TRAP4,-(SP)
MOV   #4,-(SP)
MOV   #3,-(SP)
TRAP  C#SVEC
ADD   #10,SP

;START 3.5 MINUTE COUNTER
;INCR TIME1 FROM #1 TO #25 BY #1
MOV   #1,TIME1
BR    50365:
JMP   50363:

```







MISCELLANEOUS SECTIONS MACRO M1113 30-NOV-83 10:17  
INITIALIZE SECTION

SEQ 109

```

3324
3325 022732          503724:
3326
3327 022732 000412          BR      503734
3328 022734          503704:
3329 022734          PRINTF #NRDYM,DEVTBL(R5)
      022734 016546 002604          MOV      DEVTBL(R5),-(SP)
      022740 012746 023700          MOV      #NRDYM,-(SP)
      022744 012746 000002          MOV      #2,-(SP)
      022750 010600          MOV      SP,R0
      022752 104417          TRAP    C#PNTF
      022754 062706 000006          ADD      #6,SP

3330
3331 022760          503734:
3332 022760 012767 000001 160452      MOV      #1,TIME2          ;INCR TIME2 FROM #1 TO #13 BY #1
3333 022766 000402          BR      503744
3334 022770          503754:
3335 022770 005267 160444          INC      TIME2
3336 022774          503744:
3337 022774 026727 160440 000013      CMP      TIME2,#13
3338 023002 003016          BGT     503764
3339 023004          DELAY   100.          ;WAIT FOR UNIT TO BE SET ON-LINE
      023004 012727 000144          MOV      #100.,(PC)+
      023010 000000          .WORD   0
      023012 016727 157100          MOV      L#DLY,(PC)+
      023016 000000          .WORD   0
      023020 005367 177772          DEC      -6(PC)
      023024 001375          BNE     .-4
      023026 005367 177756          DEC      -22(PC)
      023032 001367          BNE     .-20

3340 023034          BREAK          ;ALLOW TERMINAL INTERRUPT
      023034 104422          TRAP    C#BRK
3341 023036 000754          BR      503754
3342 023040          503764:
3343 023040 000167 177214          JMP     503664
3344 023044          503674:
3345 023044          503644:
3346 023044          CLRVEC #4          ;CLEAR VECTOR AT 4
      023044 012700 000004          MOV      #4,R0
      023050 104436          TRAP    C#CVEC

3347 023052 026727 160360 000025      CMP      TIME1,#25
3348 023060 003404          BLE     503774          ;IF OFF LINE FOR 3.5 MINUTES
3349 023062 004767 167646          JSR     PC,MOVMSG      ;GET MESSAGE PACKET
3350 023066 004767 170360          JSR     PC,TCC1        ;PRINT ERROR AND DROP OFF LINE UNIT
3351
3352 023072          503774:
3353
3354 023072 004767 174052          JSR     PC,NEXTU      ;REPEAT UNTIL ON LINE OR TIMED OUT.
3355
3356 023076 000167 177100          JMP     503624        ;SET UP FOR NEXT UNIT.
3357
3358 023102          503634:
3359 023102          503614:
3360 023102 105767 160421          TSTB    PWRFLG ;IFB PWRFLG EQ #0 THEN
3361 023106 001026          BNE     504004
3362 023110          MEMORY DATAW      ;REQUEST MEMORY FROM SUPER FOR RD/WR BUFFERS.
      023110 104431          TRAP    C#MEM

```

MISCELLANEOUS SECTIONS  
INITIALIZE SECTION

MACRO M1113 30-NOV-83 10:17

SEQ 110

```

3363 023112 010067 160270          MOV      DATAW, DATARD      ;SET RD BFR ADDRESS          MOV      RO, DATAW
3364 023116 016767 160264 160264  ADD      @DATCNT, DATARD
3365 023124 062767 004000 160256  CMP      @DATAW, @DATCNT    ;WHEN NOT ENOUGH FREE MEMO AVAILABLE
3366 023132 027727 160250 004000  BGE      504011
3367 023140 002011          PRINTF  #MEMOM              ;WARN OPERATOR
          023142 012746 023210          MOV      #MEMOM, -(SP)
          023146 012746 000001          MOV      #1, -(SP)
          023152 010600          MOV      SP, RO
          023154 104417          TRAP    C#PNTF
          023156 062706 000004          ADD      #4, SP
3368 023162          DOCLN              ;AND ABORT PASS          TRAP    C#DCLN
          023162 104444          ;DIAG MUST BE RE-LOADED IN A CPU WITH LARGER MEMO
3369
3370 023164          504011:
3371
3372 023164          504001:
3373
3374 023164 105067 157024          CLRB    CHGFLG              ;CLR CHANGE CMD SEQ TBL FLAG.
3375 023170 012703 003526          MOV     #ENDFLG, R3        ;LET R3 := #ENDFLG
3376 023174 004767 167464          JSR     PC, CLRERR         ;CLEAR ALL FLAGS.
3377 023200 105067 160323          CLRB    PWRFLG            ;CLEAR THE POWER FAIL FLAG.
3378
3379 023204          EXIT    INIT
          023204 104432          TRAP    C#EXIT
          023206 000104          .WORD  L10012-
3380 023210 045 101 106 MEMOM: .ASCII /#AFREE MEMO TOO SMALL FOR RD-WR BFRS#N/
          023213 122 105 105
          023216 040 115 105
          023221 115 117 040
          023224 124 117 117
          023227 040 123 115
          023232 101 114 114
          023235 040 106 117
          023240 122 040 122
          023243 104 055 127
          023246 122 040 102
          023251 106 122 123
          023254 045 116
3381 023256 045 101 122 .ASCIZ /#ARE-LOAD IN LARGER MEMO#N/
          023261 105 055 114
          023264 117 101 104
          023267 040 111 116
          023272 040 114 101
          023275 122 107 105
          023300 122 040 115
          023303 105 115 117
          023306 045 116 000
3382          .EVEN
3383
3384 023312          ENDINIT
          023312          L10012:
          023312 104411          TRAP    C#INIT
3385
3386          .SBTTL AUTO DROP SECTION
3387
3388          ***

```

```

3389 ;SECTION EXECUTED AFTER THE INIT CODE WHEN "ADR" FLAG IS SET BY OPERATOR
3390 ;SECTION CHEKS FOR A VALID INTERFACE LOCATION. DROPS UNIT IF NO RESPONSE
3391 ;FROM INTERFACE
3392 ;--
3393
3394 023314          BGNAUTO
          023314          L#AUTO::
3395
3396 023314 004767 173562          JSR PC,FIRSTU          ;FIND FIRST UNIT
3397 023320          50402#: ;WHILE DEVTBL(R5) NE #END DO          ;
3398 023320 026527 002604 177777  CMP      DEVTBL(R5),#END
3399 023326 001525          BEQ      50403#
3400 023330 105067 160174          CLRB    TRAPD4          ;LET TRAPD4 :B= #0
3401 023334          SETVEC #4,#TRAP4,#INTPRI          ;SET VECTOR 4
          023334 012746 000340          MOV      #INTPRI,-(SP)
          023340 012746 023730          MOV      #TRAP4,-(SP)
          023344 012746 000004          MOV      #4,-(SP)
          023350 012746 000003          MOV      #3,-(SP)
          023354 104437          TRAP    C#SVEC
          023356 062706 000010          ADD      #10,SP
3402 023362 017502 002514          MOV      @TSDB(R5),R2          ;ADDRESS TS05 INTERFACE
3403 023366          CLRVEC #4          ;CLEAR VECTOR AT 4
          023366 012700 000004          MOV      #4,R0
          023372 104436          TRAP    C#CVEC
3404 023374 105767 160130          TSTB    TRAPD4          ;IFB TRAPD4 NE #0 THEN
3405 023400 001423          BEQ      50404#
3406 023402 005265 003366          INC      FTLCNT(R5)          ;LET FTLCNT(R5) := FTLCNT(R5) + #1
3407 023406          PRINTF #AUTODM,TSDB(R5)          ;PRINT ERROR
          023406 016546 002514          MOV      TSDB(R5),-(SP)
          023412 012746 023604          MOV      #AUTODM,-(SP)
          023416 012746 000002          MOV      #2,-(SP)
          023422 010600          MOV      SP,R0
          023424 104417          TRAP    C#PNTF
          023426 062706 000006          ADD      #6,SP
3408 023432 016567 002604 173750          MOV      DEVTBL(R5),DROPN          ;SAVE # OF UNIT TO BE DROPPED.
3409 023440 010500          MOV      R5,R0          ;R0=LOGICAL DEVICE NUMBER
3410 023442 006200          ASR      R0
3411 023444          DODU    R0          ;DROP THE UNIT: EXEC BGNDU-ENDDU CODE IF IDU = 0
          023444 104451          TRAP    C#DODU
3412
3413 023446 000452          BR      50405#
3414 023450          50404#:
3415 023450 012775 002340 002514          MOV      #GSCP,#TSDB(R5)          ;SEND GET STATUS COMMAND
3416 023456 004767 167216          JSR      PC,WSSR          ;WAIT
3417 023462 032775 000200 002524          BIT      #TS.SSR,@TSSR(R5)          ;IF #TS.SSR SETIN @TSSR(R5) THEN
3418 023470 001423          BEQ      50406#
3419 023472 032775 000100 002524          BIT      #TS.OFL,@TSSR(R5)          ;IF #TS.OFL SETIN @TSSR(R5) THEN
3420 023500 001416          BEQ      50407#
3421 023502 005265 003366          INC      FTLCNT(R5)          ;LET FTLCNT(R5) := FTLCNT(R5) + #1
3422 023506          PRINTF #OFLINM,TSNP
          023506 016746 160022          MOV      TSNP,-(SP)
          023512 012746 005456          MOV      #OFLINM,-(SP)
          023516 012746 000002          MOV      #2,-(SP)
          023522 010600          MOV      SP,R0
          023524 104417          TRAP    C#PNTF
          023526 062706 000006          ADD      #6,SP
3423 023532 004767 173566          JSR      PC,DROPUA
    
```

```

3424
3425 023536          50407:
3426
3427 023536 000416          BR      50410:
3428 023540          50406:
3429 023540 005265 003366          INC      FTLCNT(R5)          ;LET FTLCNT(R5) := FTLCNT(R5) + #1
3430 023544          PRINTF #NRDYM,DEVTBL(R5)
      023544 016546 002604          MOV      DEVTBL(R5),-(SP)
      023550 012746 023700          MOV      #NRDYM, -(SP)
      023554 012746 000002          MOV      #2, -(SP)
      023560 010600          MOV      SP,R0
      023562 104417          TRAP    C#PNTF
      023564 052706 000006          ADD     #6,SP
3431 023570 004767 173530          JSR PC,DROPUA
3432
3433 023574          50410:
3434
3435 023574          50405:
3436 023574 004767 173350          JSR PC,NEXTU
3437
3438 023600 000647          BR      50402:
3439 023602          50403:
3440
3441 023602          ENDAUTO
      023602          L10013:
      023602 104461          TRAP    C#AUTO
3442
3443 023604          045      101      102      AUTODM: .ASCII /#ABUS TRAP AT #06#N/
      023607          125      123      040
      023612          124      122      101
      023615          120      040      101
      023620          124      040      045
      023623          117      066      045
      023626          116
3444 023627          045      101      111          .ASCIZ /#AINTERFACE BAD OR NOT SET TO ABOVE AD#N/
      023632          116      124      105
      023635          122      106      101
      023640          103      105      040
      023643          102      101      104
      023646          040      117      122
      023651          040      116      117
      023654          124      040      123
      023657          105      124      040
      023662          124      117      040
      023665          101      102      117
      023670          126      105      040
      023673          101      104      045
      023676          116      000
3445 023700          045      101      125      NRDYM: .ASCIZ /#AUNIT #D1#A NOT RDY#N/
      023703          116      111      124
      023706          040      045      104
      023711          061      045      101
      023714          040      116      117
      023717          124      040      122
      023722          104      131      045
      023725          116      000
3446          .EVEN

```

```

3447
3448           ;      DEVICE BUS TRAP HANDLER
3449           ;      OUTPUT: TRAPD4 BYTE  1: TRAPED AT 4
3450           ;
3451           ;
3452 023730   105267 157574   TRAP4:: INCB   TRAPD4,LET TRAPD4 :B= TRAPD4 + #1
3453 023734   000002           RTI
3454
3455
3456           .SBTTL  CLEANUP CODING SECTION
3457
3458           ;**
3459           ; THE CLEANUP CODING SECTION CONTAINS THE CODING THAT IS PERFORMED
3460           ; AT THE END OF EACH PASS.
3461           ;--
3462
3463 023736           BGNCLN
3464 023736           L#CLEAN::
3465 023736   004767 173140           JSR    PC,FIRSTU           ;FIND FIRST UNIT.
3466 023742           50411# : ;WHILE DEVTBL(R5) NE #END DO
3467 023742   026527 002604 177777   CMP    DEVTBL(R5),#END
3468 023750   001410           BEQ    50412#
3469 023752   004767 166722           JSR    PC,WSSR           ;WAIT FOR UNIT READY OR TIMEOUT.
3470 023756           CLRVEC   TSVCT(R5)           ;RELEASE INTERRUPT VECTORS FOR ALL DEV.
3471 023756   016500 002534           MOV    TSVCT(R5),RO
3472 023762   104436           TRAP   C#CVEC
3473 023764   004767 173160           JSR    PC,NEXTU           ;FIND NEXT UNIT.
3474 023770           BR      50411#
3475 023772           50412# :
3476 023772           EXIT    CLN
3477 023772   104432           TRAP   C#EXIT
3478 023774   000002           .WORD  L10014-.
3479 023776           .EVEN
3480 023776           ENDCLN
3481 023776   104412           L10014:
3482 023776           TRAP   C#CLEAN
3483
3484           .SBTTL  DROP UNIT SECTION
3485
3486           ;**
3487           ; THE DROP-UNIT SECTION CONTAINS THE CODING THAT CAUSES A DEVICE
3488           ; TO NO LONGER BE TESTED. THAT CODE SHALL BE EXECUTED WHEN DODU
3489           ; MACRO IS CALLED WHILE IDU FLAG IS NOT SET BY OPERATOR
3490           ;--
3491 024000           BGNDU
3492 024000           L#DU::
3493 024000   010005           MOV    RO,R5           ;R5 = LOGICAL DEVICE NUMBER X 2.
3494 024002   006305           ASL   R5
3495 024004   012765 177774 002604   MOV    #NINUSE,DEVTBL(R5) ;SET NOT IN USE FLAG FOR THE DEVICE.
3496 024012   016500 002534           CLRVEC TSVCT(R5)           ;RELEASE THE INTERRUPT VECTOR.
3497 024012           MOV    TSVCT(R5),RO
    
```

MISCELLANEOUS SECTIONS MACRO M1113 30-NOV-83 10:17  
 DROP UNIT SECTION

SEQ 114

```

3495 024016 104436
      024020          PRINTF #DROPM,DROPN          ;PRINT DROP DEVICE MESSAGE
      024020 016746 173364          TRAP          C#CVEC
      024024 012746 005065          MOV          DROPN,-(SP)
      024030 012746 000002          MOV          #DROPM,-(SP)
      024034 010600          MOV          #2,-(SP)
      024036 104417          MOV          SP,R0
      024040 062706 000006          TRAP          C#PNTF
3496 024044          EXIT          DU
      024044 000167          .WORD          J#JMP
      024046 000000          .WORD          L10015-2-.
3497          .EVEN
3498
3499 024050          ENDDU
      024050          L10015:
      024050 104453          TRAP          C#DU
3500
3501          .SBTTL ADD UNIT SECTION
3502
3503          ;++
3504          ; THE ADD-UNIT SECTION CONTAINS THE CODING THAT CAUSES A DEVICE
3505          ; TO BE (A) TESTED FOR THE FIRST TIME, OR (B) RESUMED IN TESTING. IF
3506          ; "EF.AUNIT" IS SET, THE UNIT WILL BE TESTED AS A NEW UNIT.
3507          ;--
3508
3509 024052          BGNAU
      024052          L#AU::
3510 024052 010005          MOV          R0,R5          ;R5 = LOGICAL DEVICE NUMBER X 2.
3511 024054 006305          ASL          R5
3512 024056 010065 002604          MOV          R0,DEVTBL(R5) ;STORE UNIT # IN DEVICE TABLE.
3513 024062          GPHARD R0,R0          ;GET HARDWARE P TABLE FROM SUPER.
      024062 104442          TRAP          C#GPHRD
3514 024064 011065 002514          MOV          (R0),TSDB(R5) ;SAVE TSDB ADDRESS.
3515 024070 012065 002524          MOV          (R0),TSSR(R5) ;SAVE TSSR ADDRESS.
3516 024074 062765 000002 002524          ADD          #2,TSSR(R5)
3517 024102 011065 002534          MOV          (R0),TSVCT(R5) ;SAVE INTERRUPT VECTOR ADDRESS.
3518 024106 011065 003532          MOV          (R0),TSUNT(R5) ;SAVE NUMBER OF DRIVE
3519 024112 011067 157416          MOV          (R0),TSNP      ;SAVE FOR PRINT OUT'S
3520 024116          SETVEC TSVCT(R5),TS5INT(R5),#INTPRI
      024116 012746 000340          MOV          #INTPRI,-(SP)
      024122 016546 002554          MOV          TS5INT(R5),-(SP)
      024126 016546 002534          MOV          TSVCT(R5),-(SP)
      024132 012746 000003          MOV          #3,-(SP)
      024136 104437          TRAP          C#SVEC
      024140 062706 000010          ADD          #10,SP
3521          ;SET UP INTERUPT PROCESSING CONDITIONS.
3522 024144 005065 003472          CLR          INTFLG(R5) ;CLEAR INTERRUPT FLAGS.
3523
3524 024150          EXIT          AU
      024150 000167          .WORD          J#JMP
      024152 000000          .WORD          L10016-2-.
3525
3526          .EVEN
3527
3528 024154          ENDAU
      024154          L10016:
      024154 104452          TRAP          C#AU

```

```

3529
3530
3531
3532 .TITLE HARDWARE TESTS
3533
3534 .SBTTL TEST 1: BASIC FUNCTIONS.
3535
3536 ;**
3537 ; TEST TO EXECUTE ALL TS05 FUNCTIONS.
3538 ;--
3539
3540 024156 BGNMOD
3541
3542 024156 BGNTST
024156 T1::
3543
3544 024156 105067 157333 CLR8 RANDOM ;CLR THE RANDOM OPERATIONS FLAG.
3545 024162 105067 157326 CLR8 EXPBOT ;CLR EXPECT BOT FLAG.
3546
3547 024166 BGNSUB ;SUBTEST 1 - SET CHAR, DRIVE INIT, GET STATUS.
024166 T1.1:
024166 104402 TRAP C#BSUB
3548
3549 024170 004767 172706 JSR PC,FIRSTU ;FIND THE FIRST UNIT.
3550 024174 004767 162672 JSR PC,SOFINIT ;INIT DEVICE
3551 024200 103404 BCS 11#
3552 024202 ERRDF 2,NSSRM,STAERM ;REPORT TS05 NOT READY
024202 104455 TRAP C#ERRDF
024204 000002 .WORD 2
024206 004536 .WORD NSSRM
024210 006120 .WORD STAERM
3553
3554 024212 004767 163250 11#: JSR PC,MDSET ;GO DO SETUP'S
3555 024216 012702 025074 MOV #BFSEQ0,R2 ;ADR OF CMD SEQ.
3556 024222 004767 000622 JSR PC,BFSEQ ;SET UP CMD SEQ.
3557 024226 004767 163774 JSR PC,EXALL ;EXECUTE CMD SEQ ON ALL DEVICES.
3558 024232 004767 172644 JSR PC,FIRSTU ;FIND THE FIRST UNIT.
3559 024236 50413#: ;WHILE DEVTBL(R5) NE #END DO ;WHILE THERE ARE MORE DEVICES:
3560 024236 026527 002604 177777 CMP DEVTBL(R5),#END
3561 024244 001451 BEQ 50414#
3562 024246 016502 002544 MOV MSGPKA(R5),R2 ;GET MSG PACKET ADR.
3563 024252 062702 000012 ADD #12,R2 ;LET R2 := R2 + #12 ;GET XSTAT2 ADR.
3564 024256 011265 002564 MOV (R2),TS5CL(R5) ;STORE CODE LEVEL FROM DTR BYTE.
3565 024262 042765 177700 002564 BIC #177700,TS5CL(R5)
3566 024270 011265 002574 MOV (R2),TS5SW(R5) ;STORE SWITCH SETTINGS
3567 024274 042765 177477 002574 BIC #177477,TS5SW(R5)
3568 024302 PRINTF #CODELM,DEVTBL(R5),TS5CL(R5)
024302 016546 002564 MOV TS5CL(R5),-(SP)
024306 016546 002604 MOV DEVTBL(R5),-(SP)
024312 012746 004162 MOV #CODELM, -(SP)
024316 012746 000003 MOV #3, -(SP)
024322 010600 MOV SP,R0
024324 104417 TRAP C#PNTF
024326 062706 000010 ADD #10,SP
3569 ;PRINT THE TS05 MICROCODE LEVEL.
3570 024332 PRINTF #SWSET,DEVTBL(R5),TS5SW(R5)
024332 016546 002574 MOV TS5SW(R5),-(SP)

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HARDWARE TESTS MACRO M1113 30-NOV-83 10:17  
 TEST 1: BASIC FUNCTIONS.

SEQ 116

024336	016546	002604				MOV	DEVTBL(R5), -(SP)
024342	012746	004231				MOV	#SWSET, -(SP)
024346	012746	000003				MOV	#3, -(SP)
024352	010600					MOV	SP, R0
024354	104417					TRAP	C#PNTF
024356	062706	000010				ADD	#10, SP
3571							
3572	024362		50415#:				;PRINT THE TS05 SWITCH SETTINGS.
3573	024362	004767	172562				
3574							;FIND NEXT UNIT.
3575	024366	000723					
3576	024370		50414#:				
3577							
3578	024370						
	024370		L10020:				
	024370	104403					TRAP C#ESUB
3579							
3580	024372						;SUBTEST 2 - REWIND.
	024372		T1.2:				
	024372	104402					TRAP C#BSUB
3581							
3582	024374	012702	025146			MOV	#BFSEQ1, R2
3583	024400	004767	000444			JSP	PC, BFSEQ
3584	024404	004767	163616			JSR	PC, EXALL
3585	024410	105067	157112			CLRB	STAFLG
3586	024414					ENDSUB	
	024414		L10021:				
	024414	104403					TRAP C#ESUB
3587							
3588	024416						;SUBTEST 3 - WRITE/VERIFY.
	024416		T1.3:				
	024416	104402					TRAP C#BSUB
3589							
3590	024420	012702	025160			MOV	#BFSEQ2, R2
3591	024424	004767	000420			JSR	PC, BFSEQ
3592	024430	004767	163572			JSR	PC, EXALL
3593	024434					ENDSUB	
	024434		L10022:				
	024434	104403					TRAP C#ESUB
3594							
3595	024436						;SUBTEST 4 - WRITE TAPE MARK, ERASE.
	024436		T1.4:				
	024436	104402					TRAP C#BSUB
3596							
3597	024440	012702	025252			MOV	#BFSEQ3, R2
3598	024444	004767	000400			JSR	PC, BFSEQ
3599	024450	004767	163552			JSR	PC, EXALL
3600	024454					ENDSUB	
	024454		L10023:				
	024454	104403					TRAP C#ESUB
3601							
3602	024456						;SUBTEST 5 - SPACE FILES.
	024456		T1.5:				
	024456	104402					TRAP C#BSUB
3603							
3604	024460	012702	025324			MOV	#BFSEQ4, R2
3605	024464	004767	000360			JSR	PC, BFSEQ
							;ADR OF CMD SEQ.
							;SET UP CMD SEQ.

HARDWARE TESTS MACRO M1113 30-NOV-83 10:17  
 TEST 1: BASIC FUNCTIONS.

SEQ 117

3606	024470	004767	163532	JSR	PC,EXALL	;EXECUTE CMD SEQ ON ALL DEVICES.		
3607	024474			ENDSUB				
	024474			L10024:				
	024474	104403					TRAP	C#ESUB
3608								
3609	024476			BGNSUB		;SUBTEST 6 - SPACE RECORDS.		
	024476			T1.6:				
	024476	104402					TRAP	C#BSUB
3610								
3611	024500	012702	025366	MOV	#BFSEQ5,R2	;ADR OF CMD SEQ.		
3612	024504	004767	000340	JSR	PC,BFSEQ	;SET UP CMD SEQ.		
3613	024510	004767	163512	JSR	PC,EXALL	;EXECUTE CMD SEQ ON ALL DEVICES.		
3614	024514			ENDSUB				
	024514			L10025:				
	024514	104403					TRAP	C#ESUB
3615								
3616	024516			BGNSUB		;SUBTEST 7 - WRITE RETRY.		
	024516			T1.7:				
	024516	104402					TRAP	C#BSUB
3617								
3618	024520	012702	025440	MOV	#BFSEQ6,R2	;ADR OF CMD SEQ.		
3619	024524	004767	000320	JSR	PC,BFSEQ	;SET UP CMD SEQ.		
3620	024530	004767	163472	JSR	PC,EXALL	;EXECUTE CMD SEQ ON ALL DEVICES.		
3621	024534			ENDSUB				
	024534			L10026:				
	024534	104403					TRAP	C#ESUB
3622								
3623	024536			BGNSUB		;SUBTEST 8 - READ REV RETRY.		
	024536			T1.8:				
	024536	104402					TRAP	C#BSUB
3624								
3625	024540	012702	025512	MOV	#BFSEQ7,R2	;ADR OF CMD SEQ.		
3626	024544	004767	000300	JSR	PC,BFSEQ	;SET UP CMD SEQ.		
3627	024550	004767	163452	JSR	PC,EXALL	;EXECUTE CMD SEQ ON ALL DEVICES.		
3628	024554			ENDSUB				
	024554			L10027:				
	024554	104403					TRAP	C#ESUB
3629								
3630	024556			BGNSUB		;SUBTEST 9 - READ FWD RETRY.		
	024556			T1.9:				
	024556	104402					TRAP	C#BSUB
3631								
3632	024560	012702	025544	MOV	#BFSEQ8,R2	;ADR OF CMD SEQ.		
3633	024564	004767	000260	JSR	PC,BFSEQ	;SET UP CMD SEQ.		
3634	024570	004767	163432	JSR	PC,EXALL	;EXECUTE CMD SEQ ON ALL DEVICES.		
3635	024574			ENDSUB				
	024574			L10030:				
	024574	104403					TRAP	C#ESUB
3636								
3637	024576			BGNSUB		;SUBTEST 10- CLEAN.		
	024576			T1.10:				
	024576	104402					TRAP	C#BSUB
3638								
3639	024600	012702	025576	MOV	#BFSEQ9,R2	;ADR OF CMD SEQ.		
3640	024604	004767	000240	JSR	PC,BFSEQ	;SET UP CMD SEQ.		
3641	024610	004767	163412	JSR	PC,EXALL	;EXECUTE CMD SEQ ON ALL DEVICES.		
3642	024614			ENDSUB				

HARDWARE TESTS MACRO M1113 30-NOV-83 10:17  
 TEST 1: BASIC FUNCTIONS.

SEQ 118

```

024614          L10031:
024614 104403          TRAP      C#ESUB
3643
3644 024616          BGNSUB      ;SUBTEST 11 - WTV SWAPPED DATA BYTES.
024616          T1.11:          ;TRAP      C#BSUB
024616 104402          ;ADR OF CMD SEQ.
3645 024620 012702 025620      MOV      #BFSE10,R2      ;SET UP CMD SEQ.
3646 024624 004767 000220      JSR      PC,BFSEQ      ;WRITE/VERIFY RECORDS 1 AND 2.
3647 024630 004767 163372      JSR      PC,EXALL      ;ENABLE BYTE SWAPPING.
3648 024634 112767 000001 156656  MOVB     #1,SWBFLG      ;WRITE/VERIFY RECORDS 3 AND 4.
3649 024642 004767 163360      JSR      PC,EXALL      ;DISABLE BYTE SWAPPING.
3650 024646 105067 156646      CLRB     SWBFLG
3651 024652          ENDSUB
024652          L10032:
024652 104403          TRAP      C#ESUB
3652 024654 016702 156526      MOV      DATAW,R2      ;INIT WRITE BUFFER POINTER.
3653 024660 062702 000012      ADD      #10.,R2
3654 024664          504160: ;WHILE R2 NE DATAW DO ;UNTIL 10 BYTES HAVE BEEN SWAPPED.
3655 024664 020267 156516      CMP      R2,DATAW
3656 024670 001402          BEQ      504170
3657 024672 000342          SWAB    -(R2)          ;SWAP DATA BYTES IN WRITE BUFFER.
3658
3659 024674 000773          BR       504160
3660 024676          504170:
3661 024676 105267 156621      INCB     T1SWB          ;SET T1 SWAP BYTES FLAG FOR "CKDATA" SUBR
3662
3663 024702          BGNSUB      ;SUBTEST 12 - READ SWAPPED DATA BYTES.
024702          T1.12:          ;TRAP      C#BSUB
024702 104402          ;CMD IS READ REV.
3664 024704 012767 104401 156506  MOV      #ORDR,CMDWRD   ;VERIFY ODD LENGTH SWAP (RECORD 4).
3665 024712 004767 171234      JSR      PC,VFEXC      ;CHANGE BYTE COUNT TO 10.
3666 024716 012767 000012 155412  MOV      #12,CMDPKT+CP.CNT ;VERIFY EVEN LENGTH SWAP (RECORD 3).
3667 024724 004767 171222      JSR      PC,VFEXC      ;ENABLE BYTE SWAPPING.
3668 024730 112767 000001 156562  MOVB     #1,SWBFLG      ;CHANGE BYTE COUNT TO 9.
3669 024736 012767 000011 155372  MOV      #11,CMDPKT+CP.CNT ;VERIFY ODD LENGTH SWAP (RECORD 2).
3670 024744 004767 171202      JSR      PC,VFEXC      ;CHANGE BYTE COUNT TO 10.
3671 024750 012767 000012 155360  MOV      #12,CMDPKT+CP.CNT ;VERIFY EVEN LENGTH SWAP (RECORD 1).
3672 024756 004767 171170      JSR      PC,VFEXC      ;CMD IS READ FWD.
3673 024762 012767 104001 156430  MOV      #ORDF,CMDWRD   ;VERIFY EVEN LENGTH SWAP (RECORD 1).
3674 024770 004767 171156      JSR      PC,VFEXC      ;CHANGE BYTE COUNT TO 9.
3675 024774 012767 000011 155334  MOV      #11,CMDPKT+CP.CNT ;VERIFY ODD LENGTH SWAP (RECORD 2).
3676 025002 004767 171144      JSR      PC,VFEXC      ;DISABLE BYTE SWAPPING.
3677 025006 105067 156506      CLRB     SWBFLG
3678 025012 012767 000012 155316  MOV      #12,CMDPKT+CP.CNT ;CHANGE BYTE COUNT TO 10.
3679 025020 004767 171126      JSR      PC,VFEXC      ;VERIFY EVEN LENGTH SWAP (RECORD 3).
3680 025024 012767 000011 155304  MOV      #11,CMDPKT+CP.CNT ;CHANGE BYTE COUNT TO 9.
3681 025032 004767 171114      JSR      PC,VFEXC      ;VERIFY ODD LENGTH SWAP (RECORD 4).
3682
3683 025036          ENDSUB
025036          L10033:
025036 104403          TRAP      C#ESUB
3684
3685 025040 105067 156457          CLRB     T1SWB          ;CLEAR T1 SWAP BYTES FLAG
3686
3687 025044          EXIT     TST
025044 104432          TRAP      C#EXIT
025046 000574          .WORD    L10017-.
```

```

3688
3689
3690
3691
3692
3693
3694
3695 025050 012701 003540 BFSEQ:: MOV #CMDSEQ,R1 ;INIT SEQ TABLE ADDRESS.
3696 025054 50420: ;WHILE (R2) NE #END DO ;WHILE THERE ARE MORE COMMANDS:
3697 025054 021227 177777 CMP (R2),#END
3698 025060 001402 BEQ 50421:
3699 025062 012221 MOV (R2)+,(R1)+ ;MOVE COMMANDS TO SEQ TABLE.
3700
3701 025064 000773 BR 50420:
3702 025066 50421:
3703 025066 012711 177777 MOV #END,(R1) ;STORE END OF SEQUENCE CODE.
3704 025072 000207 RTS PC ;RETURN.
3705
3706
3707
3708 ; BASIC FUNCTION COMMAND SEQUENCE
3709 025074 140004 BFSEQ0: .WORD SCH ;SET CHAR. 200. (1)
3710 025076 000200 200
3711 025100 000001 1
3712 025102 000000 0
3713 025104 100013 DRI ;DRIVE INIT. (2)
3714 025106 000001 1
3715 025110 000001 1
3716 025112 000000 0
3717 025114 140004 SCH ;SET CHAR. 20 (3)
3718 025116 000020 20
3719 025120 000001 1
3720 025122 000000 0
3721 025124 100017 GES ;GET STATUS. (4)
3722 025126 000001 1
3723 025130 000001 1
3724 025132 000000 0
3725 025134 140004 SCH ;SET CHAR. 40. (5)
3726 025136 000040 40
3727 025140 000001 1
3728 025142 000000 0
3729 025144 177777 .WORD END
3730
3731 025146 102010 BFSEQ1: RWD ;REWIND TWICE. (6)
3732 025150 000001 1
3733 025152 000002 2
3734 025154 000000 0
3735 025156 177777 .WORD END
3736
3737 025160 104105 BFSEQ2: WTV ;WRITE/VERIFY PAT 1. (7)
3738 025162 004000 DATCNT
3739 025164 000001 1
3740 025166 000001 1
3741 025170 104105 WTV ;WTV PAT 2. (8)
3742 025172 004000 DATCNT
3743 025174 000001 1
3744 025176 000002 2

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HARDWARE TESTS MACRO M1113 30-NOV-83 10:17  
 TEST 1: BASIC FUNCTIONS.

SEQ 120

3745	025200	104105		WTV		;WTV PAT 3.	(9)
3746	025202	004000		DATCNT			
3747	025204	000001		1			
3748	025206	000003		3			
3749	025210	104105		WTV		;WTV PAT 4.	(10)
3750	025212	004000		DATCNT			
3751	025214	000001		1			
3752	025216	000004		4			
3753	025220	104105		WTV		;WTV PAT 5.	(11)
3754	025222	004000		DATCNT			
3755	025224	000001		1			
3756	025226	000005		5			
3757	025230	104105		WTV		;WTV PAT 6.	(12)
3758	025232	004000		DATCNT			
3759	025234	000001		1			
3760	025236	000006		6			
3761	025240	104105		WTV		;WTV PAT 0.	(13)
3762	025242	004000		DATCNT			
3763	025244	000001		1			
3764	025246	000000		0			
3765	025250	177777	.WORD	END			
3766							
3767	025252	100011	BFSEQ3:	WTH		;WRITE TAPE MARK.	(14)
3768	025254	000001		1			
3769	025256	000001		1			
3770	025260	000000		0			
3771	025262	104005		WRT		;WRITE 10 RECORDS.	(15)
3772	025264	004000		DATCNT			
3773	025266	000010		10			
3774	025270	000001		1			
3775	025272	100411		ERS		;ERASE 10 TIMES.	(16)
3776	025274	000001		1			
3777	025276	000010		10			
3778	025300	000000		0			
3779	025302	100011		WTH		;WRITE TAPE MARK.	(17)
3780	025304	000001		1			
3781	025306	000001		1			
3782	025310	000000		0			
3783	025312	101011		WTR		;WTH RETRY	(18)
3784	025314	000001		1			
3785	025316	000001		1			
3786	025320	000000		0			
3787	025322	177777	.WORD	END			
3788							
3789	025324	105410	BFSEQ4:	SFR		;SPACE 2 FILES REV.	(19)
3790	025326	000002		2			
3791	025330	000001		1			
3792	025332	000000		0			
3793	025334	105010		SFF		;SPACE 2 FILES FWD.	(20)
3794	025336	000002		2			
3795	025340	000001		1			
3796	025342	000000		0			
3797	025344	105410		SFR		;SPACE 2 FILES REV.	(21)
3798	025346	000001		1			
3799	025350	000002		2			
3800	025352	000000		0			
3801	025354	105010		SFF		;SPACE 2 FILES FWD.	(22)

HARDWARE TESTS MACRO M1113 30-NOV-83 10:17  
 TEST 1: BASIC FUNCTIONS.

SEQ 121

3802	025356	000001		1		
3803	025360	000002		2		
3804	025362	000000		0		
3805	025364	177777	.WORD	END		
3806						
3807	025366	102010	BFSEQ5:	RWD	;REWIND.	(23)
3808	025370	000001		1		
3809	025372	000001		1		
3810	025374	000000		0		
3811	025376	104010		SRF	;SPACE 7 RECORDS FWD.	(24)
3812	025400	000007		7		
3813	025402	000001		1		
3814	025404	000000		0		
3815	025406	104410		SRR	;SPACE 7 RECORDS REV.	(25)
3816	025410	000007		7		
3817	025412	000001		1		
3818	025414	000000		0		
3819	025416	104010		SRF	;SPACE 7 RECORDS FWD.	(26)
3820	025420	000001		1		
3821	025422	000007		7		
3822	025424	000000		0		
3823	025426	104410		SRR	;SPACE 7 RECORDS REV.	(27)
3824	025430	000001		1		
3825	025432	000007		7		
3826	025434	000000		0		
3827	025436	177777	.WORD	END		
3828						
3829	025440	102010	BFSEQ6:	RWD	;REWIND.	(28)
3830	025442	000001		1		
3831	025444	000001		1		
3832	025446	000000		0		
3833	025450	104005		WRT	;WRITE.	(29)
3834	025452	004000		DATCNT		
3835	025454	000001		1		
3836	025456	000001		1		
3837	025460	105005		WRR	;WRITE RETRY.	(30)
3838	025462	004000		DATCNT		
3839	025464	000001		1		
3840	025466	000001		1		
3841	025470	100011		WTH	;WRITE TAPE MARK.	
3842	025472	000001		1		
3843	025474	000001		1		
3844	025476	000000		0		
3845	025500	105410		SFR	;SPACE 1 FILE REV.	
3846	025502	000001		1		
3847	025504	000001		1		
3848	025506	000000		0		
3849	025510	177777	.WORD	END		
3850						
3851	025512	104401	BFSEQ7:	RDR	;READ REV.	(31)
3852	025514	004000		DATCNT		
3853	025516	000001		1		
3854	025520	000001		1		
3855	025522	105401		RNR	;READ NEXT REV.	(32)
3856	025524	004000		DATCNT		
3857	025526	000001		1		
3858	025530	000001		1		

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3859 025532 125401          RNF          ;READ NEXT FWD.          (33)
3860 025534 004000          DATCNT
3861 025536 000001          1
3862 025540 000001          1
3863 025542 177777          .WORD      END
3864
3865 025544 104001          BFSEQ8:    RDF          ;READ FWD.          (34)
3866 025546 004000          DATCNT
3867 025550 000001          1
3868 025552 000001          1
3869 025554 105001          RPF          ;READ PREVIOUS FWD. (35)
3870 025556 004000          DATCNT
3871 025560 000001          1
3872 025562 000001          1
3873 025564 125001          RPR          ;READ PREVIOUS REV. (36)
3874 025566 004000          DATCNT
3875 025570 000001          1
3876 025572 000001          1
3877 025574 177777          .WORD      END
3878
3879 025576 101012          BFSEQ9:    .WORD      CLN          ;CLEAN.          (37)
3880 025600 000001          1
3881 025602 000001          1
3882 025604 000000          0
3883 025606 102010          RWD          ;REWIND          (38)
3884 025610 000001          1
3885 025612 000001          1
3886 025614 000000          0
3887 025616 177777          .WORD      END          ;END OF SEQUENCE.
3888
3889 025620 104105          BFSE10:    WTV          ;WRITE/VERIFY EVEN LENGTH. (39)
3890 025622 000012          12
3891 025624 000001          1
3892 025626 000000          0
3893 025630 104105          WTV          ;WRITE/VERIFY ODD LENGTH. (40)
3894 025632 000011          11
3895 025634 000001          1
3896 025636 000000          0
3897 025640 177777          .WORD      END
3898          .EVEN
3899
3900 025642          ENDTST
      025642          L10017:
      025642 104401          TRAP      C#ETST

3901
3902          .SBTTL TEST 2: DATA RELIABILITY.
3903
3904          ;**
3905          ; TEST TO CHECK THE DATA RELIABILITY OF THE TS05.
3906          ;**
3907 025644          RGNTST
      025644          T2::

3908
3909 025644 112767 000001 155643          MOVB      #1,RANDOM          ;SET THE RANDOM OPERATIONS FLAG.
3910 025652 105067 155636          CLR      EXPBOT          ;CLEAR EXPECT BOT FLAG.
3911 025656 005067 155574          CLR      WTMFLG          ;CLEAR WRITE TAPE MARK FLAG
3912 025662 004767 171214          JSR      PC,FIRSTU          ;FIND THE FIRST UNIT.
    
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3913 025666 004767 161200      JSR    PC,SOFINIT      ;INIT DEVICE
3914 025672 103404             BCS    11#
3915 025674             ERRDF  2,NSSRM,STAERM ;REPORT TS05 NOT READY
                                TRAP    C#ERDF
                                .WORD   2
                                .WORD   NSSRM
                                .WORD   STAERM
3916
3917 025704 004767 161556      11# : JSR    PC,M0SET      ;GO DO SETUP'S
3918 025710 012702 004000      MOV    #DATCNT,R2     ;SET UP THE RECORD LENGTH MASK,
3919 025714 005302             DEC    R2
3920 025716 010267 155506      MOV    R2,LENMSK     ;ALLOW MAXIMUM BUFFER.
3921 025722 005167 155502      COM   LENMSK
3922 025726 004767 162230      JSR   PC,SETCH       ;CMD 1 = SET CHARACTERISTIC.
3923 025732 105767 155570      TSTB  STAFLG ;IFB STAFLG NE #0 THEN ;IF STARTING THEN:
3924 025736 001417             BEQ   50424#
3925 025740 004767 162242      JSR   PC,SETRW      ;CMD2=REWIND
3926 025744 105067 155556      CLRB  STAFLG ;LET STAFLG :B= #0 ;CLR START FLAG.
3927
3928 025750             50422# :
3929 025750 012721 104105      MOV    #MTV,(R1)+
3930 025754 012721 004000      MOV    #DATCNT,(R1)+
3931 025760 012702 177740      MOV    #RNOPSC,R2
3932 025764 005102             COM   R2
3933 025766 010221             MOV    R2,(R1)+
3934 025770 012721 000007      MOV    #RANP,(R1)+
3935
3936 025774             50423# : BREAK ; DO A SUPVSR BREAK FIRST.
                                TRAP    C#BRK
3937
3938 025776             50424# : ;FILL SEQ TBL WITH RANDOM CMDS.
3939 025776 020127 003740      CMP    R1,#SEQEND
3940 026002 002012             BGE   50425#
3941 026004 066767 155422 155422 ADD    RANB,RANS ;LET RANS := RANS + RANB
3942 026012 016702 155416      MOV    RANS,R2
3943 026016 042702 177741      BIC   #177741,R2
3944 026022 004772 026160      JSR   PC,BRANCMD(R2) ;SET UP A RANDOM CMD + BRF.
3945
3946 026026 000763             BR    50424#
3947 026030             50425# :
3948 026030 012711 177777      MOV    #END,(R1) ;STORE END OF SEQUENCE CODE IN TABLE.
3949 026034 004767 162166      JSR   PC,EXALL ;GO EXECUTE ALL CMDS IN SEQUENCE TABLE.
3950
3951 026040 012701 003540      MOV    #CMDSEQ,R1 ;INIT CMD SEQ TBL POINTER,
3952 026044 005702             TST   R2 ;REPEAT UNTIL EOT IS REACHED
3953 026046 001752             BEQ   50423#
3954 026050 105267 155450      INCB  ALLEOT ;FLAG ALL UNITS @ EOT
3955 026054 000240             NOP
3956 026056 000240             NOP
3957 026060 000240             NOP
3958 026062 004767 001546      JSR   PC,TSWEOT ;WRITE ONE RECORD BEYOND EOT ON ALL UNITS
3959 ;SO THAT SHORTER READ STOP DISTANCE
3960 ;SMALL POSITION HEAD IN CLEAN IRG GAP
3961 ;READ REV THAT EXTRA REC TO RE-POSITION THE TAPE
3962 026066 004767 000126      JSR   PC,RANRD ;SET UP READ REV/FWD CMDS.
3963 026072 012767 177740 155444 MOV    #RNOPSC,CMDSEQ+4 ;# OF RECORDS FOR READ REV.
3964 026100 005167 155440      COM   CMDSEQ+4

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3965 026104 016767 155434 155442      MOV      CMDSEQ,4,CMDSEQ+14      ;# OF RECORDS FOR READ FORWARD.
3966 026112 012711 177777              MOV      #END,(R1)              ;STORE END OF SEQUENCE CODE IN SEQ TABLE.
3967 026116 004767 162104              JSR      PC,EXALL               ;GO EXECUTE READ REV/FWD OF LAST N RECORDS.
3968 026122 105067 155376              CLRB    ALLEOT                 ;CLEAR ALL UNITS @ EOT FLAG
3969 026126 112767 000001 155363      MOVB    #1,RPTFLG             ;REQUEST PERFORMANCE REPORT DURING REWIND.
3970 026134 012701 003540              MOV      #CMDSEQ,R1           ;INIT SEQ TBL POINTER,
3971 026140 004767 162042              JSR PC,SETRW                  ;STORE REWIND IN SEQ TBL,
3972 026144 012711 177777              MOV      #END,(R1)           ;STORE END IN SEQ TBL,
3973 026150 004767 162052              JSR PC,EXALL                  ;EXECUTE REWIND CMD ON ALL UNITS
3974
3975 026154                                EXIT      TST
      026154 104432
      026156 000320
                                     TRAP      C#EXIT
                                     .WORD    L10034-.

3976
3977
3978 ;      ADDRESSES OF SUBROUTINES USED TO SET UP RANDOM OPERATIONS IN
3979 ;      THE DATA RELIABILITY TEST.

3980 026160 026332      RANCMD: RANWR                ;WRITE
3981 026162 026356      RANWR                ;WRITE.
3982 026164 026332      RANWR                ;WRITE.
3983 026166 026332      RANWR                ;WRITE.
3984 026170 026332      RANWR                ;WRITE.
3985 026172 026332      RANWR                ;WRITE.
3986 026174 026332      RANWR                ;WRITE.
3987 026176 026332      RANWR                ;WRITE.
3988 026200 026220      RANRD                ;READ.
3989 026202 026220      RANRD                ;READ.
3990 026204 026220      RANRD                ;READ.
3991 026206 026220      RANRD                ;READ.
3992 026210 026220      RANRD                ;READ.
3993 026212 026220      RANRD                ;READ.
3994 026214 026220      RANRD                ;READ.
3995 026216 026220      RANRD                ;READ.
3996
3997
3998 ;      SUBROUTINE TO SET UP READ COMMANDS IN SEQUENCE TABLE.
3999 ;
4000 ;      INPUTS:
4001 ;      OUTPUTS:
4002 ;      REGISTERS:      R2
4003 ;      CALLS:

4004 026220 005767 155232      RANRD:: TST      WTMFLG                ;WAS LAST CMD A WRITE?
4005 026224 001406              BEQ      1#                      ;NO,GO AHEAD
4006 026226 004767 000136      JSR      PC,RAWTH                ;YES PUT DOWN TAPE MARK
4007 026232 004767 000160      JSR      PC,RASFR                ;AND SPACE FILE REV
4008 026236 005067 155214      CLR      WTMFLG                 ;THEN CLEAR THE FLAG
4009 026242 020127 003740      1#:   CMP      R1,#SEQEND
4010 026246 002030              BGE      2#
4011 026250 012721 104401      MOV      #RDR,(R1)+             ;STORE READ REV CMD.
4012 026254 012721 004000      MOV      #DATCNT,(R1)+         ;SET BR# TO MAX FOR READ RANDOM LENGTH;
4013 026260 066767 155150 155144      ADD      RANS,RANB              ;LET RANB := RANB + RANS
4014 026266 016702 155140      MOV      RANB,R2               ;LET R2 := RANB CLR.BY #RNOPSC
4015 026272 042702 177740      BIC     #RNOPSC,R2
4016 026276 010221              MOV      R2,(R1)+             ;SET RANDOM # OF OPERATIONS.
4017 026300 012721 000007      MOV      #RANP,(R1)+         ;RANDOM PATTERN.
4018 026304 020127 003740      CMP      R1,#SEQEND
4019 026310 002007              BGE      2#

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4020 026312 012721 104001      MOV     #RDF,(R1)+      ;STORE READ FWD CMD.
4021 026316 012721 004000      MOV     #DATCNT,(R1)+   ;SET BR# TO MAX TO READ RANDOM LENGTHS.
4022 026322 010221              MOV     R2,(R1)+       ;SET RANDOM # OF OPERATIONS.
4023 026324 012721 000007      MOV     #RANP,(R1)+    ;RANDOM PATTERN.
4024 026330 000207      2#:   RTS PC
4025
4026      ;   SUBROUTINE TO SET UP A WRITE COMMAND IN THE SEQUENCE TABLE,
4027      ;   THEN A WRITE TAPE MARK AND SPACE FILE REVERSE.
4028      ;
4029      ;   INPUTS:
4030      ;   OUTPUTS:
4031      ;   REGISTERS:
4032      ;   CALLS:
4033
4034 026332 012721 104005      RANWR:: MOV     #WRT,(R1)+      ;STORE WRITE CMD.
4035 026336 004767 000102      JSR PC,RANW             ;STORE BR# , # OF OPERATIONS, PATTERN.
4036 026342 005767 155110      TST     WTMFLG         ;LAST CMD A WRT?
4037 026346 001002              BNE     1#             ;YES,RETURN
4038 026350 005267 155102      INC     WTMFLG         ;NO,SET THE FLAG
4039 026354 000207      1#:   RTS PC
4040
4041      ;
4042      ;   SUBROUTINE TO SET UP A WRITE/VERIFY COMMAND IN THE SEQUENCE TABLE.
4043      ;   INPUTS:
4044      ;   OUTPUTS:
4045      ;   REGISTERS:
4046      ;   CALLS:
4047
4048 026356 012721 104105      RANWV:: MOV     #WTV,(R1)+      ;STORE WRITE/VERIFY CMD.
4049 026362 004767 000056      JSR PC,RANW             ;STORE BR# , # OF OPERATIONS, PATTERN.
4050 026366 000207      RTS     PC
4051
4052      ;
4053      ;   SUBROUTINE TO SET UP A WRITE TAPE MARK IN THE SEQUENCE TABLE.
4054      ;   INPUTS:
4055      ;   OUTPUTS:
4056      ;   REGISTERS:
4057      ;   CALLS:
4058
4059 026370 020127 003740      RAWTH:: CMP     R1,#SEQEND
4060 026374 002007              BGE     1#
4061 026376 012721 100011      MOV     #WTH,(R1)+      ;STORE WRITE TAPE MARK CMD.
4062 026402 012721 000001      MOV     #1,(R1)+       ;BR#
4063 026406 012721 000001      MOV     #1,(R1)+       ;# OF OPERATIONS
4064 026412 005721              TST     (R1)+          ;SKIP PATTERNS
4065 026414 000207      1#:   RTS PC
4066
4067      ;
4068      ;   SUBROUTINE TO SET UP A SPACE FILE REVERSE IN THE SEQUENCE TABLE.
4069      ;   INPUTS:
4070      ;   OUTPUTS:
4071      ;   REGISTERS:
4072      ;   CALLS:
4073
4073 026416 020127 003740      RASFR:: CMP     R1,#SEQEND
4074 026422 002007              BGE     1#
4075 026424 012721 105410      MOV     #SFR,(R1)+     ;STORE SPACE FILE REVERSE
4076 026430 012721 000001      MOV     #1,(R1)+     ;BR#

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4077 026434 012721 000001      MOV      #1,(R1)+      ;# OF OPERATIONS
4078 026440 005721              TST      (R1)+        ;SKIP PATTERNS
4079 026442 000207      1# :    RTS PC
4080
4081
4082
4083
4084
4085
4086
4087
4088
4089 026444 012721 004000      RANW::  MOV      #DATCNT,(R1)+      ;SET BRF TO MAX FOR PATTERN GENERATION.
4090
4091 026450 066767 154760 154754  ADD      RANS,RANB      ;RANDOM BRF WILL BE GENERATED FOR EACH RECORD.
4092 026456 016702 154750      MOV      RANB,R2      ;LET RANB := RANB + RANS
4093 026462 042702 177740      BIC      #RNOPSC,R2   ;LET R2 := RANB CLR.BY #RNOPSC
4094 026466 010221              MOV      R2,(R1)+      ;SET RANDOM # OF OPERATIONS.
4095 026470 012721 000007      MOV      #RANP,(R1)+   ;RANDOM PATTERN.
4096 026474 000207      RTS PC                  ;RETURN.
4097
4098
4099
4100 026476              .EVEN
      026476              ENDTST
      026476 104401      L10034:
                                     TRAP      C#ETST
4101
4102
4103
4104
4105
4106
4107
4108 026500              .SBTTL TEST 3: WRITE COMPATABILITY/WRITE UTILITY.
      026500
                                     ;**
                                     ; TEST TO WRITE RECORDS FROM BOT TO EOT.
                                     ;--
4109
4110 026500 112767 000001 155007  BGNTST
4111 026506 105067 155002      T3::
4112
4113 026512 004767 170364      MOVB     #1,RANDOM     ;SET THE RANDOM OPERATIONS FLAG.
4114 026516 004767 160350      CLRB     EXPBOT ;LET EXPBOT :B= #0 ;CLEAR EXPECT BOT FLAG.
4115 026522 103404
4116 026524              JSR      PC,FIRSTU     ;FIND THE FIRST UNIT.
      026524 104455      JSR      PC,SOFINIT   ;INIT DEVICE
      026526 000002      BCS     11#
      026530 004536      ERROF   2,NSSRM,STAERM ;REPORT TS05 NOT READY
      026532 006120
                                     TRAP      C#ERDF
                                     .WORD    2
                                     .WORD    NSSRM
                                     .WORD    STAERM
4117
4118 026534 004767 160726      11# :    JSR      PC,M0SET   ;GO DO SETUP'S
4119 026540 012702 004000      MOV      #DATCNT,R2   ;SET UP THE RECORD LENGTH MASK.
4120 026544 005302      DEC     R2
4121 026546 010267 154656      MOV     R2,LENMSK     ;ALLOW MAXIMUM BUFFER.
4122 026552 005167 154652      COM     LENMSK
4123 026556 004767 161400      JSR     PC,SETCH      ;CMD 1 = SET CHARACTERISTIC.
4124 026562 004767 161420      JSR     PC,SETRW      ;CMD2=REWIND
4125 026566 105067 154734      CLRB    STAFLG ;LET STAFLG :B= #0 ;CLEAR START FLAG
4126 026572      50426# : BREAK      ; DO A SUPVSR BREAK FIRST.

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HARDWARE TESTS MACRO M1113 30-NOV-83 10:17  
TEST 5: EXECUTE OPERATOR SELECTED COMMAND SEQUENCE.

SEQ 129

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4222 027134 0127 2 002222      MOV      #CMD0,R2      ;R2 POINTS TO CMD2 I;I SOFT P TABLE.
4223 027140 004767 000446      JSR      PC,PTCMD5     ;MOVE CMD 2 FROM P TBL TO SEQ TBL.
4224 027144 004767 000442      JSR      PC,PTCMD5     ;MOVE CMD 3 FROM P TBL TO SEQ TBL.
4225 027150 004767 000436      JSR      PC,PTCMD5     ;MOVE CMD 4 FROM P TBL TO SEQ TBL.
4226 027154 004767 000432      JSR      PC,PTCMD5     ;MOVE CMD 5 FROM P TBL TO SEQ TBL.
4227 027160 004767 000426      JSR      PC,PTCMD5     ;MOVE CMD 6 FROM P TBL TO SEQ TBL.
4228 027164 004767 000422      JSR      PC,PTCMD5     ;MOVE CMD 7 FROM P TBL TO SEQ TBL.
4229 027170 004767 000416      JSR      PC,PTCMD5     ;MOVE END CMD FROM P TBL TO SEQ TBL.
4230 027174 005067 154242      CLR      JLOOP        ;CLEAR JMP CMD LOOP COUNT.
4231 027200 105067 154322      CLRB     STAF LG      ;CLEAR START FLAG
4232 027204 012701 003540      MOV      #CMDSEQ,R1   ;INIT SEQUENCE TABLE POINTER.
4233 027210                3#:      ;WHILE (R1) NE #END DO ;WHILE THERE ARE CMDS LEFT IN SEQUENCE TBL:
4234 027210                50431#:
4235 027210 021127 177777      CMP      (R1),#END     ;
4236 027214 001574                BEQ      50432#        ;
4237 027216 022711 000040      CMP      #JMP.C,(R1)   ;IS THIS A JUMP CMD?
4238 027222 001024                BNE     6#            ;BR IF NOT.
4239 027224 062701 000002      ADD      #2,R1         ;LET R1 := R1 + #2 ;POINT TO BR F.
4240 027230 012167 154220      MOV      (R1)+,JLOC    ;SAVE BR F (LOCATION).
4241 027234 022167 154202      CMP      (R1)+,JLOOP   ;HAS LOOP COUNT BE SATISFIED?
4242 027240 001003                BNE     1#            ;IF NOT, JMP AGAIN.
4243 027242 062701 000002      ADD      #2,R1         ;IF SO, ADJUST SEQ POINTER
4244 027246 000760                BR      3#            ;AND GO TO NEXT COMMAND.
4245 027250 005267 154166      1#:      INC      JLOOP      ;UPDATE THE LOOP COUNT.
4246 027254 012701 003540      MOV      #CMDSEQ,R1   ;INIT CMD SEQ TABLE POINTER.
4247 027260 005367 154160      2#:      DEC      JLOC        ;DECR LOCATION COUNTER.
4248 027264 001751                BEQ     3#            ;IF THIS IS THE RIGHT LOCATION TO JMP TO, GO SET
4249 027266 062701 000010      ADD      #10,R1       ;IF NOT, UPDATE SEQ POINTER TO NEXT CMD.
4250 027272 000772                BR      2#            ;DO IT AGAIN.
4251
4252 027274 022711 000020      6#:      CMP      #DLY.C,(R1)   ;DELAY?
4253 027300 001026                BNE     4#            ;BR IF NOT.
4254 027302 062701 000004      ADD      #4,R1        ;R1 = LOCATION OF N COUNT.
4255 027306 011167 154126      MOV      (R1),TIME2   ;SAVE N COUNT.
4256 027312                7#:      DELAY 1              ;GO TO SUPER-WAIT 1 MSEC.
      027312 012727 000001                MOV      #1,(PC)+
      027316 000000                .WORD 0
      027320 016727 152572                MOV      L#DLY,(PC)+
      027324 000000                .WORD 0
      027326 005367 177772                DEC      -6(PC)
      027332 001375                BNE     .-4
      027334 005367 177756                DEC      -22(PC)
      027340 001367                BNE     .-20
4257 027342 005367 154072      DEC      TIME2
4258 027346 001361                BNE     7#
4259 027350 062701 000004      ADD      #4,R1         ;LET R1 := R1 + #4 ;POINT TO NEXT CMD.
4260 027354 000715                BR      3#            ;GO CHECK NEXT CMD.
4261 027356 004767 161610      4#:      JSR      PC,SETUP     ;GO SETUP THE COMMAND BLOCK.
4262 027362                50433#:      ;WHILE NCNT LT NCNT1 DO ;WHILE THERE ARE RECORDS REMAINING:
4263 027362 026767 154024 154024      CMP      NCNT,NCNT1
4264 027370 002103                BGE     50434#
4265 027372 004767 161466      JSR      PC,CMDAC     ;STORE CMD ASCII IN ERROR MSG.
4266 027376 004767 161122      JSR      PC,EXSUB     ;ISSUE CMD TO ALL,AWAIT INTS,CHECK STATUS.
4267 027402 026727 154012 100017      CMP      CMDWRD,#GES  ;IF CMD IS GET STATUS THEN:
4268 027410 001002                BNE     50435#
4269 027412 004767 167774      JSR      PC,PRXST    ;PRINT EXTENDED STATUS REGISTERS.
4270

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4328
4329 027606          EXIT   TST
      027606 104432
      027610 000140          TRAP   C#EXIT
                               .WORD L10037-.
4330
4331      ; SUBROUTINE TO MOVE A COMMAND FROM THE SOFTWARE P TABLE TO
4332      ; THE COMMAND SEQUENCE TABLE.
4333      ; INPUTS:          R2 = POINTER TO SOFT "P" TABLE
4334      ; OUTPUTS:
4335      ; REGISTERS:      R3.
4336      ; CALLS:
4337
4338 027612 012203 PTCMDS:;MOV   (R2)+,R3          ;R3 = COMMAND TABLE INDEX.
4339 027614 005303      DEC   R3
4340 027616 006303      ASL   R3
4341 027620 016321 003752      MOV   CMDTBL(R3),(R1)+      ;MOVE COMMAND WORD.
4342 027624 012221      MOV   (R2)+,(R1)+      ;MOVE # OF BYTES.
4343 027626 012221      MOV   (R2)+,(R1)+      ;MOVE # OF OPERATIONS.
4344 027630 012221      MOV   (R2)+,(R1)+      ;MOVE PATTERN CODE.
4345 027632 000207      RTS   PC
4346
4347      ; SUBROUTINE TO WRITE THEN READ REVERSE ONE RECORD BEYOND EOT
4348      ; INPUTS:
4349      ; OUTPUTS:
4350      ; REGISTERS:
4351      ; CALLS:          CMDAC,EXSUB,CKMAE
4352
4353 027634 000240 TSMEOT:; NOP
4354 027636 000240      NOP
4355 027640 004767 160660      JSR   PC,EXSUB          ;WRITE ONE RECORD BEYOND EOT
4356 027644 004767 167630      JSR   PC,CKMAE        ;SO THAT READ SHORTER STOP DISTANCE
4357                                     ;SHALL POSITION HEAD IN CLEAN IRG GAP
4358 027650 012700 000002      MOV   #2,R0          ;SET UP COUNTER FOR EOT
4359 027654 016767 153540 153542 11:      MOV   CMDWRD,PCMDWD    ;LET PCMDWD := CMDWRD ;REPOSITION TAPE
4360 027662 012767 104401 153530      MOV   #ORDR,CMDWRD    ;LET CMDWRD := #ORDR ;BEFORE EXTRA RECORD
4361 027670 012767 000004 153530      MOV   #4,CMDLG        ;BY READING REVERSE
4362 027676 016767 153516 152424      MOV   CMDWRD,CMDPKT   ;LET CMDPKT := CMDWRD CLR.BY #BRF.C
4363 027704 042767 004000 152416      BIC   #BRF.C,CMDPKT
4364 027712 016767 152412 153502      MOV   CMDPKT,CMDSAV   ;LET CMDSAV := CMDPKT ;THAT RECORD TO ALLOW
4365 027720 016767 153464 152404      MOV   DATARD,CMDPKT+CP.ADL ;NEXT COMMAND IN THE
4366 027726 004767 161132          JSR   PC,CMDAC        ;TABLE TO BE EXECUTED
4367 027732 004767 160566          JSR   PC,EXSUB
4368 027736 004767 167536          JSR   PC,CKMAE
4369 027742 005300          DEC   R0          ;FOUND EOT YET?
4370 027744 001343          BNE   11          ;NO,KEEP GOING
4371 027746 000207          RTS   PC          ;YES.RETURN
4372
4373      .EVEN
4374
4375 027750          ENDTST
      027750          L10037:
      027750 104401          TRAP   C#ETST
4376
4377 027752          ENDMOD
4378
4379      .TITLE PARAMETER CODING
4380
    
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4381          .SBTTL  HARDWARE PARAMETER CODING SECTION
4382
4383 027752          BGNMOD
4384
4385          ;**
4386          ; THE HARDWARE PARAMETER CODING SECTION CONTAINS MACROS
4387          ; THAT ARE USED BY THE SUPERVISOR TO BUILD P-TABLES.  THE
4388          ; MACROS ARE NOT EXECUTED AS MACHINE INSTRUCTIONS BUT ARE
4389          ; INTERPRETED BY THE SUPERVISOR AS DATA STRUCTURES.  THE
4390          ; MACROS ALLOW THE SUPERVISOR TO ESTABLISH COMMUNICATIONS
4391          ; WITH THE OPERATOR.
4392          ;**
4393
4394 027752          BGNHRD
4395 027752          000042          .WORD  L10040-L#HARD/2
4396 027754          L#HARD:;
4397 027754          GPRMA  TSSADR,0,0,160010,177564,YES          .WORD  T#CODE
4398 027754          000031          .WORD  TSSADR
4399 027756          030012          .WORD  T#LOLIM
4400 027760          160010          .WORD  T#HILIM
4401 027762          177564
4402 027764          GPRMD  TSSVCT,2,0,777,60,776,YES          .WORD  T#CODE
4403 027764          001032          .WORD  TSSVCT
4404 027766          030027          .WORD  777
4405 027770          000777          .WORD  T#LOLIM
4406 027772          000060          .WORD  T#HILIM
4407 027774          000776
4408 027776          GPRMD  TSSUNT,4,0,1,0,1,NO          .WORD  T#CODE
4409 027776          002022          .WORD  TSSUNT
4410 030000          030036          .WORD  1
4411 030002          000001          .WORD  T#LOLIM
4412 030004          000000          .WORD  T#HILIM
4413 030006          000001
4414 030010          EXIT HRD          .WORD  T#CODE
4415 030010          024004
4416
4417          .MLIST  BEX
4418 030012          124          123          104  TSSADR: .ASCIZ  /TSDB ADDRESS/
4419 030027          126          105          103  TSSVCT: .ASCIZ  /VECTOR/
4420 030036          123          105          114  TSSUNT: .ASCIZ  /SELECT DRIVE 0-1/
4421          .LIST  BEX
4422          .EVEN
4423
4424 030060          ENDRD          .EVEN
4425 030060
4426
4427          .SBTTL  SOFTWARE PARAMETER CODING SECTION
4428
4429          ;**
4430          ; THE SOFTWARE PARAMETER CODING SECTION CONTAINS MACROS
4431          ; THAT ARE USED BY THE SUPERVISOR TO BUILD P-TABLES.  THE
4432          ; MACROS ARE NOT EXECUTED AS MACHINE INSTRUCTIONS BUT ARE
4433          ; INTERPRETED BY THE SUPERVISOR AS DATA STRUCTURES.  THE
4434          ; MACROS ALLOW THE SUPERVISOR TO ESTABLISH COMMUNICATIONS
4435          ; WITH THE OPERATOR.
4436          ;**

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4419							
4420							
4421	030060		BGNSFT				
	030060	000302				.WORD	L10041-L#SOFT/2
	030062		L#SOFT::				
4422	030062		GPRML	CLRM,0,1,YES			
	030062	000130			.WORD	T#CODE	
	030064	030666			.WORD	CLRM	
	030066	000001			.WORD	1	
4423	030070		GPRML	RRVM,0,400,YES			
	030070	000130			.WORD	T#CODE	
	030072	030705			.WORD	RRVM	
	030074	000400			.WORD	400	
4424	030076		GPRML	RCVERM,2,400,YES			
	030076	001130			.WORD	T#CODE	
	030100	031010			.WORD	RCVERM	
	030102	000400			.WORD	400	
4425	030104		GPRML	HAEM,2,1,YES			
	030104	001130			.WORD	T#CODE	
	030106	030734			.WORD	HAEM	
	030110	000001			.WORD	1	
4426	030112		GPRML	IRECM,6,400,YES			
	030112	003130			.WORD	T#CODE	
	030114	031064			.WORD	IRECM	
	030116	000400			.WORD	400	
4427	030120		XFERT	NEXTSP			
	030120	004024			.WORD	T#CODE	
4428	030122		GPRML	BADTH,4,1,YES			
	030122	002130			.WORD	T#CODE	
	030124	030760			.WORD	BADTH	
	030126	000001			.WORD	1	
4429	030130		NEXTSP: GPRML	DINTM,6,1,YES			
	030130	003130			.WORD	T#CODE	
	030132	031041			.WORD	DINTM	
	030134	000001			.WORD	1	
4430	030136		GPRML	IREM,12,1,YES			
	030136	005130			.WORD	T#CODE	
	030140	031131			.WORD	IREM	
	030142	000001			.WORD	1	
4431	030144		GPRML	CHGM,10,1,YES			
	030144	004130			.WORD	T#CODE	
	030146	031105			.WORD	CHGM	
	030150	000001			.WORD	1	
4432	030152		XFERF	ENDSP1			
	030152	127044			.WORD	T#CODE	
4433	030154		GPRMD	CHARM,14,0,377,0,777,YES			
	030154	006032			.WORD	T#CODE	
	030156	031162			.WORD	CHARM	
	030160	000377			.WORD	377	
	030162	000000			.WORD	T#LOLIM	
	030164	000777			.WORD	T#HILIM	
4434	030166		GPRMD	CMD2M,16,D,37,1,33,YES			
	030166	007052			.WORD	T#CODE	
	030170	031207			.WORD	CMD2M	
	030172	000037			.WORD	37	
	030174	000001			.WORD	T#LOLIM	
	030176	000033			.WORD	T#HILIM	

4435	030200		GPRMD	BPCRM,20,D,-1,1,DATCNT,YES		
	030200	010052			.WORD	T#CODE
	030202	031215			.WORD	BPCRM
	030204	177777			.WORD	-1
	030206	000001			.WORD	T#LOLIM
	030210	004000			.WORD	T#HILIM
4436	030212		GPRMD	NUMBM,22,D,-1,1,77777,YES		
	030212	011052			.WORD	T#CODE
	030214	031227			.WORD	NUMBM
	030216	177777			.WORD	-1
	030220	000001			.WORD	T#LOLIM
	030222	077777			.WORD	T#HILIM
4437	030224		GPRMD	PATTM,24,D,17,0,10,YES		
	030224	012052			.WORD	T#CODE
	030226	031247			.WORD	PATTM
	030230	000017			.WORD	17
	030232	000000			.WORD	T#LOLIM
	030234	000010			.WORD	T#HILIM
4438	030236		GPRMD	CMD3M,26,D,37,1,33,YES		
	030236	013052			.WORD	T#CODE
	030240	031356			.WORD	CMD3M
	030242	000037			.WORD	37
	030244	000001			.WORD	T#LOLIM
	030246	000033			.WORD	T#HILIM
4439	030250		GPRMD	BPCRM,30,D,-1,1,DATCNT,YES		
	030250	014052			.WORD	T#CODE
	030252	031215			.WORD	BPCRM
	030254	177777			.WORD	-1
	030256	000001			.WORD	T#LOLIM
	030260	004000			.WORD	T#HILIM
4440	030262		GPRMD	NUMBM,32,D,-1,1,77777,YES		
	030262	015052			.WORD	T#CODE
	030264	031227			.WORD	NUMBM
	030266	177777			.WORD	-1
	030270	000001			.WORD	T#LOLIM
	030272	077777			.WORD	T#HILIM
4441	030274		GPRMD	PATTM,34,D,17,0,10,YES		
	030274	016052			.WORD	T#CODE
	030276	031247			.WORD	PATTM
	030300	000017			.WORD	17
	030302	000000			.WORD	T#LOLIM
	030304	000010			.WORD	T#HILIM
4442	030306		GPRMD	CMD4M,36,D,37,1,33,YES		
	030306	017052			.WORD	T#CODE
	030310	031364			.WORD	CMD4M
	030312	000037			.WORD	37
	030314	000001			.WORD	T#LOLIM
	030316	000033			.WORD	T#HILIM
4443	030320		GPRMD	BPCRM,40,D,-1,1,DATCNT,YES		
	030320	020052			.WORD	T#CODE
	030322	031215			.WORD	BPCRM
	030324	177777			.WORD	-1
	030326	000001			.WORD	T#LOLIM
	030330	004000			.WORD	T#HILIM
4444	030332		GPRMD	NUMBM,42,D,-1,1,77777,YES		
	030332	021052			.WORD	T#CODE
	030334	031227			.WORD	NUMBM