11/Z1+
TSV05

TSV05 DATA RELIABILITY

CNTSEA0

AH-T823A-MC

FICHE 01 OF 01

JUL 1984

digital

Made In USA

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                        .REM

                                IDENTIFICATION

                        PRODUCT CODE:   AC TA22A MC

                        PRODUCT NAME:   CNTSEA0 TSV05 DATA RELIABILITY

                        PRODUCT DATE:   09 APR 84

                        MAINTAINER:     ISS DIAGNOSTIC SERVICES

                        AUTHOR:         DICK GORDON

                        MODIFIED BY:    JAKI BERG
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USER DOCUMENTATION TABLE OF CONTENTS

GLOSSARY

1.0 GENERAL INFORMATION

1.1 PROGRAM ABSTRACT

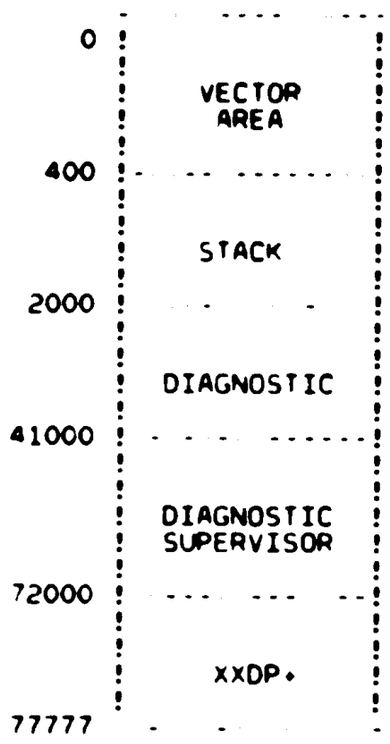
1.1.1 FUNCTIONAL DESCRIPTION

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



FREE MEMORY SPACE FOR WR/RD BFRS OR OTHER PUPOSES

IS ALLOCATED BY THE SUPERVISOR ON REQUEST OR CHOOSEN
BY PROGRAMMER TO RESIDE BETWEEN THE DIAG AND THE
SUPERVISOR.

1.1.4 DIAGNOSTIC INFORMATION

1.1.4.1 SCOPE

THIS DIAGNOSTIC CAN TEST ONE CONTROLLER AND UP TO 2 DRIVES. THE 2 DRIVES
ARE ASSIGNED LOGICAL DRIVE NUMBERS 0 - 1 BY THE DIAGNOSTIC.

THERE ARE 5 TESTS IN THIS PROGRAM:

TEST 1 BASIC FUNCTIONS.
TEST 2 - DATA RELIABILITY.
TEST 3 - WRITE COMPATABILITY/WRITE UTILITY.
TEST 4 - READ COMPATABILITY/READ UTILITY.
TEST 5 - RANDOM/OPERATOR SELECTED SEQUENCE UTILITY.

1.1.4.2 ERROR RECOVERY

ERROR RECOVERY IS PERFORMED ON READ, WRITE AND WRITE TAPE MARK FUNCTIONS
UNLESS ERROR RECOVERY IS INHIBITED BY THE OPERATOR AT START UP TIME.
THE READ FORWARD/READ REVERSE RETRY LIMIT IS 16 (8 IN THE SAME DIRECTION
AND 8 IN THE OPPOSITE DIRECTION). FOR MORE DETAILED INFORMATION ON ERROR RECOVERY
PROCEDURES, REFER TO SECTION 3.0 (ERROR REPORTING) OF THIS LISTING.

1.1.4.3 WRITE ERROR RECOVERY

THERE ARE 2 , SELECTABLE WRITE-ERROR RECOVERY ALGORITHMS USED BY THIS DIAGNOSTIC:
1. MEDIA/OPERATIONAL SELECTIVE ALGORITHM
2. OPERATIONAL ALGORITHM

BY DEFAULT THE DIAGNOSTIC SELECTS THE FIRST ALGORITHM TO IDENTIFY
MEDIA RELATED WRITE ERRORS FROM OPERATIONAL ONES.

TO SELECT THE SECOND ALGORITHM:
ANSWER 'Y' TO CHANGE SW (L) ?
ANSWER 'N' TO BAD TAPE SPOT DETECTION (L) Y ?

IF ERROR RECOVERY IS INHIBITED, THE LATTER QUESTION IS NOT ASKED
AND BOTH ALGORITHMS ARE BYPASSED.

1.1.4.3.1 MEDIA/OPERATIONAL SELECTIVE WRITE-ERROR RECOVERY ALGORITHM

SCOPE

THIS ALGORITHM IDENTIFIES MEDIA RELATED WRITE ERRORS FROM
OPERATIONAL ONES.

ALGORITHM

A WRITE RETRY SUBROUTINE IS CALLED BY THE RECOVERABLE ERROR SUBROUTINE WHICH IS
ENTERED UPON DETECTIION OF A WRITE RECOVERABLE ERROR.
THE WRITE RETRY SUBROUTINE ATTEMPTS TO REWRITE THE RECORD IN SAME SPOT ON TAPE
4 TIMES.

```
    287
    288                     IF ALL 4 REPEATS ARE GOOD, THE RECORD IS CONSIDERED AS RECOVERED AND
    289                     A RECOVERABLE WRITE ERROR IS LOGGED AT THAT RECORD NUMBER.
    290
    291                     IF ANY OF THE 4 REWRITE ATTEMPTS FAIL, THE ROUTINE WILL ERASE THE BAD RECORD, AND LO
G SUSPECTED
    292                     BAD SPOT AT THAT RECORD NUMBER,THE ROUTINE WILL THEN ATTEMPT TO
    293                     WRITE THE RECORD AGAIN 3 INCHES FURTHER DOWN TAPE AND
    294                     RETRY THIS SEQUENCE 4 TIMES, FOR UP TO 4 REPEATS EACH.
    295
    296                     IF A RECORD CANNOT BE WRITTEN WITHOUT RECOVERABLE ERRORS  AFTER 4 RETRIES,
    297                     THEN THE ROUTINE WILL ERASE THE RECORD AND  REPORT RETRY FAILED ON BAD SPOT.
    298
    299                     THE RECOVERABLE ERROR SUBROUTINE THEN CONTINUES TO CALL THE WRITE
    300                     RETRY SUBROUTINE, WHICH REISSUES THE GROUP OF 4 RETRIES,
    301                     UNTIL THE RECORD IS RECOVERED OR 20 BAD SPOTS HAVE BEEN  LOGGED .
    302
    303                     TWENTY (20) BAD SPOTS MAXIMUM ARE ALLOWED PER BOT TO EOT PASS OF TAPE.
    304                     WHEN 20 BAD SPOTS HAVE BEEN LOGGED, WETHER ON THE SAME RECORD NUMBER OR NOT,
    305                     TAPE IS CONSIDERED DEFECTIVE:  A BAD TAPE OVERFLOW MESSAGE IS PRINTED
    306                     AND THE UNIT IS REWOUND, THEN DROPPED.
    307
    308                     DURING THE RECOVERY PROCESS, IT IS NECESSARY TO PERFORM SEVERAL TAPE
    309                     POSITIONING  OPERATIONS: SPACE REVERSE, ERASE.  IF A POSITION ERROR
    310                     IS DETECTED IN THE STATUS WORD DURING THOSE OPERATIONS, THEN THE RECOVERY ATTEMPT IS
 ABORTED.
    311                     AN APPROPRIATE UNRECOVERABLE ERROR MESSAGE IS PRINTED AND THE UNIT IS DROPPED.
    312
    313                     ALL BADLY WRITTEN RECORDS LOGGED WITH RECOVERABLE ERRORS ARE ERASED
    314                     UNTIL RECOVERED, INCLUDING THE RECORD AT THE 20TH BAD SPOT,
    315                     SO THAT ALL RECORDS LEFT ON TAPE ARE KNOWN GOOD WRITTEN RECORDS.
    316
    317                     BAD SPOTS ARE ERASED WITH ERASE GAPS FROM 3 TO 12 INCHES  PER RETRY GROUP.
    318                     UP TO 20 FEET OF ERASE GAP COULD RESULT WHEN RETRYING TO RECOVER
    319                     A SINGLE RECORD.
    320                     THAT LONG STRETCH OF BAD TAPE WOULD THEN BE LOGGED WITH 20
    321                     BAD SPOTS AT SAME RECORD NUMBER AND THE TAPE CONSIDERED DEFECTIVE.
    322
    323                     BAD SPOTS REPORTS
    324
    325                     IF THE PRINTING OF RECOVERABLE ERRORS IS ENABLED, THE BAD SPOTS ON TAPE ARE
    326                     IDENTIFIED AS THEY ARE DETECTED.  SINCE THE BAD RECORDS ARE ERASED UNTIL RECOVERED,
    327                     THE BAD SPOT ACTUALLY PRECEDES THE RECORD NUMBER THAT IDENTIFIES IT.
    328                     THE NUMBER OF REPEATS AND RETRIES ATTEMPTED IS PRINTED, FROM WHICH THE
    329                     LENGTH OF ERASE GAPS CAN BE DETERMINED:  APPROXIMATELY 3 INCHES PER RETRY.
    330
    331                     THE STATISTICAL REPORT PRINTED AT THE END OF TEST 2 OR UPON A "PRINT" REQUEST,
    332                     CONTAINS A SUMMARY OF THE BAD SPOTS LOGGED ON THE CURRENT PASS OF TAPE.
    333                     IN THAT REPORT, ALL COUNTS ARE CUMULATIVE FROM PASS TO PASS, EXCEPT FOR
    334                     THE NUMBER OF BAD SPOTS: IT RELATES TO A "BOT TO EOT TAPE PASS" ONLY.
    335                     FOR THIS PURPOSE, A "TAPE PASS" IS A WRITE PASS FROM BOT TO EOT, OR FROM
    336                     BOT TO WHERE THE DIAGNOSTIC IS HALTED BEFORE REACHING EOT.
    337                     DON'T CONFUSE THIS WITH A PASS BY THE SUPERVISOR WHICH IS DEFINED AS A RUN THROUGH A
LL THE TESTS REQUESTED
    338                     ON ALL UNITS SELECTED. THOSE PASSES ARE IDENTIFIED AS "PASS" AND "EOP'.
    339
    340                     THE NUMBER OF WRITE RETRIES, CUMULATIVE FROM PASS TO PASS, IS A GLOBAL
    341                     COUNT OF HOW MANY TIMES THE GROUP OF 4 RETRIES HAS BEEN CALLED.
    342
    343                     THE NUMBER OF WRITE RECOVERAR E ERRORS EXCLUDES BAD TAPE SPOTS
```

```
344                                     AND REFLECTS THE SPECIFICATIONS OF THE HARDWARE UNDER TEST.
345
346                                     TO CLEAR CUMULATIVE COUNTS, ANSWER 'Y' TO:   CLEAR COUNTERS (L) Y ?.
347                                     THE BAD TAPE SPOTS COUNT IS THEN CLEARED WHEN WRITING THE TAPE FROM BOT.
348
349                                     IF TEST 2 IS HALTED, THEN RESTARTED OR CONTINUED, THE RECORD COUNT
350                                     IS RESET TO ZERO AND THE BAD SPOT ID SHALL FOLLOW THAT  RESET COUNT.
351
352                                     SINCE ALL WRITTEN RECORDS ARE KNOWN GOOD, THE READ ERRORS CAN
353                                     BE ATTRIBUTED TO TRANSIENT NOISE, TRANSIENT ELECTRICAL MALFUNCTIONS,
354                                     OR CONTAMINANTS ON TAPE AS OPPOSED TO TAPE DEFECTS.
355
356                                     THE SAME RECORDS MUST BE WRITTEN FROM TAPE PASS TO TAPE PASS
357                                     FOR THE BAD SPOTS ID TO REMAIN CONSISTENT IN THOSE TAPE PASSES.
358
359                                     EXAMPLE OF A PRINT OUT FOR A BAD SPOT ON TAPE:
360
361                                     CNTSE SFT ERR  00009 ON UNIT 00 TST 002 SUB 000 PC: 012100
362                                     RECOVERABLE ERROR
363                                     WRT CMD FAILED   UNIT 0   PASS:    1   RECORD:    6
364                                     PREVIOUS CMD WAS  WRT
365                                     CMDPKT  TSBA    RFC     TSSR   TCC
366                                     100205  002406  000000  100210  4
367                                     026600
368                                     000000
369                                     003107
370                                     XST0    XST1    XST2    XST3    XST4
371                                     000350  000002  100400  000000  000000
372                                     SUSPECT BAD SPOT AFTER 1 RETRY, 2 REPEAT
373                                     SUSPECT BAD SPOT AFTER 2 RETRY, 1 REPEAT
374                                     SUSPECT BAD SPOT AFTER 3 RETRY, 1 REPEAT
375                                     SUSPECT BAD SPOT AFTER 4 RETRY, 3 REPEAT
376                                     RETRY FAILED ON BAD SPOT...ERASED!
377                                     SUSPECT BAD SPOT AFTER 1 RETRY, 1 REPEAT
378                                     SUSPECT BAD SPOT AFTER 2 RETRY, 1 REPEAT
379
380
381                                     CNTSE SFT ERR  00009 ON UNIT 00 TST 002 SUB 000 PC: 012100
382                                     RECOVERABLE ERROR
383                                     WRT CMD FAILED - UNIT 0   PASS:    1   RECORD:10210
384                                     PREVIOUS CMD WAS  WRT
385                                     CMDPKT  TSBA    RFC     TSSR   TCC
386                                     100205  002406  000000  100210  4
387                                     026600
388                                     000000
389                                     004000
390                                     XST0    XST1    XST2    XST3    XST4
391                                     000350  000002  100010  000000  000000
392                                     RECOVERED ON RETRY # 1
393                                     ↑C
394                                     DR>PRI
395
396                                     UNIT 0   PASS:    1   RECORD:10210
397                                     BYTES WRITTEN    0,272,279,691
398                                     BYTES READ REV   0,301,123,654
399                                     BYTES READ REV   0,301,120,381
400                                                        WRT    RDR    RDF
```

```
401                             RECOVERABLE ERRORS        1       0       0
402                             UNRECOVERABLE ERRORS      0       0       0
403                             WRITE RETRIES             3
404
405                              2 BAD SPOTS THIS TAPE PASS PRECEDING RECORD #:
406                                        6       6
407                             SPEC COND    HARD    FATAL    COMPARE
408                                   2        0        0        0
409                             DR>
410
411                             THIS EXAMPLE SHOWS:
412                                     RECORD 6 RECOVERED ON 2ND RETRY GROUP
413                                     THE 2 BAD SPOTS RESIDE IN A 18 INCH ERASE GAP BETWEEN RECORDS 5 AND 6
414                                     RECORD 10210 RECOVERED ON 1ST RETRY OF 4 GOOD REPEATS
415                                     3 WRITE GROUP RETRIES ATTEMPTED, RESULTING IN:
416                                             1 RECOVERABLE  WRT ERR FROM RECORD 10210
417                                             2 BAD SPOTS BETWEEN RECORDS 5 AND 6
418
419
420
421                     1.1.4.3.2       OPERATIONAL WRITE-ERROR RECOVERY ALGORITHM
422
423                             WHEN THIS ALGORITHM IS SELECTED, THE TSV05 WRITE RETRY COMMAND
424                             IS ISSUED UP TO 16 TIMES OR UNTIL RECORD IS RECOVERED, ON
425                             A WRITE RECOVERABLE ERROR.  THE WRITE  RETRY COMMAND CONSISTS
426                             OF A SPACE REVERSE OVER THE BAD RECORD, THEN AN ERASE OF 3 INCHES
427                             OF TAPE AND REWRITE OF THE RECORD.  THAT COMPOSITE COMMAND
428                             DOES NOT ALLOW THE DETECTECTION OF BAD SPOTS ON TAPE.
429                             THEREFORE NO BAD TAPE SPOTS STATUS IS PRINTED.
430
431                             IF RECORD CANNOT BE RECOVERED AFTER 16 WRITE RETRY COMMANDS,
432                             A RETRY LIMIT EXCEEDED IS FLAGGED AND UNIT IS DROPPED.
433
434
435                     1.1.4.4 DIAGNOSTIC TIMING ADJUSTMENT
436
437                             A NUMBER OF SUPERVISOR TIMING DELAY MACROS, KNOWN AS WATCH DOG
438                             DELAYS, ARE CALLED BY THE DIAGNOSTIC TO WAIT FOR VARIOUS COMMANDS
439                             COMPLETION.  THESE DELAYS ARE NOT CALIBRATED AND SIMPLY EXPANDS
440                             INTO AN INLINE NESTED LOOP PAIR.  THE COUNT FOR THE OUTER LOOP
441                             COMES FROM THE VARIABLE ARGUMENT SUPPLIED BY THE DELAY CALLS.
442                             THE COUNT FOR THE INNER LOOP COMES FROM THE FIXED  HEADER
443                             ELEMENT "L$DLY".
444                             THE DELAYS WILL VARY IN LENGTH WITH MEMORY SPEED.
445
446                             IF TIME-OUT OCCURS WHEN NO APPARENT MALFUNCTIONS IN THE TAPE
447                             UNIT IS EVIDENT, ALL TIMINGS OF THE DIAGNOSTIC MAY BE ADJUSTED
448                             TO MATCH MEMORY SPEED AND NOT RESULT IN TIME OUTS, BY PATCHING
449                             THAT FIXED DELAY ELEMENT "L$DLY".
450
451                             A PRESET COUNT OF 500 RESIDES AT  L$DLY  IN LOCATION 2116 OF THE
452                             "HEADER" SECTION.
453
454
455                     1.2 SYSTEM REQUIREMENTS
456                         ----  - -
457
```

1.2.1 HARDWARE REQUIREMENTS

SBC-11/21+ PROCESSOR WITH 32K OR MORE OF MEMORY
CONSOLE DEVICE (VT52,LA36,ETC.)
PROGRAM LOAD DEVICE
TSV05/TS05

1.2.2 SOFTWARE REQUIREMENTS

DIAGNOSTIC SUPERVISOR

1.3 RELATED DOCUMENTS AND STANDARDS

DIGITAL EQUIPMENT CORPORATION DOCUMENTS:

1. XXDP+ PROGRAMMER'S MANUAL
2. TSV05 TRANSPORT SUBSYSTEM USER'S GUIDE
3. TSV05 TRANSPORT SUBSYSTEM TECHNICAL MANUAL
4. TSV05 TRANSPORT SUBSYSTEM INSTALLATION MANUAL

1.4 DIAGNOSTIC HIERARCHY PREREQUISITES

ORDER OF HOST CPU DIAGNOSTIC USAGE:

1) CONTROL LOGIC PROGRAM - ALL TESTS.

   (NTSA,NTSB,NTSC,NTSD)

2) DATA RELIABILITY PROGRAM:

   A) BASIC FUNCTION TEST.
   B) DATA RELIABILITY TEST.

1.5 ASSUMPTIONS

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.
NTSA,NTSB,NTSC, AND NTSD HAVE ALL SUCESSFULLY RUN WITHOUT ERRORS.

2.0 OPERATING INSTRUCTIONS

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

COMMANDS

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
DROP	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

THE TSV05 DIAGNOSTIC IS A SBC 11/21+ DIAGNOSTIC SUPERVISOR COMPATIBLE
PROGRAM. ALL LOADING AND RUNTIME INSTRUCTIONS CAN BE REFERENCED IN THE
PDP-11 XXDP+ PROGRAMMERS MANUAL. THE USER ENTRY IS IN QUOTES.

BOOT THE DIAGNOSTIC XXDP MEDIA

```
CHMDLB0 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 NTSEA0
NTSEA0BINDRS LOADED
DIAG. RUN TIME SERVICES REV D. APR 79
CNTSE A-0
```

```
                                TSV05 DATA RELIABILITY
                                UNIT IS TSV05


                                SWITCHES
                                - ------

                                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 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


                                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 UNIT'S
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 TSDB = 176000 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

```
                        TSDB ADDRESS (O) 176000 ?

                        VECTOR (O) 224 ?

                        SELECT DRIVE 0-1 (O) ?

                        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 ?

                        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 =	WTM	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" MILISECONDS 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.
7	RANDOM DATA PATTERN.

SEQ 0617

```
856                                    8        NO PATTERN GENERATION.
```

2.3 EXAMPLES OF SOFTWARE DIALOGUE

```
                    CHANGE HW (L) ?

                    #UNITS (D)  ?

                    TSDB ADDRESS (O) 176000 ?

                    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 ?                   <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>
```

```
                                INHIBIT RFC ERROR REPORT (L) N ?          Y<CR>
                                CHANGE CMD SEQUENCE (L) N ?               N<CR>
                                DEFAULT SWITCH SETTINGS (L) Y ?           <CR>
```

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:

```
                                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 ?                Y<CR>
                                INHIBIT RFC ERROR REPORT (L) N ?          Y<CR>
                                CHANGE CMD SEQUENCE (L) N ?               Y<CR>
                                CHARACTERISTICS CODE (O) 40 ?             40<CR>
                                CMD/2 (D) 5 ?                             13<CR>    (REWIND)
                                BRF COUNT (D) 2048 ?                      1<CR>
                                # OF OPERATIONS (D) 10 ?                 1<CR>
                                PATTERN (D) 7 ?                           1<CR>
                                CMD/3 (D) 5 ?                             4<CR>     (WRITE)
                                BRF (D) 2048 ?                            1000<CR>
                                # OF OPERATIONS (D) 10 ?                 10000<CR>
                                PATTERN (D) 7 ?                           1<CR>
                                CMD/4 (D) 5 ?                             27<CR>    (END)
                                BRF (D) 2048 ?                            <↑Z>
```

2.4 EXECUTION TIMES

2.4.1 SYSTEM CONFIGURATION

PDP11/21+
MEMORY
CONSOLE
TSV05/TS05

2.4.2 TEST EXECUTION TIME (2400 FT. TAPE)

THE TIME TO EXECUTE THE FIVE TESTS IS APPROXIAMATELY 4 HOURS.

NOTE: THE EXECUTION TIMES GIVEN IS FOR ONE DRIVE OPERATION.

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:

```
CNTSE 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:

```
CNTSE 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
000371
XST0    XST1    XST2    XST3    XST4
000350  000002  100004  000000  040055
```

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

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 TSO5 NOT READY:

BEFORE ANY COMMAND IS ISSUED TO THE TSO5, 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 TSO5 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 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.

31.5.5 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.

3.1.6 ERROR #13 - RFC NON-ZERO ERROR:

IF, AFTER EXECUTION, THE RESIDUAL FRAME COUNT IS NON-ZERO, THE ERROR IS REPORTED AND A HARD ERROR IS LOGGED. THE PROGRAM THEN

PROCEEDS NORMALLY. THE REPORTING AND LOGGING OF THESE ERRORS
IS OPTIONAL.

3.1.7 ERROR #14 - RETRY LIMIT EXCEEDED:

ON A WRITE COMMAND THIS IS A FATAL DEVICE ERROR AND THE DEVICE
WILL BE DROPPED FROM THE TEST CYCLE UNLESS THE IDU OPTION IS USED.

ON A READ COMMAND THIS ERROR IS LOGGED AS A HARD ERROR AND
THE PROGRAM PROCEEDS NORMALLY.

3.1.8 ERROR #15 - TOO MANY INTERRUPTS:

IF MORE THAN ONE INTERRUPT OCCURS PER COMMAND, THIS ERROR IS REPORTED.
THIS IS A FATAL DEVICE ERROR AND THE DEVICE WILL BE DROPPED FROM
THE TEST CYCLE UNLESS THE IDU OPTION IS USED.

3.1.9 ERROR #16 - CAPSTAN RUNAWAY:

CAPSTAN DID NOT STOP WITHIN ACCEPTABLE WINDOW AFTER LAST
COMMAND. THE PROGRAM WILL ISSUE A GET STATUS COMMAND BEFORE REPORTING
THE ERROR SO THAT THE DEAD TRACK FIELD IN EXTENDED STATUS REGISTER 2
WILL CONTAIN THE TACH COUNT WHEN THE TAPE STOPPED.
THIS IS A FATAL DEVICE ERROR AND THE DEVICE WILL BE DROPPED FROM
THE TEST CYCLE UNLESS THE IDU OPTION IS USED.

3.1.10 ERROR #17 - DATA COMPARE ERROR:

IF A DATA VALIDATION ERROR OCCURS DURING A WRITE/VERIFY COMMAND,
THE PROGRAM PRINTS WHAT THE DATA SHOULD HAVE BEEN AND WHAT THE
DATA WAS, AND PRINTS THE BYTE AND RECORD NUMBER THE ERROR OCCURRED
ON. ONLY THE FIRST 10 BYTES IN ERROR PER RECORD ARE PRINTED.
THE TOTAL # OF BYTES IN ERROR PER RECORD IS ALSO PRINTED. A
HARD ERROR IS LOGGED AND THE PROGRAM PROCEEDS NORMALLY.

3.2 ERROR HALTS

ERROR HALTS ARE SUPPORTED PER DESCRIBED IN THE PREVIOUS SECTION
WITH /FLAG:HOE. THERE ARE NO OTHER HALTS.

4.0 PERFORMANCE REPORT

UNIT X PASS:XXXXX RECORD:XXXXX
BYTES WRITTEN XXX,XXX,XXX,XXX
BYTES READ REV XXX,XXX,XXX,XXX
BYTES READ FWD XXX,XXX,XXX,XXX

	WRT	RDR	RDF
RECOVERABLE ERRORS	XXXXX	XXXXX	XXXXX
UNRECOVERABLE ERRORS	XXXXX	XXXXX	XXXXX

```
1200                                    SPEC COND   HARD   FATAL   COMPARE
1201                                       XXXXX   XXXXX   XXXXX   XXXXX
1202
1203
1204
1205
1206
1207                    5.0 TEST SUMMARIES
1208                        ------ ---
1209
1210                    5.1     TEST 1 -        BASIC FUNCTIONS.
1211
1212                                            EXECUTES AND VERIFIES CORRECT COMPLETION OF ALL TS05 FUNCTIONS.
1213
1214                                            SUBTEST 1    SET CHAR, DRIVE INIT, GET STATUS.
1215                                                            * SET CHARACTERISTIC 200.
1216                                                            * DRIVE INITIATE.
1217                                                            * SET CHARACTERISTIC  20.
1218                                                            * GET STATUS
1219                                                            * SET CHARACTERISTIC  40.
1220                                                            * PRINT TS05 MICROCODE LEVEL (PASS 1 ONLY)
1221
1222                                            SUBTEST 2  - REWIND.
1223                                                            * REWIND.
1224                                                            * REWIND AT BOT.
1225
1226                                            SUBTEST 3    WRITE/VERIFY.
1227                                                            * WRITE/VERIFY PATTERN 1.
1228                                                            * WRITE/VERIFY PATTERN 2.
1229                                                            * WRITE/VERIFY PATTERN 3.
1230                                                            * WRITE/VERIFY PATTERN 4.
1231                                                            * WRITE/VERIFY PATTERN 5.
1232                                                            * WRITE/VERIFY PATTERN 6.
1233                                                            * WRITE/VERIFY PATTERN 0.
1234
1235                                            SUBTEST 4  - WRITE TAPE MARK, ERASE.
1236                                                            * WRITE TAPE MARK.
1237                                                            * WRITE 10 RECORDS
1238                                                            * ERASE 10 TIMES
1239                                                            * WRITE TAPE MARK.
1240                                                            * WRITE TAPE MARK RETRY.
1241
1242                                            SUBTEST 5  - SPACE FILES.
1243                                                            * SPACE 2 FILES REVERSE.
1244                                                            * SPACE 2 FILES FORWARD.
1245                                                            * SPACE 2 FILES REVERSE.
1246                                                            * SPACE 2 FILES FORWARD.
1247
1248                                            SUBTEST 6    SPACE RECORDS.
1249                                                            * REWIND.
1250                                                            * SPACE 7 RECORDS FORWARD.
1251                                                            * SPACE 7 RECORDS REVERSE.
1252                                                            * SPACE 7 RECORDS FORWARD.
1253                                                            * SPACE 7 RECORDS REVERSE.
1254
1255                                            SUBTEST 7    WRITE RETRY.
1256                                                            * 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.
```

5.2 TEST 2 DATA RELIABILITY.

1. THE TAPE IS INITIATED WITH THE FOLLOWING COMMANDS:
   SET CHARACTERISTIC 40
   REWIND
   WRITE 64 RECORDS OF RANDOM LENGTH AND DATA
2. WRITE AND READ COMMANDS ARE SELECTED AT RANDOM AND ARE EXECUTED A RANDOM NUMBER OF TIMES WITH RANDOM LENGTHS AND RANDOM PATTERN UNTIL END OF TAPE IS REACHED.
3. AT THE END OF EACH PASS, A REWIND COMMAND IS ISSUED AND A PERFORMANCE REPORT IS PRINTED.

NOTE: IF A RESTART COMMAND IS USED TO INITIATE TEST 1, THE INITIAL REWIND COMMAND IS NOT ISSUED.

5.3 TEST 3 WRITE COMPATABILITY/WRITE UTILITY.

REWINDS AND WRITES RECORDS OF RANDOM LENGTHS AND RANDOM DATA FROM BOT TO EOT.

5.4 TEST 4 READ COMPATABILITY/READ UTILITY.

REWINDS AND READS ENTIRE TAPE, FORWARD AND REVERSE.

5.5 TEST 5 RANDOM/OPERATOR SELECTED COMMAND SEQUENCE.

A DEFAULT SEQUENCE OF REWIND/WRITE/READ REV/READ FWD/REWIND OF ENTIRE TAPE IS EXECUTED WITH RANDOM PATTERN AND RECORD LENGTH OF 2048 BYTES. OPERATOR CAN ENTER SEQUENCE OF COMMANDS UP TO SEVEN IF THEY DON'T WANT DEFAULT SEQUENCE.

6.0 DEVICE INFORMATION TABLES

6.1 GENERAL

THE TSO5 TAPE SUBSYSTEM CONSISTS OF A TSV05 Q-BUS CONTROLLER CONNECTED TO A TSO5 DRIVE. FROM A SOFTWARE VIEWPOINT THIS CONFIGURATION IS UNIQUE (FOR A Q-BUS DEVICE) IN A NUMBER OF WAYS:

A. ONLY ONE REGISTER MAY BE WRITTEN - TSDB (TAPE SYSTEM DATA BUFFER).

B. TWO REGISTERS MAY BE READ - TSSR AND TSBA (TAPE SYSTEM STATUS REGISTER AND TAPE SYSTEM BUS ADDRESS REGISTER).

C. COMMANDS ARE NOT WRITTEN TO THE DRIVE; RATHER, COMMAND POINTERS ARE WRITTEN WHICH POINT TO COMMAND PACKETS SOMEWHERE IN CPU MEMORY. THE COMMAND POINTER IS USED BY THE TSO5 SUBSYSTEM TO FETCH THE WORD(S) WITHIN THE COMMAND PACKET. THE WORDS WITHIN THE COMMAND PACKET ARE:

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 NEC
ESSARY 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 TS05 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) .

1384 4.2 Q BUS INTERFACE SPECIFICATIONS
1385
1386
1387
1388
1389
1390
1391
1392
1393
1394

TSV05/ TS05	INT. VECTOR	UNIBUS ADDRESS	REGISTER
FIRST	224	772520	TSBA/TSDB
		772522	TSSR

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	P01	P16
(R/O) TSSR	SC	0	SCE	RMR	NXM	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	RLL	WLE	NEF	ILC	ILA	MOT	ONL	IE	VCK	PED	WLK	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	WCF	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):

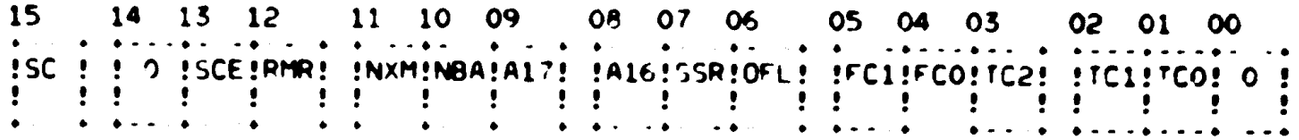
0 = NORMAL TERMINATION
1 = ATTENTION CONDITION
2 = TAPE STATUS ALERT
3 = FUNCTION REJECT
4 = RECOVERABLE ERROR - TAPE POSITION = ONE RECORD DOWN TAPE FROM START OF FUNCTION
5 = RECOVERABLE ERROR - TAPE NOT MOVED
6 = UNRECOVERABLE ERROR - TAPE POSITION LOST
7 = FATAL CONTROLLER ERROR

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

6.3.2 TSV05 STATUS REGISTER (TSSR)

Q BUS ADDRESS + 2 READ ONLY



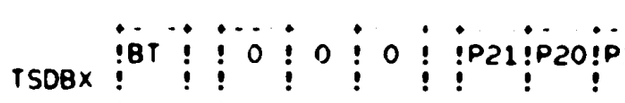
BIT	NAME	TCC	DEFINITION
15	SC	S	SPECIAL CONDITION. WHEN SET, INDICATES THAT THE LAST COMMAND DID NOT COMPLETE WITHOUT INCIDENT. SPECIFICALLY, EITHER AN ERROR WAS DETECTED OR AN EXCEPTION CONDITION OCCURRED. EXCEPTION CONDITIONS CAN BE TAPE MARKS ON READ COMMANDS. REVERSE MOTION AND AT BOT, EOT WHILE 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	FCO	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 TSDB AND SUB-SYSTEM READY (SSR) IS NOT SET. NOTE THAT THIS BIT CAUSES SPECIAL CONDITION BUT NO TERMINATION CLASS (IN FACT, THE TS05 NEVER SEES THIS ERROR) BECAUSE IN 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 TS05 NEEDS A MESSAGE BUFFER ADDRESS. THIS BIT IS CLEARED DURING THE SET CHARACTERISTICS

				COMMAND (IF A GOOD ADDRESS WAS GIVEN).
	09	A17	S	BUS ADDRESS BIT 17. A17 AND A16 (BIT 08) TRACK THE VALUES OF BITS 17 AND 16 OF THE TSBA REGISTER. LOADED FROM TSDB BITS 01 00 WHEN TSDB IS WRITTEN.
	08	A16	S	BUS ADDRESS BIT 16. SEE A17 (BIT 09).
	07	SSR	S	SUB SYSTEM READY. WHEN SET, INDICATES THAT THE TSV05/TSO5 SUBSYSTEM IS NOT BUSY AND IS READY TO ACCEPT A NEW COMMAND POINTER.
	06	OFL	S,1,3	OFF-LINE. WHEN SET, INDICATES THAT THE TSO5 IS OFF-LINE AND UNAVAILABLE FOR ANY TAPE MOTION COMMANDS. THIS BIT CAN CAUSE A TERMINATION CLASS OF 1 (ON ATTN INTERRUPT) OR 3 (RESULTS IN NEF).
	05	FC1	7	FATAL TERMINATION CLASS 01. FC1 AND FC0 (BIT 04) ARE USED TO INDICATE THE TYPE OF FATAL ERROR WHICH HAS OCCURRED ON THE TSO5. THESE BITS ARE VALID ONLY WHEN SC IS SET AND THE TERMINATION CLASS CODE BITS ARE ALL SET (111).
	04	FC0	7	FATAL TERMINATION CLASS 00. SEE FC1 (BIT 05).
	03	TC2	S	TERMINATION CLASS BIT 02. THIS BIT, ALONG WITH THE TC1 AND TC0 BITS, ACT AS AN OFFSET VALUE WHENEVER AN ERROR OR EXCEPTION CONDITION OCCURS ON A COMMAND. EACH OF THE EIGHT POSSIBLE VALUES OF THIS FIELD REPRESENT A PARTICULAR CLASS OF ERRORS OR EXCEPTIONS. THE CONDITIONS IN EACH CLASS HAVE SIMILAR SIGNIFICANCE AND, AS APPLICABLE, RECOVERY PROCEDURES. THE CODE PROVIDED IN THIS FIELD IS EXPECTED TO BE UTILIZED AS AN OFFSET INTO A DISPATCH TABLE FOR HANDLING OF THE CONDITION.
	02	TC1	S	TERMINATION CLASS BIT 01. SEE TC2 (BIT 03).
	01	TC0	S	TERMINATION CLASS BIT 00. SEE TC2 (BIT 03).
	00	-	-	NOT USED. (ALWAYS A 0)

Q BUS ADDRESS + 2 - WRITE ONLY

SUBSYSTEM INITIALIZE

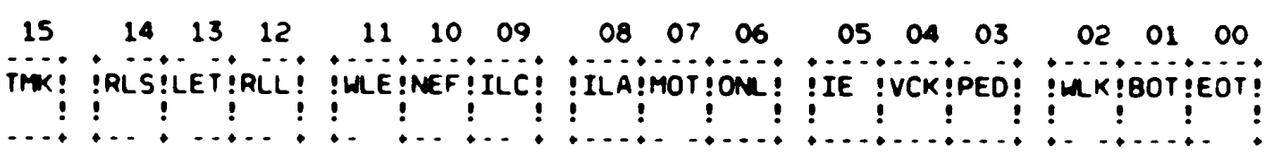
6.3.2.1 TSV05 EXTENDED DATA BUFFER REGISTER (TSDBX)



(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)

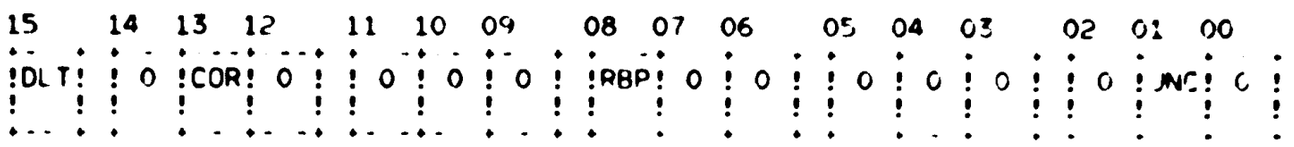


BIT	NAME	TCC	DEFINITION
15	TMK	S,2	TAPE MARK DETECTED. SET WHENEVER A TAPE MARK WAS DETECTED DURING A READ, SPACE, OR SKIP COMMAND AND AS A RESULT OF THE WRITE TAPE MARK OR WITE TAPE MARK RETRY COMMANDS.
14	RLS	2	RECORD LENGTH SHORT. THIS BIT INDICATES THAT EITHER THE RECORD'S LENGTH WAS SHORTER THAN 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.

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: THE COMMAND SPECIFIED REVERSE TAPE DIRECTION BUT THE TAPE WAS ALREADY POSITIONED AT BOT. - THE ISSUING OF ANY MOTION COMMAND EXCEPT

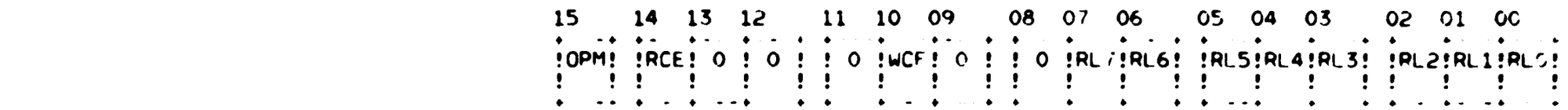
				WHEN THE VOLUME CHECK BIT IS SET. - ANY COMMAND, EXCEPT GET STATUS OR DRIVE INITIALIZE, WHEN THE TS05 IS OFF LINE. ANY WRITE COMMAND WHEN THE TAPE DOES NOT CONTAIN A WRITE ENABLE RING (WRITE LOCK STATUS WLS).
	09	ILC	3	ILLEGAL COMMAND. SET WHEN A COMMAND IS ISSUED AND EITHER ITS COMMAND FIELD OR ITS 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.

6.3.4 EXTENDED STATUS REGISTER 1 (XSTAT1)



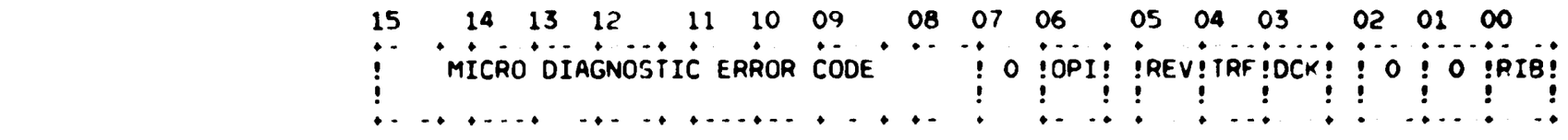
BIT	NAME	TCC	DEFINITION
15	DLT	4	DATA LATE. SET WHEN THE FIFO IS FULL ON A READ OR EMPTY ON A WRITE. THESE CONDITIONS OCCUR WHENEVER THE Q BUS LATENCY EXCEEDS THE DATA TRANSFER RATE OF THE TSO5.
14		-	NOT USED. (ALWAYS A 0)
13	COR	S	CORRECTABLE DATA. CORRECTABLE DATA ERROR HAS BEEN ENCOUNTERED.
12-09			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.

6.3.5 EXTENDED STATUS REGISTER 2 (XSTAT2)



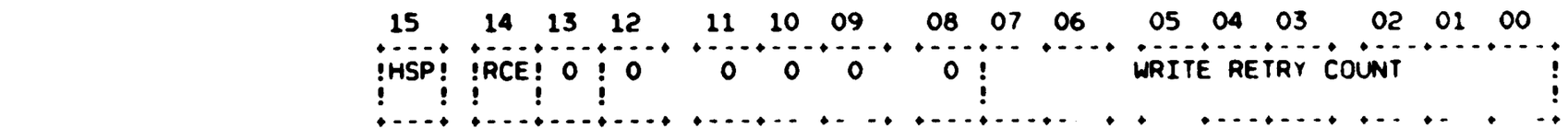
BIT	NAME	TCC	DEFINITION
15	OPM	S	OPERATION IN PROGRESS. (TAPE MOVING)
14	RCE	7,F2	RAM CHECKSUM ERROR. CAUSES FATAL CLASS 2 BECAUSE THE ERROR MIGHT HAVE OCCURRED DURING THE TRANSMISSION OF THE MESSAGE PACKET.
13-11			RESERVED (ALWAYS A 0)
10	WCF	7	WRITE CLOCK FAILURE. SET DURING A WRITE TO INDICATE THAT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

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

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)
14	RCE	6	RETRY COUNT EXCEEDED. WHEN SET,INDICATES THAT THE CONTROLLER WAS BUFFERING WRITE DATA AND COULD NOT SUCESSFULLY OUTPUT THE BUFFERED RECORD WITHIN THE SPECIFIED NUMBER OF RETRIES. CAUSES TAPE POSITION LOST TERMINATION.
13 8			RESERVED (ALWAYS A 0)
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.

7.0 DIAGNOSTIC HISTORY

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.

CVTSEB0 => CNTSEA0 JAKI BERG 9-APR-1984

CHANGES WERE MADE TO CVTSEB0 TO PRODUCE CNTSEA0 FOR THE FALCON PLUS PROJECT (SBC-11/21+). CHANGES, MARKED BY ";JB REV A-0", ARE:

- SET THE ODT BREAK VECTOR (LOCATION 140) TO THE STARTING ADDRESS OF FALCON'S ODT ROM (170000 OCTAL).
- LOWER THE GENERAL INTERRUPT PRIORITY FROM 7 TO 6.
- CHANGE DEFAULT CSR ADDRESS FROM 172540 TO 176000.

```
                                .TITLE PROGRAM HEADER AND TABLES
                                .SBTTL  PROGRAM HEADER

                                        .ENABL  ABS,AMA
        002000                  .       =       2000
002000                                  BGNMOD

                                ;++
                                ; THE PROGRAM HEADER IS THE INTERFACE BETWEEN
                                ; THE DIAGNOSTIC PROGRAM AND THE SUPERVISOR.
                                ; -

002000                                  POINTER BGNRPT,BGNSW,BGNSFT,BGNAU,BGNDU

                                        HEADER  CNTSE,A,0,5000,1
002000                          L$NAME::                ;DIAGNOSTIC NAME
002000  103                                                             .ASCII /C/
002001  116                                                             .ASCII /N/
002002  124                                                             .ASCII /T/
002003  123                                                             .ASCII /S/
002004  105                                                             .ASCII /E/
002005  000                                                             .BYTE   0
002006  000                                                             .BYTE   0
002007  000                                                             .BYTE   0
002010                          L$REV::                 ;REVISION LEVEL
002010  101                                                             .ASCII  /A/
002011                          L$DEPO::                ;0
002011  060                                                             .ASCII  /0/
002012                          L$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  030002                                                          .WORD   L$HARD
002020                          L$SPCP::                ;POINTER TO S.W. QUES.
002020  030110                                                          .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$[illegible]
002030                          L$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
```

SEQ 0040

PROGRAM HEADER

```
002044  000000                  L$EXP1::        ;EXPANSION WORD                 .WORD   0
002046
002046  000000                  L$MREV::        ;SVC REV AND EDIT #             .WORD   0
002050
002050     003                  L$EF::          ;DIAG. EVENT FLAGS              .BYTE   C$REVISION
002051     003                                                                  .BYTE   C$EDIT
002052
002052  000000                                                                  .WORD   0
002054  000000                  L$SPC::                                         .WORD   0
002056
002056  000000                  L$DEVP::        ; POINTER TO DEVICE TYPE LIST   .WORD   0
002060
002060  002164                  L$REPP::        ;PTR. TO REPORT CODE            .WORD   L$DVTYP
002062
002062  017570                  L$EXP4::                                        .WORD   L$PPT
002064
002064  000000                  L$EXP5::                                        .WORD   0
002066
002066  000000                  L$AUT::         ;PTR. TO ADD UNIT CODE          .WORD   0
002070
002070  024100                  L$DUT::         ;PTR. TO DROP UNIT CODE         .WORD   L$AU
002072
002072  024026                  L$LUN::         ;LUN FOR EXERCISERS TO FILL     .WORD   L$DU
002074
002074  000000                  L$DESP::        ;POINTER TO DIAG. DESCRIPTION   .WORD   0
002076
002076  002136                  L$LOAD::        ;GENERATE SPECIAL AUTOLOAD EMT  .WORD   L$DESC
002100
002100  104035                  L$ETP::         ;POINTER TO ERRTBL              EMT     E$LOAD
002102
002102  000000                  L$ICP::         ;PTR. TO INIT CODE              .WORD   0
002104
002104  021324                  L$CCP::         ;PTR. TO CLEAN-UP CODE          .WORD   L$INIT
002106
002106  023764                  L$ACP::         ;PTR. TO AUTO CODE              .WORD   L$CLEAN
002110
002110  023342                  L$PRT::         ;PTR. TO PROTECT TABLE          .WORD   L$AUTO
002112
002112  021316                  L$TEST::        ;TEST NUMBER                    .WORD   L$PROT
002114
002114  000000                  L$DLY::         ;DELAY COUNT                    .WORD   0
002116
002116  000000                  L$HIME::        ;PTR. TO HIGH MEM               .WORD   0
002120
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 002122                      DISPATCH 5
    002122  000005                                                              .WORD   5
    002124
    002124  024204      L$DISPATCH::                                            .WORD   T1
```

DISPATCH TABLE

```
002126  025672                                                          .WORD   T2
002130  026526                                                          .WORD   T3
002132  026722                                                          .WORD   T4
002134  027102                                                          .WORD   T5
```

```
                        .SBTTL  DESCRIPTIVE TEXT
                        ;++
                        ;2 LINES OF TEXT PRINTED TO THE OPERATOR TO IDENTIFY THE DIAGNOSTIC AND THE DEVICE UNDER TES
T
                        ;-
                                DESCRIPT        <DATA RELIABILITY TEST>
002136                  L$DESC:.
002136  104 101 124                                                      .ASCIZ  /DATA RELIABILITY TE
ST
002141  101 040 122
002144  105 114 111
002147  101 102 111
002152  114 111 124
002155  131 040 124
002160  105 123 124
002163  000
                                                                        .EVEN
                                DEVTYP          <TSV05>
002164                  L$DVTYP::
002164  124 123 126                                                      .ASCIZ  #TSV05#
002167  060 065 000
                                                                        .EVEN
                        .SBTTL  DEFAULT HARDWARE P TABLE
                        ;++
                        ; THE DEFAULT HARDWARE P-TABLE CONTAINS DEFAULT VALUES OF
                        ; THE TEST-DEVICE PARAMETERS.  THE STRUCTURE OF THIS TABLE
                        ; IS IDENTICAL TO THE STRUCTURE OF THE RUN TIME P TABLE.
                        ;--
                                BGNHW   DFPTBL
002172  000003                                                          .WORD   L10000-L$HW/2
002174                  L$HW::
002174                  DFPTBL::
                        .WORD   176000          ;TSDB ADDRESS.          ;JB REV A 0
002174  176000          .WORD   224             ;VECTOR ADDRESS.
002176  000224          .WORD   0               ;DRIVE #0 FOR DEFAULT
002200  000000
                                ENDHW
002202                  L10000:
                        .SBTTL  SOFTWARE P-TABLE
                        ;++
                        ; THE SOFTWARE P-TABLE CONTAINS THE VALUES OF THE PROGRAM
                        ; PARAMETERS THAT CAN BE CHANGED BY THE OPERATOR.
                        ;
                                BGNSW   SFPTBL
002202  000051                                                          .WORD   L10001-L$SW/2
```

SOFTWARE P-TABLE

```
                    002204                  L$SW::
                    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             HAE::    .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                      .BYTE   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                      .BYTE   0               ;SPARE.
                137 002216  000             PIRE::   .BYTE   0               ;INHIBIT RESIDUAL FRAMECOUNT ERROR REPORT FLAG.
                138 002217  000                      .BYTE   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                   .WORD   1               ;BYTE COUNT
                142 002226  000001                   .WORD   1               ;NUMBER OF OPERATIONS
                143 002230  000007                   .WORD   RANP            ;PATTERN
                144 002232  000004                   .WORD   4               ;COMMAND 3  (DEFAULT = WRITE)
                145 002234  004000                   .WORD   DATCNT          ;BYTE COUNT (DEFAULT = MAX BUFFER SIZE).
                146 002236  076400                   .WORD   32000.          ;NUMBER OF OPERATIONS (DEFAULT = 32000).
                147 002240  000007                   .WORD   RANP            ;PATTERN (DEFAULT = RANDOM).
                148 002242  000003                   .WORD   3               ;COMMAND 4 (DEFAULT = READ REV).
                149 002244  004000                   .WORD   DATCNT          ;BYTE COUNT (DEFAULT = MAX BUFFER SIZE).
                150 002246  076400                   .WORD   32000.          ;NUMBER OF OPERATIONS (DEFAULT = 32,000).
                151 002250  000007                   .WORD   RANP            ;PATTERN (DEFAULT = RANDOM).
                152 002252  000002                   .WORD   2               ;COMMAND 5 (DEFAULT = READ FWD).
                153 002254  004000                   .WORD   DATCNT          ;BYTE COUNT (DEFAULT = MAX BUFFER SIZE).
                154 002256  076400                   .WORD   32000.          ;NUMBER OF OPERATIONS (DEFAULT = 32,000).
                155 002260  000007                   .WORD   RANP            ;PATTERN (DEFAULT = RANDOM).
                156 002262  000015                   .WORD   13.             ;COMMAND 6 (DEFAULT = REWIND).
                157 002264  000001                   .WORD   1               ;BYTE COUNT
                158 002266  000001                   .WORD   1               ;NUMBER OF OPERATIONS
                159 002270  000007                   .WORD   RANP            ;PATTERN
                160 002272  000033                   .WORD   27.             ;END OF CMD SEQ TABLE CODE (DEF) OR CMD 7
                161 002274  004000                   .WORD   DATCNT          ;BYTE COUNT (DEFAULT = MAX BUFFER SIZE).
                162 002276  076400                   .WORD   32000.          ;NUMBER OF OPERATIONS (DEFAULT = 32000).
                163 002300  000007                   .WORD   RANP            ;PATTERN (DEFAULT = RANDOM).
                164 002302  000033                   .WORD   27.             ;END OF CMD SEQ TABLE CODE (DEF) OR CMD 8
                165 002304  004000                   .WORD   DATCNT          ;BYTE COUNT (DEFAULT = MAX BUFFER SIZE).
                166 002306  076400                   .WORD   32000.          ;NUMBER OF OPERATIONS (DEFAULT = 32000).
                167 002310  000007                   .WORD   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          MSSW::   .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
                    002326                  L10001:
                176
                177 002326                           ENDMOD
```

```
                                .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
                                ;
                                ;                                       ;  BIT POSITION IN SECOND STATUS WORD
000040                          EF.START==      32.                     ; (100000) START COMMAND WAS ISSUED
000037                          EF.RESTART==    31.                     ; (040000) RESTART COMMAND WAS ISSUED
000036                          EF.CONTINUE==   30.                     ; (020000) CONTINUE COMMAND WAS ISSUED
000035                          EF.NEW==        29.                     ; (010000) A NEW PASS HAS BEEN STARTED
000034                          EF.PWR==        28.                     ; (004000) A POWER-FAIL/POWER UP OCCURRED
                                ;
                                ;
                                ; PRIORITY LEVEL DEFINITIONS
                                ;
000340                          PRI07== 340
```

GLOBAL EQUATES SECTION

```
                000300                  PRIO6== 300
                000240                  PRIO5== 240
                000200                  PRIO4== 200
                000140                  PRIO3== 140
                000100                  PRIO2== 100
                000040                  PRIO1== 40
                000000                  PRIO0== 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
  210
  218
  219                                   ; REGISTER USAGE.
  220                                   ;
  221                                   ;       R0 - PASSES PARAMETERS TO/FROM DIAGNOSTIC SUPERVISOR.
  222                                   ;       R1 - COMMAND SEQUENCE TABLE POINTER.
  223                                   ;       R2 - GENERAL PURPOSE REGISTER.
  224                                   ;       R3 - GENERAL PURPOSE REGISTER.
  225                                   ;       R4 - GENERAL PURPOSE REGISTER.
  226                                   ;       R5 - CURRENT LOGICAL DEVICE NUMBER X 2.
  227                                   ;       R6 - STACK POINTER.
  228                                   ;       R7 - PROGRAM COUNTER.
  229
  230                                   ;THE FOLLOWING ARE BIT DEFINITIONS FOR THE TSSR REGISTERS.
  231
  232           100000                  TS.SC==100000                   ;SPECIAL CONDITION BIT.
  233           040000                  TS.UPE==40000                   ;UNIBUS PARITY ERROR
  234           020000                  TS.SPE==20000                   ;SERIAL BUS PARITY ERROR.
  235           010000                  TS.RMR==10000                   ;REGISTER MODIFICATION REFUSED.
  236           004000                  TS.NXM==4000                    ;NON-EXISTENT MEMORY.
  237           002000                  TS.NBA==2000                    ;NEED BUFFER ADDRESS.
  238           001000                  TS.A17==1000                    ;BUS ADDRESS BIT 17.
  239           000400                  TS.A16==400                     ;BUS ADDRESS BIT 16.
  240           000200                  TS.SSR==200                     ;UNIT READY BIT.
  241           000100                  TS.OFL==100                     ;OFF LINE.
  242           177717                  TSC.FCC==177717                 ;FATAL CLASS CODE MASK.
  243           177761                  TSC.TCC==177761                 ;TERMINATION CLASS CODE MASK.
  244
  245                                   ;THE FOLLOWING ARE BIT DEFINITIONS FOR THE COMMAND WORD
  246
  247           100000                  ACK.C==100000                   ;ACKNOWLEDGE BIT
  248           040000                  CVC.C==40000                    ;CLEAR VOLUME CHECK.
  249           020000                  OPP.C==20000                    ;OPPOSITE BIT
```

GLOBAL EQUATES SECTION

```
                                SWB.C==10000                    ;SWAP BYTE BIT
                                MOD.C3==4000                    ;MODE BIT 3
                                BRF.C==4000                     ;BYTE/RECORD/FILE COUNT FLAG BIT.  NOT USED
                                                                ;BY TSO5 BUT USED INTERNALLY BY THIS PROGRAM ONLY.
                                MOD.C2==2000                    ;MODE BIT 2
                                MOD.C1==1000                    ;MODE BIT 1
                                MOD.C0==400                     ;MODE BIT 0
                                IE.C==200                       ;INTERRUPT ENABLE
                                FMT.C1==100                     ;FORMAT BIT 1
                                VFY.C==100                      ;WRITE VERIFY FLAG BIT.  INTERNAL USE ONLY.
                                                                ;NOT USED BY TSO5.
                                FMT.C0==40                      ;FORMAT BIT 0.
                                JMP.C==40                       ;JUMP BIT-TO DIRECT THIS PROGRAM TO JUMP TO
                                                                ;A CERTAIN LOCATION IN THE COMMAND SEQUENCE
                                                                ;TABLE.  INTERNAL USE ONLY.
                                CMD.C4==20                      ;COMMAND BIT 4
                                DLY.C==20                       ;INSERT DELAY. INTERNAL USE ONLY.
                                CMD.C3==10                      ;COMMAND BIT 3
                                CMD.C2==4                       ;COMMAND BIT 2
                                CMD.C1==2                       ;COMMAND BIT 1
                                CMD.C0==1                       ;COMMAND BIT 0

                                ;BIT DEFINITIONS FOR DEVICE CHARACTERISTICS.

                                CH.ESS==200                     ;ENABLE SKIP TAPE MARKS STOP (STOP AT LOGICAL EOT).
                                CH.EAI==40                      ;ENABLE ATTENTION INTERRUPTS.
                                CH.ERI==20                      ;ENABLE MESSAGE BUFFER RELEASE INTERRUPTS.
                                DFTSCH==CH.EAI                  ;DEFAULT CHARACTERISTICS CODE.

                                ;BIT DEFINITIONS FOR EXTENDED CONTROL WORD

                                EF.HSS==40                      ;ENABLE HIGH SPEED SELECT
                                EF.RWB==30                      ;ENABLE BOTH READ & WRITE BUFFERING
                                EF.RBO==20                      ;ENABLE READ BUFFERING ONLY

                                ;THE FOLLOWING INDICATES THE RELATIVE POSITIONS OF THE STATUS WORDS
                                ;IN THE MESSAGE BUFFER.

                                MS.RFC==4                       ;RESIDUAL FRAME COUNT.
                                MS.XS0==6                       ;EXT STATUS REG 0
                                MS.XS1==10                      ;EXT STATUS REG 1
                                MS.XS2==12                      ;EXT STATUS REG 2
                                MS.XS3==14                      ;EXT STATUS REG 3
                                MS.XS4==16                      ;EXT STATUS REG 4

                                ;THE FOLLOWING ARE BIT DEFINITIONS FOR EXTENDED STATUS REGISTER 0.

                                XO.TMK==100000                  ;TAPE MARK.
                                XO.RLS==40000                   ;RECORD LENGTH SHORT.
                                XO.LET==20000                   ;LOGICAL EOT.
                                XO.RLL==10000                   ;RECORD LENGTH LONG.
                                XO.ONL==100                     ;ON LINE BIT.
                                XO.WLK==4                       ;WRITE LOCK BIT
                                XO.BOT==2                       ;BOT BIT.
                                XO.EOT==1                       ;EOT BIT.

                                ;THE FOLLOWING ARE BIT DEFINITIONS FOR EXTENDED STATUS REGISTER 2.
```

GLOBAL EQUATES SECTION

```
                                ;
100000          X2.OPM==100000          ;OPERATION IN PROGRESS, TAPE MOVING
000200          X2.EFE==200             ;EXTENDED FEATURES ENABLED
000100          X2.BFE==100             ;BUFFERING ENABLED
                                ;
                ;THE FOLLOWING ARE BIT DEFINITIONS FOR EXTENDED STATUS REGISTER 3.
                                ;
000010          X3.DCK==10              ;DENSITY CHECK.
157400          X3.RNY==157400          ;CAPSTAN RUNAWAY UDIAG ERROR CODE.
                                ;
                ;THE FOLLOWING ARE BIT DEFINITIONS FOR EXTENDED STATUS REGISTER 4.
                                ;
100000          X4.HSS==100000          ;HIGH SPEED SWITCH INDICATING 100IPS
040000          X4.RCE== 40000          ;RETRY COUNT EXCEEDED
                                ;
                                ;
                ;THE FOLLOWING DEFINITIONS SHOW THE RELATIVE POSITIONS OF THE COMMAND
                ;PACKET ENTRIES.
                                ;
000000          CP.CMD==0               ;CMDPKT+0==TSO5 COMMAND.
000002          CP.ADL==2               ;CMDPKT+2==BUFFER ADDRESS LOW.
000004          CP.ADH==4               ;CMDPKT+4==BUFFER ADDRESS HIGH.
000006          CP.CNT==6               ;CKDPKT+6==BYTE/FILE/RECORD COUNT
                                ;
                ;MISCELLANEOUS DEFINITIONS.
                                ;
000300          INTPRI==PRIO6           ;PRIORITY TO BE USED IN INTERRUPT STATE.
000012          SCHCNT==12              ;ARBITRARY BYTE LENGTH FOR CHARACTERISTIC
                                        ;BUFFER LENGTH. (EVEN #)
000020          MSGCNT==20              ;MESSAGE BUFFER LENGTH IN BYTES. (EVEN #)
000020          DIACNT==20              ;DIAGNOSTIC COMMAND BUFFER EXTENT.
004000          DATCNT==2048.           ;MAXIMUM RECORD LENGTH IN BYTES.
                                        ;THIS COUNT SHOULD BE A MULTIPLE OF 256 TO INSURE
                                        ;PROPER READ/WRITE BUFFER ALLOCATION BY THE SUPER.
177740          RNOPSC==177740          ;RANDOM # OF OPERATIONS MASK.
000007          RANP==7                 ;CODE TO SELECT RANDOM PATTERN.
000020          RRECL==16.              ;READ RECOVERY ATTEMPT LIMIT.
000020          WRECL==16.              ;WRITE RECOVERY ATTEMPT LIMIT.
153624          RANBC==153624           ;CONSTANT USED TO RESET RANDOM # GENERATOR BASE.
032561          RANSC==32561            ;CONSTANT USED TO RESET RANDOM # SAVE LOCATION.
177774          NINUSE==177774          ;NOT IN USE CODE FOR DEVICE STATE TABLE.
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
                                        ;NOT "COMMAND" BITS.
                                ;
                ;THE FOLLOWING DEFINES THE COMMAND WORD FOR EACH TSO5 COMMAND.
                                ;
100013          DRI==   ACK.C!CMD.C3!CMD.C1!CMD.CO
                                        ;DRIVE INIT.
                                ;
104001          RDF==   ACK.C!BRF.C!CMD.CO
                                        ;READ FORWARD
                                ;
104401          RDR==   ACK.C!BRF.C!MOD.CO!CMD.CO
                                        ;READ REVERSE
                                ;
104005          WRT==   ACK.C!BRF.C!CMD.CO!CMD.C2
                                        ;WRITE COMMAND
```

GLOBAL EQUATES SECTION

```
364
365          104105                  WTV==   ACK.C!BRF.C!VFY.C!CMD.CO!CMD.C2
366                                                          ;WRITE VERIFY
367
368          104010                  SRF==   ACK.C!BRF.C!CMD.C3
369                                                          ;SPACE RECORD FORWARD
370
371          104410                  SRR==   ACK.C!BRF.C!MOD.CO!CMD.C3
372                                                          ;SPACE RECORD REVERSE
373
374          105401                  RNR==   ACK.C!BRF.C!MOD.C1!MOD.CO!CMD.CO
375                                          ;READ REV RETRY1 - REREAD NEXT REVERSE, IE. SPACE FWD, READ REVERSE
376
377          125401                  RNF==   ACK.C!BRF.C!OPP.C!MOD.C1!MOD.CO!CMD.CO
378                                          ;READ REV RETRY2 - REREAD NEXT FORWARD, IE.READ FORWARD, SPACE REVERSE
379
380          105001                  RPF==   ACK.C!BRF.C!MOD.C1!CMD.CO
381                                          ;READ FWD RETRY1 - REREAD PREVIOUS FORWARD, IE. SPACE REVERSE, READ FORWARD
382
383          125001                  RPR==   ACK.C!BRF.C!OPP.C!MOD.C1!CMD.CO
384                                          ;READ FWD RETRY2 - REREAD PREVIOUS REVERSE, IE. READ REVERSE, SPACE FORWARD
385
386          105005                  WRR==   ACK.C!MOD.C1!BRF.C!CMD.C2!CMD.CO
387                                                          ;WRITE RETRY
388
389          102010                  RWD==   ACK.C!MOD.C2!CMD.C3
390                                                          ;REWIND COMMAND
391
392          100012                  MBR==   ACK.C!CMD.C3!CMD.C1
393                                                          ;MESSAGE BUFFER RELEASE
394
395          100011                  WTM==   ACK.C!CMD.C3!CMD.CO
396                                                          ;WRITE TAPE MARK.
397
398          101011                  WTR==   ACK.C!MOD.C1!CMD.C3!CMD.CO
399                                                          ;WRITE TAPE MARK RETRY.
400
401          105010                  SFF==   ACK.C!BRF.C!MOD.C1!CMD.C3
402                                                          ;SPACE FILE FORWARD
403
404          105410                  SFR==   ACK.C!BRF.C!MOD.CO!MOD.C1!CMD.C3
405                                                          ;SPACE FILE REVERSE
406
407          100017                  GES==   ACK.C!CMD.CO!CMD.C1!CMD.C2!CMD.C3
408                                                          ;GET EXTENDED STATUS
409
410          100411                  ERS==   ACK.C!MOD.CO!CMD.C3!CMD.CO
411                                                          ;ERASE 3 INCHES OF TAPE
412
413          100412                  UNL==   ACK.C!MOD.CO!CMD.C3!CMD.C1
414                                                          ;UNLOAD COMMAND
415
416          101012                  CLN==   ACK.C!MOD.C1!CMD.C3!CMD.C1
417                                                          ;ERASE TAPE.
418
419          140004                  SCH==   ACK.C!CVC.C!CMD.C2      ;SET DEVICE CHARACTERISTICS.
420
```

```
GLOBAL EQUATES SECTION

                140006          WSM==   ACK.C!CVC.C!CMD.C2!CMD.C1       ;WRITE SUB SYS MEM
                100006          DIA==   ACK.C!CMD.C2!CMD.C1            ;DIAGNOSTICS.
                000040          JMP==   JMP.C                           ;JUMP TO 'N'TH COMMAND
                000020          DLY==   DLY.C                           ;DELAY 'N  MS.
                177777          END==   177777                          ;END OF COMMAND SEQUENCES

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



                                ;       COMMAND PACKET.

                002330          .       =       <.+3>&177774    ;MUST BE ON MOD 4 BOUNDRY.
002330  000000                  CMDPKT:: 0                      ;1ST WORD IS TSO5 COMMAND.
002332  000000                           0                      ;2ND WORD IS THE BUFFER LOW ADDRESS.
002334  000000                           0                      ;3RD WORD IS THE BUFFER HIGH ADDRESS.
002336  000000                           0                      ;4TH WORD IS THE BYTE/RECORD/FILE COUNT.


                                ;       GET STATUS COMMAND PACKET.

                002340          .       =       <.+3>&177774    ;MUST BE ON MOD 4 BOUNDRY.
002340  100017                  GSCPK:: .WORD   GES

                                ;       MESSAGE BUFFER RELEASE COMMAND PACKET.

                002344          .       =       <.+3>&177774    ;MUST BE ON MOD 4 BOUNDRY.

002344  100012                  BRCPK:: .WORD   MBR


                                ;       REWIND COMMAND PACKET (USED IN ERROR RECOVERY ONLY)

                002350          .       =       <.+3>&177774    ;MUST BE ON MOD 4 BOUNDRY.

002350  102010                  RWCPK:: .WORD   RWD
002352  000001                          .WORD   1


                                ;       WORK AREA FOR ANALYSIS OF MESSAGE PACKET CONTENTS.

002354                          MSGPKT:: .BLKW  8.              ;1ST WORD:: MESSAGE TYPE.
                                                                ;2ND WORD:: DATA FIELD LENGTH.
                                                                ;3RD WORD:: RESIDUAL FRAME COUNT.
                                                                ;4TH WORD:: XSTAT0
                                                                ;5TH WORD:: XSTAT1
                                                                ;6TH WORD:: XSTAT2
```

GLOBAL DATA SECTION

```
                                                        ;7TH WORD:: XSTAT3
                                                        ;8TH WORD:: XSTAT4
                                ;       MESSAGE PACKETS.

002374                          MSGPK0:: .BLKW  8.      ;MESSAGE PACKET FOR DEVICE #0
002414                          MSGPK1:: .BLKW  8.      ;MESSAGE PACKET FOR DEVICE #1
002434                          MSGPK2:: .BLKW  8.      ;MESSAGE PACKET FOR DEVICE #2
002454                          MSGPK3:. .BLKW  8.      ;MESSAGE PACKET FOR DEVICE #3

                                ;       SET CHARACTERISTIC BLOCK.

002474  002374                  SCHBK:: MSGPK0          ;1ST WORD:: MSGPKT ADDR LO(SET UP BY EXCUTE ROUTINE).
002476  000000                          0               ;2ND WORD:: MSGPKT ADDR HI.
002500  000020                          MSGCNT          ;3RD WORD:: MSG BUFFER LENGTH (BYTES)
002502  000040                          CH.EAI          ;4TH WORD:: CHARACTERISTICS WORD(SET BY SETUP ROUTINE).
002504  000000                          0               ;5TH WORD:: HSP & BUFFER CONTROL ON EXT'D FEATURES


                                ;       WRITE SUB SYSTEM MEMORY CHARACTERISTIC BLOCK.

002506  000000                  WSMBK:: 0               ;1ST WORD:: SEL 0
002510  000000                          0               ;2ND WORD:: SEL 2
002512  000000                          0               ;3RD WORD:: SEL 4

                                ;       TS05 REGISTER ADDRESSES.

002514                          TSDB:: .BLKW    4       ;TS05 DATA BUFFER ADDRESSES.
002524                          TSSR:: .BLKW    4       ;TS05 STATUS REGISTER ADDRESSES.
002534                          TSVCT:: .BLKW   4       ;TS05 VECTOR ADDRESSES.
        002514                  TSBA==TSDB              ;DATA BUFFER ADDRESS REGISTER.


                                ;       ADDRESSES OF MESSAGE PACKETS.

002544  002374                  MSGPKA:: MSGPK0         ;DEVICE 0.
002546  002414                          MSGPK1          ;DEVICE 1.
002550  002434                          MSGPK2          ;DEVICE 2.
002552  002454                          MSGPK3          ;DEVICE 3.

                                ;       ADDRESSES OF INTERRUPT HANDLING ROUTINES.

002554  010034                  TS5INT:: TS5IN0         ;DEVICE 0.
002556  010042                          TS5IN1          ;DEVICE 1.
002560  010050                          TS5IN2          ;DEVICE 2.
002562  010056                          TS5IN3          ;DEVICE 3.

                                ;       TS05 CODE LEVELS, WILL BE STORED AFTER SCH CMD IN BASIC FUNCTION TEST

002564  000000                  TS5CL:: 0               ;DEVICE 0
002566  000000                          0               ;DEVICE 1
002570  000000                          0               ;DEVICE 2
002572  000000                          0               ;DEVICE 3

                                ;       TS05 EXT. FEA & BUF. ENA SW'S, WILL BE STORED AFTER SCH CMD IN BASIC FUNCTION TEST

002574  000000                  TS5SW:: 0               ;DEVICE 0
002576  000000                          0               ;DFVICE 1
```

GLOBAL DATA SECTION

```
                                        0                       ;DEVICE 2
                                        0                       ;DEVICE 3

                                ;       UNIT NUMBERS OF ALL DEVICES BEING TESTED(1 4).
                                ;       WHEN DEVICE IS NOT IN USE, IT,S LOCATION WILL =  3.
                                ;       R5 WILL ALWAYS CONTAIN THE PRESENT LOGICAL UNIT NUMBER X 2.

                                DEVTBL:. .WORD  NINUSE
                                        .WORD   NINUSE
                                        .WORD   NINUSE
                                        .WORD   NINUSE
                                        .WORD   END


                                ;       BAD TAPE TABLE POINTER: USED BY WRITE RETRY ROUTINE
                                ;       "WRTY" TO LOG BAD TAPE SPOTS ON UNITS UNDER TEST

                                BTADDR:: BT0
                                         BT1
                                         BT2
                                         BT3
                                ;       COUNTER AREA.

                                CNTBGN=.
                                WRBC:: .BLKW    20              ;BYTES WRITTEN.
                                RRBC:: .BLKW    20              ;BYTES READ REV.
                                RFBC:: .BLKW    20              ;BYTES READ FWD.
                                WRREC:: .BLKW   4               ;RECOVERABLE WRITE ERRORS.
                                WRUNR:: .BLKW   4               ;UNRECOVERABLE WRITE ERRORS.
                                RRREC:: .BLKW   4               ;RECOVERABLE READ REV ERRORS.
                                RRUNR:: .BLKW   4               ;UNRECOVERABLE READ REV ERRORS.
                                RFREC:: .BLKW   4               ;RECOVERABLE READ FWDERRORS.
                                RFUNR:: .BLKW   4               ;UNRECOVERABLE READ FWD ERRORS.
                                BT0::   .BLKW   21.             ;UNIT 0 BAT TAPE SPOTS LOG
                                BT1::   .BLKW   21.             ;UNIT 1 BAT TAPE SPOTS LOG
                                BT2::   .BLKW   21.             ;UNIT 2 BAT TAPE SPOTS LOG
                                BT3::   .BLKW   21.             ;UNIT 3 BAT TAPE SPOTS LOG
                                WRTYCT:: .BLKW  4               ;WRITE RETRY COUNTER
                                PASCNT:: .BLKW  4               ;PASS COUNT.
                                SCCNT:: .BLKW   4               ;SPECIAL CONDITION COUNT.
                                VFYCNT:: .BLKW  4               ;COUNT OF TSO5 DATA COMPARE ERRORS.
                                HRDCNT:: .BLKW  4               ;COUNT OF HARD ERRORS.
                                FTLCNT:: .BLKW  4               ;COUNT OF FATAL ERRORS.
                                CNTEND=.                        ;END OF STATICTICAL COUNTERS.
                                RECCNT:: .BLKW  4               ;NUMBER OF RECORDS FROM BOT: CLEARED  ON REWIND
                                                                ;AND WHEN RESTARTING OR CONTINUING TEST 2.
                                CNTLEN==CNTEND-CNTBGN           ;LENGTH OF STATISTICAL COUNTER AREA.


                                ;       THE FOLLOWING ARE THE DEFINITIONS OF VARIABLES
                                ;       USED BY THE PROGRAM.

                                DATAWT:: .WORD  0               ;WRITE BUFFER ADDRESS.
                                DIABLK==DATAWT                  ;WRITE BUFFER ALSO USED FOR DIAG CMD.
                                DATARD:: .WORD  0               ;READ BUFFER ADDRESS.
                                NCNT:: .WORD    0               ;STORAGE FOR VALUE OF N.
                                NCNT1:: .WORD   0               ;TEMP STORAGE FOR VALUE OF N.
```

SEQ 0051

GLOBAL DATA SECTION

```
                                BRFCNT:: .WORD  0               ;STORAGE FOR BPCR VALUE.
                                CMDWRD:: .WORD  END             ;CONTAINS COMMAND WORD BEING EXECUTED PRESENTLY.
                                CMDSAV:: .WORD  END             ;SAVE LOCATION FOR CMD WORD DURING ERROR RECOVERY
                                PCMDWD:: .WORD  END             ;CONTAINS PREVOUS COMMAND WORD.
                                CMDLG:: .WORD   0               ;CURRENT COMMAND LOGGING CODE.
                                LENMSK:: .WORD  0               ;RANDOM WRITE LENGTH MASK, TO BE SET UP BY TESTS
                                RANB:: .WORD    153624          ;RANDOM # GENERATOR BASE.
                                RANS:: .WORD    32561           ;RANDOM # SAVE LOCATION.
                                TIME1:: .WORD   0               ;TIME COUNT 1.
                                TIME2:: .WORD   0               ;TIME COUNT 2.
                                JLOOP:: .WORD   0               ;JMP COMMAND LOOP COUNT.
                                JLOC::  .WORD   0               ;JMP COMMAND LOCATION COUNT.
                                PATERN:: .WORD  0               ;PATTERN SELECT CODE.
                                CTCC:: .WORD    0               ;CURRENT TERMINATION CLASS CODE.
                                R5SAVE:: .WORD  0               ;LOCATION FOR SAVING CURRENT DEVICE POINTER.
                                TSSREG:: .WORD  0               ;CURRENT STATUS REGISTER.
                                WTMFLG:: .WORD  0               ;WRITE TAPE MARK FLAG

                                ;       ERROR FLAG AREA, THESE FLAGS ARE CLEARED DURING INITIALIZATION AND
                                ;       AFTER EACH COMMAND IS COMPLETED.

                        00346   BGNFLG=.
                                RETRYC:: .WORD  0               ;# OF RECOVERY ATTEMPTS EXECUTED.
                                RPTCNT:: .BYTE  0               ;WRITE REPEAT ON SAME SPOT CNTR: 4 PER WRITE RETRY
                                WRTYFG:: .BYTE  0               ;WRITE RETRY ON SAME SPOT IN PROGRESS FLAG
                                WRTYER:: .BYTE  0               ;WRITE RETRY ON SAME SPOT ERROR FLAG
                                RECLOG:: .BYTE  0               ;RECORD COUNT HAS BEEN UPDATED FOR THIS RECORD.
                                ERLOG:: .BYTE   0               ;DATA BYTES AND ERRORS HAVE BEEN LOGGED FOR THIS RECORD.
                                RWERR:: .BYTE   0               ;READ/WRITE ERROR HAS OCCURED.
                                UNREC:: .BYTE   0               ;UNRECOVERABLE ERROR HAS OCCURED.
                                ERRREC:: .BYTE  0               ;ERROR RECOVERY MODE.
                                        .EVEN
                        003472  ENDERF=.


                                ;       ADDITIONAL FLAGS, THESE FLAGS ARE CLEARED DURING INITIALIZATION.

                                INTFLG:: .BLKW  4               ;INTERRUPT OCCURRED FLAGS FOR EACH DEVICE.
                                EOTFLG:: .BLKW  4               ;EOT/BOT FLAGS FOR EACH DEVICE (XSTATO).
                                BTPT::   .WORD  0               ;BAD TAPE SPOT POINTER TO BT0-BT3 VIA BTADDR
                                EXPBOT:: .BYTE  0               ;BOT IS EXPECTED, DO NOT ABORT ON BOT/FUNC RTI.
                                RANDOM:: .BYTE  0               ;RANDOM EVERYTHING FLAG.
                                VFYFLG:: .BYTE  0               ;SET DURING WRITE/VERIFY COMMAND.
                                RPTFLG:: .BYTE  0               ;PERFORMANCE REPORT HAS BEEN REQUESTED.
                                SWBFLG:: .BYTE  0               ;ENABLES SWAP BYTE FUNCTION WHEN NOT EQUAL TO ZERO.
                                IRE::   .BYTE   0               ;INHIBIT RESIDUAL FRAME COUNT ERROR REPORT.
                                DROPED:: .BYTE  0               ;CURRENT UNIT HAS BEEN DROPPED
                                T1SWB::  .BYTE  0               ;TEST1 SWAP BYTES FLAG
                                ALLEOT:: .BYTE  0               ;ALL UNITS @ EOT FLAG
                                ERSFLG:: .BYTE  0               ;ERASE FLAG:  DO ERASE AFTER A SPACE REV TO DELETE
                                                                ;BADLY WRITTEN RECORD.  1 TO 4 ERASES LEAVING
                                                                ;A 3 TO 12 INCH GAP MAY RESULT.
                                        .EVEN
                        003526  ENDFLG=.

                                ;       ADDITIONAL FLAGS, THESE FLAGS ARE CLEARED ONLY AFTER BEING CHECKED.
```

GLOBAL DATA SECTION

```
                                ST4FLG:: .BYTE  0               ;START FLAG - SET BY INIT CODE IF STARTING.
                                PWRFLG:: .BYTE  0               ;POWER FAILURE FLAG - SET ONLY DURING INIT.
                                TRAPD4:: .BYTE  0               ;TRAPED AT 4 FLAG
                                MISCFG:: .BYTE  0               ;MISCELLANEOUS FLAG
                                TSUNT:: .WORD   0               ;NUMBER OF THE UNIT UNDER TEST PLUS HSSP&BUF
                                TSNP::  .WORD   0               ;FOR PRINT OUT UNIT # ONLY

                                ;       OPERATOR FLAG SETTINGS PASSED BY DIAG. SUPERVISOR IN A 16 BIT WORD
                                ;       SEE GLOBAL EQUATES SECTION FOR FLAG BIT LIST

                                OPFLAG:: .WORD  0       ;READ ONLY OPERATOR FLAG WORD
                                        .EVEN

                                        ;THE FOLLOWING IS THE COMMAND SEQUENCE TABLE.  THE TABLE
                                        ;HAS DEFAULT VALUES AT PROGRAM LOAD AS SHOWN.  THESE VALUES
                                        ;CAN BE UPDATED BY A TEST OR BY OPERATOR INPUT.

                                CMDSEQ:: .WORD  SCH             ;SET CHARACTERISTICS.
                                        .WORD   CH.EAI
                                        .WORD   1
                                        .WORD   0
                                CMDSE2:: .WORD  RWD             ;REWIND.
                                        .WORD   1               ;BYTE COUNT.
                                        .WORD   1               ;ONCE.
                                        .WORD   RANP            ;PATTERN.
                                        .WORD   WRT             ;WRITE.
                                        .WORD   DATCNT          ;MAX BUFFER LENGTH.
                                        .WORD   32000.          ;32,000 RECORDS.
                                        .WORD   RANP            ;RANDOM PATTERN.
                                        .WORD   RDR             ;READ REV.
                                        .WORD   DATCNT          ;MAX BUFFER LENGTH.
                                        .WORD   32000.          ;32,000 RECORDS
                                        .WORD   RANP            ;RANDOM PATTERN.
                                        .WORD   RDF             ;READ FWD.
                                        .WORD   DATCNT          ;MAX BUFFER LENGTH.
                                        .WORD   32000.          ;32,000 RECORDS.
                                        .WORD   RANP            ;RANDOM PATTERN.
                                        .WORD   RWD             ;REWIND.
                                        .WORD   1               ;BYTE COUNT.
                                        .WORD   1               ;ONCE.
                                        .WORD   RANP            ;PATTERN.
                                        .BLKW   40.             ;EXTENSTION TO DOUBLE BUFFER SIZE
                                SEQEND:: .WORD  END             ;SOFT END OF SEQUENCE TABLE
                                        .WORD   END
                                        .WORD   END
                                        .WORD   END
                                        .WORD   END             ;HARD END OF SEQUENCE TABLE.
                                        ;THE FOLLOWING IS THE TSO5 COMMAND TABLE

                                CMD1BL:: .WORD  DRI             ;DRIVE INIT.
                                        .WORD   RDF             ;READ FORWARD.
                                        .WORD   RDR             ;READ REVERSE.
                                        .WORD   WRT             ;WRITE
                                        .WORD   WTV             ;WRITE/VERIFY.  (WRITE ALL RECORDS, RDR AND
                                                                ;CHECK DATA ON ALL RECORDS, RDF AND
                                                                ;CHECK DATA ON ALL RECORDS.)

                                        .WORD   SRF             ;SPACE "N" RECORDS FORWARD.
```

GLOBAL DATA SECTION

```
706 003766  104410                        .WORD   SPR             ;SPACE "N" RECORDS REVERSE.
707 003770  105401                        .WORD   RNR             ;READ NEXT REVERSE. I.E., SPACE FWD, READ REVERSE.
708 003772  125401                        .WORD   RNF             ;READ NEXT FORWARD, I.E., READ FORWARD, SPACE REVERSE.
709 003774  105001                        .WORD   RPF             ;READ PREVIOUS FORWARD. I.E., SPACE REVERSE, READ FORWARD
710 003776  125001                        .WORD   RPR             ;READ PREVIOUS REVERSE. I.E., READ REVERSE, SPACE FORWARD
711 004000  105005                        .WORD   WRR             ;WRITE RETRY.
712 004002  102010                        .WORD   RWD             ;REWIND.
713 004004  100012                        .WORD   MBR             ;MESSAGE BUFFER RELEASE
714 004006  100011                        .WORD   WTM             ;WRITE TAPE MARK
715 004010  101011                        .WORD   WTR             ;WRITE TAPE MARK RETRY.
716 004012  105010                        .WORD   SFF             ;SPACE "N" FILES FORWARD.
717 004014  105410                        .WORD   SFR             ;SPACE "N" FILES REVERSE.
718 004016  100017                        .WORD   GES             ;GET EXTENDED STATUS.
719 004020  100411                        .WORD   ERS             ;ERASE 3 INCHES OF TAPE.
720 004022  100412                        .WORD   UNL             ;REWIND AND UNLOAD.
721 004024  101012                        .WORD   CLN             ;CLEAR TAPE.
722 004026  140004                        .WORD   SCH             ;SET CHARACTERISTICS.
723 004030  100006                        .WORD   DIA             ;DIAGNOSTIC COMMAND.
724 004032  000040                        .WORD   JMP             ;JUMP TO THE NTH COMMAND IN THE SEQUENCE.
725 004034  000020                        .WORD   DLY             ;DELAY "N" MS.
726 004036  177777                        .WORD   END             ;END OF COMMAND TABLE
727
728                             ;       THE FOLLOWING TABLE CONTAINS THE ASCII FOR EACH COMMAND.
729
730 004040      104     122     111 CMDASC:: .ASCII /DRI/           ;DRIVE INIT.
731 004043      122     104     106         .ASCII  /RDF/           ;READ FORWARD.
732 004046      122     104     122         .ASCII  /RDR/           ;READ REVERSE.
733 004051      127     122     124         .ASCII  /WRT/           ;WRITE
734 004054      127     124     126         .ASCII  /WTV/           ;WRITE/VERIFY.  (WRITE ALL RECORDS, RDR AND CHECK DATA
735                                                                 ;ON ALL RECORDS, RDF AND CHECK DATA ON ALL RECORDS.)
736 004057      123     122     106         .ASCII  /SRF/           ;SPACE "N" RECORDS FORWARD.
737 004062      123     122     122         .ASCII  /SRR/           ;SPACE "N"  RECORDS REVERSE.
738 004065      122     116     122         .ASCII  /RNR/           ;READ NEXT REVERSE. I.E., SPACE FWD READ REVERSE.
739 004070      122     116     106         .ASCII  /RNF/           ;READ NEXT FORWARD, I.E., READ FORWARD, SPACE REVERSE.
740 004073      122     120     106         .ASCII  /RPF/           ;READ PREVIOUS FORWARD. IE., SPACE REVERSE, READ FORWARD
741 004076      122     120     122         .ASCII  /RPR/           ;READ PREVIOUS REVERSE. IE., READ REVERSE, SPACE FORWARD
742 004101      127     122     122         .ASCII  /WRR/           ;WRITE RETRY.
743 004104      122     127     104         .ASCII  /RWD/           ;REWIND.
744 004107      115     102     122         .ASCII  /MBR/           ;MESSAGE BUFFER RELEASE
745 004112      127     124     115         .ASCII  /WTM/           ;WRITE TAPE MARK
746 004115      127     124     122         .ASCII  /WTR/           ;WRITE TAPE MARK RETRY.
747 004120      123     106     106         .ASCII  /SFF/           ;SPACE "N" FILES FORWARD.
748 004123      123     106     122         .ASCII  /SFR/           ;SPACE "N" FILES REVERSE.
749 004126      107     105     123         .ASCII  /GES/           ;GET EXTENDED STATUS.
750 004131      105     122     123         .ASCII  /ERS/           ;ERASE 3 INCHES OF TAPE.
751 004134      125     116     114         .ASCII  /UNL/           ;REWIND AND UNLOAD.
752 004137      103     114     116         .ASCII  /CLN/           ;CLEAN TAPE.
753 004142      123     103     110         .ASCII  /SCH/           ;SET CHARACTERISTICS.  WHERE BRF=200, 40, 20, 0.
754                                                                 ;SEE TSV05/TSO5 PROGRAMMING SPECIFICATION FOR DESCRIPTION.
755 004145      104     111     101         .ASCII  /DIA/           ;DIAGNOSTICS.  SEE TSV05/TSO5 PROGRAMMING SPECIFICATION
756                                                                 ;FOR DESCRIPTION.  ODT MUST BE USED TO LOAD DIAGNOSTIC DATA
757                                                                 ;INTO THE WRITE BUFFER BEFORE THIS CMD IS ISSUED.
758 004150      112     115     120         .ASCII  /JMP/           ;JUMP TO THE NTH COMMAND IN THE COMMAND
759                                                                 ;SEQUENCE TABLE, WHERE N IS DEFINED IN
760                                                                 ;THE # OF OPERATIONS.
761 004153      104     114     131         .ASCII  /DLY/           ;DELAY "N" MS, WHERE N IS DEFINED IN
762                                                                 ;THE # OF OPERATIONS.
```

GLOBAL DATA SECTION

```
763 004156      105     116     104             .ASCII  /END/           ;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
783                                     ;
784                                     ; FORMAT STATEMENTS USED IN PRINT CALLS
785                                     ;
786
787                                             .NLIST  BEX
788
789 004162      045     116     045  CODELM:: .ASCIZ /%N%AUNIT %D1%A TSO5 CODE LEVEL %O3%N%N/
790 004231      045     116     045  SWSET:: .ASCIZ  /%N%AUNIT %D1%A TSO5 SWITCH SETTINGS %O3%N%N/
791                                             .EVEN
792 004306      130     130     130  HALTM:: .ASCIZ  /XXX CMD - TYPE <CR> TO CONTINUE/
793 004346      103     115     104  CMDPKM:: .ASCIZ /CMD PACKET ADR NOT ON MODULO 4 BOUNDARY: RELOAD!/
794                                             .EVEN
795 004430      104     101     124  WTVERM:: .ASCIZ /DATA COMPARE ERROR/
796 004453      116     117     040  TOERM:: .ASCIZ  /NO TSV05 RESPONSE/
797 004475      125     116     104  SCERM:: .ASCIZ  /UNDEFINED SPEC COND/
798 004521      122     106     103  RFCERM:: .ASCIZ /RFC NON ZERO/
799 004536      124     123     126  NSSRM:: .ASCIZ  /TSV05 NOT READY/
800 004556      122     105     124  RLEXM:: .ASCIZ  /RETRY LIMIT EXCEEDED/
801 004603      104     122     111  ATTNM:: .ASCIZ  /DRIVE OFF LINE/
802 004622      106     125     116  FUNRM:: .ASCIZ  /FUNCTION REJECT/
803 004642      106     101     124  FATSM:: .ASCIZ  /FATAL SUBSYSTEM ERROR/
804 004670      116     117     040  NOINTM:: .ASCIZ /NO INTERRUPT/
805 004705      124     101     120  TSAM::  .ASCIZ  /TAPE STATUS ALERT/
806 004727      124     117     117  TOOMM:: .ASCIZ  /TOO MANY INTERRUPTS/
807 004753      103     101     120  RNYM::  .ASCIZ  /CAPSTAN RUNAWAY-GET STATUS RESULTS:/
808 005017      122     105     103  RERM::  .ASCIZ  /RECOVERABLE ERROR/
809 005041      125     116     122  URERM:: .ASCIZ  /UNRECOVERABLE ERROR/
810 005065      045     116     045  DROPDM:: .ASCIZ /%N%ADROPPED UNIT %D1%N/
811 005114      045     116     045  AUDRPM:: .ASCIZ /%N%AALL UNITS DROPPED%N%N/
812 005146      045     116     045  AUDRUN:: .ASCIZ /%N%ADIAGNOSTIC ONLY SUPPORTS ONE CONTROLLER%N%N/
813 005226      045     116     045  DTAER2:: .ASCIZ "%N%ABYTE:%D4%S2%AWAS:%B8%S2%AS/B:%B8%N"
814 005275      045     104     064  DTAER3:: .ASCIZ "%D4%A BYTES IN ERROR OUT OF %D4%N"
815 005337      045     101     116  DTAER4:: .ASCIZ /%ANO DATA READ%N/
816 005360      045     101     122  DTAER5:: .ASCIZ /%ARECORD TOO LONG: >%D4%A BYTES%N/
817 005422      045     101     122  NURTY1:: .ASCIZ /%ARECOVERED ON RETRY #%D2%N/
818 005456      045     101     104  OFLINM:: .ASCIZ /%ADRIVE %D1%A OFF LINE%N/
819 005507      045     101     107  GETSTM:: .ASCIZ /%AGET STATUS CMD RESULTS:%N/
820 005543      045     116     045  NODEV:: .ASCII  /%N%ABUS TRAP AT %O6%N/
821 005570      045     101     111             .ASCIZ  /%AINTERFACE BAD OR TSD8 NOT SET TO ABOVE ADDRESS%N/
822 005653      040     052     052  UNIWLK: .ASCIZ  / *****TAPE IS WRITE LOCKED AND WILL CAUSE ERRORS*****
823 005741      045     116     000  CRLF::  .ASCIZ  /%N/
824 005744      045     116     045  CRLFSP:: .ASCIZ /%N%S7/
825                                             .LIST   BEX
```

GLOBAL TEXT SECTION

```
826                                             .EVEN
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 005752                                       BGNMSG  DTAERM
    005752                              DTAERM::
842 005752                              DATERM::PRINTB  @STAER1,TSNP,PASCNT(R5),,RECCNT(R5)
    005752  016546  003376                                                          MOV     RECCNT(R5),-(SP)
    005756  016546  003326                                                          MOV     PASCNT(R5),-(SP)
    005762  013746  003534                                                          MOV     TSNP,-(SP)
    005766  012746  006436                                                          MOV     @STAER1,-(SP)
    005772  012746  000004                                                          MOV     #4,-(SP)
    005776  010600                                                                  MOV     SP,R0
    006000  104414                                                                  TRAP    C$PNTB
    006002  062706  000012                                                          ADD     #12,SP
843 006006                                      PRINTB  @STAER7
    006006  012746  006530                                                          MOV     @STAER7,-(SP)
    006012  012746  000001                                                          MOV     #1,-(SP)
    006016  010600                                                                  MOV     SP,R0
    006020  104414                                                                  TRAP    C$PNTB
    006022  062706  000004                                                          ADD     #4,SP
844 006026  010237  007066                      MOV     R2,RECRED               ;SAVE R2
845 006032  010337  003436                      MOV     R3,TIME1                ;SAVE R3
846 006036  010437  003440                      MOV     R4,TIME2                ;SAVE R4
847 006042  004737  010064                      JSR     PC,RECTAP                       ;RETRIEVE RECORD READ
848 006046  013702  007066                      MOV     RECRED,R2               ;RESTORE R2
849 006052  010337  007066                      MOV     R3,RECRED               ;SAVE RECORD READ
850 006056  013703  003436                      MOV     TIME1,R3                ;RESTORE R3
851 006062  013704  003440                      MOV     TIME2,R4                ;RESTORE R4
852 006066                                      PRINTB  @STAER6,RECRED          ;PRINT RECORD READ
    006066  013746  007066                                                          MOV     RECRED,-(SP)
    006072  012746  006562                                                          MOV     @STAER6,-(SP)
    006076  012746  000002                                                          MOV     #2,-(SP)
    006102  010600                                                                  MOV     SP,R0
    006104  104414                                                                  TRAP    C$PNTB
    006106  062706  000006                                                          ADD     #6,SP
853 006112                                      EXIT    MSG
    006112  000167                                                                  .WORD   J$JMP
    006114  000000                                                                  .WORD   L10002-2-.
854
855                                             .EVEN
856 006116
    006116                                      ENDMSG
                                        L10002:
    006116  104423                                                                 TRAP    C$MSG
857
858 006120                                      BGNMSG  STAERM
    006120                              STAERM::
859 006120                              STAERM::PRINTB  @STAER1,TSNP,PASCNT(R5),RECCNT(R5)
    006120  016546  003376                                                          MOV     RECCNT(R5),-(SP)
    006124  016546  003326                                                          MOV     PASCNT(R5),-(SP)
    006130  013746  003534                                                          MOV     TSNP,-(SP)
```

GLOBAL ERROR REPORT SECTION

```
        006134  012746  006436                                                  MOV     #STAER1,-(SP)
        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  013702  002330          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  004737  010064          JSR     PC,RECTAP                       ;THEN RETRIEVE
    867 006216  010337  010064          MOV     R3,RECTAP               ;AND
    868 006222                          PRINTB  #STAER6,RECRED          ;TYPE RECORD READ
        006222  013746  007066                                                  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$PNTX
        006262  062706  000004                                                  ADD     #4,SP
    870 006266                          PRINTX  #STAER3,CMDPKT,@TSDB(R5),MSGPKT+MS.RFC,TSSREG,CTCC
        006266  013746  003450                                                  MOV     CTCC,-(SP)
        006272  013746  003454                                                  MOV     TSSREG,-(SP)
        006276  013746  002360                                                  MOV     MSGPKT+MS.RFC,-(SP)
        006302  017546  002514                                                  MOV     @TSDB(R5),-(SP)
        006306  013746  002330                                                  MOV     CMDPKT,-(SP)
        006312  012746  006675                                                  MOV     #STAER3,-(SP)
        006316  012746  000006                                                  MOV     #6,-(SP)
        006322  010600                                                          MOV     SP,R0
        006324  104415                                                          TRAP    C$PNTX
        006326  062706  000016                                                  ADD     #16,SP
    871 006332                          PRINTX  #STAER4,CMDPKT+2,CMDPKT+4,CMDPKT+6
        006332  013746  002336                                                  MOV     CMDPKT+6,-(SP)
        006336  013746  002334                                                  MOV     CMDPKT+4,-(SP)
        006342  013746  002332                                                  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
4
        006366  013746  002372                                                  MOV     MSGPKT+MS.XS4,-(SP)
        006372  013746  002370                                                  MOV     MSGPKT+MS.XS3,-(SP)
        006376  013746  002366                                                  MOV     MSGPKT+MS.XS2,-(SP)
        006402  013746  002364                                                  MOV     MSGPKT+MS.XS1,-(SP)
        006406  013746  002362                                                  MOV     MSGPKT+MS.XS0,-(SP)
```

GLOBAL ERROR REPORT SECTION

```
        006412  012746  006753                                                  MOV     @STAER5,-(SP)
        006416  012746  000006                                                  MOV     @6,-(SP)
        006422  010600                                                          MOV     SP,R0
        006424  104415                                                          TRAP    C$PNTX
        006426  062706  000016                                                  ADD     @16,SP
    873 006432                          EXIT    MSG
        006432  000167                                                          .WORD   J$JMP
        006434  000432                                                          .WORD   L10003-.
    874
    875                                 .NLIST  BEX
    876 006436      045     101     130 STAER1: .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  /@06@S2@06@S2@06@S2@06@S2@D1@N/
    882 006733      045     117     066 STAER4: .ASCII  /@06@N/
    883 006740      045     117     066         .ASCII  /@06@N/
    884 006745      045     117     066         .ASCIZ  /@06@N/
    885 006753      045     101     130 STAER5: .ASCII  /@AXST0@S4@AXST1@S4@AXST2@S4@AXST3@S4@AXST4@N/
    886 007027      045     117     066         .ASCIZ  /@06@S2@06@S2@06@S2@06@S2@06@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:
```

GLOBAL SUBROUTINES SECTION

```
                                        ;       JSR     PC,FIRSTU
                                        ;       JSR     PC,SOFINIT
                                        ;       BCS     CONTINUE
                                        ;       ERRDF                   ;REPORT FATAL ERROR
                                        ;
                                        ;
                                        SOFINIT.:
                                                                        ; (SAVREG) SAVE THE REGISTERS
007072  012775  000000  002524                  MOV     #0,@TSSR(R5)    ; DO THE INIT.
007100  004737  012700                        JSR     PC,WSSR         ;WAIT FOR UNIT TO BE READY
007104  012703  000550                        MOV     #360.,R3
007110  004737  007204                2$:     JSR     PC,WAITF        ; WAIT FOR SSR
007114  103416                               BCS     3$
007116                                       DELAY   250
007116  012727  000250                                                                    MOV     #250.,(PC)+
007122  000000                                                                          .WORD   0
007124  013727  002116                                                                  MOV     L$DLY,(PC)+
007130  000000                                                                          .WORD   0
007132  005367  177772                                                                  DEC     -6(PC)
007136  001375                                                                          BNE     .-4
007140  005367  177756                                                                  DEC     -22(PC)
007144  001367                                                                          BNE     .-20
007146  005303                               DEC     R3
007150  001357                               BNE     2$
007152  017500  002524                3$:     MOV     @TSSR(R5),R0            ;GET THE TSSR REGISTER
007156  010004                               MOV     R0,R4                   ;TSSR CONTENTS
007160  042704  176277                       BIC     #^C<TS.A17!TS.A16!TS.OFL>,R4
007164  052704  002200                       BIS     #TS.SSR!TS.NBA,R4       ;R4 HAS EXPECTED CONTENTS
007170  020400                               CMP     R4,R0                   ;ONLY EXPECTED BITS SET ?
007172  001402                               BEQ     5$                      ;BRANCH IF OKAY
007174  000241                               CLC                             ;CLEAR THE CARRY FOR ERROR
007176  000401                               BR      10$                     ;GO TO EXIT
007200  000261                5$:     SEC                                     ;SET THE CARRY BIT
007202  000207                10$:    RTS     PC                              ;RETURN TO CALLER

                                        ;
                                        ; SUBROUTINE TO WAIT FOR THE SUBSYSTEM READY FLAG
                                        ;
                                        ;INPUTS:
                                        ;
                                        ;       R5      CURRENT UNIT NUMBER
                                        ;
                                        ;
                                        ;OUTPUTS:
                                        ;
                                        ;       R0      CONTENTS OF LAST TSSR READ
                                        ;       CARRY   SET - READY BIT SET
                                        ;               CLR - TIMEOUT WAITING FOR READY
                                        ;
007204                                  WAITF:: BREAK                   ; DO A SUPVSR BREAK FIRST.
007204  104422                                                                          TRAP    C$BRK
007206  012746  005670                        MOV     #3000.,-(SP)    ; 300 MSEC TIMER.
007212  017500  002524                2$.     MOV     @TSSR(R5),R0    ;READ THE TSSR REGISTER
007216  105700                               TSTB    R0              ;TEST FOR READY BIT SET
007220  100420                               BMI     3$              ; EXIT ON STOP FLAG.
007222                                       DELAY   25              ; WAIT
```

```
        007222  012727  000025                                                  MOV     #25,(PC)+
        007226  000000                                                          .WORD   0
        007230  013727  002116                                                  MOV     L$DLY,(PC)+
        007234  000000                                                          .WORD   0
        007236  005367  177772                                                  DEC     -6(PC)
        007242  001375                                                          BNE     .-4
        007244  005367  177756                                                  DEC     -22(PC)
        007250  001367                                                          BNE     .-20
   969  007252  005316                  DEC     (SP)            ;REDUCE DELAY COUNT
   970  007254  001356                  BNE     2$              ;RETRY UNTIL TIMER EXPIRES
   971  007256  000241                  CLC                     ; C = 0, CONTROLLER STILL RUNNING...
   972  007260  000401                  BR      4$              ;...OR HUNG-UP AFTER 300 MSEC.
   973  007262  000261          3$:     SEC                     ; C = 1, CONTROLLER IS STOPPED.
   974  007264  005326          4$:     DEC     (SP)+           ;RESTORE STACK WITHOUT CHANGING CARRY BIT
   975  007266  000207                  RTS     PC
   976
   977
   978
   979                          ;+
   980                          ;
   981                          ;ROUTINE TO ISSUE A WRITE CHARACTERISTICS COMMAND AND CHECK FEATURES
   982                          ;
   983                          ;INPUT:
   984                          ;
   985                          ;       R4      ADDRESS OF COMMAND PACKET
   986                          ;       R5      CURRENT UNIT NUMBER
   987                          ;       REQUIRES A CALL TO SOFINIT BE DONE PREVIOUSLY
   988                          ;
   989                          ;OUTPUT:
   990                          ;
   991                          ;       R0      TSSR CONTENTS
   992                          ;       CARRY   SET   WRITE CHARACTERISTICS COMMAND OK
   993                          ;               CLR - WRITE CHARACTERISTICS FAILED
   994                          ;
   995                          ;IMPLICIT OUTPUT:
   996                          ;
   997                          ;       SOFTWARE SWITCHES SET AS FOLLOWS:
   998                          ;               EXTFEA = EXTENDED FEATURES PRESENT
   999                          ;               BENBSW = BUFFER ENABLE SWITCH ON OR OFF
  1000                          ;
  1001                          ;
  1002                          ;SIDE EFFECTS:
  1003                          ;
  1004                          ;
  1005                          ;-
  1006
  1007  007270                  WRTCHK::
  1008  007270  010475  002514  10$:     MOV     R4,@TSDB(R5)            ;SEND OUT COMMAND
  1009  007274  004737  007204          JSR     PC,WAITF                ;WAIT FOR SSR
  1010  007300  103401                  BCS     40$                     ;BR, IF SSR IS SET AND OK
  1011  007302  000421                  BR      60$                     ;BR IF TROUBLE CARRY = CLEAR
  1012  007304  005724          40$:    TST     (R4)+                   ;STEP IT
  1013  007306  011402                  MOV     (R4),R2                 ;POINT TO WRT CHARA DATA PACKET
  1014  007310  011203                  MOV     (R2),R3                 ;GET ADDRESS OF MESSAGE BUFFER
  1015  007312  032763  000200  000012  BIT     #X2.EFE,MS.XS2(R3)      ;EXTENDED FEATURES BIT SET?
  1016  007320  001402                  BEQ     45$                     ;BR IF NO
  1017  007322  005237  002322          INC     EXTFEA                  ;SET EXTENDED FEATURES SW SWITCH
```

GLOBAL SUBROUTINES SECTION

```
1018 007326                            45$:
1019 007326  032763  000100  000012          BIT     #X2.BFE,MS.XS2(R3)      ;BUFFER ENABLE SWITCH SET
1020 007334  001402                          BEQ     50$                     ;BR, IF SWITCH NOT SET
1021 007336  005237  002324                  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                                   ;ROUTINE TO CHECK WRITE LOCK CONDITION
1032                                   ;
1033                                   ;INPUT:
1034                                   ;
1035                                   ;       R4      ADDRESS OF COMMAND PACKET
1036                                   ;       R5      CURRENT UNIT NUMBER
1037                                   ;
1038                                   ;-
1039 007356                            WLKCHK::
1040 007356  010475  002514            10$:  MOV     R4,@TSDB(R5)            ;SEND OUT COMMAND
1041 007362  004737  007204                  JSR     PC,WAITF                ;WAIT FOR SSR
1042 007366  103401                          BCS     40$                     ;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
     007410  104456                                                                  TRAP    C$ERHRD
     007412  000001                                                                  .WORD   1
     007414  005653                                                                  .WORD   UNIWLK
     007416  000000                                                                  .WORD   0
1050 007420  004737  017200                  JSR     PC,DROPU                ;DROP IT
1051 007424  000402                          BR      60$                     ;EXIT WITH CARRY=0
1052 007426  000261                    55$:  SEC                             ;SET CARRY NO TROUBLE
1053 007430  000401                          BR      70$                     ;EXIT
1054 007432  000241                    60$:  CLC                             ;CARRY CLEAR = ERROR
1055 007434                            70$:
1056 007434  000207                          RTS     PC                      ;RETURN
1057
1058
1059                                   ;+
1060                                   ;
1061                                   ;ROUTINE TO ISSUE A WRITE CHARACTERISTICS COMMAND
1062                                   ;
1063                                   ;INPUT:
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                                   ;
```

```
GLOBAL SUBROUTINES SECTION

                                        ;       R0      TSSR CONTENTS
                                        ;       CARRY   SET - WRITE CHARACTERISTICS COMMAND OK
                                        ;               CLR   WRITE CHARACTERISTICS FAILED
                                        ;
                                        ;IMPLICIT OUTPUT:
                                        ;
                                        ;
                                        ;SIDE EFFECTS:
                                        ;
                                        ;
                                        ;-
                                        WRTCHR::
007436                                  10$:    MOV     R4,@TSDB(R5)            ;SEND OUT COMMAND
007436  010475  002514                  
007442  004737  007204                          JSR     PC,WAITF                ;WAIT FOR SSR
007446  103401                                  BCS     50$                     ;BR, IF SSR IS SET AND OK
007450  000402                                  BR      60$                     ;BR IF TROUBLE CARRY = CLEAR
007452                                  50$:
007452  000261                                  SEC                             ;SET CARRY NO TROUBLE
007454  000401                                  BR      70$                     ;EXIT
007456  000241                          60$:    CLC                             ;CARRY CLEAR = ERROR
007460  017500  002524                  70$:    MOV     @TSSR(R5),R0            ;RETURN TSSR CONTENTS
007464  000207                                  RTS     PC                      ;RETURN

                                        ;+
                                        ;
                                        ;ROUTINE TO DO SET UP OF RUNNING CONDITIONS
                                        ;
                                        ;INPUTS:
                                        ;
                                        ;       R5      CURRENT UNIT NUMBER
                                        ;
                                        ;
                                        ;OUTPUTS:
                                        ;
                                        ;
                                        ;CALLING SEQUENCE:
                                        ;       JSR     PC,FIRSTU
                                        ;       JSR     PC,SOFINIT
                                        ;       BCS     CONTINUE
                                        ;       ERRDF                   ;REPORT FATAL ERROR
                                        ;       JSR     PC,MDSET
                                        ;
                                        ;
007466                                  MDSET:: BREAK                           ; DO A SUPVSR BREAK FIRST.
007466  104422                                                                          TRAP    C$BRK
007470  004737  007766                          JSR     PC,SETDEF               ;RESTORE DEFAULT
007474  004737  007356                          JSR     PC,WLKCHK               ;CHECK WRITE LOCK
007500  103416                                  BCS     1$                      ;C=1 IS O.K.
007502                                          DELAY   1                       ;WAIT
007502  012727  000001                                                                  MOV     #1,(PC)+
007506  000000                                                                          .WORD   0
007510  013727  002116                                                                  MOV     L$DLY,(PC)+
007514  000000                                                                          .WORD   0
```

GLOBAL SUBROUTINES SECTION

```
        007516  005367  177772                                                          DEC     6(PC)
        007522  001375                                                                  BNE     .-4
        007524  005367  177756                                                          DEC     -22(PC)
        007530  001367                                                                  BNE     .-20
1123    007532                          BREAK                   ;BREAK TO SUPER
        007532  104422                                                                  TRAP    C$BRK
1124    007534                          DOCLN                   ;DO CLEAN AND ABORT
        007534  104444                                                                  TRAP    C$DCLN
1125    007536  005737  002312      1$: TST     TS1MD           ;RUN IN DEFAULT MODE?
1126    007542  001064                  BNE     10$             ;YES,RETURN
1127    007544  004737  007766          JSR     PC,SETDEF       ;RESTORE DEFAULT
1128    007550  004737  007270          JSR     PC,WRTCHK       ;GO DO SWITCH CHECK
1129    007554  005737  002320          TST     HSSW            ;DO WE RUN AT 100IPS?
1130    007560  001415                  BEQ     3$              ;NO
1131    007562  052737  000040  003532  BIS     #EF.HSS,TSUNT   ;YES,SET THE BIT
1132    007570  005737  002322          TST     EXTFEA          ;ARE WE SET?
1133    007574  001002                  BNE     2$              ;YES
1134    007576  004737  007724          JSR     PC,INVRT        ;INVERT THE SWITCH
1135    007602  004737  007766      2$: JSR     PC,SETDEF       ;NOW SET THE MODES
1136    007606  004737  007436          JSR     PC,WRTCHR       ;DO IT
1137    007612  000443                  BR      11$
1138    007614  005737  002316      3$: TST     WTBUF           ;RUN WITH WRITE BUFFERING?
1139    007620  001415                  BEQ     5$              ;NO
1140    007622  052737  000030  003532  BIS     #EF.RWB,TSUNT   ;YES SET THE BITS
1141    007630  005737  002322          TST     EXTFEA          ;ARE WE SET?
1142    007634  001002                  BNE     4$              ;YES
1143    007636  004737  007724          JSR     PC,INVRT        ;INVERT THE SWITCH
1144    007642  004737  007766      4$: JSR     PC,SETDEF       ;NOW SET THE MODES
1145    007646  004737  007436          JSR     PC,WRTCHR       ;DO IT
1146    007652  000423                  BR      11$
1147    007654  005737  002314      5$: TST     RDBUF           ;RUN WITH READ BUFFERING?
1148    007660  001415                  BEQ     10$             ;NO
1149    007662  052737  000020  003532  BIS     #EF.RBO,TSUNT   ;YES SET THE BITS
1150    007670  005737  002322          TST     EXTFEA          ;ARE WE SET?
1151    007674  001002                  BNE     6$              ;YES
1152    007676  004737  007724          JSR     PC,INVRT        ;INVERT THE SWITCH
1153    007702  004737  007766      6$: JSR     PC,SETDEF       ;NOW SET THE MODES
1154    007706  004737  007436          JSR     PC,WRTCHR       ;DO IT
1155    007712  000403                  BR      11$
1156
1157    007714  013737  003532  002504 10$: MOV     TSUNT,SCHBK+10  ;AND UNIT #
1158
1159    007722  000207              11$: RTS     PC              ;RETURN
1160
1161
1162                                    ;
1163                                    ; SUBROUTINE TO INVERT SENSE OF EXT'D FEATURES SWITCH
1164                                    ;
1165                                    ;INPUTS:
1166                                    ;
1167                                    ;
1168                                    ;
1169                                    ;OUTPUTS:
1170                                    ;
1171
1172
1173    007724                          INVRT::
```

```
GLOBAL SUBROUTINES SECTION

1174 007724  012737  140006  002330          MOV     #WSM,CMDPKT+CP.CMD      ;WRT SUB SYS MEM
1175 007732  012737  002506  002332          MOV     #WSMBK,CMDPKT+CP.ADL    ;MSG BUF ADDR
1176 007740  012737  000006  002336          MOV     #6,CMDPKT+CP.CNT        ;BYTE COUNT
1177 007746  012737  100010  002506          MOV     #100010,WSMBK           ;INVERT THE SWITCH
1178 007754  012704  002330                  MOV     #CMDPKT,R4              ;
1179 007760  004737  007436                  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  010137  002330                  MOV     R1,CMDPKT+CP.CMD        ;SET UP COMMAND
1196 007776  012737  002474  002332          MOV     #SCHBK,CMDPKT+CP.ADL    ;SET UP ADR LO TO POINT TO MSG BUF(MSGPKO)
1197 010004  012737  000012  002336          MOV     #SCHCNT,CMDPKT+CP.CNT   ;SET BUFFER EXTENT
1198 010012  012737  000040  002502          MOV     #DFTSCH,SCHBK+6         ;STORE CHARACTERISTIC CODE IN SCH BLOCK.
1199 010020  013737  003532  002504          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
     010034                          TS5IN0::
1208 010034  005237  003472                  INC     INTFLG                  ;SET INTERRUPT OCCURRED FLAG.
1209 010040                                  ENDSRV
     010040                          L10004:
     010040  000002                                                          RTI
1210
1211 010042                                  BGNSRV  TS5IN1
     010042                          TS5IN1::
1212 010042  005237  003474                  INC     INTFLG+2        ;SET INTERRUPT OCCURRED FLAG.
1213 010046                                  ENDSRV
     010046                          L10005:
     010046  000002                                                          RTI
1214
1215 010050                                  BGNSRV  TS5IN2
     010050                          TS5IN2::
1216 010050  005237  003476                  INC     INTFLG+4        ;SET INTERRUPT OCCURRED FLAG.
1217 010054                                  ENDSRV
     010054                          L10006:
     010054  000002                                                          RTI
1218
1219 010056                                  BGNSRV  TS5IN3
     010056                          TS5IN3::
1220 010056  005237  003500                  INC     INTFLG+6        ;SFT INTERRUPT OCCURRED FLAG.
```

GLOBAL SUBROUTINES SECTION

```
1221 010062                                ENDSRV
     010062                          L10007:
     010062  000002                                                              RTI
1222
1223                                ;       SUBROUTINE TO RETRIEVE RECORD COUNT READ FROM TAPE FOR ERROR
1224                                ;       PRINTS.
1225                                ;       INPUTS:
1226                                ;       OUTPUTS:  R3 = RECORD COUNT READ
1227                                ;       REGISTERS:  R2, R3, R4
1228                                ;       CALLS:
1229
1230 010064  032737  000400  003420 RECTAP::BIT     @MOD.CO,CMDWRD                  ;READ REV FETCH
1231 010072  001430                        BEQ     50001$
1232 010074  013702  002360                MOV     MSGPKT+MS.RFC,R2                ;FIND LAST READ AD.
1233 010100  063702  003410                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  105737  003520                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                                ;       SUBROUTINE TO STORE A  SET CHARACTERISTIC COMMAND AS
1261                                ;       THE FIRST ENTRY IN THE SEQUENCE TABLE.
1262                                ;       INPUTS:
1263                                ;       OUTPUTS:
1264                                ;       REGISTERS:
1265                                ;       CALLS:
1266
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                                ;       SUBROUTINE TO STORE A REWIND COMMAND IN THE SEQUENCE TABLE
```

GLOBAL SUBROUTINES SECTION

```
1276                                    ;       INPUTS:
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  004737  011172                    JSR     PC,SETUP        ;GO SETUP THE COMMAND BLOCK.
1299 010244                            50010$: BREAK                   ; DO A SUPVSR BREAK FIRST.
     010244  104422                                                                          TRAP    C$BRK
1300 010246  023737  003412  003414            CMP     NCNT,NCNT1      ;WHILE THERE ARE RECORDS REMAINING:
1301 010254  002116                            BGE     50011$
1302 010256  004737  011064                    JSR     PC,CMDAC        ;STORE CMD ASCII IN ERROR MESSAGE.
1303 010262  105737  003515                    TSTB    RANDOM          ;IF IN RANDOM MODE:
1304 010266  001435                            BEQ     50012$
1305 010270  023727  003420  104005            CMP     CMDWRD,#WRT     ;IF CMD IS A WRITE THEN:
1306 010276  001031                            BNE     50013$
1307 010300  105737  003516                    TSTB    VFYFLG          ;IF DATA IS NOT TO BE VERIFIED THEN:
1308 010304  001026                            BNE     50014$
1309 010306  063737  003434  003432            ADD     RANS,RANB       ;LET RANB := RANB + RANS  ;GENERATE
1310 010314  063737  003432  003434            ADD     RANB,RANS       ;LET RANS := RANS + RANB  ;RANDOM
1311 010322  013737  003434  003416            MOV     RANS,BRFCNT     ;LET BRFCNT := RANS        ;LENGTH
1312 010330  043737  003430  003416            BIC     LENMSK,BRFCNT   ;MASK RANDOM LENGTH.
1313 010336  023727  003416  000022            CMP     BRFCNT,#18.     ;DO NOT ALLOW BYTE COUNT OF LESS THAN 18
1314 010344  002003                            BGE     50015$
1315 010346  012737  000022  003416            MOV     #18.,BRFCNT     ;CHANGE COUNT OF 0-17 TO 18.
1316
1317 010354                            50015$:
1318 010354  013737  003416  002336            MOV     BRFCNT,CMDPKT+CP.CNT    ;MOVE BRF TO CMD PACKET.
1319
1320 010362                            50014$:
1321
1322 010362                            50013$:
1323
1324 010362                            50012$:
1325 010362  004737  010524                    JSR     PC,EXSUB                ;ISSUE CMD TO ALL,AWAIT INTS,CHECK STATUS.
1326 010366  004737  017500                    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  004737  017102                    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     500178
1333 010412  032737  000400  003420          BIT     #MOD.CO,CMDWRD          ;IF CMD IS REVERSE THEN:
1334 010420  001406                          BEQ     500208
1335 010422  032765  000002  003502          BIT     #X0.BOT,EOTFLG(R5)      ;IF NOT AT BOT THEN:
1336 010430  001001                          BNE     500218
1337 010432  005002                          CLR     R2                  ;LET R2 := #0 ;CLEAR EOT/BOT FLAG.
1338
1339 010434                          500218:
1340 010434  000411                          BR      500228                          ;ELSE IF CMD IS NOT REVERSE:
1341 010436                          500208:
1342 010436  032765  000001  003502          BIT     #X0.EOT,EOTFLG(R5)
1343 010444  001404                          BEQ     500238
1344 010446  032737  000001  003420          BIT     #LMD.CO,CMDWRD
1345 010454  001001                          BNE     500248
1346 010456                          500238:
1347                                                 ;IF NOT AT EOT OR NOT A MOTION CMD THEN:
1348 010456  005002                          CLR     R2              ;CLEAR EOT/BOT FLAG.
1349
1350 010460                          500248:
1351
1352 010460                          500228:
1353 010460  004737  017150                  JSR     PC,NEXTU                ;FIND NEXT UNIT
1354 010464  000746                          BR      500168
1355 010466                          500178:
1356 010466  020227  000001                  CMP     R2,#1                   ;IF ALL UNIT ARE AT EOT/BOT THEN:
1357 010472  001001                          BNE     500258
1358 010474  000412                          BR      EXARTN          ;RETURN WITH R2 = #1.
1359
1360 010476                          500258:
1361 010476  005237  003412                  INC     NCNT        ;LET NCNT := NCNT + #1      ;UPDATE RECORD COUNT.
1362 010502  013737  003420  003424          MOV     CMDWRD,PCMDWD           ;SAVE PREVIOUS COMMAND WORD.
1363
1364 010510  000655                          BR      500108
1365 010512                          500118:
1366 010512  004737  016066                  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      500068
1370 010520                          500078:
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:          EXCUTE,GOWAIT,NEXTU,FIRSTU.
1382
1383 010524  004737  017102          EXSUB:: JSR     PC,FIRSTU               ;SET UP FOR FIRST UNIT.
1384 010530                          500268:
1385 010530  026527  002604  177777          CMP     DEVTBL(R5),#END         ;WHILE THERE ARE MORE DEVICES:
1386 010536  001465                          BEQ     500278
1387 010540  032737  000400  003420          BIT     #MOD.CO,CMDWRD      ;IF CMD IS REVERSE THEN:
1388 010546  001421                          BEQ     500308
```

```
1389 010550  032765  000002  003502          BIT     #X0.BOT,EOTFLG(R5)      ;IF NOT AT BOT
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  105737  003524                  TSTB    ALLEOT                  ;AND ALL OTHERS AT EOT
1394 010574  001402                          BEQ     50033$
1395 010576  004737  012054                  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$:
1400 010604  004737  012054                  JSR     PC,EXCUTE                       ;NOT AT EOT, EXEC REV CMD
1401
1402 010610                          50034$:
1403
1404 010610                          50031$:
1405 010610  000435                          BR      50035$                  ;ELSE IF CMD IS NOT REVERSE:
1406 010612                          50030$:
1407 010612  023727  003426  000002          CMP     CMDLG,#2
1408 010620  001011                          BNE     50036$
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  016537  002616  003512          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  032737  000001  003420          BIT     #CMD.CO,CMDWRD
1419 010662  001003                          BNE     50040$
1420 010664                          50037$:
1421                                                                 ;IF NOT AT EOT OR NOT A MOTION CMD THEN:
1422 010664  004737  012054                  JSR     PC,EXCUTE               ;ISSUE CMD TO TSO5
1423
1424 010670  000405                          BR      50041$
1425 010672                          50040$:
1426 010672  105737  003524                  TSTB    ALLEOT          ;IFB ALLEOT NE #0 THEN
1427 010676  001402                          BEQ     50042$
1428 010700  004737  012054                  JSR     PC,EXCUTE
1429
1430 010704                          50042$:
1431
1432 010704                          50041$:
1433
1434 010704                          50035$:
1435 010704  004737  017150                  JSR     PC,NEXTU        ;FIND NEXT UNIT IN TEST CYCLE.
1436
1437 010710  000707                          BR      50026$
1438 010712                          50027$:
1439 010712  105737  003517                  TSTB    RPTFLG          ;IF REPORT HAS BEEN REQUESTED THEN:
1440 010716  001403                          BEQ     50043$
1441 010720  105037  003517                  CLRB    RPTFLG                  ;CLR THE FLAG,
1442 010724                                  DORPT                   ;PRINT THE PERFORMANCE REPORT.
     010724  104424                                                          TRAP    C$DRPT
1443 010726                          50043$:
1444 010726  004737  017102                  JSR     PC,FIRSTU               ;SET UP FOR FIRST UNIT.
```

```
1445 010732                                  50044$:
1446 010732  026527  002604  177777                CMP     DEVTBL(R5),#END   ;WHILE THERE ARE MORE DEVICES:
1447 010740  001450                                BEQ     50045$
1448 010742  032737  000400  003420                BIT     #MOD.CO,CMDWRD      ;IF CMD IS REVERSE THEN:
1449 010750  001421                                BEQ     50046$
1450 010752  032765  000002  003502                BIT     #XO.BOT,EOTFLG(R5)  ;IF NOT AT BOT
1451 010760  001014                                BNE     50047$
1452 010762  032765  000001  003502                BIT     #XC.EOT,EOTFLG(R5)      ;BUT IF AT EOT
1453 010770  0014 6                                BEQ     50050$
1454 010772  105737  003524                        TSTB    ALLEOT                          ;AND ALL OTHERS AT EOT
1455 010776  001402                                BEQ     50051$
1456 011000  004737  012364                        JSR     PC,GOWAIT                       ;THEN WAIT FOR CMD END
1457                                                                                        ;IF NOT ALL AT EOT, DO NOT WAIT
1458 011004                                  50051$:
1459                                                                                        ;NOT AT BOT, AND NOT AT EOT
1460 011004  000402                                BR      50052$
1461 011006                                  50050$:
1462 011006  004737  012364                        JSR     PC,GOWAIT                       ;WAIT FOR INT,CHECK STAT
1463
1464 011012                                  50052$:
1465
1466
1467 011012                                  50047$:
1468 011012  000420                                BR      50053$                          ;ELSE IF CMD IS FORWARD:
1469 011014                                  50046$:
1470 011014  032765  000001  003502                BIT     #XO.EOT,EOTFLG(R5)
1471 011022  001404                                BEQ     50054$
1472 011024  032737  000001  003420                BIT     #CMD.CO,CMDWRD
1473 011032  001003                                BNE     50055$
1474 011034                                  50054$:
1475                                                                    ;IF NOT AT EOT OR NOT A MOTION CMD THEN:
1476 011034  004737  012364                        JSR     PC,GOWAIT                   ;WAIT FOR INT,CHECK STATUS.
1477
1478 011040  000405                                BR      50056$
1479 011042                                  50055$:
1480 011042  105737  003524                        TSTB    ALLEOT              ;IFB ALLEOT NE #0 THEN
1481 011046  001402                                BEQ     50057$
1482 011050  004737  012364                        JSR     PC,GOWAIT
1483
1484 011054                                  50057$:
1485
1486 011054                                  50056$:
1487
1488 011054                                  50053$:
1489 011054  004737  017150                        JSR     PC,NEXTU        ;FIND NEXT UNIT IN TEST CYCLE.
1490
1491 011060  000724                                BR      50044$
1492 011062                                  50045$:
1493 011062  000207                                RTS     PC                          ;RETURN.
1494
1495                                         ;       THIS SUBROUTINE STORES THE ASCII FOR THE CURRENT COMMAND AND PREVIOUS
1496                                         ;       COMMAND IN THE STANDARD ERROR MESSAGE.  ON ENTRY LOCATION CMDWRD
1497                                         ;       CONTAINS CURRENT CMD AND LOCATION PCMDWD CONTAINS PREVIOUS CMD.
1498                                         ;       INPUTS:
1499                                         ;       OUTPUTS:
1500                                         ;       REGISTERS:      R3, R4.
1501                                         ;       CALLS:          GCMDA
```

GLOBAL SUBROUTINES SECTION

```
1502
1503 011064  013704  003420          CMDAC:: MOV     CMDWRD,R4;LET R4 := CMDWRD              ;R4 = CMD BINARY.
1504 011070  004737  011136                  JSR     PC,GCMDA                ;GET CMD ASCII.
1505 011074  112337  006440                  MOVB    (R3)+,STAER1+2          ;MOVE CMD ASCII
1506 011100  112337  006441                  MOVB    (R3)+,STAER1+3          ;
1507 011104  111337  006442                  MOVB    (R3),STAER1+4           ;INTO MSG.
1508 011110  013704  003424                  MOV     PCMDWD,R4                       ;R4 = PREVIOUS CMD BINARY.
1509 011114  004737  011136                  JSR     PC,GCMDA                ;GET CMD ASCII.
1510 011120  112337  006554                  MOVB    (R3)+,STAER7+24                 ;MOVE CMD ASCII
1511 011124  112337  006555                  MOVB    (R3)+,STAER7+25
1512 011130  111337  006556                  MOVB    (R3),STAER7+26                  ;INTO MSG.
1513 011134  000207                          RTS     PC                      ;RETURN. GO EXECUTE NEXT FUNCTION.
1514
1515
1516                                  ;       SUBROUTINE TO FIND THE ASCII EQUIVILENT 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                          50060$:
1525 011140  026304  003752                  CMP     CMDTBL(R3),R4           ;UNTIL CURRENT CMD IS FOUND:
1526 011144  001403                          BEQ     50061$
1527 011146  062703  000002                  ADD     #2,R3     ;LET R3 := R3 + 02            ;SEARCH CMD TABLE.
1528 011152  000772                          BR      50060$
1529 011154                          50061$:
1530 011154  010304                          MOV     R3,R4   ;LET R4 := R3
1531 011156  006203                          ASR     R3                      ;POINT TO ASCII FOR THAT COMMAND
1532 011160  000240                          NOP
1533 011162  060403                          ADD     R4,R3
1534 011164  062703  004040                  ADD     #CMDASC,R3
1535 011170  000207                          RTS     PC                      ;RETURN.
1536
1537                                  ;       THIS SUBROUTINE LOADS THE TS05 COMMAND PACKET FROM ONE
1538                                  ;       ENTRY IN THE SEQUENCE TABLE.
1539                                  ;       INPUTS:
1540                                  ;       OUTPUTS:
1541                                  ;       REGISTERS:      R2, R3.
1542                                  ;       CALLS:          GENPAT.
1543
1544 011172  005037  003426          SETUP:: CLR     CMDLG                   ;CLR CMD LOGGING CODE(DISABLES LOGGING)
1545 011176  012137  002330                  MOV     (R1)+,CMDPKT            ;LOAD THE COMMAND WORD.
1546 011202  011137  002336                  MOV     (R1),CMDPKT+CP.CNT      ;LOAD THE BYTE/RECORD/FILE COUNT.
1547 011206  011137  003416                  MOV     (R1),BRFCNT             ;SAVE BRF FOR THIS COMMAND.
1548 011212  013702  002330                  MOV     CMDPKT,R2               ;GET CMD.
1549 011216  042702  177740                  BIC     #NCMD.C,R2              ;CLR ALL BUT CMD BITS.
1550 011222  010203                          MOV     R2,R3                   ;SAVE IT TWICE.
1551 011224  162703  000010                  SUB     #CMD.C3,R3              ;POSITION COMMAND?
1552 011230  001003                          BNE     2$                      ;BR IF NOT.
1553 011232  011137  002332                  MOV     (R1),CMDPKT+2           ;MOVE BPCR IN 2ND PKT WORD FOR POSITION CMD.
1554 011236  000464                          BR      3$
1555 011240  023727  002330  100011  2$:     CMP     CMDPKT,#WTM             ;IF CMD IS A WRITE TAPE MARK THEN:
1556 011246  001003                          BNE     50062$
1557 011250  012737  000002  003426          MOV     #2,CMDLG                  ;WTM LOGGING CODE IS 2.
1558
```

GLOBAL SUBROUTINES SECTION

```
1559 011256                                  50062$:
1560 011256  010203                                 MOV     R2,R3
1561 011260  162703  000001                         SUB     #CMD.CO,R3              ;IS IT A READ?
1562 011264  001017                                 BNE     1$                      ;BR IF NOT.
1563 011266  013737  003410  002332                 MOV     DATARD,CMDPKT+CP.ADL    ;IF SO, LOAD THE BUFFER ADDR.
1564 011274  032737  000400  002330                 BIT     #MOD.CO,CMDPKT          ;IF CMD IS A READ REV THEN:
1565 011302  001404                                 BEQ     50063$
1566 011304  012737  000004  003426                 MOV     #4,CMDLG                ;LOGGING CODE IS 4.
1567                                                                                 ;ELSE   IF CMD IS A READ FWD:
1568 011312  000403                                 BR      50064$
1569 011314                                  50063$:
1570 011314  012737  000006  003426                 MOV     #6,CMDLG                        ;LOGGING CODE IS 6.
1571
1572 011322                                  50064$:
1573 011322  000432                                 BR      3$                      ;CONTINUE.
1574 011324  010203                          1$:    MOV     R2,R3                   ;IS IT
1575 011326  162703  000004                         SUB     #CMD.C2,R3              ;A SET CHARACTERISTICS CMD?
1576 011332  001014                                 BNE     4$                      ;BR IF NOT.
1577 011334  012737  002474  002332                 MOV     #SCHBK,CMDPKT+CP.ADL    ;SET UP ADR LO FOR SET CHAR.
1578 011342  012737  000012  002336                 MOV     #SCHCNT,CMDPKT+CP.CNT   ;SET BUFFER EXTENT
1579 011350  011137  002502                         MOV     (R1),SCHBK+6            ;STORE CHARACTERISTIC CODE IN SCH BLOCK.
1580 011354  013737  003532  002504                 MOV     TSUNT,SCHBK+10          ;UNIT #
1581 011362  000412                                 BR      3$                      ;CONTINUE.
1582 011364  010203                          4$:    MOV     R2,R3                   ;IS IT
1583 011366  162703  000006                         SUB     #CMD.C1!CMD.C2,R3       ;A DIAGNOSTIC (DIA) CMD?
1584 011372  001006                                 BNE     3$                      ;BR IF NOT.
1585 011374  012737  000020  002336                 MOV     #DIACNT,CMDPKT+CP.CNT   ;LOAD BUFFER EXTENT.
1586 011402  012737  003406  002332                 MOV     #DIABLK,CMDPKT+CP.ADL   ;LOAD BUFFER ADR LOW.
1587 011410  005721                          3$:    TST     (R1)+                   ;POINT TO N (NUMBER OF TIMES TO EXECUTE THIS INS
1588 011412  012137  003414                         MOV     (R1)+,NCNT1             ;SAVE NUMBER OF OPERATIONS
1589 011416  005037  003412                         CLR     NCNT                    ;CLEAR OPERATION COUNTER.
1590 011422  012137  003446                         MOV     (R1)+,PATERN            ;SAVE PATTERN CODE FOR CURRENT CMD.
1591 011426  010203                                 MOV     R2,R3                   ;IS IT
1592 011430  162703  000005                         SUB     #CMD.CO!CMD.C2,R3       ;A WRITE?
1593 011434  001010                                 BNE     5$                      ;BR IF NOT.
1594 011436  013737  003406  002332                 MOV     DATAWT,CMDPKT+CP.ADL    ;LOAD WRITE BUFFER LO ORDER.
1595 011444  004737  011556                         JSR     PC,GENPAT               ;GO GENERATE THE WRITE PATTERN.
1596 011450  012737  000002  003426                 MOV     #2,CMDLG                ;WRITE LOGGING CODE IS 2.
1597 011456  032737  000100  002330          5$:    BIT     #VFY.C,CMDPKT           ;IF DATA VERIFICATION IS REQUIRED:
1598 011464  001407                                 BEQ     50065$
1599 011466  112737  000001  003516                 MOVB    #1,VFYFLG               ;SET VERIFY FLAG.
1600 011474  042737  000100  002330                 BIC     #VFY.C,CMDPKT           ;CLEAR VERIFY BIT(NOT USED BY HARDWARE).
1601                                                                                 ;IF DATA VERIFICATION IS NOT REQUIRED:
1602 011502  000402                                 BR      50066$
1603 011504                                  50065$:
1604 011504  105037  003516                         CLRB    VFYFLG                  ;CLR VERIFY FLAG.
1605
1606 011510                                  50066$:
1607 011510  013737  003420  003424                 MOV     CMDWRD,PCMDWD           ;SAVE PREVIOUS CMD WORD.
1608 011516  013737  002330  003420                 MOV     CMDPKT,CMDWRD           ;SAVE PRESENT CMD WORD.
1609 011524  105737  003520                         TSTB    SWBFLG                  ;IF SWAP BYTES IS ENABLED:
1610 011530  001403                                 BEQ     50067$
1611 011532  052737  010000  002330                 BIS     #SWB.C,CMDPKT           ;SET SWAP BIT IN COMMAND.
1612
1613 011540                                  50067$:
1614 011540  042737  004000  002330                 BIC     #BRF.C,CMDPKT           ;CLR BRF BIT (INTERNAL ONLY).
1615 011546  013737  002330  003422                 MOV     CMDPKT,CMDSAV           ;SAVE 1ST WORD OF COMMAND PACKET.
```

GLOBAL SUBROUTINES SECTION

```
1616 011554  000207                    RTS     PC                      ;RETURN.
1617
1618                                ;       THIS SUBROUTINE SETS UP AND CALLS THE APPROPRIATE SUBROUTINE TO GENERATE
1619                                .       THE DESIRED PATTERN FOR THE WRITE AND WRITE/VERIFY COMMANDS.
1620                                ;       INPUTS:
1621                                ;       OUTPUTS:
1622                                ;       REGISTERS:      R2, R3, R4.
1623                                ;       CALLS:          PATR0   PATR7
1624
1625 011556  013703  003446        GENPAT::MOV     PATERN,R3       ;SETUP PATTERN ROUTINE POINTER
1626 011562  006303                        ASL     R3
1627 011564  013704  003416                MOV     BRFCNT,R4       ;SET LENGTH OF WRITE BFR
1628 011570  005204                        INC     R4
1629 011572  042704  000001                BIC     #1,R4           ;ROUNDED UP TO NEXT WORD
1630 011576  162704  000002                SUB     #2,R4           ;WITH FIRST WORD RESERVED
1631 011602  013702  003406                MOV     DATAWT,R2       ;FOR RECORD COUNT
1632 011606  062702  000002                ADD     #2,R2
1633 011612  004773  011620                JSR     PC,@PATTBL(R3)  ;GO GENERATE THE APPROPRIATE PATTERN.
1634 011616  000207                        RTS     PC              ;RETURN TO SETUP SUBROUTINE.
1635
1636                                        ;TS05 WRITE PATTERN LOOKUP TABLE.  USED TO JSR TO THE
1637                                        ;CORRECT DATA PATTERN GENERATING ROUTINE.
1638
1639 011620  011642                PATTBL: PATR0
1640 011622  011700                        PATR1
1641 011624  011720                        PATR2
1642 011626  011730                        PATR3
1643 011630  011754                        PATR4
1644 011632  011766                        PATR5
1645 011634  012000                        PATR6
1646 011636  012020                        PATR7
1647 011640  012052                        PATR8
1648
1649                                        ;INCREMENTING PATTERN.  0 - 377.
1650
1651 011642  012703  000400        PATR0:: MOV     #400,R3;LET R3 := #400
1652 011646  162704  000002        1$:     SUB     #2,R4;LET R4 := R4   #2 ;DECREMENT WORD COUNT.
1653 011652  100411                        BMI     2$              ;BR IF DONE.
1654 011654  010322                        MOV     R3,(R2)+        ;STORE DATA WORD.
1655 011656  062703  001002                ADD     #1002,R3        ;UPDATE PATTERN.
1656 011662  020327  001000                CMP     R3,#1000        ;IF PATTERN HAS WRAPPED AROUND THEN:
1657 011666  001002                        BNE     50070$
1658 011670  012703  000400                MOV     #400,R3           ;INIT THE PATTERN AGAIN.
1659
1660 011674                        50070$:
1661 011674  000764                        BR      1$              ;DO IT AGAIN.
1662
1663 011676  000207                2$:     RTS     PC              ;RETURN.
1664
1665                                        ;ALL ONE'S PATTERN.
1666
1667 011700  012703  177777        PATR1:: MOV     #-1,R3          ;ALL ONES PATTERN;.
1668 011704  162704  000002        ZROPAT: SUB     #2,R4           ;DECREMENT BYTE COUNT.
1669 011710  100402                        BMI     1$              ;DONE?,BR IF YES.
1670 011712  010322                        MOV     R3,(R2)+        ;IF NOT LOAD NEXT BYTE WITH PATTERN.
1671 011714  000773                        BR      ZROPAT          ;DO IT AGAIN.
1672
```

GLOBAL SUBROUTINES SECTION

```
1673 011716  000207                  1$:     RTS     PC              ;RETURN.
1674
1675                                         ;ALL ZEROES PATTERN.
1676
1677 011720  005003                  PATR2:: CLR     R3              ;CLR PATTERN REGISTER.
1678 011722  004737  011704                  JSR     PC,ZROPAT       ;GO GENERATE IT.
1679 011726  000207                          RTS     PC              ;RETURN.
1680
1681                                         ;ONE BIT WALKING FROM R TO L IN A FIELD OF ZEROES.
1682
1683 011730  012703  000401          PATR3:: MOV     #401,R3         ;INIT PATTERN REGISTER.
1684 011734  162704  000002          WLKZRO: SUB     #2,R4;LET R4 := R4 - #2 ;DECREMENT WORD COUNT.
1685 011740  100404                          BMI     1$              ;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  00C771                          BR      WLKZRO          ;DO IT AGAIN.
1690 011752  000207                  1$:     RTS     PC              ;RETURN.
1691
1692                                         ;ZERO BIT WALKING FROM R TO L IN A FIELD OF 1'S.
1693
1694 011754  012703  177376          PATR4:: MOV     #177376,R3      ;INIT PATTERN REGISTER.
1695 011760  004737  011734                  JSR     PC,WLKZRO       ;GO GENERATE ;IT.
1696 011764  000207                          RTS     PC              ;RETURN.
1697
1698                                         ;ALTERNATING ONE AND ZERO BITS WITH ALTERNATE BYTES
1699                                         ;COMPLEMENTED.
1700
1701 011766  012703  125125          PATR5:: MOV     #125125,R3      ;INIT PATTERN REGISTER.
1702 011772  004737  011704                  JSR     PC,ZROPAT       ;GO GENERATE IT.
1703 011776  000207                          RTS     PC              ;RETURN.
1704
1705                                         ;ALTERNATING BYTES OF 000 AND 377.
1706
1707 012000  012703  177400          PATR6:: MOV     #177400,R3      ;INIT PATTERN REGISTER.
1708 012004  162704  000002          1$:     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  063737  003434  003432          ADD     RANS,RANB
1719 012034  063737  003432  003434          ADD     RANB,RANS       ;GET NEW #.
1720 012042  013722  003434                  MOV     RANS,(R2)+      ;SAVE #.
1721 012046  000764                          BR      PATR7           ;CONTINUE.
1722 012050  000207                  GIT:    RTS     PC              ;RETURN
1723
1724                                 ;       NO PATTERN GENERATION.
1725
1726 012052  000207                  PATR8:: RTS     PC              ;RETURN.
1727
1728                                 ;       THIS SUBROUTINE INITIATES TSO5 COMMAND EXECUTION
1729                                 ;       AND CHECKS FOR TSO5 RESPONSE.
```

GLOBAL SUBROUTINES SECTION

```
1730                                    ;       INPUTS:
1731                                    ;       OUTPUTS:
1732                                    ;       REGISTERS:      R2, R3.
1733                                    ;       CALLS:          DROPU, MOVMSG, FIRSTU, NEXTU, WSSR.
1734
1735 012054  012737  177777  003436  EXCUTE:: MOV     #1,TIME1               ;INIT TIMEOUT COUNTER.
1736 012062                          50071$: ;REPEAT                         ;WAIT
1737 012062  005337  003436                  DEC     TIME1                  ;UPDATE TIMEOUT COUNTER.
1738 012066  005737  003436                  TST     TIME1                  ;IF TIMED OUT:
1739 012072  001011                          BNE     50072$
1740 012074  004737  012734                  JSR     PC,MOVMSG              ;MOVE CURRENT PACKET MSG.
1741 012100                                  ERRDF   2,NSSRM,STAERM         ;REPORT TS05 NOT READY
     012100  104455                                                                  TRAP    C$ERDF
     012102  000002                                                                  .WORD   2
     012104  004536                                                                  .WORD   NSSRM
     012106  006120                                                                  .WORD   STAERM
1742 012110  004737  017200                  JSR     PC,DROPU               ;DROP THE UNIT.
1743 012114  000522                          BR      EXCRTN                 ;RETURN.
1744
1745 012116                          50072$:
1746 012116  032775  000200  002524          BIT     #TS.SSR,@TSSR(R5)      ;WAIT UNTIL DEVICE IS READY.
1747 012124  001756                          BEQ     50071$
1748 012126  023727  003420  140004          CMP     CMDWRD,#SCH            ;IF WE ARE DOING A SET CHAR CMD THEN:
1749 012134  001022                          BNE     50073$
1750 012136  010537  003452                  MOV     R5,R5SAVE                ;SAVE CURRENT DEVICE POINTER.
1751 012142  004737  017102                  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  004737  012700                  JSR     PC,WSSR                  ;WAIT FOR UNIT READY OR TIME OUT.
1756 012162  004737  017150                  JSR     PC,NEXTU                 ;FIND NEXT UNIT.
1757
1758 012166  000767                          BR      50074$
1759 012170                          50075$:
1760 012170  013705  003452                  MOV     R5SAVE,R5                ;RESTORE CURRENT DEVICE POINTER.
1761 012174  016537  002544  002474          MOV     MSGPKA(R5),SCHBK         ;SET UP ADR OF MSG PKT IN SCH BLOCK.
1762
1763 012202                          50073$:
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$:
1774 012230  105737  002212                  TSTB    DINT                   ;ARE INTERRUPTS DISABLED.
1775 012234  001023                          BNE     1$                     ;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  017537  002524  003454          MOV     @TSSR(R5),TSSREG       ;FREEZE THE CURRENT STATUS REG FOR PRINT
1779 012254                                  ERRDF   15,TOOMM,STAERM  ;REPORT TOO MANY INTERRUPTS.
     012254  104455                                                                  TRAP    C$ERDF
     012256  000017                                                                  .WORD   15
     012260  004727                                                                  .WORD   TOOMM
```

GLOBAL SUBROUTINES SECTION

```
      012262  006120                                                          .WORD   STAERM
1780  012264  004737  017200                JSR     PC,DROPU                          ;DROP THE UNIT
1781  012270  000434                       BR      EXCRTN                    ;RETURN   UNIT HAS BEEN DROPPED.
1782
1783  012272                        50100$:
1784  012272  005065  003472                CLR     INTFLG(R5)                ;CLR INTERRUPT FLAG FOR THIS DEV.
1785  012276  052737  000200  002330        BIS     #IE.C,CMDPKT              ;SET INT ENABLE BIT.
1786  012304  105737  003471          1$:   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  004737  012734                JSR     PC,MOVMSG                 ;MOVE CURRENT MESSAGE PACKET TO COMMON.
1797  012346                                ERRDF   3,TOERM,STAERM            ;REPORT NO TSO5 RESPONSE.
      012346  104455                                                                  TRAP    C$ERDF
      012350  000003                                                                  .WORD   3
      012352  004453                                                                  .WORD   TOERM
      012354  006120                                                                  .WORD   STAERM
1798  012356  004737  017200                JSR     PC,DROPU                  ;DROP THE UNIT
1799
1800  012362                        50102$:
1801  012362  000207                EXCRTN: RTS     PC                        ;RETURN.
1802
1803                                ;       THIS SUBROUTINE WAITS FOR THE TSO5 INERRUPT OR DONE BIT TO SET AND ALLOWS THE
1804                                ;       OPERATOR TO TRANSFER CONROL 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 NESSASARY.
1807                                ;       INPUTS:
1808                                ;       OUTPUTS:
1809                                ;       REGISTERS:      R2, R3.
1810                                ;       CALLS:          DROPU, MOVMSG, RECUD, CHKERR, LOG, CLRERR.
1811
1812  012364  012737  177777  003436  GOWAIT:: MOV    #-1,TIME1                 ;INIT TIME OUT COUNTER.
1813  012372                        50103$: ;REPEAT                           ;REPEAT UNTIL INTERRUPT OCCURES:
1814  012372                                BREAK                             ;GO TO THE SUPER TO ALLOW TTY INPUT.
      012372  104422                                                                  TRAP    C$BRK
1815  012374  023727  003420  102010        CMP     CMDWRD,#RWD               ;IF COMMAND WAS REWIND THEN:
1816  012402  001014                       BNE     50104$                                                  #
1817  012404                                DELAY   10.                       ;WAIT  EXTRA MSECS EACH LOOP.
      012404  012727  000012                                                          MOV     #10.,(PC)+
      012410  000000                                                                  .WORD   0
      012412  013727  002116                                                          MOV     L$DLY,(PC)+
      012416  000000                                                                  .WORD   0
      012420  005367  177772                                                          DEC     -6(PC)
      012424  001375                                                                  BNE     . 4
      012426  005367  177756                                                          DEC      22(PC)
      012432  001367                                                                  BNE     .-20
1818  012434                        50104$:
1819  012434  023727  003420  105010        CMP     CMDWRD,#SFF       IF CMDWRD EQ #SFF OR CMDWRD EQ #SFR THEN
1820  012442  001404                       BEQ     50105$
1821  012444  023727  003420  105410        CMP     CMDWRD,#SFR
1822  012452  001014                       BNE     50106$
```

GLOBAL SUBROUTINES SECTION

```
1823 012454                            50105$:
1824 012454                                    DELAY   12.             ;ADD DELAY FOR SPACE TAPE MARK COMMANDS
     012454  012727  000014                                                    MOV     #12.,(PC)+
     012460  000000                                                           .WORD   0
     012462  013727  002116                                                    MOV     L$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$:
1826 012504  105737  002212                    TSTB    DINT                    ;IF INTERRUPTS ARE ENABLED.
1827 012510  001003                            BNE     50107$
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  005337  003436                    DEC     TIME1           ;UPDATE TIMEOUT COUNTER.
1839 012540  005702                            TST     R2              ;REPEAT UNTIL INTERRUPT OR READY OCCURES.
1840 012542  001003                            BNE     50111$
1841 012544  005737  003436                    TST     TIME1
1842 012550  001310                            BNE     50103$
1843 012552                            50111$:
1844 012552  005737  003436                    TST     TIME1                   ;IF TIME OUT HAS OCCURRED:
1845 012556  001022                            BNE     50112$
1846 012560  016577  003376  170620            MOV     RECCNT(R5),@DATAWT
1847 012566  005377  170614                    DEC     @DATAWT
1848 012572  004737  012734                    JSR     PC,MOVMSG       ;MOVE CURRENT MSG PACKET TO COMMON AREA.
1849 012576                                    ERRDF   4,NOINTM,STAERM ;REPORT NO INTERRUPT.
     012576  104455                                                            TRAP    C$ERDF
     012600  000004                                                           .WORD   4
     012602  004670                                                           .WORD   NOINTM
     012604  006120                                                           .WORD   STAERM
1850 012606  004737  017200                    JSR     PC,DROPU                ;DROP THE UNIT.
1851 012612  012703  003472                    MOV     #ENDERF,R3      ;LET R3 := #ENDERF
1852 012616  004737  012664                    JSR     PC,CLRERR               ;CLEAR ALL ERROR FLAGS
1853
1854 012622  000417                            BR      50113$
1855 012624                            50112$:
1856 012624  004737  012734                    JSR     PC,MOVMSG       ;MOVE CURRENT MSG. PACKET TO COMMON AREA.
1857 012630  004737  013020                    JSR     PC,RECUD        ;UPDATE THE RECORD COUNT.
1858 012634  004737  013210                    JSR     PC,CHKERR       ;CHECK FOR STATUS ERRORS.
1859 012640  105737  003463                    TSTB    WRTYFG          ;IFB WRTYFG EQ #0 THEN
1860 012644  001006                            BNE     50114$
1861 012646  004737  015566                    JSR     PC,LOG          ;LOG BYTES AND ERRORS.
1862 012652  012703  003472                    MOV     #ENDERF,R3      ;LET R3 := #ENDERF
1863 012656  004737  012664                    JSR     PC,CLRERR       ;CLEAR ALL ERROR FLAGS
1864
1865 012662                            50114$:
1866
1867 012662                            50113$:
```

GLOBAL SUBROUTINES SECTION

```
1868 012662  000207                          RTS     PC                      ;RETURN IF DONE.
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::
1891 012700  012737  177777  003436          MOV     #-1,TIME1               ;INIT TIMEOUT COUNTER.
1892 012706                         50116$:                                   ;REPEAT UNTIL DEV READY OR TIMEOUT:
1893 012706                                 BREAK                             ;BREAK TO THE SUPERVISOR.
     012706  104422                                                                       TRAP    C$BRK
1894 012710  005337  003436                 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  005737  003436                 TST     TIME1
1898 012730  001366                         BNE     50116$
1899 012732                         50117$:
1900 012732  000207                         RTS     PC                      ;RETURN.
1901
1902
1903
1904                                 ;       SUBROUTINE TO MOVE THE CURRENT MESSAGE PACKET TO THE COMMON AREA AND
1905                                 ;       TO UPDATE THE CURRENT TERMINATION CLASS CODE.
1906                                 ;       INPUTS:
1907                                 ;       OUTPUTS:
1908                                 ;       REGISTERS:      R2, R3.
1909                                 ;       CALLS:
1910
1911 012734  017537  002524  003454 MOVMSG::MOV     @TSSR(R5),TSSREG        ;FREEZE THE STATUS REG CONTENTS
1912 012742  013702  003454                 MOV     TSSREG,R2               ;EXTRACT THE TERMINATION CLASS CODE.
1913 012746  042702  177761                 BIC     #TSC.TCC,R2
1914 012752  010237  003450                 MOV     R2,CTCC                 ;AND SAVE IT
1915 012756  006237  003450                 ASR     CTCC
1916 012762  016503  002544                 MOV     MSGPKA(R5),R3           ;ADR OF THIS DEVICE'S MSG.
1917 012766  005002                         CLR     R2                              ;CLR COUNTER.
1918 012770                         50120$:
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
```

GLOBAL SUBROUTINES SECTION

```
1924 013006  000770                          BR      50120$
1925 013010                          50121$:
1926 013010  013737  002362  003502          MOV     MSGPKT+MS.XSO,EOTFLG     ;MOVE XSTATO T  FOT FLAG.
1927 013016  000207                          RTS     PC
1928
1929                                 ;       SUBROUTINE TO ADJUST THE RECORD COUNT.
1930                                 ;       INPUTS:
1931                                 ;       OUTPUTS:
1932                                 ;       REGISTERS:
1933                                 ;       CALLS:
1934
1935 013020  105737  003465          RECUD:: TSTB    RECLOG           ;IF RECORD HAS NOT BEEN LOGGED:
1936 013024  001070                          BNE     50122$
1937 013026  005365  003376                  DEC     RECCNT(R5)         ;LET RECCNT(R5) := RECCNT(R5)   #1
1938 013032  032737  000001  003450          BIT     #BIT0,CTCC       ;IF TAPE MOVED
1939 013040  001057                          BNE     50123$
1940 013042  032737  100000  002366          BIT     #X2.OPM,MSGPKT+MS.XS2
1941 013050  001453                          BEQ     50123$
1942 013052  105237  003465                  INCB    RECLOG                   ;SET RECORD LOGGED.
1943 013056  023727  003420  102010          CMP     CMDWRD,#RWD              ;IF THIS IS A REWIND CMD:
1944 013064  001003                          BNE     50124$
1945 013066  005065  003376                  CLR     RECCNT(R5)               ;CLEAR RECORD COUNT.
1946
1947 013072  000442                          BR      50125$
1948 013074                          50124$:
1949 013074  032737  004000  003420          BIT     #BRF.C,CMDWRD            ;IF BRF USED, UPDATE RECORD COUNT.
1950 013102  001436                          BEQ     50126$
1951 013104  032737  000400  003420          BIT     #MOD.CO,CMDWRD             ;IF A FORWARD CMD:
1952 013112  001007                          BNE     50127$
1953 013114  032737  000400  003424          BIT     #MOD.CO,PCMDWD             ;IF PREV CMD WAS A FWD ALSO:
1954 013122  001002                          BNE     50130$
1955 013124  005265  003376                  INC     RECCNT(R5)                 ;INCREMENT RECORD COUNT.
1956
1957 013130                          50130$:
1958                                                                         ;IF REVERSE CMD:
1959 013130  000423                          BR      50131$
1960 013132                          50127$:
1961 013132  032737  000400  003424          BIT     #MOD.CO,PCMDWD           ;IF PREVIOUS CMD WAS A REV ALSO:
1962 013140  001417                          BEQ     50132$
1963 013142  032765  000002  003502          BIT     #XO.BOT,EOTFLG(R5)       ;WHEN NOT AT BOT THEN
1964 013150  001013                          BNE     50133$
1965 013152  105737  003471                  TSTB    ERRREC                    ;CHECK THE ERROR RETRY INDICATOR
1966 013156  001406                          BEQ     2$                        ;BR, IF WE ARE NOT NOW IN ERROR RETRY
1967 013160  105737  003516                  TSTB    VFYFLG                    ;CHECK THE WRITE VERIFY INDICATOR
1968 013164  001403                          BEQ     2$                        ;BR, IF WE ARE NOT IN WRT/VFY MODE
1969 013166  105737  003465                  TSTB    RECLOG                    ;CHECK IF THIS RECORD HAS BEEN CO NTED
1970 013172  001002                          BNE     10$                       ;BR, IF HAVE ALREADY BUMPED RECORD CNTR.
1971 013174  005365  003376          2$:     DEC     RECCNT(R5)                ;DECREMENT RECORD COUNT.
1972 013200                          10$:
1973
1974 013200                          50133$:
1975
1976 013200                          50132$:
1977
1978 013200                          50131$:
1979
1980
```

GLOBAL SUBROUTINES SECTION

```
1981 013200                          50126$:
1982
1983 013200                          50125$:
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  032737  100000  003454  CHKERR:: BIT     @TS.SC,TSSREG             ;IF SPECIAL COND STATUS IS SET THEN:
2002 013216  001441                          BEQ     50134$
2003 013220  023727  003450  000002          CMP     CTCC,@2                     ;IF TCC IS NOT 2 THEN:
2004 013226  001405                          BEQ     50135$
2005 013230  105737  003471                  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  032737  004000  003454          BIT     @TS.NXM,TSSREG            ;WHEN NON-EXISTANT MEMO
2013 013250  001004                          BNE     50137$
2014 013252  032737  040000  003454          BIT     @TS.UPE,TSSREG
2015 013260  001412                          BEQ     50140$
2016 013262                          50137$:
2017 013262  032737  100000  002366          BIT     @X2.OPM,MSGPKT+MS.XS2           ;AND TAPE NOT MOVED
2018 013270  001003                          BNE     50141$
2019 013272  012702  000005                  MOV     @5,R2                           ;SET TCC5 INDEX
2020
2021 013276  000402                          BR      50142$
2022 013300                          50141$:
2023 013300  012702  000004                  MOV     @4,R2                   ;TAPE MOVED, SET TCC4 INDEX
2024
2025 013304                          50142$:
2026
2027 013304  000402                          BR      50143$
2028 013306                          50140$:
2029 013306  013702  003450                  MOV     CTCC,R2                         ;SET DETECTED TCC INDEX
2030
2031 013312                          50143$:
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  032737  004000  003420          BIT     @BRF.C,CMDWRD           ;IF BRF IS USED IN THIS CMD THEN:
```

GLOBAL SUBROUTINES SECTION

```
2038 013330  001422                        BEQ     50145$
2039 013332  005737  002360                TST     MSGPKT+MS.RFC           ;IF THERE IS AN RFC THEN:
2040 013336  001417                        BEQ     50146$
2041 013340  105737  003515                TSTB    RANDOM          ;IFB RANDOM EQ 00 ORB VFYFLG NE 00 THEN
2042 013344  001403                        BEQ     50147$
2043 013346  105737  003516                TSTB    VFYFLG
2044 013352  001411                        BEQ     50150$
2045 013354                        50147$:
2046                                                                ;IF NOT IN RANDOM OR IF CMD IS WTV:
2047 013354  105737  003521                TSTB    IRE                     ;IF RFC ERROR REPORTS ARE ALLOWED:
2048 013360  001006                        BNE     50151$
2049 013362  005265  003556                INC     HRDCNT(R5)              ;UPDATE HARD ERROR COUNT
2050 013366                                ERRHRD  13,RFCERM,STAERM        ;REPORT RFC ERROR
     013366  104456                                                                TRAP    C$ERHRD
     013370  000015                                                                .WORD   13
     013372  004521                                                                .WORD   RFCERM
     013374  006120                                                                .WORD   STAERM
2051
2052 013376                        50151$:
2053
2054 013376                        50150$:
2055
2056 013376                        50146$:
2057
2058 013376                        50145$:
2059
2060 013376                        50144$:
2061 013376  105737  003467                TSTB    RWERR                   ;IF A READ/WRITE ERROR HAS OCCURRED THEN:
2062 013402  001403                        BEQ     50152$
2063 013404  013737  003422  002330        MOV     CMDSAV,CMDPKT             ;RESTORE CMD PACKET AFTER ERROR RECO..
2064
2065 013412                        50152$:
2066 013412  000207                        RTS     PC                      ;RETURN.
2067
2068                               ;        ADDRESSES OF TCC HANDLING ROUTINES FOR TERMINATION CLASS CODES 0    '.
2069
2070 013414  013434                TCCRA:  TCC0
2071 013416  013452                        TCC1
2072 013420  013470                        TCC2
2073 013422  013600                        TCC3
2074 013424  013616                        TCC4
2075 013426  014232                        TCC5
2076 013430  014330                        TCC6
2077 013432  014472                        TCC7
2078
2079                               ;        SUBROUTINE TO HANDLE TERMINATION CLASS CODE 0, UNDEFINED SPECIAL
2080                               ;        CONDITION ERROR.
2081                               ;        INPUTS:
2082                               ;        OUTPUTS:
2083                               ;        REGISTERS:
2084                               ;        CALLS:
2085
2086 013434  005265  003556        TCC0::  INC     HRDCNT(R5)              ;JPDATE HARD ERROR COUNT.
2087 013440                                ERRHRD  5,SCERM,STAERM          ;REPORT SPECIAL CONDITION ERROR.
     013440  104456                                                                TRAP    C$ERHRD
     013442  000005                                                                .WORD   5
     013444  004475                                                                .WORD   SCERM
```

GLOBAL SUBROUTINES SECTION

```
      013446  006120                                                          .WORD   STAERM
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$ERDF
      013454  000006                                                          .WORD   6
      013456  004603                                                          .WORD   ATTNM
      013460  006120                                                          .WORD   STAERM
2100  013462  004737  017200                JSR     PC,DROPU                        ;DROP THE UNIT.
2101  013466  000207                        RTS     PC                              ;RETURN.
2102
2103                                  ;       SUBROUTINE TO HANDLE TERMINATION CLASS CODE 2, TAPE STATUS ALERT.
2104                                  ;       A STATUS CONDITION HAS BEEN ENCOUNTERED THAT MAY HAVE SIGNIFICANCE
2105                                  ;       TO THE PROGRAM.  BITS OF INTEREST INCLUDE TMK, RLS, LET, RLL, BOT, EOT.
2106                                  ;       INPUTS:
2107                                  ;       OUTPUTS:
2108                                  ;       REGISTERS:
2109                                  ;       CALLS:
2110
2111  013470  032737  000002  002362  TCC2::  BIT     #X0.BOT,MSGPKT+MS.XS0
2112  013476  001404                        BEQ     50153$
2113  013500  105737  003514                TSTB    EXPBOT
2114  013504  001401                        BEQ     50153$
2115                                                                  ;IF AT BOT AND BOT IS EXPECTED:
2116  013506  000433                        BR      TC2RTN                  ;RETURN-TCC2 CAUSED BY EXPECTED BOT.
2117
2118  013510                          50153$:
2119  013510  032737  170002  002362              BIT     #X0.RLS!X0.RLL!X0.TMK!X0.LET!X0.BOT,MSGPKT+MS.XS0
2120                                                ;IF #X0.RLS!X0.RLL!X0.TMK!X0.LET!X0.BOT SETIN MSGPKT+MS.XS0 THEN
2121
2122  013516  001427                              BEQ     50154$
2123                                                                  ;IF TCC2 CAUSED BY ANYTHING BUT EOT:
2124  013520  105737  003515                      TSTB    RANDOM          ;IFB RANDOM EQ #0 ORB VFYFLG NE #0 THEN
2125  013524  001403                              BEQ     50155$
2126  013526  105737  003516                      TSTB    VFYFLG
2127  013532  001421                              BEQ     50156$
2128  013534                          50155$:
2129                                                                  ;IF NOT IN RANDOM OR IF CMD IS WTV:
2130  013534  105737  003521                      TSTB    IRE                     ;IF RFC ERROR REPORTS ARE ALLOWED:
2131  013540  001016                              BNE     50157$
2132  013542  105737  003471                      TSTB    ERRREC                  ;IF WE ARE IN ERROR RECOVERY THEN:
2133  013546  001403                              BEQ     50160$
2134  013550  105237  003470                      INCB    UNREC                   ;SET UNRECOVERABLE FLAG FOR LOG.
2135                                                                  ;ELSE - IF NOT IN ERROR RECOVERY:
2136  013554  000402                              BR      50161$
2137  013556                          50160$:
2138  013556  005265  003336                      INC     SCCNT(R5)               ;INCREMENT THE SPEC COND COUNTER.
2139
```

GLOBAL SUBROUTINES SECTION

```
2140 013562                          501618:
2141 013562  005265  003356                  INC     HRDCNT(R5)          ;UPDATE HARD ERROR COUNT.
2142 013566                          ERRHRD  7,TSAM,STAERM               ;REPORT TAPE STATUS ALERT.
     013566  104456                                                              TRAP    C$ERHRD
     013570  000007                                                              .WORD   7
     013572  004705                                                              .WORD   TSAM
     013574  006120                                                              .WORD   STAERM
2143
2144 013576                          501578:
2145
2146 013576                          501568:
2147
2148 013576                          501548:
2149
2150 013576  000207                  TC2RTN:   RTS   PC                                ;RETURN.
2151
2152
2153                                 ;       SUBROUTINE TO HANDLE TERMINATION CLASS CODE 3, FUNCTION REJECT.
2154                                 ;       THE SPECIFIED FUNCTION WAS NOT INITIATED.  BITS OF INTEREST ARE
2155                                 ;       RMR, OFL, VCK, BOT, ILC, WLE, ILA, AND NBA.
2156                                 ;       INPUTS:
2157                                 ;       OUTPUTS:
2158                                 ;       REGISTERS:      R2,R4
2159                                 ;       CALLS:          DROPU
2160
2161 013600                          TCC3::  ERRDF   8,FUNRM,STAERM              ;REPORT FUNCTION REJECT.
     013600  104455                                                              TRAP    C$ERDF
     013602  000010                                                              .WORD   8
     013604  004622                                                              .WORD   FUNRM
     013606  006120                                                              .WORD   STAERM
2162 013610  004737  017200                  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  023727  003426  000002  TCC4::  CMP     CMDLG,#2            ;IF CMDLG EQ #2 ANDB BADTSW NE #0 THEN
2184 013624  001125                          BNE     50162$
2185 013626  105737  002210                  TSTB    BADTSW
2186 013632  001522                          BEQ     50162$
2187 013634  105737  003471                  TSTB    ERRREC      ;IFB ERRREC EQ #0 ANDB ERCVER NE #0 THEN
2188 013640  001007                          BNE     50163$
```

GLOBAL SUBROUTINES SECTION

```
2189 013642  105737  002207                TSTB    ERCVER
2190 013646  001404                       BEQ     50163$
2191 013650                                ERRSOFT 9,RERM,STAERM   ;
     013650  104457                                                TRAP    C$ERSOFT
     013652  000011                                                .WORD   9
     013654  005017                                                .WORD   RERM
     013656  006120                                                .WORD   STAERM
2192
2193 013660                          50163$:
2194 013660  105737  002213                TSTB    IREC        ;IFB IREC EQ #0 THEN
2195 013664  001102                       BNE     50164$
2196 013666  105237  003471                INCB    ERRREC      ;RETRY FLAG FOR EXCUTE SUBR: DON T UPDATE REC CN
2197 013672  105237  003464                INCB    WRTYER      ;REWRITE ERROR FLAG FOR WRTY SUBR
2198 013676  105737  003463                TSTB    WRTYFG      ;FIRST RETRY ON THIS RECORD: SUBSEQUENT
2199 013702  001072                       BNE     50165$
2200                                                           ;RETRIES WITH TCC4 ERRORS BY PASS THIS SECTION
2201 013704  013737  003420  015106        MOV     CMDWRD,WTYWRD   ;SAVE WRITE COMMAND PACKET
2202 013712  013737  002330  015104        MOV     CMDPKT,WTYCMD
2203 013720  013737  002336  015110        MOV     CMDPKT+CP.CNT,WTYBRF
2204 013726  105237  003467                INCB    RWERR           ;LOG SUBR FLAG: COUNT WRT ERRORS
2205 013732  105237  003463                INCB    WRTYFG          ;RETRY IN PROGRESS FLAG
2206
2207 013736                          50166$:      ;REPEAT
2208 013736  005265  003316                INC     WRTYCT(R5)      ;COUNT GLOBAL WRITE RETRIES
2209 013742  005037  003460                CLR     RETRYC          ;CLEAR # OF RETRIES PER RECORD
2210 013746  105037  003462                CLRB    RPTCNT          ;CLEAR # OF REPEATS
2211 013752  004737  014636                JSR     PC,WRTY         ;CALL WRITE RETRY
2212 013756  105737  003464                TSTB    WRTYER          ;REPEAT RETRIES ON SAME RECORD
2213 013762  001404                       BEQ     50167$
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,R0
     014016  104414                                                TRAP    C$PNTB
     014020  062706  000004                                        ADD     #4,SP
2221 014024  004737  015316                JSR     PC,BORERS       ;ERASE BAD RECORD
2222 014030  005365  003376                DEC     RECCNT(R5)
2223 014034  004737  017200                JSR     PC,DROPU        ;DROP UNIT
2224 014040  005065  003376                CLR     RECCNT(R5)
2225 014044  012775  002350  002514        MOV     #RWCPK,@TSDB(R5)    ;REWIND UNIT
2226
2227 014052                          50170$:
2228 014052  105037  003463                CLRB    WRTYFG          ;RETRY COMPLETE FLAG
2229 014056  105237  003531                INCB    MISCFG          ;DO NOT HALT ON THIS CMD FLG
2230 014062  013737  015106  003424        MOV     WTYWRD,PCMDWD   ;RESTORE ORIGINAL WRT CMD AFTER RECOVERY
2231
2232 014070                          50165$:
2233
2234 014070  000402                       BR      50171$
2235 014072                          50164$:
2236 014072  105237  003470                INCB    UNREC       ;LET JNREC :B= UNREC + #1   ;
```

GLOBAL SUBROUTINES SECTION

```
2237
2238 014076                        50171$:
2239
2240 014076  000454                        BR      50172$
2241 014100                        50162$:
2242 014100  004737  014510                JSR     PC,RTLE                 ;CHECK FOR RETRY LIMIT EXCEEDED.
2243 014104  023727  003426  000002        CMP     CMDLG,#2                        ;IF READ CMD THEN:
2244 014112  003411                        BLE     50173$
2245 014114  012702  000020                MOV     #RRECL,R2               ;R2=READ RETRY COUNT LIMIT / 2
2246 014120  006202                        ASR     R2
2247 014122  023702  003460                CMP     RETRYC,R2       ;IF RETRY COUNT IS MORE THAN HALF LIMIT:
2248 014126  002403                        BLT     50174$
2249 014130  052737  020000  002330        BIS     #OPP.C,CMDPKT           ;SET OPPOSITE BIT FOR RETRY2.
2250
2251 014136                        50174$:
2252
2253 014136                        50173$:
2254 014136  005737  003460                TST     RETRYC      ;IF THIS IS THE ORIGINAL ERROR THEN:
2255 014142  001007                        BNE     50175$
2256 014144  105737  002207                TSTB    ERCVER
2257 014150  001404                        BEQ     50175$
2258 014152                                ERRSOFT 9,RERM,STAERM   ;REPORT RECOVERABLE ERROR
     014152  104457                                                        TRAP    C$ERSOFT
     014154  000011                                                        .WORD   9
     014156  005017                                                        .WORD   RERM
     014160  006120                                                        .WORD   STAERM
2259                                                            ;PROVIDED OPERATOR HAS ENABLED THE REPORT
2260 014162                        50175$:
2261 014162  005237  003460                INC     RETRYC                  ;UPDATE RETRY COUNT.
2262 014166  052737  001000  002330        BIS     #MOD.C1,CMDPKT  ;SET RETRY BIT IN CMD PACKET.
2263 014174  105737  002213                TSTB    IREC                    ;IF ERROR RECOVERY ENABLED:
2264 014200  001011                        BNE     50176$
2265 014202  105237  003471                INCB    ERRREC          ;SET ERROR RECOVERY FLAG.
2266 014206  012602                        MOV     (SP)+,R2                ;POP 2 RTN ADRS FROM STACK.
2267 014210  012602                        MOV     (SP)+,R2
2268 014212  004737  012054                JSR     PC,EXCUTE                       ;GO EXECUTE THE RETRY COMMAND.
2269 014216  000137  012364                JMP     GOWAIT                  ;GO WAIT FOR INTERRUPT + CHECK STATUS.
2270                                                            ;ELSE IF ERROR RECOVERY IS NOT ENABLED:
2271 014222  000402                        BR      50177$
2272 014224                        50176$:
2273 014224  105237  003470                INCB    UNREC           ;SET UNRECOVERABLE ERROR FLAG.
2274
2275 014230                        50177$:
2276
2277 014230                        50172$:
2278 014230  000207                        RTS PC                          ;RETURN
2279
2280                               ;       SUBROUTINE TO HANDLE TERMINATION CLASS CODE 5, RECOVERABLE ERROR.
2281                               ;       TAPE POSITION HAS NOT CHANGED.  RECOVERY PROCEDURE IS TO LOG THE
2282                               ;       ERROR AND RE-ISSUE THE ORIGINAL COMMAND.
2283                               ;       INPUTS:
2284                               ;       OUTPUTS:
2285                               ;       REGISTERS:      R2,R4.
2286                               ;       CALLS:          RTLE, EXCUTE, GOWAIT, DROPU.
2287
2288 014232  004737  014510        TCC5::  JSR     PC,RTLE                 ;CHECK FOR RETRY LIMIT EXCEEDED
2289 014236  005737  003460                TST     RETRYC                  ;IF THIS IS THE ORIGINAL ERROR THEN:
```

GLOBAL SUBROUTINES SECTION

```
2290 014242  001004                        BNE     50200$
2291 014244                                ERRSOFT 10,RERM,STAERM  ;REPORT RECOVERABLE ERROR.
     014244  104457                                                        TRAP    C$ERSOFT
     014246  000012                                                        .WORD   10
     014250  005017                                                        .WORD   RERM
     014252  006120                                                        .WORD   STAERM
2292 014254                         50200$:
2293 014254  005237  003460                 INC     RETRYC          ;UPDATE RETRY COUNTER.
2294 014260  105737  002213                 TSTB    IREC                    ;IF ERROR RECOVERY IS ENABLED:
2295 014264  001016                        BNE     50201$
2296 014266  105237  003471                 INCB    ERREC           ;SET ERROR RECOVERY FLAG.
2297 014272  005265  003376                 INC     RECCNT(R5)      ;UPDATE REC COUNT
2298 014276  016577  003376  167102         MOV     RECCNT(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  004737  012054                 JSR     PC,EXCUTE                       ;GO RE-ISSUE THE COMMAND.
2302 014314  000137  012364                 JMP     GOWAIT                  ;GO WAIT FOR INTERRUPT + CHECK STATUS.
2303                                                                        ;ELSE IF ERROR RECOVERY IS NOT ENABLED:
2304 014320  000402                        BR      50202$
2305 014322                         50201$:
2306 014322  105237  003470                 INCB    UNREC           ;SET UNRECOVERABLE ERROR FLAG.
2307
2308 014326                         50202$:
2309 014326  000207                        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  037737  000010  002370 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  005737  003426                 TST     CMDLG                   ;IF CMD IS A READ OR WRITE THEN:
2327 014344  001404                        BEQ     50204$
2328 014346  105237  003467                 INCB    RWERR                   ;SET RD/WR ERROR FLAG.
2329 014352  105237  003470                 INCB    UNREC                   ;SET UNRECOVERABLE ERROR FLAG.
2330
2331 014356                         50204$:
2332 014356                                ERRDF   11,URERM,STAERM ;REPORT UNRECOVERABLE ERROR.
     014356  104455                                                        TRAP    C$ERDF
     014360  000013                                                        .WORD   11
     014362  005041                                                        .WORD   URERM
     014364  006120                                                        .WORD   STAERM
2333 014366  004737  017200                 JSR     PC,DROPU                        ;REPORT ERROR + DROP UNIT.
2334                                                                    ;ELSE-IF THERE IS DENSITY CHECK:
2335 014372  000436                        BR      50205$
2336 014374                         50203$:
2337 014374  004737  014510                 JSR     PC,RTLE                 ;CHECK FOR RETRY LIMIT EXCEEDED.
2338 014400  005737  003460                 TST     RETRYC                  ;IF THIS IS THE ORIGINAL ERROR THEN:
```

```
GLOBAL SUBROUTINES SECTION

2339 014404  001004                          BNE     50206$
2340 014406                                  ERRSOFT 11,URERM,STAERM          ;REPORT DENSITY CHECK ERROR
     014406  104457                                                                TRAP    C$ERSOFT
     014410  000013                                                                .WORD   11
     014412  005041                                                                .WORD   URERM
     014414  006120                                                                .WORD   STAERM
2341
2342 014416                          50206$:
2343 014416  005237  003460                  INC     RETRYC                    ;UPDATE RETRY COUNT.
2344 014422  105737  003521                  TSTB    IRE                       ;IF ERROR RECOVERY IS ENABLED THEN:
2345 014426  001016                          BNE     50207$
2346 014430  105237  003471                  INCB    ERREC                       ;SET ERROR RECOVERY FLAG.
2347 014434  012775  002350  002514          MOV     #RWCPK,@TSDB(R5)            ;ISSUE A REWIND COMMAND.
2348 014442  004737  012700                  JSR     PC,WSSR                     ;WAIT FOR SUBSYSTEM READY.
2349 014446  012602                          MOV     (SP)+,R2                  ;POP 2 RTN ADRS FROM STACK.
2350 014450  012602                          MOV     (SP)+,R2
2351 014452  004737  012054                  JSR     PC,EXCUTE                   ;REISSUE THE COMMAND.
2352 014456  000137  012364                  JMP     GOWAIT                      ;WAIT FOR INTERRUPT
2353                                                                            ;ELSE-IF ERR REC DISABLED:
2354 014462  000402                          BR      50210$
2355 014464                          50207$:
2356 014464  105237  003470                  INCB    UNREC                 ;SET UNRECOVERABLE ERROR FLAG.
2357
2358 014470                          50210$:
2359
2360 014470                          50205$:
2361 014470  000207                          RTS     PC                                ;RETURN
2362
2363                                 ;       SUBROUTINE TO HANDLE TERMINATION CLASS CODE 7, FATAL SUBSYSTEM
2364                                 ;       ERROR.  THE SUBSYSTEM IS INCAPABLE OF PROPERLY PERFORMING
2365                                 ;       COMMANDS OR AT LEAST ITS INTEGRITY IS SERIOUSLY QUESTIONABLE.
2366                                 ;       REFER TO THE FATAL CLASS CODE FIELD IN THE TSSR REGISTER FOR
2367                                 ;       ADDITIONAL INFORMATION ON THE TYPE OF FATAL ERROR.
2368                                 ;       INPUTS:
2369                                 ;       OUTPUTS:
2370                                 ;       REGISTERS:      R2, R4
2371                                 ;       CALLS:
2372
2373 014472                          TCC7::  ERRDF   12,FATSM,STAERM          ;REPORT FATAL SUBSYSTEM ERROR.
     014472  104455                                                                TRAP    C$ERDF
     014474  000014                                                                .WORD   12
     014476  004642                                                                .WORD   FATSM
     014500  006120                                                                .WORD   STAERM
2374 014502  004737  017200                  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  005737  003426          RTLE::  TST     CMDLG             ;IF CMD IS NOT A READ OR WRITE THEN:
2386 014514  001010                          BNE     50211$
2387 014516                                  ERRDF   11,URERM,STAERM ;REPORT UNRECOVERABLE ERROR.
```

GLOBAL SUBROUTINES SECTION

```
     014516  104455                                                          TRAP    C$ERDF
     014520  000013                                                          .WORD   11
     014522  005041                                                          .WORD   URERM
     014524  006120                                                          .WORD   STAERM
2388 014526  004737  017200              JSR     PC,DROPU                        ;DROP THE UNIT.
2389 014532  012602                      MOV     (SP)+,R2                ;POP  RTN ADRS FROM STACK.
2390 014534  000437                      BR      RTLRTN                  ;AND RETURN.
2391
2392 014536                      50211$:
2393 014536  105237  003467              INCB    RWERR           ;SET READ/WRITE ERROR FLAG.
2394 014542  023727  003426  000002      CMP     CMDLG,#2                ;IF CMD IS A WRT OR WTM:
2395 014550  001016                      BNE     50212$
2396 014552  023727  003460  000020      CMP     RETRYC,#WRECL   ;IF RETRY COUNT HAS REACHED LIMIT:
2397 014560  001011                      BNE     50213$
2398 014562  105237  003470              INCB    UNREC           ;SET UNRECOVERABLE FLAG
2399 014566                              ERRDF   14,RLEXM,STAERM ;REPORT RETRY LIMIT EXCEEDED.
     014566  104455                                                          TRAP    C$ERDF
     014570  000016                                                          .WORD   14
     014572  004556                                                          .WORD   RLEXM
     014574  006120                                                          .WORD   STAERM
2400 014576  004737  017200              JSR     PC,DROPU                ;DROP THE UNIT.
2401 014602  012602                      MOV     (SP)+,R2                ;POP 2 RTN ADRS FROM STACK.
2402 014604                      50213$:
2403                                                                     ;ELSE   CMD IS A READ:
2404 014604  000413                      BR      50214$
2405 014606                      50212$:
2406 014606  023727  003460  000020      CMP     RETRYC,#RRECL   ;IF RETRY COUNT HAS REACHED LIMIT:
2407 014614  001007                      BNE     50215$
2408 014616  105237  003470              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
```

GLOBAL SUBROUTINES SECTION

```
2433
2434 014636                                50217$:
2435                                            ;BEGIN REPEAT                ;REPEAT
2436
2437 014636                                50221$:
2438 014636  004737  015316                       JSR     PC,BORERS              ;BACKSPACE/ERASE ONE RECORD
2439 014642  105037  003464                       CLRB    WRTYER                 ;CLEAR WRITE RETRY ERROR
2440 014646  004737  015472                       JSR     PC,REWRT               ;REWRITE RECORD ON SAME SPOT
2441 014652  105237  003462                       INCB    RPTCNT                 ;COUNT REPEATS
2442 014656  123727  003462  000004               CMPB    RPTCNT,#4              ;LIMIT: 4 REPEATS OR RECOVERED
2443 014664  001403                               BEQ     50222$
2444 014666  105737  003464                       TSTB    WRTYER
2445 014672  001761                               BEQ     50221$
2446 014674                                50222$:
2447                                            ;END REPEAT
2448 014674                                50220$:
2449 014674  005237  003460                       INC     RETRYC                 ;COUNT RETRIES
2450 014700  105737  003464                       TSTB    WRTYER
2451 014704  001001                               BNE     50223$
2452 014706  000457                               BR      50216$                 ;EXIT RETRY LOOP IF RECOVERED
2453
2454 014710                                50223$:
2455 014710  105737  002207                       TSTB    ERCVER           ;IFB ERCVER NE #0 THEN
2456 014714  001415                               BEQ     50225$
2457 014716                                      PRINTB  #BTMSG1,RETRYC,<B,RPTCNT>       ;PRINT SUSPECTED BAD SPOT
     014716  005046                                                                        CLR     -(SP)
     014720  153716  003462                                                               BISB    RPTCNT,(SP)
     014724  013746  003460                                                               MOV     RETRYC,-(SP)
     014730  012746  015112                                                               MOV     #BTMSG1,(SP)
     014734  012746  000003                                                               MOV     #3,-(SP)
     014740  010600                                                                       MOV     SP,R0
     014742  104414                                                                       TRAP    C$PNTB
     014744  062706  000010                                                               ADD     #10,SP
2458 014750                                50225$:
2459 014750  023727  003460  000001               CMP     RETRYC,#1              ;ON FIRST RETRY, LOGG BAD SPOT
2460 014756  001021                               BNE     50226$
2461 014760  016537  002616  003512               MOV     BTADDR(R5),BTPT        ;BTPT IS BOTH THE BAD SPOT COUNTER
2462 014766  017704  166520                       MOV     @BTPT,R4               ;AND THE LOGGING INDEX
2463 014772  062704  000002                       ADD     #2,R4
2464 014776  010477  166510                       MOV     R4,@BTPT
2465 015002  020427  000050                       CMP     R4,#40.          ;IF R4 LOS #40. THEN
2466 015006  101005                               BHI     50227$
2467 015010  013703  003512                       MOV     BTPT,R3          ;STORE FIRST 20 BAD SPOTS
2468 015014  060304                               ADD     R3,R4            ;LET R4 := R4 + R3          ;
2469 015016  016514  003376                       MOV     RECCNT(R5),(R4)  ;LET (R4) := RECCNT(R5)     ;
2470
2471 015022                                50227$:
2472
2473 015022                                50226$:
2474 015022  105237  003525                       INCB    ERSFLG           ;ERASE FLAG TO ERASE BAD RECORD
2475 015026  105037  003467                       CLRB    RWERR            ;CANCELL 'LOG' ERROR FLAG ON FAILING RET
2476 015032  105037  003462                       CLRB    RPTCNT           ;CLEAR REPEAT COUNT FOR NEXT RETRY
2477
2478 015036                                50224$:
2479 015036  023727  003460  000004               CMP     RETRYC,#4                      ;LIMIT: 4 RETRIES
2480 015044  001274                               BNE     50217$
2481                                            ;END RETRY
```

GLOBAL SUBROUTINES SECTION

```
2482 015046                                50216$:
2483 015046  105737  003464                       TSTB    WRTYER  ;IFB WRTYER NE #0 THEN
2484 015052  001413                               BEQ     50230$
2485 015054  105737  002207                       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  B MSG1: .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/
     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
```

GLOBAL SUBROUTINES SECTION

```
        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                                                .EVEN
2502
2503                                    ;       SUBR TO BACSPACE ONE RECORD
2504                                    ;       IF THE ERASE FLAG IS SET, THEN ERASE THAT RECORD
2505                                    ;       INPUTS:         ERSFLG  1 = DO ERASE
2506                                    ;       OUTPUTS:
2507                                    ;       REGISTERS:
2508                                    ;       CALLS:          EXCUTE, GOWAIT, CKHAE
2509
2510 015316  013737  003420  003424  BORERS::MOV     CMDWRD,PCMDWD   ;SET COMMAND  TO SPACE REV
2511 015324  012737  104410  003420          MOV     #SRR,CMDWRD     ;LET CMDWRD := #SRR     ;
2512 015332  013737  003420  002330          MOV     CMDWRD,CMDPKT   ;LET CMDPKT := CMDWRD CLR.BY #BRF.C     ;
2513 015340  042737  004000  002330          BIC     #BRF.C,CMDPKT
2514 015346  013737  002330  003422          MOV     CMDPKT,CMDSAV   ;LET CMDSAV := CMDPKT   ;
2515 015354  012737  000001  002332          MOV     #1,CMDPKT+CP.ADL        ;LET CMDPKT+CP.ADL := #1        ;
2516 015362  005037  003426                  CLR     CMDLG   ;LET CMDLG := #0                ;
2517 015366  004737  011064                  JSR     PC,CMDAC                ;
2518 015372  004737  012054                  JSR     PC,EXCUTE               ;
2519 015376  004737  012364                  JSR     PC,GOWAIT               ;
2520 015402  004737  017500                  JSR     PC,CKHAE                ;
2521 015406  105737  003525                  TSTB    ERSFLG          ;WHEN ERASE FLAG IS SET, DO ERASE
2522 015412  001426                          BEQ     50232$
2523 015414  013737  003420  003424          MOV     CMDWRD,PCMDWD     ;LET PCMDWD := CMDWRD ;
2524 015422  012737  100411  003420          MOV     #ERS,CMDWRD       ;LET CMDWRD := #ERS   ;
2525 015430  013737  003420  002330          MOV     CMDWRD,CMDPKT     ;LET CMDPKT := CMDWRD ;
2526 015436  013737  002330  003422          MOV     CMDPKT,CMDSAV     ;LET CMDSAV := CMDPKT ;
2527 015444  004737  011064                  JSR     PC,CMDAC                ;
2528 015450  004737  012054                  JSR     PC,EXCUTE
2529 015454  004737  012364                  JSR     PC,GOWAIT
2530 015460  004737  017500                  JSR     PC,CKHAE
2531 015464  105037  003525                  CLRB    ERSFLG          ;LET ERSFLG :B= #0
2532
2533 015470                          50232$:
2534 015470  000207                          RTS     PC
2535
2536                                    ;       SUBR TO REWRITE A BADLY WRITTEN RECORD
2537
2538 015472  013737  003420  003424  REWRT:: MOV     CMDWRD,PCMDWD   ;RESTORE WRITE COMMAND PACKET
2539 015500  013737  015106  003420          MOV     WTYWRD,CMDWRD   ;LET CMDWRD := WTYWRD   ;
2540 015506  013737  015104  002330          MOV     WTYCMD,CMDPKT   ;LET CMDPKT := WTYCMD   ;
2541 015514  013737  002330  003422          MOV     CMDPKT,CMDSAV   ;LET CMDSAV := CMDPKT   ;
2542 015522  013737  003406  002332          MOV     DATAWT,CMDPKT+CP.ADL    ;LET CMDPKT+CP.ADL := DATAWT    ;
2543 015530  013737  015110  002336          MOV     WTYBRF,CMDPKT+CP.CNT    ;LET CMDPKT+CP.CNT := WTYBRF    ;
2544 015536  012737  000002  003426          MOV     #2,CMDLG        ;LET CMDLG := #2                        ;
2545 015544  004737  011064                  JSR     PC,CMDAC
2546 015550  004737  012054                  JSR     PC,EXCUTE                       ;RE-WRITE RECORD
2547 015554  004737  012364                  JSR     PC,GOWAIT                       ;
2548 015560  004737  017500                  JSR     PC,CKHAE                        ;
```

GLOBAL SUBROUTINES SECTION

```
2549 015564  000207                        RTS     PC
2550
2551                                ;       SUBROUTINE TO LOG BYTES READ/WRITTEN.
2552                                ;       ALSO UPDATES READ/WRITE ERROR COUNTERS.
2553                                ;       INPUTS:
2554                                ;       OUTPUTS:
2555                                ;       REGISTERS:      R2, R3, R4.
2556                                ;       CALLS:
2557
2558 015566  105737  003466        LOG::   TSTB    ERLOG           ;IF DATA AND ERRORS HAVE NOT BEEN LOGGED THEN:
2559 015572  001126                        BNE     50233$
2560 015574  105237  003466                INCB    ERLOG           ;SET LOG DONE FLAG.
2561 015600  013704  003426                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  063712  003416                ADD     BRFCNT,(R2)             ;ADD BRF TO LSW.
2569 015632  023737  002360  003416        CMP     MSGPKT+MS.RFC,BRFCNT  ;IF THE RFC IS LOWER OR THE SAME AS BRF THEN
2570 015640  101002                        BHI     50235$
2571 015642  163712  002360                SUB     MSGPKT+MS.RFC,(R2)      ;SUBTRACT RFC FROM EXPECTED BRF.
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  105737  003467                TSTB    RWERR                   ;IF R/W ERROR, UPDATE ERROR COUNT.
```

GLOBAL SUBROUTINES SECTION

```
2606 015746  001440                        BEQ     50244$
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  105737  003470                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$:
2617 016000  005212                        INC     (R2)            ;UPDATE THE ERROR COUNTER
2618 016002  105737  002213                TSTB    IREC            ;IF ERROR RECOVERY IS ENABLED:
2619 016006  001020                        BNE     50247$
2620 016010  105737  003522                TSTB    DROPED          ;IF UNIT HAS NOT BEEN DROPPED:
2621 016014  001015                        BNE     50250$
2622 016016  105737  002207                TSTB    ERCVER
2623 016022  001412                        BEQ     50250$
2624 016024                                PRINTB  #NURTY1,RETRYC     ;PRINT # OF RETRIES TO RECOVER
     016024  013746  003460                                                  MOV     RETRYC, (SP)
     016030  012746  005422                                                  MOV     #NURTY1,-(SP)
     016034  012746  000002                                                  MOV     #2,-(SP)
     016040  010600                                                          MOV     SP,R0
     016042  104414                                                          TRAP    C$PNTB
     016044  062706  000006                                                  ADD     #6,SP
2625                                                            ;PROVIDED PRINT HAS BEEN ENABLED
2626 016050                          50250$:
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                                 ;       INDEXES TO BYTE COUNTERS.
2641 016052  000000                  BINC:   0                               ;WRITE.
2642 016054  000040                          40                              ;READ REV.
2643 016056  000100                          100                             ;READ FWD.
2644                                 ;       INDEXES TO READ/WRITE ERROR COUNTERS.
2645 016060  000000                  EINC:   0                               ;WRITE.
2646 016062  000020                          20                              ;READ REV.
2647 016064  000040                          40                              ;READ FWD.
2648
2649                                 ;       IF A WRITE/VERIFY COMMAND IS ISSUED, CONTROL IS THEN
2650                                 ;       TRANSFERRED TO THIS SUBROUTINE TO READ REVERSE, CHECK DATA,
2651                                 ;       READ FORWARD, CHECK DATA, THEN CONTINUE TO NEXT COMMAND.
2652                                 ;       INPUTS:
2653                                 ;       OUTPUTS:
2654                                 ;       REGISTERS:
2655                                 ;       CALLS:          VFEXC.
2656
```

GLOBAL SUBROUTINES SECTION

```
2657 016066  105737  003516          VFYDAT::TSTB    VFYFLG          ;IF DATA IS TO BE VERIFIED:
2658 016072  001426                          BEQ     50251$
2659 016074  013737  003420  003424          MOV     CMDWRD,PCMDWD     ;SAVE THE PREVIOUS COMMAND WORD.
2660 016102  012737  104401  003420          MOV     #RDR,CMDWRD       ;COMMAND IS READ REV.
2661 016110  012737  000004  003426          MOV     #4,CMDLG          ;SET UP CMD LOGGING INDEX.
2662 016116  004737  016152                  JSR     PC,VFEXC          ;GO READ ALL THE RECORDS REV.
2663 016122  013737  003420  003424          MOV     CMDWRD,PCMDWD     ;SAVE THE PREVIOUS COMMAND WORD.
2664 016130  012737  104001  003420          MOV     #RDF,CMDWRD       ;COMMAND IS READ FWD.
2665 016136  012737  000006  003426          MOV     #6,CMDLG          ;SET UP CMD LOGGING INDEX.
2666 016144  004737  016152                  JSR     PC,VFEXC                ;GO READ ALL RECORDS FWD.
2667
2668 016150                          50251$:
2669 016150  000207                          RTS     PC      ;RETURN.
2670
2671
2672
2673
2674                                 ;       SUBROUTINE TO EXECUTE THE READ AND VERIFY, FORWARD OR REVERSE.
2675                                 ;       INPUTS:
2676                                 ;       OUTPUTS:
2677                                 ;       REGISTERS:      R2
2678                                 ;       CALLS:          CMDAC, FIRSTU, VFISU, NEXTU, CMMAE.
2679
2680 016152  013737  003420  002330  VFEXC:: MOV     CMDWRD,CMDPKT   ;COMMAND PACKET = READ REV OR FWD.
2681 016160  042737  004000  002330          BIC     #BRF.C,CMDPKT
2682 016166  105737  003520                  TSTB    SWBFLG                  ;IF BYTES ARE TO BE SWAPPED:
2683 016172  001403                          BEQ     50252$
2684 016174  052737  010000  002330          BIS     #SWB.C,CMDPKT     ;SET SWAB BIT IN CMD PACKET.
2685
2686 016202                          50252$:
2687 016202  013737  002330  003422          MOV     CMDPKT,CMDSAV                   ;SAVE COMMAND PACKET 1ST WORD.
2688 016210  013737  003410  002332          MOV     DATARD,CMDPKT+CP.ADL    ;SAVE BUFFER START ADDRESS.
2689 016216  005037  003412                  CLR     NCNT                            ;CLEAR NUMBER OF OPERATIONS.
2690
2691 016222                          50253$: ;WHILE NCNT LT NCNT1 DO         ;WHILE THERE ARE RECORDS REMAINING:
2692 016222  023737  003412  003414          CMP     NCNT,NCNT1
2693 016230  002062                          BGE     50254$
2694 016232  004737  011064                  JSR     PC,CMDAC                        ;STORE CMD ASCII IN ERROR MSG.
2695 016236  004737  017102                  JSR     PC,FIRSTU               ;SET UP FOR FIRST UNIT.
2696 016242                          50255$:    ;WHILE  DEVTBL(R5) NE #END DO ;WHILE THERE ARE DEVICES REMAINING:
2697 016242  026527  002604  177777          CMP     DEVTBL(R5),#END
2698 016250  001442                          BEQ     50256$
2699 016252  032737  000400  003420          BIT     #MOD.CO,CMDWRD            ;IF CMD IS REVERSE THEN:
2700 016260  001421                          BEQ     50257$
2701 016262  032765  000002  003502          BIT     #X0.BOT,EOTFLG(R5)         ;IF NOT AT BOT
2702 016270  001014                          BNE     50260$
2703 016272  032765  000001  003502          BIT     #X0.EOT,EOTFLG(R5)         ;BUT IF AT EOT
2704 016300  001406                          BEQ     50261$
2705 016302  105737  003524                  TSTB    ALLEOT                      ;AND ALL OTHERS AT EOT
2706 016306  001402                          BEQ     50262$
2707 016310  004737  016400                  JSR     PC,VFISU                    ;THEN READ VERIFY
2708                                                                         ;IF NOT ALL AT EOT, FREEZE UNIT(S)
2709 016314                          50262$:
2710                                                                             ;IF NOT AT BOT AND
2711 016314  000402                          BR      50263$
2712 016316                          50261$:
2713 016316  004737  016400                  JSR     PC,VFISU                        ;NOT AT EOT, READ VFY
```

GLOBAL SUBROUTINES SECTION

```
2714
2715 016322                                  502638:
2716
2717 016322                                  502608:
2718 016322  000412                                BR      502648                  ;ELSE IF CMD IS NOT REVERSE:
2719 016324                                  502578:
2720 016324  032765  000001  003502                BIT     #X0.EOT,EOTFLG(R5)
2721 016332  001404                                BEQ     502658
2722 016334  032737  000001  003420                BIT     #CMD.CO,CMDWRD
2723 016342  001002                                BNE     502668
2724 016344                                  502658:
2725                                                                 ;IF NOT AT EOT OR NOT A MOTION CMD THEN:
2726 016344  004737  016400                        JSR     PC,VFISU                ;ISSUE CMD, CHECK STATUS AND DATA.
2727
2728 016350                                  502668:
2729
2730 016350                                  502648:
2731 016350  004737  017150                        JSR     PC,NEXTU                ;GO FIND THE NEXT UNIT.
2732
2733 016354  000732                                BR      502558
2734 016356                                  502568:
2735 016356  004737  017500                        JSR     PC,CKHAE                ;CHECK FOR HALT AFTER EACH CMD.
2736 016362  005237  003412                        INC     NCNT                    ;UPDATE THE RECORD COUNT.
2737 016366  013737  003420  003424                MOV     CMDWRD,PCMDWD           ;SAVE PREVIOUS COMMAND WORD.
2738
2739 016374  000712                                BR      502538
2740 016376                                  502548:
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:          EXCUTE, GOWAIT, CKDATA.
2749
2750 016400  013702  003410          VFISU:: MOV     DATARD,R2               ;INIT READ BUFFER POINTER.
2751 016404  062702  000010                  ADD     #8.,R2
2752 016410                                  502678: ;WHILE R2 NE DATARD DO          ;UNTIL 8 BYTES HAVE BEEN SET.
2753 016410  020237  003410                        CMP     R2,DATARD
2754 016414  001403                                BEQ     502708
2755 016416  012742  177777                        MOV     #-1,-(R2)               ;INIT READ BUFFER.
2756
2757 016422  000772                                BR      502678
2758 016424                                  502708:
2759 016424  004737  012054                        JSR     PC,EXCUTE               ;GO EXECUTE THE COMMAND.
2760 016430  105737  003522                        TSTB    DROPED          ;IF UNIT HAS NOT BEEN DROPPED THEN:
2761 016434  001002                                BNE     502718
2762 016436  004737  012364                        JSR     PC,GOWAIT       ;GO WAIT FOR DONE BIT.
2763
2764 016442                                  502718:
2765 016442  105737  003522                        TSTB    DROPED          ;IF UNIT HAS NOT BEEN DROPPED THEN:
2766 016446  001006                                BNE     502728
2767 016450  032765  000002  003502                BIT     #X0.BOT,EOTFLG(R5)      ;WHEN NOT REVERSED INTO BOT, THEN
2768 016456  001002                                BNE     502738
2769 016460  004737  016466                        JSR     PC,CKDATA       ;GO VERIFY DATA.
2770
```

GLOBAL SUBROUTINES SECTION

```
2771 016464                          502738:
2772
2773 016464                          502728:
2774 016464  000207                          RTS     PC
2775
2776
2777                                 ;       SUBROUTINE TO COMPARE DATA BETWEEN READ AND WRITE BUFFERS
2778                                 ;       AND PRINT ERROR MESSAGE ON MISCOMPARE.
2779                                 ;       INPUTS:
2780                                 ;       OUTPUTS:
2781                                 ;       REGISTERS:      R2, R3, R4.
2782                                 ;       CALLS:          GCMDA
2783
2784 016466  013703  003416          CKDATA::MOV     BRFCNT,R3               ;COMPUTE REC LENGTH READ
2785 016472  163703  002360                  SUB     MSGPKT+MS.RFC,R3
2786 016476  005703                          TST     R3                      ;WHEN NO DATA RECEIVED
2787 016500  001015                          BNE     502748
2788 016502                                  ERRHRD  17,WTVERM,DTAERM                ;PRINT ERROR AND EXIT
      016502  104456                                                                  TRAP    C$ERHRD
      016504  000021                                                                  .WORD   17
      016506  004430                                                                  .WORD   WTVERM
      016510  005752                                                                  .WORD   DTAERM
2789 016512                                  PRINTB  #DTAER4         ;COMPARE ROUTINE
      016512  012746  005337                                                          MOV     #DTAER4,-(SP)
      016516  012746  000001                                                          MOV     #1,-(SP)
      016522  010600                                                                  MOV     SP,R0
      016524  104414                                                                  TRAP    C$PNTB
      016526  062706  000004                                                          ADD     #4,SP
2790 016532  000560                          BR      502758
2791 016534                          502748:
2792 016534  020337  003416                  CMP     R3,BRFCNT               ;WHEN REC READ IS LONGER
2793 016540  101417                          BLOS    502768
2794 016542                                      ERRHRD 17,WTVERM,DTAERM             ;THAN EXPECTED, PRINT
      016542  104456                                                                  TRAP    C$ERHRD
      016544  000021                                                                  .WORD   17
      016546  004430                                                                  .WORD   WTVERM
      016550  005752                                                                  .WORD   DTAERM
2795 016552                                      PRINTB #DTAER5,CMDPKT+CP.CNT        ;AN ERROR MESSAGE
      016552  013746  002336                                                          MOV     CMDPKT+CP.CNT,-(SP)
      016556  012746  005360                                                          MOV     #DTAER5,-(SP)
      016562  012746  000002                                                          MOV     #2,-(SP)
      016566  010600                                                                  MOV     SP,R0
      016570  104414                                                                  TRAP    C$PNTB
      016572  062706  000006                                                          ADD     #6,SP
2796                                                                        ;AND EXIT ROUTINE
2797 016576  000536                          BR      502778
2798 016600                          502768:
2799 016600  010337  017076                  MOV     R3,CKDCNT               ;SAVE VERIFICATION LENGTH - 1.
2800 016604  005337  017076                  DEC     CKDCNT
2801 016610  005037  017100                  CLR     CKDFF                   ;CLEAR # OF BYTES IN ERROR COUNTER.
2802 016614  005002                          CLR     R2                      ;INIT BYTE COUNTER
2803 016616  013703  003406                  MOV     DATAWT,R3               ;GET WRITE BUFFER ADDRESS.
2804 016622  013704  003410                  MOV     DATARD,R4               ;GET READ BUFFER ADDRESS.
2805 016626  105737  003523                  TSTB    T1SWB                   ;WHEN RUNNING TEST1-SUB 12.
2806 016632  001401                          BEQ     503008
2807 016634  000313                          SWAB    (R3)                    ;SWAP FIRST WORD OF WRT BFR
2808                                                                ;WHICH CONTAINS THE RECORD COUNT
```

GLOBAL SUBROUTINES SECTION

```
2809 016636                                50300$:
2810                                           ;REPEAT                          ;REPEAT UNTIL ALL DATA IS COMPARED:
2811 016636                                50301$:
2812 016636  020237  017076                       CMP     R2,CKDCNT             ;IF THIS IS THE LAST BYTE THEN:
2813 016642  001011                               BNE     50302$
2814 016644  105737  003520                       TSTB    SWBFLG                ;IF BYTE SWAPPING IS ENABLED THEN:
2815 016650  001406                               BEQ     50303$
2816 016652  032737  000001  017076               BIT     #BIT00,CKDCNT         ;IF RECORD LENGTH IS ODD THEN:
2817 016660  001002                               BNE     50304$
2818 016662  105723                               TSTB    (R3)+           ;LAST BYTE WILL BE IN
2819 016664  105724                               TSTB    (R4)+           ;THE UPPER BYTE.
2820
2821 016666                                50304$:
2822
2823 016666                                50303$:
2824
2825 016666                                50302$:
2826 016666  121314                               CMPB    (R3),(R4)             ;ARE THEY EQUAL.
2827 016670  001452                               BEQ     3$                    ;BR IF SO.
2828 016672  005737  017100                       TST     CKDFF                 ;1 ST TIME THRU?
2829 016676  001010                               BNE     2$                    ;BR IF NOT.
2830 016700  005265  003346                       INC     VFYCNT(R5)            ;INC THE VERIFY ERROR COUNTER.
2831 016704  005265  003356                       INC     HRDCNT(R5)            ;INC THE HARD ERROR COUNT.
2832 016710                                       ERRHRD  17,WTVERM,DTAERM      ;REPORT WRITE/VERIFY ERROR.
     016710  104456                                                                 TRAP    C$ERHRD
     016712  000021                                                                 .WORD   17
     016714  004430                                                                 .WORD   WTVERM
     016716  005752                                                                 .WORD   DTAERM
2833 016720  005237  017100                2$:    INC     CKDFF;LET CKDFF := CKDFF + #1   ;INCREMENT # OF BYTES IN ERROR.
2834 016724  111437  003436                       MOVB    (R4),TIME1            ;SAVE WAS DATA FOR TYPOUT.
2835 016730  042737  177400  003436               BIC     #177400,TIME1         ;CLEAR GARBAGE.
2836 016736  111337  003440                       MOVB    (R3),TIME2            ;SAVE SHOUL  BE DATA FOR TYPOUT
2837 016742  042737  177400  003440               BIC     #177400,TIME2         ;CLEAR GARBAGE.
2838 016750  023727  017100  000013               CMP     CKDFF,#11.            ;IF ERROR BYTE COUNT IS LESS THAN 11:
2839 016756  002017                               BGE     50305$
2840 016760                                       PRINTX  #DTAER2,R2,<B,TIME1>,<B,TIME2>;PRINT ACTUAL & EXPECTED DATA
     016760  005046                                                                 CLR     -(SP)
     016762  153716  003440                                                         BISB    TIME2,(SP)
     016766  005046                                                                 CLR     -(SP)
     016770  153716  003436                                                         BISB    TIME1,(SP)
     016774  010246                                                                 MOV     R2,-(SP)
     016776  012746  005226                                                         MOV     #DTAER2,-(SP)
     017002  012746  000004                                                         MOV     #4,-(SP)
     017006  010600                                                                 MOV     SP,R0
     017010  104415                                                                 TRAP    C$PNTX
     017012  062706  000012                                                         ADD     #12,SP
2841 017016                                50305$:
2842
2843 017016  105723                        3$:    TSTB    (R3)+                 ;UPDATE WRITE BUFFER ADDRESS.
2844 017020  105724                               TSTB    (R4)+                 ;UPDATE READ BUFFER ADDRESS.
2845 017022  105722                               TSTB    (R2)+                 ;UPDATE BYTE COUNTER.
2846 017024  020237  017076                       CMP     R2,CKDCNT             ;END OF DATA COMPARE REPEAT LOOP.
2847 017030  003702                               BLE     50301$
2848 017032  005237  017076                       INC     CKDCNT                ;CKDCNT EQUALS RECORD LENGTH.
2849 017036  005737  017100                       TST     CKDFF                 ;IF COMPARE ERROR HAS OCCURED THEN:
2850 017042  001414                               BEQ     50306$
2851 017044                                       PRINTB  #DTAER3,CKDFF,CKDCNT    ;PRINT # OF BYTES IN ERROR.
```

GLOBAL SUBROUTINES SECTION

```
        017044  013746  017076                                                          MOV     CKDCNT,(SP)
        017050  013746  017100                                                          MOV     CKDFF,-(SP)
        017054  012746  005275                                                          MOV     #DTAER3,-(SP)
        017060  012746  000003                                                          MOV     #3,(SP)
        017064  010600                                                                  MOV     SP,R0
        017066  104411                                                                  TRAP    C$PNTB
        017070  062706  000010                                                          ADD     #10,SP
2852
2853 017074                             50306$:
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                                     ;       INPUTS:
2865                                     ;       OUTPUTS:
2866                                     ;       REGISTERS:
2867                                     ;       CALLS:
2868
2869 017102  105037  003522             FIRSTU:: CLRB   DROPED          ;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$:
2876 017126  026527  002604  177777             CMP     DEVTBL(R5),#END                ;IF ALL UNITS HAVE BEEN DROPPED THEN:
2877 017134  001001                             BNE     50311$
2878 017136                                     DOCLN                                  ;DO CLEAN CODE AND TERMINATE PASS.
     017136  104444                                                                    TRAP    C$DCLN
2879
2880 017140                             50311$:
2881 017140  016537  002604  002074             MOV     DEVTBL(R5),L$LUN               ;SET UNIT # IN "HEADER" FOR ERROR REPORT
2882 017146  000207                             RTS     PC                             ;RETURN WITH 1ST DEVICE IN R5.
2883
2884
2885                                     ;       SUBROUTINE TO FIND THE NEXT UNIT IN THE TEST CYCLE.
2886                                     ;       INPUTS:
2887                                     ;       OUTPUTS:
2888                                     ;       REGISTERS:
2889                                     ;       CALLS:
2890
2891 017150  105037  003522             NEXTU:: CLRB    DROPED                 ;CLR UNIT DROPPED FLAG
2892                                             ;REPEAT                        ;REPEAT UNTIL THE NEXT DEVICE IS FOUND.
2893 017154                             50312$:
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  016537  002604  002074             MOV     DEVTBL(R5),L$LUN       ;SET UNIT # IN "HEADER' FOR ERROR REPORT
2898 017176  000207                             RTS     PC                     ;RETURN.
2899
2900
```

GLOBAL SUBROUTINES SECTION

```
2901                                    ;       SUBROUTINE TO DROP A DEVICE FROM THE TEST SEQUENCE.
2902                                    ;       INPUTS:
2903                                    ;       OUTPUTS:
2904                                    ;       REGISTERS:
2905                                    ;       CALLS:          MOVMSG, PRXST, LOG
2906
2907 017200  005265  003366            DROPU:: INC     FTLCNT(R5)          ;INCREMENT THE FATAL ERROR COUNT.
2908 017204  013704  002370                    MOV     MSGPKT+MS.XS3,R4    ;GET UDIAG ERROR CODE FROM XSTAT3.
2909 017210  042704  000377                    BIC     #377,R4
2910 017214  016503  002544                    MOV     MSGPKA(R5),R3   ;ADR OF THIS UNIT'S MSG PACKET.
2911 017220  005002                            CLR     R2      ;LET R2 := #0                   ;CLR COUNTER.
2912 017222                            50313$: ;WHILE R2 NE #MSGCNT DO         ;WHILE THERE ARE MORE LOCATIONS:
2913 017222  020227  000020                    CMP     R2,#MSGCNT
2914 017226  001405                            BEQ     50314$
2915 017230  012723  177777                    MOV     #-1,(R3)+               ;INIT THE MSG PACKET WITH ALL 1'S
2916 017234  062702  000002                    ADD     #2,R2       ;LET R2 := R2 + #2          ;UPDATE COUNTER.
2917
2918 017240  000770                            BR      50313$
2919 017242                            50314$:
2920 017242  012775  002340  002514            MOV     #GSCPK,@TSDB(R5)        ;INITIATE A GET STATUS COMMAND.
2921 017250  004737  012700                    JSR     PC,WSSR                 ;WAIT A WHILE FOR SSR=1
2922 017254  004737  012734                    JSR     PC,MOVMSG               ;MOVE MSG PACKET TO COMMON AREA.
2923 017260  020427  157400                    CMP     R4,#X3.RNY              ;IF WE HAVE A CAPSTAN RUNAWAY THEN:
2924 017264  001005                            BNE     50315$
2925 017266                                    ERRDF   16.,RNYM,STAERM         ;REPORT CAPSTAN RUNAWAY WITH TACH CNT.
     017266  104455                                                                    TRAP    C$ERDF
     017270  000020                                                                    .WORD   16.
     017272  004753                                                                    .WORD   RNYM
     017274  006120                                                                    .WORD   STAERM
2926                                                                            ;ELSE IF NOT A RUNNAWAY:
2927 017276  000402                            BR      50316$
2928 017300                            50315$:
2929 017300  004737  017412                    JSR     PC,PRXST                ;PRINT EXTENDED STATUS REGISTERS.
2930
2931 017304                            50316$:
2932 017304  105737  003465                    TSTB    RECLOG                  ;IF THE RECORD HAS BEEN LOGGED THEN:
2933 017310  001404                            BEQ     50317$
2934 017312  105237  003522                    INCB    DROPED                  ;SET UNIT DROPPED FLAG.
2935 017316  004737  015566                    JSR     PC,LOG                  ;LOG DATA BYTES + RD/WR ERRORS.
2936
2937 017322                            50317$:
2938 017322                                    DORPT                           ;PRINT PERFORMANCE REPORT
     017322  104424                                                                    TRAP    C$DRPT
2939 017324  005765  003326            DROPUA: TST     PASCNT(R5)              ;IF PASCNT(R5) NE #0 THEN
2940 017330  001402                            BEQ     50320$
2941 017332  005365  003326                    DEC     PASCNT(R5)      ;LET PASCNT(R5) := PASCNT(R5) - #1
2942
2943 017336                            50320$:
2944 017336  013737  003534  017410            MOV     TSNP,DROPN              ;SAVE # OF UNIT TO BE DROPPED.
2945 017344  013700  003534                    MOV     TSNP,R0                 ;R0=LOGICAL DEVICE NUMBER
2946 017350                                    DODU    R0                      ;DROP THE UNIT
     017350  104451                                                                    TRAP    C$DODU
2947                                                                            ;EXEC BGNDU-ENDDU CODE IF IDU = 0
2948
2949 017352  026527  002504  177774            CMP     DEVTBL(R5),#NINUSE      ;IF UNIT NOT DROPPED
2950 017360  001410                            BEQ     50321$
2951 017362  105737  002213                    TSTB    IREC                      ;IF RECOVERY IS ENABLED THEN:
```

GLOBAL SUBROUTINES SECTION

```
2952 017366  001005                    BNE     50322$
2953 017370  000240                    NOP
2954 017372  000240                    NOP
2955 017374  000240                    NOP
2956 017376  105237  003526            INCB    STAFLG              ;SET START FLAG TO ENABLE REWIND.
2957
2958 017402                        50322$:
2959
2960 017402                        50321$:
2961 017402  105237  003522        DRORTN: INCB    DROPED                  ;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$PNTX
     017426  062706  000004                                                 ADD     #4,SP
2973 017432                                PRINTX  #STAER5,MSGPKT+MS.XS0,MSGPKT+MS.XS1,MSGPKT+MS.XS2,MSGPKT+MS.XS3,MSGPKT+MS.XS
4
     017432  013746  002372                                                 MOV     MSGPKT+MS.XS4,-(SP)
     017436  013746  002370                                                 MOV     MSGPKT+MS.XS3,-(SP)
     017442  013746  002366                                                 MOV     MSGPKT+MS.XS2,-(SP)
     017446  013746  002364                                                 MOV     MSGPKT+MS.XS1,-(SP)
     017452  013746  002362                                                 MOV     MSGPKT+MS.XS0,-(SP)
     017456  012746  006753                                                 MOV     #STAER5,-(SP)
     017462  012746  000006                                                 MOV     #6,-(SP)
     017466  010600                                                         MOV     SP,R0
     017470  104415                                                         TRAP    C$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  105737  002206        CKHAE:: TSTB    HAE;IFB HAE NE #0 THEN          ;IF HALT FLAG IS SET:
2983 017504  001430                        BEQ     50323$
2984 017506  105737  003531                TSTB    MISCFG    ;IFB MISCFG EQ #0 THEN                ;
2985 017512  001023                        BNE     50324$
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  013704  003420                MOV     CMDWRD,R4           ;LET R4 := CMDWRD           ;COMMAND WORD.
2989 017524  004737  011136                    JSR PC,GCMDA                ;FETCH ADR OF CMD ASCII.
2990 017530  112337  004306                MOVB    (R3)+,HALTM             ;MOVE CMD ASCII
2991 017534  112337  004307                MOVB    (R3)+,HALTM+1       ;LET HALTM+1 :B= (R3)+
```

```
2992 017540  111337  004310                  MOVB    (R3),HALTM+2            ;INTO MESSAGE.
2993 017544                                  GMANIL HALTM,TIME1,1,YES    ;HALT   WAIT FOR AN OPERATOR 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$:
2998 017562  105037  003531                CLRB    MISCFG      ;LET MISCFG :B= #0          ;
2999
3000 017566                       50325$:
3001
3002 017566                       50323$:
3003 017566  000207                 CKHRTN: RTS     PC                      ;RETURN
3004                                        .EVEN
3005
3006 017570                                ENDMOD
3007
3008
3009                              .TITLE MISCELLANEOUS SECTIONS
3010                              .SBTTL  REPORT CODING SECTION
3011
3012
3013                              ;++
3014                              ; THE REPORT CODING SECTION CONTAINS THE
3015                              ; 'PRINTS" CALLS THAT GENERATE STATISTICAL REPORTS.
3016                              ;--
3017
3018 017570                                BGNRPT
     017570                       L$RPT::
3019 017570  010537  003452                MOV     R5,R5SAVE               ;SAVE CURRENT DEVICE POINTER.
3020 017574  004737  017102                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$PNTS
        017700  062706  000014                                                  ADD     #14,SP
3026    017704                          PRINTS  #RPT1C,RRBC+30(R5),RRBC+20(R5),RRBC+10(R5),RRBC(R5)
        017704  016546  002666                                                  MOV     RRBC(R5),-(SP)
        017710  016546  002676                                                  MOV     RRBC+10(R5),-(SP)
        017714  016546  002706                                                  MOV     RRBC+20(R5),-(SP)
        017720  016546  002716                                                  MOV     RRBC+30(R5),-(SP)
        017724  012746  020560                                                  MOV     #RPT1C,-(SP)
        017730  012746  000005                                                  MOV     #5,-(SP)
        017734  010600                                                          MOV     SP,R0
        017736  104416                                                          TRAP    C$PNTS
        017740  062706  000014                                                  ADD     #14,SP
3027    017744                          PRINTS  #RPT1D,RFBC+30(R5),RFBC+20(R5),RFBC+10(R5),RFBC(R5)
        017744  016546  002726                                                  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$PNTS
        020000  062706  000014                                                  ADD     #14,SP
3028    020004                          PRINTS  #RPT1F,WRREC(R5),RRREC(R5),RFREC(R5)
        020004  016546  003026                                                  MOV     RFREC(R5),(SP)
        020010  016546  003006                                                  MOV     RRREC(R5),-(SP)
        020014  016546  002766                                                  MOV     WRREC(R5),-(SP)
        020020  012746  020735                                                  MOV     #RPT1F,(SP)
        020024  012746  000004                                                  MOV     #4,-(SP)
        020030  010600                                                          MOV     SP,R0
        020032  104416                                                          TRAP    C$PNTS
        020034  062706  000012                                                  ADD     #12,SP
3029    020040                          PRINTS  #RPT1G,WRUNR(R5),RRUNR(R5),RFUNR(R5)
        020040  016546  003036                                                  MOV     RFUNR(R5),-(SP)
        020044  016546  003016                                                  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$PNTS
        020070  062706  000012                                                  ADD     #12,SP
3030    020074  105737  002210          TSTB    BADTSW     ;IFB BADTSW NE #0 THEN                ;
3031    020100  001402                  BEQ     50330$
3032    020102  004737  020164              JSR PC,BTRPT         ;GO PRINT BAD TAPE SPOTS WHEN  ENABLED
3033
3034    020106                  50330$:
3035    020106                          PRINTS  #RPT1I,SCCNT(R5),HRDCNT(R5),FTLCNT(R5),VFYCNT(R5)
        020106  016546  003346                                                  MOV     VFYCNT(R5),-(SP)
        020112  016546  003366                                                  MOV     FTLCNT(R5),-(SP)
        020116  016546  003356                                                  MOV     HRDCNT(R5),-(SP)
        020122  016546  003336                                                  MOV     SCCNT(R5),-(SP)
        020126  012746  021203                                                  MOV     #RPT1I,-(SP)
        020132  012746  000005                                                  MOV     #5,-(SP)
        020136  010600                                                          MOV     SP,R0
        020140  104416                                                          TRAP    C$PNTS
        020142  062706  000014                                                  ADD     #14,SP
3036    020146  004737  017150          JSR    PC,NEXTU                ;FIND THE NEXT UNIT.
3037
```

REPORT CODING SECTION

```
3038 020152  000612                        BR      50326$
3039 020154                          50327$:
3040 020154  013705  003452                MOV     R5SAVE,R5               ;RESTORE CURRENT DEVICE POINTER.
3041 020160                                EXIT    RPT
     020160  000167                                                            .WORD   J$JMP
     020162  001130                                                            .WORD   L10010-.
3042
3043                                 ;      SUBR TO PRINT BAD TAPES SPOTS DURING THE REPORT PRINTS
3044                                 ;      WRITE RETRIES: CUMULATIVE COUNT
3045                                 ;      BAD TAPE SPOTS: COUNT PER TAPE PASS ONLY, NOT CUMULATIVE.
3046                                 ;      COUNT OF RECOVERABLE WRITE ERRORS EXCLUDES BAD TAPE SPOTS.
3047
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$PNTS
     020204  062706  000006                                                      ADD     #6,SP
3049 020210  016537  002616  003512        MOV     BTADDR(R5),BTPT         ;BTPT IS BOTH THE BAD TAPE SPOT COUNTER
3050 020216  017703  163270                MOV     @BTPT,R3                ;AND THE LOGGING INDEX
3051 020222  006203                        ASR     R3
3052 020224                                PRINTS  #RPT1J,R3       ;PRINT # OF BAD TAPE SPOTS
     020224  010346                                                              MOV     R3,(SP)
     020226  012746  021107                                                      MOV     #RPT1J,(SP)
     020232  012746  000002                                                      MOV     #2,-(SP)
     020236  010600                                                              MOV     SP,R0
     020240  104416                                                              TRAP    C$PNTS
     020242  062706  000006                                                      ADD     #6,SP
3053 020246  005703                        TST     R3                      ;PRINT RECORD # IF BAD SPOTS DETECTED
3054 020250  001457                        BEQ     50331$
3055 020252  020327  000024                CMP     R3,#20.                 ;IF R3 HI #20. THEN     ;
3056 020256  101402                        BLOS    50332$
3057 020260  012703  000024                MOV     #20.,R3                 ;20 BAD SPOTS IS THE LIMIT
3058
3059 020264                          50332$:
3060 020264                            PRINTS        #CRLFSP         ;
     020264  012746  005744                                                      MOV     #CRLFSP,-(SP)
     020270  012746  000001                                                      MOV     #1,-(SP)
     020274  010600                                                              MOV     SP,R0
     020276  104416                                                              TRAP    C$PNTS
     020300  062706  000004                                                      ADD     #4,SP
3061 020304  013704  003512                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                          50333$:   ;REPEAT                     ;
3065 020316                              PRINTS      #RPT1K,(R4)     ;PRINT A BAD SPOT ID
     020316  011446                                                              MOV     (R4),(SP)
     020320  012746  021174                                                      MOV     #RPT1K,(SP)
     020324  012746  000002                                                      MOV     #2,(SP)
     020330  010600                                                              MOV     SP,R0
     020332  104416                                                              TRAP    C$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     50334$
```

```
REPORT CODING SECTION

   3070 020354                                          PRINTS #CRLFSP            ;GO TO NEXT PRINT LINE PAST 10 PRINTS
        020354  012746  005744                                                     MOV     #CRLFSP,-(SP)
        020360  012746  000001                                                     MOV     #1, (SP)
        020364  010600                                                             MOV     SP,R0
        020366  104416                                                             TRAP    C$PNTS
        020370  062706  000004                                                     ADD     #4,SP
   3071 020374  162703  000012                  SUB     #10.,R3       ;LET R3 := R3   #10.      ;ADJUST BAD SPOT COUNT
   3072 020400  162702  000012                  SUB     #10.,R2       ;LET R2 := R2 - #10.      ;ADJUST PRINT COUNT
   3073                                                                 ;
   3074 020404                          50334$:
   3075 020404  020203                          CMP     R2,R3     ;UNTIL R2 EQ R3               ;LIMIT: # OF BAD SPOTS
   3076 020406  001343                          BNE     50333$
   3077                                                                 ;
   3078 020410                          50331$:
   3079 020410                                  PRINTS  #CRLF             ;
        020410  012746  005741                                                     MOV     #CRLF, (SP)
        020414  012746  000001                                                     MOV     #1, (SP)
        020420  010600                                                             MOV     SP,R0
        020422  104416                                                             TRAP    C$PNTS
        020424  062706  000004                                                     ADD     #4,SP
   3080 020430  000207                          RTS PC
   3081
   3082                                         .NLIST  BEX
   3083 020432     045     116     045  RPT1A:  .ASCIZ  /%N%N%AUNIT %D1%S3%APASS:%D5%S3%ARECORD:%D5%N/
   3084 020507     045     101     102  RPT1B:  .ASCIZ  /%ABYTES WRITTEN  %D3%A,%Z3%A,%Z3%A,%Z3%N/
   3085 020560     045     101     102  RPT1C:  .ASCIZ  /%ABYTES READ REV %D3%A,%Z3%A,%Z3%A,%Z3%N/
   3086 020631     045     101     102  RPT1D:  .ASCII  /%ABYTES READ FWD %D3%A,%Z3%A,%Z3%A,%Z3%N/
   3087 020701     045     123     062          .ASCIZ  /%S23%AWRT%S4%ARDR%S4%ARDF%N/
   3088 020735     045     101     122  RPT1F:  .ASCIZ  /%ARECOVERABLE ERRORS   %D5%S2%D5%S2%D5%N/
   3089 021006     045     101     125  RPT1G:  .ASCIZ  /%AUNRECOVERABLE ERRORS %D5%S2%D5%S2%D5%N/
   3090 021057     045     101     127  RPT1E:  .ASCIZ  /%AWRITE RETRIES%S8%D5%N/
   3091 021107     045     116     045  RPT1J:  .ASCIZ  /%N%D2%A BAD SPOTS THIS TAPE PASS PRECEDING RECORD #:/
   3092 021174     045     104     065  RPT1K:  .ASCIZ  /%D5%S1/
   3093 021203     045     101     123  RPT1I:  .ASCII  "%ASPEC COND%S3%AHARD%S3%AFATAL%S3%ACOMPARE%N"
   3094 021257     045     123     063          .ASCIZ  /%S3%D5%S3%D5%S3%D5%S3%D5%N%N/
   3095                                         .LIST   BEX
   3096                                         .EVEN
   3097
   3098 021314                                  ENDRPT
        021314                          L10010:
        021314  104425                                                             TRAP    C$RPT
   3099
   3100                                 .SBTTL  LOAD DEVICE PROTECTION TABLE
   3101
   3102                                 ;++
   3103                                 ;TABLE FOR SUPERVISOR TO IDENTIFY THE P-TBL FOR THE LOAD DEV
   3104                                 ;THE SUPERVISOR USES THE TBL TO WARN THE OPERATOR WHEN HE TRIES TO TEST THE LOAD DEV
   3105                                 ; -
   3106
   3107 021316                                  BGNPROT
        021316                          L$PROT::
   3108
   3109 021316  000000                            .WORD 0                 ;P-TBL OFFSET OF TSDB
   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                                  ENDPROT
   3113
```

INITIALIZE SECTION

```
                                .SBTTL  INITIALIZE SECTION

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

                                        BGNINIT
021324                          L$INIT::

                                        SETVEC  #140,#170000,#340       ;ODT ROM ADDRESS                ;JB REV A-0
021324  012746  000340                                                  MOV     #340,-(SP)
021330  012746  170000                                                  MOV     #170000,-(SP)
021334  012746  000140                                                  MOV     #140,-(SP)
021340  012746  000003                                                  MOV     #3,-(SP)
021344  104437                                                          TRAP    C$SVEC
021346  062706  000010                                                  ADD     #10,SP

021352  032727  000003  002330  INIT10: BIT     #BIT0!BIT1,#CMDPKT    ;IF CMD PACKET IS NOT ON MODULO 4 BOUNDRY:
021360  001421                          BEQ     50335$
021362                                    ERRSF 1,CMDPKM                ;PRINT ERROR MSG.
021362  104454                                                          TRAP    C$ERSF
021364  000001                                                          .WORD   1
021366  004346                                                          .WORD   CMDPKM
021370  000000                                                          .WORD   0
021372                                    DELAY 200.                    ;GO TO SUPERVISOR, WAIT 2 SECONDS.
021372  012727  000310                                                  MOV     #200.,(PC)+
021376  000000                                                          .WORD   0
021400  013727  002116                                                  MOV     L$DLY,(PC)+
021404  000000                                                          .WORD   0
021406  005367  177772                                                  DEC     -6(PC)
021412  001375                                                          BNE     .-4
021414  005367  177756                                                  DEC     -22(PC)
021420  001367                                                          BNE     .-20
021422  000753                            BR    INIT10                  ;

021424                          50335$:

021424  105737  002204                  TSTB    CLRFLG                  ;IF CLR COUNTERS FLAG SET:
021430  001413                          BEQ     50336$
021432  105037  002204                    CLRB  CLRFLG                  ;INIT CLR FLAG.
021436  005002                          CLR     R2          ;LET R2 := #0
021440                          50337$:   ;WHILE R2 NE #CNTLEN DO
021440  020227  000550                  CMP     R2,#CNTLEN
021444  001405                          BEQ     50340$
021446  005062  002626                  CLR     WRBC(R2)                ;CLR ALL STATISTICAL COUNTERS.
021452  062702  000002                  ADD     #2,R2       ;LET R2 := R2 + #2

021456  000770                          BR      50337$
021460                          50340$:

021460                          50336$:

021460  105737  002205                  TSTB    RRANV           ;IF RESET RANDOM VARIABLE FLAG IS SET THEN:
021464  001406                          BEQ     50341$
021466  012737  153624  003432          MOV     #RANBC,RANB             ;RESET RANDOM BASE #.
```

INITIALIZE SECTION

```
3152 021474  012737  032561  003434          MOV     #RANSC,RANS                ;RESET RANDOM SAVE LOCATION.
3153
3154 021502                          50341$:
3155 021502                                  READEF  #EF.START                  ;READ START COMMAND EVENT FLAG.
     021502  012700  000040                                                                  MOV     #EF.START,R0
     021506  104447                                                                          TRAP    C$REFG
3156 021510                                  BNCOMPLETE      INIT15             ;BRANCH IF NOT STARTING.
     021510  103057                                                                          BCC     INIT15
3157 021512  105237  003526                  INCB    STAFLG                     ;SET START COMMAND FLAG.
3158 021516  012705  000006                  MOV     #6,R5   ;LET R5 := #6
3159 021522                          50342$: ;REPEAT                            ;INITIATE UNIT NUMBER TABLE
3160 021522  012765  177774  002604          MOV     #NINUSE,DEVTBL(R5)         ;BY STORING NOT IN USE IN EACH LOCATION.
3161 021530  162705  000002                  SUB     #2,R5     ;LET R5 := R5 - #2
3162 021534  005705                          TST     R5      ;UNTIL R5 EQ #0
3163 021536  001371                          BNE     50342$
3164 021540  022737  000001  002012          CMP     #1,L$UNIT                  ;ONLY ONE UNIT ALLOWED
3165 021546  001425                          BEQ     5034$                      ;OK
3166 021550                                  PRINTF  #AUDRUN                    ;TELL THE MAN
     021550  012746  005146                                                                  MOV     #AUDRUN, (SP)
     021554  012746  000001                                                                  MOV     #1, (SP)
     021560  010600                                                                          MOV     SP,R0
     021562  104417                                                                          TRAP    C$PNTF
     021564  062706  000004                                                                  ADD     #4,SP
3167 021570                                  DELAY   25                         ;WAIT
     021570  012727  000025                                                                  MOV     #25.,(PC)+
     021574  000000                                                                          .WORD   0
     021576  013727  002116                                                                  MOV     L$DLY,(PC)+
     021602  000000                                                                          .WORD   0
     021604  005367  177772                                                                  DEC     -6(PC)
     021610  001375                                                                          BNE     .-4
     021612  005367  177756                                                                  DEC     -22(PC)
     021616  001367                                                                          BNE     . 20
3168 021620                                  DOCLN                              ;ABORT
     021620  104444                                                                          TRAP    C$DCLN
3169 021622  013705  002012          5034$:  MOV     L$UNIT,R5       ;LET R5 := L$UNIT SHIFT 1
3170 021626  006305                          ASL     R5
3171 021630                          50343$: ;REPEAT                            ;STORE ALL UNIT
3172 021630  162705  000002                  SUB     #2,R5     ;LET R5 := R5 - #2          ;NUMBERS IN DEVTBL.
3173 021634  010565  002604                  MOV     R5,DEVTBL(R5)     ;LET DEVTBL(R5) := R5 SHIFT -1
3174 021640  006265  002604                  ASR     DEVTBL(R5)
3175 021644  005705                          TST     R5      ;UNTIL R5 EQ #0
3176 021646  001370                          BNE     50343$
3177
3178 021650                          INIT15: READEF  #EF.PWR                    ;HAS THERE BE A POWER FAILURE?
     021650  012700  000034                                                                  MOV     #EF.PWR,R0
     021654  104447                                                                          TRAP    C$REFG
3179 021656                                  BNCOMPLETE INIT16                  ;BRANCH IF NOT.
     021656  103004                                                                          BCC     INIT16
3180 021660  105237  003526                  INCB    STAFLG                     ;IF SO - SET THE START FLAG.
3181 021664  105237  003527                  INCB    PWRFLG                     ;IF SO - SET THE POWER FAIL FLAG.
3182
3183 021670                          INIT16: RFLAGS  OPFLAG                     ;READ AND STORE FLAGS SET BY OPERATOR
     021670  104421                                                                          TRAP    C$RFLA
     021672  010037  003536                                                                  MOV     R0,OPFLAG
3184 021676  005003                          CLR     R3      ;LET R3 := #0                  ;CLEAR EVENT FLAG
3185 021700  105737  003527                  TSTB    PWRFLG          ;IF POWER FAIL HAS NOT OCCURRED THEN:
3186 021704  001020                          BNE     50344$
```

```
                                        READEF @EF.NEW          ;UPDATE PASS COUNT WHEN
021706  012700  000035                                                    MOV     @EF.NEW,R0
021712  104447                                                            TRAP    C$REFG
                        BCC     50345$                          ;SUPERVISOR IS IN NEW PASS
                        TSTB    STAFLG                          ;AND DIAG WAS NEITHER STARTED
                        BNE     50346$
                          READEF @EF.RES        ;NOR
021724  012700  000037                                                    MOV     @EF.RES,R0
021730  104447                                                            TRAP    C$REFG
                        BCS     50347$          ;IFCOND CC THEN         ;RESTARTED
                        COM     R3                ;LET R3 := COMP R3    ;DO IT

                        BR      50350$
                50347$:
                        INC     R3                              ;SET 1ST PASS IF NEW PASS AND
                                                                ;RESTARTING
                50350$:

                        BR      50351$
                50346$:
                        INC     R3                              ;SET 1ST PASS IF NEW PASS AND
                                                                ;STARTING
                50351$:
                                                ;DO NOT UPDATE IT ON CONTINUE
                50345$:
                                                ;OR ON POWER FAIL
                50344$:
                        JSR     PC,FIRSTU                       ;INIT DEVICE POINTER.
                        CLR     R2      ;LET R2 := @0                   ;INIT DEVICE COUNTER.
                50352$: ;WHILE DEVTBL(R5) NE @END DO
177777  002604  026527  CMP     DEVTBL(R5),@END
                        BEQ     50353$
                        INC     R2          ;LET R2 := R2 + @1
                        MOV     R5,R0       ;LET R0 := R5 SHIFT -1
                        ASR     R0
                        GPHARD  R0,R0                           ;GET HARDWARE P TABLE FROM SUPER.
021772  104442                                                            TRAP    C$GPHRD
                        BCC     50354$      ;IFCOND CS THEN
002514  011065  MOV     (R0),TSDB(R5)                   ;SAVE TSDB ADDRESS.
002524  012065  MOV     (R0)+,TSSR(R5)                  ;SAVE TSSR ADDRESS.
002524  062765  000002  ADD     @2,TSSR(R5)
002534  012065  MOV     (R0)+,TSVCT(R5)                 ;SAVE INTERRUPT VECTOR ADDRESS.
003532  011065  MOV     (R0),TSUNT(R5)                  ;SAVE NUMBER OF DRIVE
003534  011037  MOV     (R0),TSNP                       ;SAVE FOR PRINT OUT S
                        SETVEC  TSVCT(R5),TSSINT(R5),@INTPRI
000300  012746                                                            MOV     @INTPRI,-(SP)
002554  016546                                                            MOV     TSSINT(R5),-(SP)
002534  016546                                                            MOV     TSVCT(R5),-(SP)
000003  012746                                                            MOV     @3,-(SP)
022050  104437                                                            TRAP    C$SVEC
000010  062706                                                            ADD     @10,SP
                                                                ;SET UP INTERUPT PROCESSING CONDITIONS.
003472  005065  CLR     INTFLG(R5)                      ;CLEAR INTERRUPT FLAGS.
                        TST     R3                              ;ACTUAL PASSCOUNT UPDATE PER R3
                        BEQ     50355$
                        TST     R3              ;IF R3 LT @0 THEN
002003                  BGE     50356$
```

```
3233 022072  005265  003326                  INC     PASCNT(R5)              ;LET PASCNT(R5) := PASCNT(R5) + 1
3234
3235 022076  000403                          BR      5035738
3236 022100                           5035628:
3237 022100  012765  000001  003326          MOV     #1,PASCNT(R5)           ;LET PASCNT(R5) := 1
3238
3239 022106                           5035738:
3240
3241 022106                           5035558:
3242
3243 022106                           5035548:
3244 022106  005065  003376                  CLR     RECCNT(R5)              ;CLEAR RECORD COUNT
3245 022112  004737  017150                    JSR   PC,NEXTU                ;DO IT FOR ALL DEVICES.
3246
3247 022116  000716                          BR      5035528
3248 022120                           5035538:
3249
3250 022120  005702                          TST     R2                      ;IF THERE ARE NO UNITS:
3251 022122  001026                          BNE     5036038
3252 022124                                    PRINTF #AUDRPM                ;PRINT ALL UNITS DROPPED.
     022124  012746  005114                                                      MOV     #AUDRPM,-(SP)
     022130  012746  000001                                                      MOV     #1,-(SP)
     022134  010600                                                            MOV     SP,R0
     022136  104417                                                            TRAP    C$PNTF
     022140  062706  000004                                                    ADD     #4,SP
3253 022144                                    DELAY 200.                    ;GO TO SUPERVISOR, WAIT 2 SECONDS.
     022144  012727  000310                                                    MOV     #200.,(PC)+
     022150  000000                                                            .WORD   0
     022152  013727  002116                                                    MOV     L$DLY,(PC)+
     022156  000000                                                            .WORD   0
     022160  005367  177772                                                    DEC     -6(PC)
     022164  001375                                                            BNE     .-4
     022166  005367  177756                                                    DEC     -22(PC)
     022172  001367                                                            BNE     .-20
3254 022174                                    BREAK                         ;GO TO SUPERVISOR, CHECK TTY.
     022174  104422                                                            TRAP    C$BRK
3255 022176                                  DOCLN                           ;DO CLEAN CODE - ABORT PASS.
     022176  104444                                                            TRAP    C$DCLN
3256
3257 022200                           5036038:
3258
3259
3260 022200                                  SETPRI #PRI00                   ;LOWER CPU PRIORITY TO 0
     022200  012700  000000                                                    MOV     #PRI00,R0
     022204  104441                                                            TRAP    C$SPRI
3261 022206  105737  002213                  TSTB    IREC                    ;IF ERROR RECOVERY IS ENABLED
3262 022212  001033                          BNE     1$
3263 022214  032737  000020  003536          BIT     #ADR,OPFLAG
3264 022222  001027                          BNE     1$
3265 022224  004737  017102                  JSR     PC,FIRSTU               ;AND AUTO-DROP NOT CALLED, THEN SET UP FOR FIRST
3266 022230                           5036238:                               ;WHILE THERE ARE MORE DEVICES:
3267 022230  026527  002604  177777          CMP     DEVTBL(R5),#END
3268 022236  001421                          BEQ     1$
3269 022240  105037  003530                  CLRB    TRAPD4                  ;CLEAR TRAP FLAG
3270 022244                                  SETVEC  #4,#TRAP4,#INTPRI       ;SET VECTOR 4,PRIORITY 6
     022244  012746  000300                                                    MOV     #INTPRI,-(SP)
     022250  012746  023756                                                    MOV     #TRAP4,-(SP)
```

INITIALIZE SECTION

```
        022254  012746  000004                                                          MOV     #4.,-(SP)
        022260  012746  000003                                                          MOV     #3.,-(SP)
        022264  104437                                                                  TRAP    C$SVEC
        022266  062706  000010                                                          ADD     #10.,SP
3271                                                                    ;START 3.5 MINUTE COUNTER
3272 022272  012737  000001  003436          MOV     #1,TIME1        ;INCR TIME1 FROM #1 TO #25 BY #1
3273 022300  000404                          BR      50365$
3274 022302  000137  023130          1$:     JMP     50363$
3275
3276 022306                          50366$:
3277 022306  005237  003436                  INC     TIME1
3278 022312                          50365$:
3279 022312  023727  003436  000025          CMP     TIME1,#25
3280 022320  003134                          BGT     4$
3281 022322  012775  002340  002514          MOV     @GSCPK,@TSDB(R5)        ;AND GET UNITS STATUS
3282 022330                                  DELAY   25                      ;WAIT
        022330  012727  000025                                                          MOV     #25.,(PC)+
        022334  000000                                                                  .WORD   0
        022336  013727  002116                                                          MOV     L$DLY,(PC)+
        022342  000000                                                                  .WORD   0
        022344  005367  177772                                                          DEC     -6(PC)
        022350  001375                                                                  BNE     .-4
        022352  005367  177756                                                          DEC     -22(PC)
        022356  001367                                                                  BNE     .-20
3283 022360                                  CLRVEC  #4                      ;CLEAR VECTOR AT 4
        022360  012700  000004                                                          MOV     #4,R0
        022364  104436                                                                  TRAP    C$CVEC
3284 022366  105737  003530                  TSTB    TRAPD4                  ;IFB TRAPD4 NE #0 THEN
3285 022372  001423                          BEQ     2$
3286 022374  005265  003366                  INC     FTLCNT(R5)              ;LET FTLCNT(R5) := FTLCNT(R5) + #1
3287 022400                                  PRINTF  #NODEV,TSSR(R5)         ;PRINT ERROR
        022400  016546  002524                                                          MOV     TSSR(R5),-(SP)
        022404  012746  005543                                                          MOV     #NODEV,-(SP)
        022410  012746  000002                                                          MOV     #2,-(SP)
        022414  010600                                                                  MOV     SP,R0
        022416  104417                                                                  TRAP    C$PNTF
        022420  062706  000006                                                          ADD     #6.SP
3288 022424  016537  002604  017410          MOV     DEVTBL(R5),DROPN        ;SAVE # OF UNIT TO BE DROPPED.
3289 022432  010500                          MOV     R5,R0                   ;R0=LOGICAL DEVICE NUMBER
3290 022434  006200                          ASR     R0
3291 022436                                  DODU    R0                      ;DROP THE UNIT
        022436  104451                                                                  TRAP    C$DODU
3292                                                                    ; EXEC BGNDU-ENDDU CODE IF IDU = 0
3293 022440                                  DOCLN                           ;DO CLEAN &ABORT
        022440  104444                                                                  TRAP    C$DCLN
3294
3295 022442  105037  003530          2$:     CLRB    TRAPD4                  ;CLEAR TRAP FLAG
3296 022446                                  SETVEC  #4,#TRAP4,#INTPRI       ;SET VECTOR 4,PRIORITY #6
        022446  012746  000300                                                          MOV     #INTPRI,-(SP)
        022452  012746  023756                                                          MOV     #TRAP4,-(SP)
        022456  012746  000004                                                          MOV     #4,-(SP)
        022462  012746  000003                                                          MOV     #3,-(SP)
        022466  104437                                                                  TRAP    C$SVEC
        022470  062706  000010                                                          ADD     #10.SP
3297 022474  005775  002524                  TST     @TSSR(R5)               ;CHECK FOR ADDRESS
3298 022500                                  DELAY   25                      ;WAIT
        022500  012727  000025                                                          MOV     #25.,(PC)+
```

```
                022504  000000
                022506  013727  002116                                                          .WORD   0
                                                                                                MOV     L$DLY,(PC)+
                022512  000000                                                                  .WORD   0
                022514  005367  177772                                                          DEC     6(PC)
                022520  001375                                                                  BNE     .-4
                022522  005367  177756                                                          DEC     22(PC)
                022526  001367                                                                  BNE     .-20
3299            022530                          CLRVEC  04                      ;CLEAR VECTOR AT 4
                022530  012700  000004                                                          MOV     #4,R0
                022534  104436                                                                  TRAP    C$CVEC
3300            022536  105737  003530          TSTB    TRAPD4                  ;IFB TRAPD4 NE #0 THEN
3301            022542  001424                  BEQ     3$
3302            022544  005265  003366          INC     FTLCNT(R5)              ;LET FTLCNT(R5) := FTLCNT(R5) + #1
3303            022550                          PRINTF  #NODEV,TSSR(R5)         ;PRINT ERROR
                022550  016546  002524                                                          MOV     TSSR(R5),-(SP)
                022554  012746  005543                                                          MOV     #NODEV,-(SP)
                022560  012746  000002                                                          MOV     #2,-(SP)
                022564  010600                                                                  MOV     SP,R0
                022566  104417                                                                  TRAP    C$PNTF
                022570  062706  000006                                                          ADD     #6,SP
3304            022574  016537  002604  017410      MOV     DEVTBL(R5),DROPN        ;SAVE # OF UNIT TO BE DROPPED.
3305            022602  010500                  MOV     R5,R0                   ;R0=LOGICAL DEVICE NUMBER
3306            022604  006200                  ASR     R0
3307            022606                          DODU    R0                      ;DROP THE UNIT
                022606  104451                                                                  TRAP    C$DODU
3308                                                                            ; EXEC BGNDU ENDDU CODE IF IDU = 0
3309            022610                          DOCLN                           ;DO CLEAN &ABORT
                022610  104444                                                                  TRAP    C$DCLN
3310
3311            022612  003127          4$:     BGT     50367$
3312
3313            022614  004737  007766  3$:     JSR     PC,SETDEF               ;SET UNIT NUMBER
3314            022620  010475  002514          MOV     R4,@TSDB(R5)
3315            022624                          DELAY   25
                022624  012727  000025                                                          MOV     #25.,(PC)+
                022630  000000                                                                  .WORD   0
                022632  013727  002116                                                          MOV     L$DLY,(PC)+
                022636  000000                                                                  .WORD   0
                022640  005367  177772                                                          DEC     -6(PC)
                022644  001375                                                                  BNE     .-4
                022646  005367  177756                                                          DEC     -22(PC)
                022652  001367                                                                  BNE     .-20
3316            022654  012775  002340  002514      MOV     #GSCPK,@TSDB(R5)        ;AND GET UNITS STATUS
3317            022662                          DELAY   25                      ;WAIT
                022662  012727  000025                                                          MOV     #25.,(PC)+
                022666  000000                                                                  .WORD   0
                022670  013727  002116                                                          MOV     L$DLY,(PC)+
                022674  000000                                                                  .WORD   0
                022676  005367  177772                                                          DEC     -6(PC)
                022702  001375                                                                  BNE     .-4
                022704  005367  177756                                                          DEC     -22(PC)
                022710  001367                                                                  BNE     .-20
3318            022712  032775  000200  002524      BIT     #TS.SSR,@TSSR(R5)       ;IF #TS.SSR SETIN @TSSR(R5) THEN
3319            022720  001420                  BEQ     50370$
3320            022722  032775  000100  002524      BIT     #TS.OFL,@TSSR(R5)       ;IF #TS.OFL NOTSETIN @TSSR(R5) THEN
3321            022730  001001                  BNE     50371$
3322            022732  000457                  BR      50364$                  ;EXIT COUNTER WHEN UNIT ON LINE
```

INITIALIZE SECTION

```
3323
3324 022734                                50371$:
3325 022734                                        PRINTF #OFLINM,TSNP              ;PRINT UNIT OFF LINE EVERY 10 SEC
     022734  013746  003534                                                         MOV     TSNP,-(SP)
     022740  012746  005456                                                         MOV     #OFLINM,-(SP)
     022744  012746  000002                                                         MOV     #2,-(SP)
     022750  010600                                                                 MOV     SP,R0
     022752  104417                                                                 TRAP    C$PNTF
     022754  062706  000006                                                         ADD     #6,SP
3326
3327 022760                                50372$:
3328
3329 022760  000412                                BR      50373$
3330 022762                                50370$:
3331 022762                                          PRINTF #NRDYM,DEVTBL(R5)
     022762  016546  002604                                                         MOV     DEVTBL(R5),-(SP)
     022766  012746  023726                                                         MOV     #NRDYM,-(SP)
     022772  012746  000002                                                         MOV     #2,-(SP)
     022776  010600                                                                 MOV     SP,R0
     023000  104417                                                                 TRAP    C$PNTF
     023002  062706  000006                                                         ADD     #6,SP
3332
3333 023006                                50373$:
3334 023006  012737  000001  003440              MOV     #1,TIME2                 ;INCR TIME2 FROM #1 TO #13 BY #1
3335 023014  000402                              BR      50374$
3336 023016                                50375$:
3337 023016  005237  003440                      INC     TIME2
3338 023022                                50374$:
3339 023022  023727  003440  000013              CMP     TIME2,#13
3340 023030  003016                              BGT     50376$
3341 023032                                      DELAY   100.             ;WAIT FOR UNIT TO BE SET ON-LINE
     023032  012727  000144                                                         MOV     #100.,(PC)+
     023036  000000                                                                 .WORD   0
     023040  013727  002116                                                         MOV     L$DLY,(PC)+
     023044  000000                                                                 .WORD   0
     023046  005367  177772                                                         DEC     -6(PC)
     023052  001375                                                                 BNE     .-4
     023054  005367  177756                                                         DEC     -22(PC)
     023060  001367                                                                 BNE     .-20
3342 023062                                      BREAK                    ;ALLOW TERMINAL INTERRUPT
     023062  104422                                                                 TRAP    C$BRK
3343 023064  000754                              BR      50375$
3344 023066                                50376$:
3345 023066  000137  022306                      JMP     50366$
3346 023072                                50367$:
3347 023072                                50364$:
3348 023072                                      CLRVEC  #4                       ;CLEAR VECTOR AT 4
     023072  012700  000004                                                         MOV     #4,R0
     023076  104436                                                                 TRAP    C$CVEC
3349 023100  023727  003436  000025              CMP     TIME1,#25                ;IF OFF LINE FOR 3.5 MINUTES
3350 023106  003404                              BLE     50377$
3351 023110  004737  012734                            JSR PC,MOVMSG              ;GET MESSAGE PACKET
3352 023114  004737  013452                            JSR PC,TCC1                ;PRINT ERROR AND DROP OFF LINE UNIT
3353
3354 023120                                50377$:
3355                                                                                ;REPEAT UNTIL ON LINE OR TIMED OUT
3356 023120  004737  017150                      JSR PC,NEXTU                     ;SET UP FOR NEXT UNIT.
```

INITIALIZE SECTION

```
3357
3358 023124  000137  022230                    JMP     50362$
3359
3360 023130                              50363$:
3361 023130                              50361$:
3362 023130  105737  003527                    TSTB    PWRFLG  ;IFB PWRFLG EQ #0 THEN
3363 023134  001026                            BNE     50400$
3364 023136                                      MEMORY DATAWT          ;REQUEST MEMORY FROM SUPER FOR RD/WR BUFFERS.
     023136  104431                                                                  TRAP    C$MEM
     023140  010037  003406                                                          MOV     R0,DATAWT
3365 023144  013737  003406  003410            MOV     DATAWT,DATARD   ;SET RD BFR ADDRESS
3366 023152  062737  004000  003410            ADD     #DATCNT,DATARD
3367 023160  027727  160222  004000            CMP     @DATAWT,#DATCNT   ;WHEN NOT ENOUGH FREE MEMO AVAILABLE
3368 023166  002011                            BGE     50401$
3369 023170                                        PRINTF #MEMOM                ;WARN OPERATOR
     023170  012746  023236                                                          MOV     #MEMOM, (SP)
     023174  012746  000001                                                          MOV     #1, (SP)
     023200  010600                                                                  MOV     SP,R0
     023202  104417                                                                  TRAP    C$PNTF
     023204  062706  000004                                                          ADD     #4,SP
3370 023210                                        DOCLN                        ;AND ABORT PASS
     023210  104444                                                                  TRAP    C$DCLN
3371                                                        ;DIAG MUST BE RE-LOADED IN A CPU WITH LARGER MEMO
3372 023212                              50401$:
3373
3374 023212                              50400$:
3375
3376 023212  105037  002214                    CLRB    CHGFLG                  ;CLR CHANGE CMD SEQ TBL FLAG.
3377 023216  012703  003526                    MOV     #ENDFLG,R3      ;LET R3 := #ENDFLG
3378 023222  004737  012664                    JSR     PC,CLRERR               ;CLEAR ALL FLAGS.
3379 023226  105037  003527                    CLRB    PWRFLG                  ;CLEAR THE POWER FAIL FLAG.
3380
3381 023232                                    EXIT    INIT
     023232  104432                                                                  TRAP    C$EXIT
     023234  000104                                                                  .WORD   L10012 .
3382 023236     045     101     106  MEMOM:   .ASCII  /%AFREE MEMO TOO SMALL FOR RD WR BFRS%N/
     023241     122     105     105
     023244     040     115     105
     023247     115     117     040
     023252     124     117     117
     023255     040     123     115
     023260     101     114     114
     023263     040     106     117
     023266     122     040     122
     023271     104     055     127
     023274     122     040     102
     023277     106     122     123
     023302     045     116
3383 023304     045     101     122          .ASCIZ  /%ARE-LOAD IN LARGER MEMO%N/
     023307     105     055     114
     023312     117     101     104
     023315     040     111     116
     023320     040     114     101
     023323     122     107     105
     023326     122     040     115
     023331     105     115     117
     023334     045     116     000
```

INITIALIZE SECTION

```
3384                                    .EVEN
3385
3386 023340                             ENDINIT
     023340                         L10012:
     023340  104411                                                        TRAP    C$INIT
3387
3388                                    .SBTTL  AUTO DROP SECTION
3389
3390                                    ;++
3391                                    ;SECTION EXECUTED AFTER THE INIT CODE WHEN "ADR' FLAG IS SET BY OPERATOR
3392                                    ;SECTION CHEKS FOR A VALID INTERFACE LOCATION.  DROPS UNIT IF NO RESPONSE
3393                                    ;FROM INTERFACE
3394                                    ; -
3395
3396 023342                             BGNAUTO
     023342                         L$AUTO::
3397
3398 023342  004737  017102             JSR PC,FIRSTU                   ;FIND FIRST UNIT
3399 023346                         50402$: ;WHILE DEVTBL(R5) NE @END DO    ;
3400 023346  026527  002604  177777       CMP     DEVTBL(R5),@END
3401 023354  001525                       BEQ     50403$
3402 023356  105037  003530               CLRB    TRAPD4     ;LET TRAPD4 .B= @0           ;
3403 023362                               SETVEC @4,@TRAP4,@INTPRI      ;SET VECTOR 4
     023362  012746  000300                                                     MOV     @INTPRI,(SP)
     023366  012746  023756                                                     MOV     @TRAP4,-(SP)
     023372  012746  000004                                                     MOV     @4,(SP)
     023376  012746  000003                                                     MOV     @3,(SP)
     023402  104437                                                            TRAP    C$SVEC
     023404  062706  000010                                                     ADD     @10,SP
3404 023410  017502  002514               MOV     @TSDB(R5),R2                ;ADDRESS TSOS INTERFACE
3405 023414                               CLRVEC @4                           ;CLEAR VECTOR AT 4
     023414  012700  000004                                                     MOV     @4,R0
     023420  104436                                                            TRAP    C$CVEC
3406 023422  105737  003530               TSTB    TRAPD4     ;IFB TRAPD4 NE @0 THEN
3407 023426  001423                       BEQ     50404$
3408 023430  005265  003366               INC     FTLCNT(R5)          ;LET FTLCNT(R5) := FTLCNT(R5) + @1
3409 023434                                   PRINTF @AUTODM,TSDB(R5)     ;PRINT ERROR
     023434  016546  002514                                                     MOV     TSDB(R5),-(SP)
     023440  012746  023632                                                     MOV     @AUTODM,(SP)
     023444  012746  000002                                                     MOV     @2,-(SP)
     023450  010600                                                            MOV     SP,R0
     023452  104417                                                            TRAP    C$PNTF
     023454  062706  000006                                                     ADD     @6,SP
3410 023460  016537  002604  017410       MOV     DEVTBL(R5),DROPN                ;SAVE # OF UNIT TO BE DROPPED.
3411 023466  010500                       MOV     R5,R0                       ;R0=LOGICAL DEVICE NUMBER
3412 023470  006200                       ASR     R0
3413 023472                               DODU    R0      ;DROP THE UNIT: EXEC BGNDU ENDDU CODE IF IDU = 0
     023472  104451                                                            TRAP    C$DODU
3414
3415 023474  000452                       BR      50405$
3416 023476                         50404$:
3417 023476  012775  002340  002514       MOV     @GSCPK,@TSDB(R5)            ;SEND GET STATUS COMMAND
3418 023504  004737  012700                   JSR PC,WSSR                     ;WAIT
3419 023510  032775  000200  002524       BIT     @TS.SSR,@TSSR(R5)           ;IF @TS.SSR SETIN @TSSR(R5) THEN
3420 023516  001423                       BEQ     50406$
3421 023520  032775  000100  002524       BIT     @TS.OFL,@TSSR(R5)       .   ;IF @TS.OFL SETIN @TSSR(R5) THEN
3422 023526  001416                       BEQ     50407$
```

AUTO DROP SECTION

```
3423 023530  005265  003366                  INC     FTLCNT(R5)              ;LET FTLCNT(R5) := FTLCNT(R5) + #1
3424 023534                                  PRINTF #OFLINM,TSNP
     023534  013746  003534                                                  MOV     TSNP,-(SP)
     023540  012746  005456                                                  MOV     #OFLINM,-(SP)
     023544  012746  000002                                                  MOV     #2,-(SP)
     023550  010600                                                          MOV     SP,R0
     023552  104417                                                          TRAP    C$PNTF
     023554  062706  000006                                                  ADD     #6,SP
3425 023560  004737  017324                      JSR PC,DROPUA
3426
3427 023564                          50407$:
3428
3429 023564  000416                      BR      50410$
3430 023566                          50406$:
3431 023566  005265  003366                  INC     FTLCNT(R5)              ;LET FTLCNT(R5) := FTLCNT(R5) + #1
3432 023572                                 PRINTF #NRDYM,DEVTBL(R5)
     023572  016546  002604                                                  MOV     DEVTBL(R5),-(SP)
     023576  012746  023726                                                  MOV     #NRDYM,-(SP)
     023602  012746  000002                                                  MOV     #2,-(SP)
     023606  010600                                                          MOV     SP,R0
     023610  104417                                                          TRAP    C$PNTF
     023612  062706  000006                                                  ADD     #6,SP
3433 023616  004737  017324                     JSR PC,DROPUA
3434
3435 023622                          50410$:
3436
3437 023622                          50405$:
3438 023622  004737  017150                       JSR PC,NEXTU
3439
3440 023626  000647                      BR      50402$
3441 023630                          50403$:
3442
3443 023630                                  ENDAUTO
     023630                          L10013:
     023630  104461                                                          TRAP    C$AUTO
3444
3445 023632     045     101     102  AUTODM: .ASCII  /%ABUS TRAP AT %O6%N/
     023635     125     123     040
     023640     124     122     101
     023643     120     040     101
     023646     124     040     045
     023651     117     066     045
     023654     116
3446 023655     045     101     111          .ASCIZ  /%AINTERFACE BAD OR NOT SET TO ABOVE AD%N/
     023660     116     124     105
     023663     122     106     101
     023666     103     105     040
     023671     102     101     104
     023674     040     117     122
     023677     040     116     117
     023702     124     040     123
     023705     105     124     040
     023710     124     117     040
     023713     101     102     117
     023716     126     105     040
     023721     101     104     045
     023724     116     000
```

```
3447 023726  045  101  125  NRDYM:  .ASCIZ  /%AUNIT %D1%A NOT RDY%N/
     023731  116  111  124
     023734  040  045  104
     023737  061  045  101
     023742  040  116  117
     023745  124  040  122
     023750  104  131  045
     023753  116  000
3448                                .EVEN
3449
3450                            ;       DEVICE BUS TRAP HANDLER
3451                            ;       OUTPUT: TRAPD4 BYTE  1: TRAPED AT 4
3452                            ;                            0: NO TRAP
3453
3454 023756  105237  003530     TRAP4:: INCB    TRAPD4;LET TRAPD4 :B= TRAPD4 + #1
3455 023762  000002             RTI
3456
3457
3458                            .SBTTL  CLEANUP CODING SECTION
3459
3460                            ;++
3461                            ; THE CLEANUP CODING SECTION CONTAINS THE CODING THAT IS PERFORMED
3462                            ; AT THE END OF EACH PASS.
3463                            ;--
3464
3465 023764                      BGNCLN
     023764                     L$CLEAN::
3466
3467 023764  004737  017102             JSR     PC,FIRSTU               ;FIND FIRST UNIT.
3468 023770                     50411$: ;WHILE DEVTBL(R5) NE #END DO
3469 023770  026527  002604  177777     CMP     DEVTBL(R5),#END
3470 023776  001410                     BEQ     50412$
3471 024000  004737  012700               JSR PC,WSSR                   ;WAIT FOR UNIT READY OR TIMEOUT.
3472 024004                               CLRVEC          TSVCT(R5)     ;RELEASE INTERRUPT VECTORS FOR ALL DEV.
     024004  016500  002534                                                     MOV     TSVCT(R5),R0
     024010  104436                                                             TRAP    C$CVEC
3473 024012  004737  017150               JSR   PC,NEXTU                ;FIND NEXT UNIT.
3474
3475 024016  000764             BR      50411$
3476 024020                     50412$:
3477
3478 024020                      EXIT    CLN
     024020  104432                                                     TRAP    C$EXIT
     024022  000002                                                     .WORD   L10014-.
3479                                .EVEN
3480
3481 024024                      ENDCLN
     024024                     L10014:
     024024  104412                                                     TRAP    C$CLEAN
3482
3483                            .SBTTL  DROP UNIT SECTION
3484
3485                            ;++
3486                            ; THE DROP-UNIT SECTION CONTAINS THE CODING THAT CAUSES A DEVICE
3487                            ; TO NO LONGER BE TESTED.  THAT CODE SHALL BE EXECUTED WHEN DODU
3488                            ;MACRO IS CALLED WHILE IDU FLAG IS NOT SET BY OPERATOR
3489                            ; -
```

DROP UNIT SECTION

```
3490
3491 024026                                    BGNDU
     024026                              L$DU::
3492
3493 024026  010005                            MOV     R0,R5                   ;R5 = LOGICAL DEVICE NUMBER X 2.
3494 024030  006305                            ASL     R5
3495 024032  012765  177774  002604            MOV     #NINUSE,DEVTBL(R5)      ;SET NOT IN USE FLAG FOR THE DEVICE.
3496 024040                                    CLRVEC TSVCT(R5)                ;RELEASE THE INTERRUPT VECTOR.
     024040  016500  002534                                                            MOV     TSVCT(R5),R0
     024044  104436                                                                    TRAP    C$CVEC
3497 024046                                    PRINTF  #DROPDM,DROPN           ;PRINT DROP DEVICE MESSAGE
     024046  013746  017410                                                            MOV     DROPN,-(SP)
     024052  012746  005065                                                            MOV     #DROPDM,-(SP)
     024056  012746  000002                                                            MOV     #2,-(SP)
     024062  010600                                                                    MOV     SP,R0
     024064  104417                                                                    TRAP    C$PNTF
     024066  062706  000006                                                            ADD     #6,SP
3498 024072                                    EXIT    DU
     024072  000167                                                                    .WORD   J$JMP
     024074  000000                                                                    .WORD   L10015 2-.
3499                                           .EVEN
3500
3501 024076                                    ENDDU
     024076                              L10015:
     024076  104453                                                                    TRAP    C$DU
3502
3503                                    .SBTTL  ADD UNIT SECTION
3504
3505                                    ;**
3506                                    ; THE ADD UNIT SECTION CONTAINS THE CODING THAT CAUSES A DEVICE
3507                                    ;  TO BE (A) TESTED FOR THE FIRST TIME, OR (B) RESUMED IN TESTING.  IF
3508                                    ;  "EF.AUNIT" IS SET, THE UNIT WILL BE TESTED AS A NEW UNIT.
3509                                    ;-
3510
3511 024100                                    BGNAU
     024100                              L$AU::
3512 024100  010005                            MOV     R0,R5                   ;R5 = LOGICAL DEVICE NUMBER X 2.
3513 024102  006305                            ASL     R5
3514 024104  010065  002604                    MOV     R0,DEVTBL(R5)           ;STORE UNIT # IN DEVICE TABLE.
3515 024110                                    GPHARD  R0,R0                   ;GET HARDWARE P TABLE FROM SUPER.
     024110  104442                                                                    TRAP    C$GPHRD
3516 024112  011065  002514                    MOV     (R0),TSDB(R5)           ;SAVE TSDB ADDRESS.
3517 024116  012065  002524                    MOV     (R0)+,TSSR(R5)          ;SAVE TSSR ADDRESS.
3518 024122  062765  000002  002524            ADD     #2,TSSR(R5)
3519 024130  011065  002534                    MOV     (R0),TSVCT(R5)          ;SAVE INTERRUPT VECTOR ADDRESS.
3520 024134  011065  003532                    MOV     (R0),TSUNT(R5)          ;SAVE NUMBER OF DRIVE
3521 024140  011037  003534                    MOV     (R0),TSNP               ;SAVE FOR PRINT OUT'S
3522 024144                                    SETVEC TSVCT(R5),TS5INT(R5),#INTPRI
     024144  012746  000300                                                            MOV     #INTPRI,-(SP)
     024150  016546  002554                                                            MOV     TS5INT(R5),-(SP)
     024154  016546  002534                                                            MOV     TSVCT(R5),-(SP)
     024160  012746  000003                                                            MOV     #3,-(SP)
     024164  104437                                                                    TRAP    C$SVEC
     024166  062706  000010                                                            ADD     #10,SP
3523                                                                           ;SET UP INTERUPT PROCESSING CONDITIONS.
3524 024172  005065  003472                    CLR     INTFLG(R5)              ;CLEAR INTERRUPT FLAGS.
3525
```

ADD UNIT SECTION

```
3526 024176                                     EXIT    AU
     024176  000167                                                          .WORD   J$JMP
     024200  000000                                                          .WORD   L10016-2 .
3527
3528                                            .EVEN
3529
3530 024202                                     ENDAU
     024202                             L10016:
     024202  104452                                                          TRAP    C$AU
3531
3532
3533
3534                                    .TITLE HARDWARE TESTS
3535
3536                                    .SBTTL  TEST 1:  BASIC FUNCTIONS.
3537
3538                                    ;++
3539                                    ; TEST TO EXECUTE ALL TS05 FUNCTIONS.
3540                                    ;--
3541
3542 024204                                     BGNMOD
3543
3544 024204                                     BGNTST
     024204                             T1::
3545
3546 024204  105037  003515                     CLRB    RANDOM                  ;CLR THE RANDOM OPERATIONS FLAG.
3547 024210  105037  003514                     CLRB    EXPBOT                  ;CLR EXPECT BOT FLAG.
3548
3549 024214                                     BGNSUB                  ;SUBTEST 1 - SET CHAR, DRIVE INIT, GET STATUS.
     024214                             T1.1:
     024214  104402                                                          TRAP    C$BSUB
3550
3551 024216  004737  017102                     JSR     PC,FIRSTU               ;FIND THE FIRST UNIT.
3552 024222  004737  007072                     JSR     PC,SOFINIT              ;INIT DEVICE
3553 024226  103404                             BCS     11$
3554 024230                                     ERRDF   2,NSSRM,STAERM          ;REPORT TS05 NOT READY
     024230  104455                                                          TRAP    C$ERDF
     024232  000002                                                          .WORD   2
     024234  004536                                                          .WORD   NSSRM
     024236  006120                                                          .WORD   STAERM
3555
3556 024240  004737  007466          11$:       JSR     PC,MDSET                ;GO DO SETUP'S
3557 024244  012702  025122                     MOV     #BFSEQ0,R2              ;ADR OF CMD SEQ.
3558 024250  004737  025076                     JSR     PC,BFSEQ                ;SET UP CMD SEQ.
3559 024254  004737  010226                     JSR     PC,EXALL                ;EXECUTE CMD SEQ ON ALL DEVICES.
3560 024260  004737  017102                     JSR     PC,FIRSTU               ;FIND THE FIRST UNIT.
3561 024264                            50413$: ;WHILE DEVTBL(R5) NE #END DO    ;WHILE THERE ARE MORE DEVICES:
3562 024264  026527  002604  177777           CMP     DEVTBL(R5),#END
3563 024272  001451                             BEQ     50414$
3564 024274  016502  002544                     MOV     MSGPKA(R5),R2           ;GET MSG PACKET ADR,
3565 024300  062702  000012                     ADD     #12,R2    ;LET R2 := R2 + #12           ;GET XSTAT2 ADR,
3566 024304  011265  002564                     MOV     (R2),TS5CL(R5)            ;STORE CODE LEVEL FROM DTR BYTE,
3567 024310  042765  177700  002564           BIC     #177700,TS5CL(R5)
3568 024316  011265  002574                     MOV     (R2),TS5SW(R5)                  ;STORE  SWITCH SETTINGS
3569 024322  042765  177477  002574           BIC     #177477,TS5SW(R5)
3570 024330                                     PRINTF  #CODELM,DEVTBL(R5),TS5CL(R5)
     024330  016546  002564                                                          MOV     TS5CL(R5),-(SP)
```

TEST 1: BASIC FUNCTIONS.

```
        024334  016546  002604                                                  MOV     DEVTBL(R5),-(SP)
        024340  012746  004162                                                  MOV     #CODELM,-(SP)
        024344  012746  000003                                                  MOV     #3,-(SP)
        024350  010600                                                          MOV     SP,R0
        024352  104417                                                          TRAP    C$PNTF
        024354  062706  000010                                                  ADD     #10,SP
  3571                                                  ;PRINT THE TS05 MICROCODE LEVEL.
  3572 024360                           PRINTF  #SWSET,DEVTBL(R5),TS5SW(R5)
        024360  016546  002574                                                  MOV     TS5SW(R5),(SP)
        024364  016546  002604                                                  MOV     DEVTBL(R5),-(SP)
        024370  012746  004231                                                  MOV     #SWSET,-(SP)
        024374  012746  000003                                                  MOV     #3,-(SP)
        024400  010600                                                          MOV     SP,R0
        024402  104417                                                          TRAP    C$PNTF
        024404  062706  000010                                                  ADD     #10,SP
  3573                                                  ;PRINT THE TS05 SWITCH SETTINGS.
  3574 024410                   50415$:
  3575 024410  004737  017150             JSR     PC,NEXTU                    ;FIND NEXT UNIT.
  3576
  3577 024414  000723                   BR      50413$
  3578 024416                   50414$:
  3579
  3580 024416                           ENDSUB
        024416                  L10020:
        024416  104403                                                          TRAP    C$ESUB
  3581
  3582 024420                           BGNSUB                                ;SUBTEST 2 - REWIND.
        024420                  T1.2:
        024420  104402                                                          TRAP    C$BSUB
  3583
  3584 024422  012702  025174           MOV     #BFSEQ1,R2                    ;ADR OF CMD SEQ.
  3585 024426  004737  025076           JSR     PC,BFSEQ                      ;SET UP CMD SEQ.
  3586 024432  004737  010226           JSR     PC,EXALL                      ;EXECUTE CMD SEQ ON ALL DEVICES.
  3587 024436  105037  003526           CLRB    STAFLG                        ;CLEAR START FLAG
  3588 024442                           ENDSUB
        024442                  L10021:
        024442  104403                                                          TRAP    C$ESUB
  3589
  3590 024444                           BGNSUB                                ;SUBTEST 3 - WRITE/VERIFY.
        024444                  T1.3:
        024444  104402                                                          TRAP    C$BSUB
  3591
  3592 024446  012702  025206           MOV     #BFSEQ2,R2                    ;ADR OF CMD SEQ.
  3593 024452  004737  025076           JSR     PC,BFSEQ                      ;SET UP CMD SEQ.
  3594 024456  004737  010226           JSR     PC,EXALL                      ;EXECUTE CMD SEQ ON ALL DEVICES.
  3595 024462                           ENDSUB
        024462                  L10022:
        024462  104403                                                          TRAP    C$ESUB
  3596
  3597 024464                           BGNSUB                                ;SUBTEST 4 - WRITE TAPE MARK, ERASE.
        024464                  T1.4:
        024464  104402                                                          TRAP    C$BSUB
  3598
  3599 024466  012702  025300           MOV     #BFSEQ3,R2                    ;ADR OF CMD SEQ.
  3600 024472  004737  025076           JSR     PC,BFSEQ                      ;SET UP CMD SEQ.
  3601 024476  004737  010226           JSR     PC,EXALL                      ;EXECUTE CMD SEQ ON ALL DEVICES.
  3602 024502                           ENDSUB
```

TEST 1: BASIC FUNCTIONS.

```
        024502                          L10023:
        024502  104403                                                   TRAP    C$ESUB
   3603
   3604 024504                                  BGNSUB                  ;SUBTEST 5 - SPACE FILES.
        024504                          T1.5:
        024504  104402                                                   TRAP    C$BSUB
   3605
   3606 024506  012702  025352                  MOV     #BFSEQ4,R2      ;ADR OF CMD SEQ.
   3607 024512  004737  025076                  JSR     PC,BFSEQ        ;SET UP CMD SEQ.
   3608 024516  004737  010226                  JSR     PC,EXALL        ;EXECUTE CMD SEQ ON ALL DEVICES.
   3609 024522                                  ENDSUB
        024522                          L10024:
        024522  104403                                                   TRAP    C$ESUB
   3610
   3611 024524                                  BGNSUB                  ;SUBTEST 6 - SPACE RECORDS.
        024524                          T1.6:
        024524  104402                                                   TRAP    C$BSUB
   3612
   3613 024526  012702  025414                  MOV     #BFSEQ5,R2      ;ADR OF CMD SEQ.
   3614 024532  004737  025076                  JSR     PC,BFSEQ        ;SET UP CMD SEQ.
   3615 024536  004737  010226                  JSR     PC,EXALL        ;EXECUTE CMD SEQ ON ALL DEVICES.
   3616 024542                                  ENDSUB
        024542                          L10025:
        024542  104403                                                   TRAP    C$ESUB
   3617
   3618 024544                                  BGNSUB                  ;SUBTEST 7 - WRITE RETRY.
        024544                          T1.7:
        024544  104402                                                   TRAP    C$BSUB
   3619
   3620 024546  012702  025466                  MOV     #BFSEQ6,R2      ;ADR OF CMD SEQ.
   3621 024552  004737  025076                  JSR     PC,BFSEQ        ;SET UP CMD SEQ.
   3622 024556  004737  010226                  JSR     PC,EXALL        ;EXECUTE CMD SEQ ON ALL DEVICES.
   3623 024562                                  ENDSUB
        024562                          L10026:
        024562  104403                                                   TRAP    C$ESUB
   3624
   3625 024564                                  BGNSUB                  ;SUBTEST 8 - READ REV RETRY.
        024564                          T1.8:
        024564  104402                                                   TRAP    C$BSUB
   3626
   3627 024566  012702  025540                  MOV     #BFSEQ7,R2      ;ADR OF CMD SEQ.
   3628 024572  004737  025076                  JSR     PC,BFSEQ        ;SET UP CMD SEQ.
   3629 024576  004737  010226                  JSR     PC,EXALL        ;EXECUTE CMD SEQ ON ALL DEVICES.
   3630 024602                                  ENDSUB
        024602                          L10027:
        024602  104403                                                   TRAP    C$ESUB
   3631
   3632 024604                                  BGNSUB                  ;SUBTEST 9 - READ FWD RETRY.
        024604                          T1.9:
        024604  104402                                                   TRAP    C$BSUB
   3633
   3634 024606  012702  025572                  MOV     #BFSEQ8,R2      ;ADR OF CMD SEQ.
   3635 024612  004737  025076                  JSR     PC,BFSEQ        ;SET UP CMD SEQ.
   3636 024616  004737  010226                  JSR     PC,EXALL        ;EXECUTE CMD SEQ ON ALL DEVICES.
   3637 024622                                  ENDSUB
        024622                          L10030:
        024622  104403                                                   TRAP    C$ESUB
```

TEST 1: BASIC FUNCTIONS.

```
3638
3639 024624                                  BGNSUB                          ;SUBTEST 10- CLEAN.
     024624                          T1.10:
     024624  104402                                                          TRAP    C$BSUB
3640
3641 024626  012702  025624                   MOV     #BFSEQ9,R2              ;ADR OF CMD SEQ.
3642 024632  004737  025076                   JSR     PC,BFSEQ                ;SET UP CMD SEQ.
3643 024636  004737  010226                   JSR     PC,EXALL                ;EXECUTE CMD SEQ ON ALL DEVICES.
3644 024642                                   ENDSUB
     024642                          L10031:
     024642  104403                                                          TRAP    C$ESUB
3645
3646 024644                                  BGNSUB                          ;SUBTEST 11 - WTV SWAPPED DATA BYTES.
     024644                          T1.11:
     024644  104402                                                          TRAP    C$BSUB
3647 024646  012702  025646                   MOV     #BFSE10,R2              ;ADR OF CMD SEQ.
3648 024652  004737  025076                   JSR     PC,BFSEQ                ;SET UP CMD SEQ.
3649 024656  004737  010226                   JSR     PC,EXALL                ;WRITE/VERIFY RECORDS 1 AND 2.
3650 024662  112737  000001  003520           MOVB    #1,SWBFLG               ;ENABLE BYTE SWAPPING.
3651 024670  004737  010226                   JSR     PC,EXALL                ;WRITE/VERIFY RECORDS 3 AND 4.
3652 024674  105037  003520                   CLRB    SWBFLG                  ;DISABLE BYTE SWAPPING.
3653 024700                                   ENDSUB
     024700                          L10032:
     024700  104403                                                          TRAP    C$ESUB
3654 024702  013702  003406                   MOV     DATAWT,R2               ;INIT WRITE BUFFER POINTER.
3655 024706  062702  000012                   ADD     #10.,R2
3656 024712                          504168: ;WHILE R2 NE DATAWT DO  ;UNTIL 10 BYTES HAVE BEEN SWAPPED.
3657 024712  020237  003406                   CMP     R2,DATAWT
3658 024716  001402                          BEQ     504178
3659 024720  000342                            SWAB  -(R2)                   ;SWAP DATA BYTES IN WRITE BUFFER.
3660
3661 024722  000773                          BR      504168
3662 024724                          504178:
3663 024724  105237  003523                   INCB    T1SWB           ;SET T1 SWAP BYTES FLAG FOR "CKDATA" SUBR
3664
3665 024730                                  BGNSUB                          ;SUBTEST 12 - READ SWAPPED DATA BYTES.
     024730                          T1.12:
     024730  104402                                                          TRAP    C$BSUB
3666 024732  012737  104401  003420           MOV     #RDR,CMDWRD             ;CMD IS READ REV.
3667 024740  004737  016152                   JSR     PC,VFEXC                ;VERIFY ODD LENGTH SWAP (RECORD 4).
3668 024744  012737  000012  002336           MOV     #12.,CMDPKT+CP.CNT      ;CHANGE BYTE COUNT TO 10.
3669 024752  004737  016152                   JSR     PC,VFEXC                ;VERIFY EVEN LENGTH SWAP (RECORD 3).
3670 024756  112737  000001  003520           MOVB    #1,SWBFLG               ;ENABLE BYTE SWAPPING.
3671 024764  012737  000011  002336           MOV     #11.,CMDPKT+CP.CNT      ;CHANGE BYTE COUNT TO 9.
3672 024772  004737  016152                   JSR     PC,VFEXC                ;VERIFY ODD LENGTH SWAP (RECORD 2).
3673 024776  012737  000012  002336           MOV     #12.,CMDPKT+CP.CNT      ;CHANGE BYTE COUNT TO 10.
3674 025004  004737  016152                   JSR     PC,VFEXC                ;VERIFY EVEN LENGTH SWAP (RECORD 1).
3675 025010  012737  104001  003420           MOV     #RDF,CMDWRD             ;CMD IS READ FWD.
3676 025016  004737  016152                   JSR     PC,VFEXC                ;VERIFY EVEN LENGTH SWAP (RECORD 1).
3677 025022  012737  000011  002336           MOV     #11.,CMDPKT+CP.CNT      ;CHANGE BYTE COUNT TO 9.
3678 025030  004737  016152                   JSR     PC,VFEXC                ;VERIFY ODD LENGTH SWAP (RECORD 2).
3679 025034  105037  003520                   CLRB    SWBFLG                  ;DISABLE BYTE SWAPPING.
3680 025040  012737  000012  002336           MOV     #12.,CMDPKT+CP.CNT      ;CHANGE BYTE COUNT TO 10.
3681 025046  004737  016152                   JSR     PC,VFEXC                ;VERIFY EVEN LENGTH SWAP (RECORD 3).
3682 025052  012737  000011  002336           MOV     #11.,CMDPKT+CP.CNT      ;CHANGE BYTE COUNT TO 9.
3683 025060  004737  016152                   JSR     PC,VFEXC                ;VERIFY ODD LENGTH SWAP (RECORD 4).
3684
```

TEST 1: BASIC FUNCTIONS.

```
3685 025064                                    END,JB
     025064                              L10033:
     025064  104403                                                                  TRAP    CSESUB
3686
3687 025066  105037  003523                    CLRB    T1SWB                 ;CLEAR T1 SWAP BYTES FLAG
3688
3689 025072                                    EXIT    TST
     025072  104432                                                                  TRAP    CSEXIT
     025074  000574                                                                  .WORD   L10017-.
3690
3691                                 ;         SUBROUTINE TO MOVE A COMMAND SEQUENCE TO THE SEQUENCE TABLE.
3692                                 ;         INPUTS:         R2 = FWA OF COMMAND SEQUENCE.
3693                                 ;         OUTPUTS:
3694                                 ;         REGISTERS:
3695                                 ;         CALLS:
3696
3697 025076  012701  003540          BFSEQ:: MOV     #CMDSEQ,R1            ;INIT SEQ TABLE ADDRESS.
3698 025102                          50420$: ;WHILE (R2) NE #END DO        ;WHILE THERE ARE MORE COMMANDS:
3699 025102  021227  177777                  CMP     (R2),#END
3700 025106  001402                          BEQ     50421$
3701 025110  012221                          MOV     (R2)+,(R1)+           ;MOVE COMMANDS TO SEQ TABLE.
3702
3703 025112  000773                          BR      50420$
3704 025114                          50421$:
3705 025114  012711  177777                  MOV     #END,(R1)             ;STORE END OF SEQUENCE CODE.
3706 025120  000207                          RTS     PC                    ;RETURN.
3707
3708
3709                                 ;         BASIC FUNCTION COMMAND SEQUENCE
3710
3711 025122  140004                  BFSEQ0: .WORD   SCM                   ;SET CHAR. 200.         (1)
3712 025124  000200                          200
3713 025126  000001                          1
3714 025130  000000                          0
3715 025132  100013                          DRI                   ;DRIVE INIT.            (2)
3716 025134  000001                          1
3717 025136  000001                          1
3718 025140  000000                          0
3719 025142  140004                          SCM                   ;SET CHAR. 20           (3)
3720 025144  000020                          20
3721 025146  000001                          1
3722 025150  000000                          0
3723 025152  100017                          GES                   ;GET STATUS.            (4)
3724 025154  000001                          1
3725 025156  000001                          1
3726 025160  000000                          0
3727 025162  140004                          SCM                   ;SET CHAR. 40.          (5)
3728 025164  000040                          40
3729 025166  000001                          1
3730 025170  000000                          0
3731 025172  177777                  .WORD   END
3732
3733 025174  102010                  BFSEQ1:         RWD             ;REWIND TWICE.          (6)
3734 025176  000001                          1
3735 025200  000002                          2
3736 025202  000000                          0
3737 025204  177777                  .WORD   END
```

TEST 1: BASIC FUNCTIONS.

```
3738
3739 025206  104105          BFSEQ2:     WTV             ;WRITE/VERIFY PAT 1.    (7)
3740 025210  004000                      DATCNT
3741 025212  000001                      1
3742 025214  000001                      1
3743 025216  104105                      WTV             ;WTV PAT 2.             (8)
3744 025220  004000                      DATCNT
3745 025222  000001                      1
3746 025224  000002                      2
3747 025226  104105                      WTV             ;WTV PAT 3.             (9)
3748 025230  004000                      DATCNT
3749 025232  000001                      1
3750 025234  000003                      3
3751 025236  104105                      WTV             ;WTV PAT 4.             (10)
3752 025240  004000                      DATCNT
3753 025242  000001                      1
3754 025244  000004                      4
3755 025246  104105                      WTV             ;WTV PAT 5.             (11)
3756 025250  004000                      DATCNT
3757 025252  000001                      1
3758 025254  000005                      5
3759 025256  104105                      WTV             ;WTV PAT 6.             (12)
3760 025260  004000                      DATCNT
3761 025262  000001                      1
3762 025264  000006                      6
3763 025266  104105                      WTV             ;WTV PAT 0.             (13)
3764 025270  004000                      DATCNT
3765 025272  000001                      1
3766 025274  000000                      0
3767 025276  177777              .WORD   END
3768
3769 025300  100011          BFSEQ3:     WTM             ;WRITE TAPE MARK.       (14)
3770 025302  000001                      1
3771 025304  000001                      1
3772 025306  000000                      0
3773 025310  104005                      WRT             ;WRITE 10 RECORDS.      (15)
3774 025312  004000                      DATCNT
3775 025314  000010                      10
3776 025316  000001                      1
3777 025320  100411                      ERS             ;ERASE 10 TIMES.        (16)
3778 025322  000001                      1
3779 025324  000010                      10
3780 025326  000000                      0
3781 025330  100011                      WTM             ;WRITE TAPE MARK.       (17)
3782 025332  000001                      1
3783 025334  000001                      1
3784 025336  000000                      0
3785 025340  101011                      WTR             ;WTM RETRY              (18)
3786 025342  000001                      1
3787 025344  000001                      1
3788 025346  000000                      0
3789 025350  177777              .WORD   END
3790
3791 025352  105410          BFSEQ4:     SFR             ;SPACE 2 FILES REV.     (19)
3792 025354  000002                      2
3793 025356  000001                      1
3794 025360  000000                      0
```

TEST 1: BASIC FUNCTIONS.

```
3795 025362  105010                          SFF             ;SPACE 2 FILES FWD.     (20)
3796 025364  000002                          2
3797 025366  000001                          1
3798 025370  000000                          0
3799 025372  105410                          SFR             ;SPACE 2 FILES REV.     (21)
3800 025374  000001                          1
3801 025376  000002                          2
3802 025400  000000                          0
3803 025402  105010                          SFF             ;SPACE 2 FILES FWD.     (22)
3804 025404  000001                          1
3805 025406  000002                          2
3806 025410  000000                          0
3807 025412  177777                  .WORD   END
3808
3809 025414  102010          BFSEQ5:         RWD             ;REWIND.                (23)
3810 025416  000001                          1
3811 025420  000001                          1
3812 025422  000000                          0
3813 025424  104010                          SRF             ;SPACE 7 RECORDS FWD.   (24)
3814 025426  000007                          7
3815 025430  000001                          1
3816 025432  000000                          0
3817 025434  104410                          SRR             ;SPACE 7 RECORDS REV.   (25)
3818 025436  000007                          7
3819 025440  000001                          1
3820 025442  000000                          0
3821 025444  104010                          SRF             ;SPACE 7 RECORDS FWD.   (26)
3822 025446  000001                          1
3823 025450  000007                          7
3824 025452  000000                          0
3825 025454  104410                          SRR             ;SPACE 7 RECORDS REV.   (27)
3826 025456  000001                          1
3827 025460  000007                          7
3828 025462  000000                          0
3829 025464  177777                  .WORD   END
3830
3831 025466  102010          BFSEQ6:         RWD             ;REWIND.                (28)
3832 025470  000001                          1
3833 025472  000001                          1
3834 025474  000000                          0
3835 025476  104005                          WRT             ;WRITE.                 (29)
3836 025500  004000                          DATCNT
3837 025502  000001                          1
3838 025504  000001                          1
3839 025506  105005                          WRR             ;WRITE RETRY.           (30)
3840 025510  004000                          DATCNT
3841 025512  000001                          1
3842 025514  000001                          1
3843 025516  100011                          WTM             ;WRITE TAPE MARK.
3844 025520  000001                          1
3845 025522  000001                          1
3846 025524  000000                          0
3847 025526  105410                          SFR             ;SPACE 1 FILE REV.
3848 025530  000001                          1
3849 025532  000001                          1
3850 025534  000000                          0
3851 025536  177777                  .WORD   END
```

TEST 1: BASIC FUNCTIONS.

```
3852
3853 025540  104401          BFSEQ7:         RDR             ;READ REV.              (31)
3854 025542  004000                          DATCNT
3855 025544  000001                          1
3856 025546  000001                          1
3857 025550  105401                          RNR             ;READ NEXT REV.         (32)
3858 025552  004000                          DATCNT
3859 025554  000001                          1
3860 025556  000001                          1
3861 025560  125401                          RNF             ;READ NEXT FWD.         (33)
3862 025562  004000                          DATCNT
3863 025564  000001                          1
3864 025566  000001                          1
3865 025570  177777                  .WORD   END
3866
3867 025572  104001          BFSEQ8:         RDF             ;READ FWD.              (34)
3868 025574  004000                          DATCNT
3869 025576  000001                          1
3870 025600  000001                          1
3871 025602  105001                          RPF             ;READ PREVIOUS FWD.     (35)
3872 025604  004000                          DATCNT
3873 025606  000001                          1
3874 025610  000001                          1
3875 025612  125001                          RPR             ;READ PREVIOUS REV.     (36)
3876 025614  004000                          DATCNT
3877 025616  000001                          1
3878 025620  000001                          1
3879 025622  177777                  .WORD   END
3880
3881 025624  101012          BFSEQ9: .WORD   CLN             ;CLEAN.                 (37)
3882 025626  000001                          1
3883 025630  000001                          1
3884 025632  000000                          0
3885 025634  102010                          RWD             ;REWIND                 (38)
3886 025636  000001                          1
3887 025640  000001                          1
3888 025642  000000                          0
3889 025644  177777                  .WORD   END             ;END OF SEQUENCE.
3890
3891 025646  104105          BFSE10:         WTV             ;WRITE/VERIFY EVEN LENGTH.  (39)
3892 025650  000012                          12
3893 025652  000001                          1
3894 025654  000000                          0
3895 025656  104105                          WTV             ;WRITE/VERIFY ODD LENGTH.   (40)
3896 025660  000011                          11
3897 025662  000001                          1
3898 025664  000000                          0
3899 025666  177777                  .WORD   END
3900                                 .EVEN
3901
3902 025670                          ENDTST
     025670                  L10017:
     025670  104401                                                  TRAP    C$ETST
3903
3904                         .SBTTL  TEST 2: DATA RELIABILITY.
3905
3906                         ;++
```

TEST 2: DATA RELIABILITY.

```
3907                                    ; TEST TO CHECK THE DATA RELIABILITY OF THE TS05.
3908                                    ;
3909 025672                             BGNTST
     025672                             T2::
3910
3911 025672  112737  000001  003515      MOVB    #1,RANDOM               ;SET THE RANDOM OPERATIONS FLAG.
3912 025700  105037  003514              CLRB    EXPBOT                  ;CLEAR EXPECT BOT FLAG.
3913 025704  005037  003456              CLR     WTMFLG                  ;CLEAR WRITE TAPE MARK FLAG
3914 025710  004737  017102              JSR     PC,FIRSTU               ;FIND THE FIRST UNIT.
3915 025714  004737  007072              JSR     PC,SOFINIT              ;INIT DEVICE
3916 025720  103404                      BCS     11$
3917 025722                              ERRDF   2,NSSRM,STAERM          ;REPORT TS05 NOT READY
     025722  104455                                                                  TRAP    C$ERDF
     025724  000002                                                                  .WORD   2
     025726  004536                                                                  .WORD   NSSRM
     025730  006120                                                                  .WORD   STAERM
3918
3919 025732  004737  007466      11$:    JSR     PC,MDSET                ;GO DO SETUP'S
3920 025736  012702  004000              MOV     #DATCNT,R2              ;SET UP THE RECORD LENGTH MASK.
3921 025742  005302                      DEC     R2
3922 025744  010237  003430              MOV     R2,LENMSK               ;ALLOW MAXIMUM BUFFER.
3923 025750  005137  003430              COM     LENMSK
3924 025754  004737  010162              JSR PC,SETCH                    ;CMD 1 = SET CHARACTERISTIC.
3925 025760  105737  003526              TSTB    STAFLG  ;IFB STAFLG NE #0 THEN          ;IF STARTING THEN:
3926 025764  001417                      BEQ     50424$
3927 025766  004737  010206                JSR   PC,SETRW                ;CMD2=REWIND
3928 025772  105037  003526              CLRB    STAFLG    ;LET STAFLG :B= #0            ;CLR START FLAG.
3929
3930 025776                      50422$:
3931 025776  012721  104105              MOV     #WTV,(R1)+
3932 026002  012721  004000              MOV     #DATCNT,(R1)+
3933 026006  012702  177740              MOV     #RNOPSC,R2
3934 026012  005102                      COM     R2
3935 026014  010221                      MOV     R2,(R1)+
3936 026016  012721  000007              MOV     #RANP,(R1)+
3937
3938 026022                      50423$: BREAK                           ; DO A SUPVSR BREAK FIRST.
     026022  104422                                                                  TRAP    C$BRK
3939
3940 026024                      50424$:                                ;FILL SEQ TBL WITH RANDOM CMDS.
3941 026024  020127  003740              CMP     R1,#SEQEND
3942 026030  002012                      BGE     50425$
3943 026032  063737  003432  003434      ADD     RANB,RANS          ;LET RANS := RANS + RANB
3944 026040  013702  003434              MOV     RANS,R2
3945 026044  042702  177741              BIC     #177741,R2
3946 026050  004772  026206              JSR     PC,@RANCMD(R2)          ;SET UP A RANDOM CMD + BRF.
3947
3948 026054  000763                      BR      50424$
3949 026056                      50425$:
3950 026056  012711  177777              MOV     #END,(R1)               ;STORE END OF SEQUENCE CODE IN TABLE.
3951 026062  004737  010226                JSR   PC,EXALL                ;GO EXECUTE ALL CMDS IN SEQUENCE TABLE.
3952
3953 026066  012701  003540              MOV     #CMDSEQ,R1              ;INIT CMD SEQ TBL POINTER.
3954 026072  005702                      TST     R2                              ;REPEAT UNTIL EOT IS REACHED
3955 026074  001752                      BEQ     50423$
3956 026076  105237  003524              INCB    ALLEOT                  ;FLAG ALL UNITS @ EOT
3957 026102  000240                      NOP
```

TEST 2: DATA RELIABILITY.

```
3958 026104  000240                        NOP
3959 026106  000240                        NOP
3960 026110  004737  027662                JSR     PC,TSWEOT       ;WRITE ONE RECORD BEYOND EOT ON ALL UNITS
3961                                                                ;SO THAT SHORTER READ STOP DISTANCE
3962                                                                ;SHALL POSITION HEAD IN CLEAN IRG GAP
3963                                                                ;READ REV THAT EXTRA REC TO RE-POSITION THE TAPE
3964 026114  004737  026246                JSR     PC,RANRD        ;SET UP READ REV/FWD CMDS,
3965 026120  012737  177740  003544        MOV     #RNOPSC,CMDSEQ+4        ;# OF RECORDS FOR READ REV.
3966 026126  005137  003544                COM     CMDSEQ+4
3967 026132  013737  003544  003554        MOV     CMDSEQ+4,CMDSEQ+14      ;# OF RECORDS FOR READ FORWARD.
3968 026140  012711  177777                MOV     #END,(R1)               ;STORE END OF SEQUENSE CODE IN SEQ TABLE.
3969 026144  004737  010226                JSR     PC,EXALL                ;GO EXECUTE READ REV/FWD OF LAST N RECORDS.
3970 026150  105037  003524                CLRB    ALLEOT                  ;CLEAR ALL UNITS @ EOT FLAG
3971 026154  112737  000001  003517        MOVB    #1,RPTFLG               ;REQUEST PERFORMANCE REPORT DURING REWIND.
3972 026162  012701  003540                MOV     #CMDSEQ,R1              ;INIT SEQ TBL POINTER,
3973 026166  004737  010206                JSR PC,SETRW                    ;STORE REWIND IN SEQ TBL,
3974 026172  012711  177777                MOV     #END,(R1)               ;STORE END IN SEQ TBL,
3975 026176  004737  010226                JSR PC,EXALL                    ;EXECUTE REWIND CMD ON ALL UNITS
3976
3977 026202                                EXIT    TST
     026202  104432                                                                  TRAP    C$EXIT
     026204  000320                                                                  .WORD   L10034 .
3978
3979                                ;       ADDRESSES OF SUBROUTINES USED TO SET UP RANDOM OPERATIONS IN
3980                                ;       THE DATA RELIABILITY TEST.
3981
3982 026206  026360                RANCMD: RANWR                   ;WRITE
3983 026210  026404                        RANWV                   ;WRITE.
3984 026212  026360                        RANWR                   ;WRITE.
3985 026214  026360                        RANWR                   ;WRITE.
3986 026216  026360                        RANWR                   ;WRITE.
3987 026220  026360                        RANWR                   ;WRITE.
3988 026222  026360                        RANWR                   ;WRITE.
3989 026224  026360                        RANWR                   ;WRITE.
3990 026226  026246                        RANRD                   ;READ.
3991 026230  026246                        RANRD                   ;READ.
3992 026232  026246                        RANRD                   ;READ.
3993 026234  026246                        RANRD                   ;READ.
3994 026236  026246                        RANRD                   ;READ.
3995 026240  026246                        RANRD                   ;READ.
3996 026242  026246                        RANRD                   ;READ.
3997 026244  026246                        RANRD                   ;READ.
3998
3999
4000                                ;       SUBROUTINE TO SET UP READ COMMANDS IN SEQUENCE TABLE.
4001                                ;       INPUTS.
4002                                ;       OUTPUTS:
4003                                ;       REGISTERS:      R2
4004                                ;       CALLS:
4005
4006 026246  005737  003456        RANRD:: TST     WTMFLG                  ;WAS LAST CMD A WRITE?
4007 026252  001406                        BEQ     1$                      ;NO,GO AHEAD
4008 026254  004737  026416                JSR     PC,RAWTM                ;YES PUT DOWN TAPE MARK
4009 026260  004737  026444                JSR     PC,RASFR                ;AND SPACE FILE REV
4010 026264  005037  003456                CLR     WTMFLG                  ;THEN CLEAR THE FLAG
4011 026270  020127  003740        1$:     CMP     R1,#SEQEND
4012 026274  002030                        BGE     2$
```

TEST 2: DATA RELIABILITY.

```
4013 026276  012721  104401                    MOV     #RDR,(R1)+              ;STORE READ REV CMD.
4014 026302  012721  004000                    MOV     #DATCNT,(R1)+           ;SET BRF TO MAX FOR READ RANDOM LENGTHS.
4015 026306  063737  003434  003432            ADD     RANS,RANB       ;LET RANB := RANB + RANS
4016 026314  013702  003432                    MOV     RANB,R2         ;LET R2 := RANB CLR.BY #RNOPSC
4017 026320  042702  177740                    BIC     #RNOPSC,R2
4018 026324  010221                            MOV     R2,(R1)+        ;SET RANDOM # OF OPERATIONS.
4019 026326  012721  000007                    MOV     #RANP,(R1)+     ;RANDOM PATTERN.
4020 026332  020127  003740                    CMP     R1,#SEQEND
4021 026336  002007                            BGE     2$
4022 026340  012721  104001                    MOV     #RDF,(R1)+      ;STORE READ FWD CMD.
4023 026344  012721  004000                    MOV     #DATCNT,(R1)+   ;SET BRF TO MAX TO READ RANDOM LENGTHS.
4024 026350  010221                            MOV     R2,(R1)+        ;SET RANDOM # OF OPERATIONS.
4025 026352  012721  000007                    MOV     #RANP,(R1)+     ;RANDOM PATTERN.
4026 026356  000207                  2$:       RTS PC
4027
4028                                 ;         SUBROUTINE TO SET UP A WRITE COMMAND IN THE SEQUENCE TABLE,
4029                                 ;         THEN A WRITE TAPE MARK AND SPACE FILE REVERSE.
4030                                 ;
4031                                 ;         INPUTS:
4032                                 ;         OUTPUTS:
4033                                 ;         REGISTERS:
4034                                 ;         CALLS:
4035
4036 026360  012721  104005          RANWR:: MOV     #WRT,(R1)+              ;STORE WRITE CMD.
4037 026364  004737  026472                  JSR PC,RANW                     ;STORE BRF, # OF OPERATIONS, PATTERN.
4038 026370  005737  003456                  TST     WTMFLG                  ;LAST CMD A WRT?
4039 026374  001002                          BNE     1$                      ;YES,RETURN
4040 026376  005237  003456                  INC     WTMFLG                  ;NO,SET THE FLAG
4041 026402  000207                  1$:     RTS PC
4042
4043
4044                                 ;         SUBROUTINE TO SET UP A WRITE/VERIFY COMMAND IN THE SEQUENCE TABLE.
4045                                 ;         INPUTS:
4046                                 ;         OUTPUTS:
4047                                 ;         REGISTERS:
4048                                 ;         CALLS:
4049
4050 026404  012721  104105          RANWV:: MOV     #WTV,(R1)+              ;STORE WRITE/VERIFY CMD.
4051 026410  004737  026472                  JSR PC,RANW                     ;STORE BRF, # OF OPERATIONS, PATTERN.
4052 026414  000207                          RTS     PC
4053
4054
4055                                 ;         SUBROUTINE TO SET UP A WRITE TAPE MARK IN THE SEQUENCE TABLE.
4056                                 ;         INPUTS:
4057                                 ;         OUTPUTS:
4058                                 ;         REGISTERS:
4059                                 ;         CALLS:
4060
4061 026416  020127  003740          RAWTM:: CMP     R1,#SEQEND
4062 026422  002007                          BGE     1$
4063 026424  012721  100011                  MOV     #WTM,(R1)+              ;STORE WRITE TAPE MARK CMD.
4064 026430  012721  000001                  MOV     #1,(R1)+                ;BRF
4065 026434  012721  000001                  MOV     #1,(R1)+                ;# OF OPERATIONS
4066 026440  005721                          TST     (R1)+                   ;SKIP PATTERNS
4067 026442  000207                  1$:     RTS PC
4068
4069                                 ;         SUBROUTINE TO SET UP A SPACE FILE REVERSE IN THE SEQUENCE TABLE.
```

TEST 2: DATA RELIABILITY.

```
4070                                    ;       INPUTS:
4071                                    ;       OUTPUTS:
4072                                    ;       REGISTERS:
4073                                    ;       CALLS:
4074
4075 026444  020127  003740            RASFR:: CMP     R1,#SEQEND
4076 026450  002007                            BGE     1$
4077 026452  012721  105410                    MOV     #SFR,(R1)+              ;STORE SPACE FILE REVERSE
4078 026456  012721  000001                    MOV     #1,(R1)+                ;BRF
4079 026462  012721  000001                    MOV     #1,(R1)+                ;# OF OPERATIONS
4080 026466  005721                            TST     (R1)+                   ;SKIP PATTERNS
4081 026470  000207                    1$:     RTS PC
4082
4083
4084                                    ;       SUBROUTINE TO STORE BRF, # OF OPERATIONS, PATTERN IN COMMAND
4085                                    ;       SEQUENCE TABLE FOR WRITE AND WRITE/VERIFY COMMANDS.
4086                                    ;       INPUTS:
4087                                    ;       OUTPUTS:
4088                                    ;       REGISTERS:      R2
4089                                    ;       CALLS:
4090
4091 026472  012721  004000            RANW::  MOV     #DATCNT,(R1)+           ;SET BRF TO MAX FOR PATTERN GENERATION.
4092                                                                    ;RANDOM BRF WILL BE GENERATED FOR EACH RECORD.
4093 026476  063737  003434  003432            ADD     RANS,RANB               ;LET RANB := RANB + RANS
4094 026504  013702  003432                    MOV     RANB,R2                 ;LET R2 := RANB CLR.BY #RNOPSC
4095 026510  042702  177740                    BIC     #RNOPSC,R2
4096 026514  010221                            MOV     R2,(R1)+                ;SET RANDOM # OF OPERATIONS.
4097 026516  012721  000007                    MOV     #RANP,(R1)+             ;RANDOM PATTERN.
4098 026522  000207                            RTS PC                          ;RETURN.
4099
4100                                            .EVEN
4101
4102 026524                                     ENDTST
     026524                             L10034:
     026524  104401                                                                 TRAP    C$ETST
4103
4104                                    .SBTTL  TEST 3: WRITE COMPATABILITY/WRITE UTILITY.
4105
4106                                    ;++
4107                                    ; TEST TO WRITE RECORDS FROM BOT TO EOT.
4108                                    ;--
4109
4110 026526                                     BGNTST
     026526                             T3::
4111
4112 026526  112737  000001  003515            MOVB    #1,RANDOM               ;SET THE RANDOM OPERATIONS FLAG.
4113 026534  105037  003514                    CLRB    EXPBOT  ;LET EXPBOT :B= #0      ;CLEAR EXPECT BOT FLAG.
4114
4115 026540  004737  017102                    JSR     PC,FIRSTU               ;FIND THE FIRST UNIT.
4116 026544  004737  007072                    JSR     PC,SOFINIT              ;INIT DEVICE
4117 026550  103404                            BCS     11$
4118 026552                                     ERRDF   2,NSSRM,STAERM          ;REPORT TSO5 NOT READY
     026552  104455                                                                 TRAP    C$ERDF
     026554  000002                                                                 .WORD   2
     026556  004536                                                                 .WORD   NSSRM
     026560  006120                                                                 .WORD   STAERM
4119
```

TEST 3: WRITE COMPATABILITY/WRITE UTILITY.

```
4120 026562  004737  007466          11$:    JSR     PC,MDSET                ;GO DO SETUP'S
4121 026566  012702  004000                  MOV     #DATCNT,R2              ;SET UP THE RECORD LENGTH MASK.
4122 026572  005302                          DEC     R2
4123 026574  010237  003430                  MOV     R2,LENMSK               ;ALLOW MAXIMUM BUFFER.
4124 026600  005137  003430                  COM     LENMSK
4125 026604  004737  010162                  JSR PC,SETCH                    ;CMD 1 = SET CHARACTERISTIC.
4126 026610  004737  010206                  JSR PC,SETRW                    ;CMD2=REWIND
4127 026614  105037  003526                  CLRB    STAFLG  ;LET STAFLG :B= #0              ;CLEAR START FLAG
4128 026620                          50426$: BREAK                   ; DO A SUPVSR BREAK FIRST.
     026620  104422                                                                      TRAP    C$BRK
4129
4130 026622                          50427$:                         ;WHILE THERE IS MORE ROOM IN SEQ TABLE:
4131 026622  020127  003740                  CMP     R1,#SEQEND
4132 026626  002003                          BGE     50430$
4133 026630  004737  026360                  JSR     PC,RANWR                ;STORE A WRITE CMD IN SEQUENCE TABLE.
4134 026634  000772                          BR      50427$
4135 026636                          50430$:
4136 026636  012711  177777                  MOV     #END,(R1)               ;STORE END OF SEQUENCE CODE I' TABLE.
4137 026642  004737  010226                    JSR   PC,EXALL                ;EXECUTE ALL CMDS IN SEQ TBL ON UNITS.
4138 026646  012701  003540                  MOV     #CMDSEQ,R1                      ;INIT SEQ TBL POINTER.
4139 026652  005702                          TST     R2                              ;REPEAT UNTIL EOT IS REACHED
4140 026654  001761                          BEQ     50426$
4141 026656  105237  003524                  INCB    ALLEOT                  ;SET ALL UNITS @ EOT FLAG
4142 026662  000240                          NOP
4143 026664  000240                          NOP
4144 026666  000240                          NOP
4145 026670  004737  027662                  JSR     PC,TSWEOT       ;WRITE ONE RECORD BEYOND EOT ON ALL UNITS
4146                                                                  ;SO THAT SHORTER READ STOP DISTANCE
4147                                                                  ;SHALL POSITION HEAD IN CLEAN IRG GAP
4148                                                                  ;READ REV THAT EXTRA REC TO RE-POSITION TAPE
4149 026674  105037  003524                  CLRB    ALLEOT                  ;CLEAR ALL UNITS @ EOT FLAG
4150 026700  004737  010206                  JSR PC,SETRW                    ;STORE REWIND IN SEQ TBL.
4151 026704  012711  177777                  MOV     #END,(R1)               ;STORE END IN SEQ TBL.
4152 026710  004737  010226                  JSR PC,EXALL                    ;EXECUTE REWIND CMD ON ALL UNITS
4153
4154
4155 026714                                  EXIT    TST
     026714  104432                                                                      TRAP    C$EXIT
     026716  000002                                                                      .WORD   L10035-.
4156
4157                                         .EVEN
4158
4159 026720                                  ENDTST
     026720                          L10035:
     026720  104401                                                                      TRAP    C$ETST
4160
4161
4162                                 .SBTTL  TEST 4:  READ COMPATABILITY/READ UTILITY.
4163
4164                                 ;++
4165                                 ; TEST TO READ ENTIRE TAPE FORWARD AND REVERSE.
4166                                 ;--
4167
4168 026722                                  BGNTST
     026722                          T4::
4169
4170 026722  112737  000001  003515          MOVB    #1,RANDOM               ;SET THE RANDOM OPERATIONS FLAG.
```

TEST 4: READ COMPATABILITY/READ UTILITY.

```
4171 026730  112737  000001  003514          MOVB    #1,EXPBOT               ;SET EXPECT BOT FLAG.
4172
4173 026736  004737  017102                  JSR     PC,FIRSTU               ;FIND THE FIRST UNIT.
4174 026742  004737  007072                  JSR     PC,SOFINIT              ;INIT DEVICE
4175 026746  103404                          BCS     11$
4176 026750                                  ERRDF   2,NSSRM,STAERM          ;REPORT TSO5 NOT READY
     026750  104455                                                                  TRAP    C$ERDF
     026752  000002                                                                  .WORD   2
     026754  004536                                                                  .WORD   NSSRM
     026756  006120                                                                  .WORD   STAERM
4177
4178 026760  004737  007466          11$:    JSR     PC,MDSET                ;GO DO SETUP'S
4179 026764  004737  010162                  JSR PC,SETCH                    ;CMD 1 = SET CHARACTERISTIC.
4180 026770  004737  010206                  JSR PC,SETRW                    ;CMD2=REWIND.
4181 026774  105037  003526                  CLRB    STAFLG  ;LET STAFLG :B= #0              ;CLEAR START FLAG
4182 027000  012721  104001                  MOV     #RDF,(R1)+              ;CMD3 = READ FORWARD.
4183 027004  012721  004000                  MOV     #DATCNT,(R1)+           ;SET LENGTH TO MAX FOR UNKNOWN LENGTHS.
4184 027010  012721  077777                  MOV     #77777,(R1)+            ;SET RECORD COUNT TO MAX FOR WHOLE TAPE.
4185 027014  012721  000007                  MOV     #RANP,(R1)+             ;PATTERN = RANDOM.
4186 027020  012711  177777                  MOV     #END,(R1)               ;STORE END OF SEQUENCE CODE IN TABLE.
4187 027024  004737  010226                  JSR     PC,EXALL                ;EXECUTE ALL CMDS IN SEQ TBL ON ALL UNITS.
4188 027030  105237  003524                  INCB    ALLEOT                  ;FLAG TO ALLOW ALL UNITS AT EOT TO READ REV
4189 027034  012701  003540                  MOV     #CMDSEQ,R1              ;INIT CMD SEQ TBL POINTER.
4190 027040  012721  104401                  MOV     #RDR,(R1)+              ;CMD1 = READ REVERSE.
4191 027044  012721  004000                  MOV     #DATCNT,(R1)+           ;SET LENGTH TO MAX FOR UNKNOWN LENGTHS.
4192 027050  012721  077777                  MOV     #77777,(R1)+            ;RECORD COUNT = MAX FOR WHOLE TAPE.
4193 027054  012721  000007                  MOV     #RANP,(R1)+             ;PATTERN = RANDOM.
4194 027060  012711  177777                  MOV     #END,(R1)               ;STORE END OF SEQUENCE CODE IN TABLE.
4195 027064  004737  010226                  JSR     PC,EXALL                ;GO EXECUTE READ REV. OF ENTIRE TAPE.
4196 027070  105037  003524                  CLRB    ALLEOT                  ;CLEAR ALL UNITS @ EOT FLAG
4197
4198 027074                          EXIT    TST
     027074  104432                                                                  TRAP    C$EXIT
     027076  000002                                                                  .WORD   L10036-.
4199
4200                                         .EVEN
4201
4202 027100                                  ENDTST
     027100                          L10036:
     027100  104401                                                                  TRAP    C$ETST
4203
4204                                 .SBTTL  TEST 5: EXECUTE OPERATOR SELECTED COMMAND SEQUENCE.
4205
4206                                 ;++
4207                                 ; TEST TO EXECUTE  OPERATOR SELECTED COMMAND SEQUENCE.
4208                                 ;--
4209
4210 027102                                  BGNTST
     027102                          T5::
4211
4212 027102  105037  003515                  CLRB    RANDOM                  ;CLEAR RAMDOM MODE FLAG.
4213 027106  112737  000001  003514          MOVB    #1,EXPBOT               ;SET EXPECT BOT FLAG.
4214
4215 027114  004737  017102                  JSR     PC,FIRSTU               ;FIND THE FIRST UNIT.
4216 027120  004737  007072                  JSR     PC,SOFINIT              ;INIT DEVICE
4217 027124  103404                          BCS     11$
4218 027126                                  ERRDF   2,NSSRM,STAERM          ;REPORT TSO5 NOT READY
```

TEST 5: EXECUTE OPERATOR SELECTED COMMAND SEQUENCE.

```
        027126  104455                                                          TRAP    C$ERDF
        027130  000002                                                          .WORD   2
        027132  004536                                                          .WORD   NSSRM
        027134  006120                                                          .WORD   STAERM
   4219
   4220 027136  004737  007466          11$:    JSR     PC,MDSET               ;GO DO SETUP S
   4221 027142  113737  002216  003521          MOVB    PIRE,IRE               ;MOVE INHIBIT RFC ERROR REPORT FLAG.
   4222 027150  004737  010162                  JSR PC,SETCH                   ;CMD 1 = SET CHARACTERISTIC.
   4223 027154  013737  002220  003542          MOV     CHAR,CMDSEQ+2          ;MOVE CHAR CODE FROM P TBL TO SEQ TBL.
   4224 027162  012702  002222                  MOV     #CMDD,R2               ;R2 POINTS TO CMD2 IN SOFT P TABLE.
   4225 027166  004737  027640                  JSR     PC,PTCMDS              ;MOVE CMD 2 FROM P TBL TO SEQ TBL.
   4226 027172  004737  027640                  JSR     PC,PTCMDS              ;MOVE CMD 3 FROM P TBL TO SEQ TBL.
   4227 027176  004737  027640                  JSR     PC,PTCMDS              ;MOVE CMD 4 FROM P TBL TO SEQ TBL.
   4228 027202  004737  027640                  JSR     PC,PTCMDS              ;MOVE CMD 5 FROM P TBL TO SEQ TBL.
   4229 027206  004737  027640                  JSR     PC,PTCMDS              ;MOVE CMD 6 FROM P TBL TO SEQ TBL.
   4230 027212  004737  027640                  JSR     PC,PTCMDS              ;MOVE CMD 7 FROM P TBL TO SEQ TBL.
   4231 027216  004737  027640                  JSR     PC,PTCMDS              ;MOVE END CMD FROM P TBL TO SEQ TBL.
   4232 027222  005037  003442                  CLR     JLOOP                  ;CLEAR JMP CMD LOOP COUNT.
   4233 027226  105037  003526                  CLRB    STAFLG                 ;CLEAR START FLAG
   4234 027232  012701  003540                  MOV     #CMDSEQ,R1             ;INIT SEQUENCE TABLE POINTER.
   4235 027236                          3$:     ;WHILE (R1) NE #END DO         ;WHILE THERE ARE CMDS LEFT IN SEQUENCE TBLE:
   4236 027236                          50431$:
   4237 027236  021127  177777                  CMP     (R1),#END
   4238 027242  001574                          BEQ     50432$
   4239 027244  022711  000040                    CMP   #JMP.C,(R1)            ;IS THIS A JUMP CMD?
   4240 027250  001024                            BNE   6$                     ;BR IF NOT.
   4241 027252  062701  000002                  ADD     #2,R1      ;LET R1 := R1 + #2          ;POINT TO BRF.
   4242 027256  012137  003444                    MOV   (R1)+,JLOC             ;SAVE BRF (LOCATION).
   4243 027262  022137  003442                    CMP (R1)+,JLOOP              ;HAS LOOP COUNT BE SATISFIED?
   4244 027266  001003                            BNE   1$                     ;IF NOT, JMP AGAIN.
   4245 027270  062701  000002                  ADD     #2,R1                  ;IF SO, ADJUST SEQ POUNTER
   4246 027274  000760                            BR    3$                     ;AND GO TO NEXT COMMAND.
   4247 027276  005237  003442          1$:       INC   JLOOP                  ;UPDATE THE LOOP COUNT.
   4248 027302  012701  003540                  MOV     #CMDSEQ,R1             ;INIT CMD SEQ TABLE POINTER.
   4249 027306  005337  003444          2$:       DEC   JLOC                   ;DECR LOCATION COUNTER.
   4250 027312  001751                            BEQ   3$                     ;IF THIS IS THE RIGHT LOCATION TO JMP TO, GO SET
   4251 027314  062701  000010                  ADD     #10,R1                 ;IF NOT, UPDATE SEQ POINTER TO NEXT CMD.
   4252 027320  000772                            BR    2$                     ;DO IT AGAIN.
   4253
   4254 027322  022711  000020          6$:       CMP   #DLY.C,(R1)            ;DELAY?
   4255 027326  001026                            BNE   4$                     ;BR IF NOT.
   4256 027330  062701  000004                  ADD     #4,R1                  ;R1 = LOCATION OF N COUNT.
   4257 027334  011137  003440                  MOV     (R1),TIME2             ;SAVE N COUNT.
   4258 027340                          7$:       DELAY 1                      ;GO TO SUPER-WAIT 1 MSEC.
        027340  012727  000001                                                          MOV     #1,(PC)+
        027344  000000                                                                  .WORD   0
        027346  013727  002116                                                          MOV     L$DLY,(PC)+
        027352  000000                                                                  .WORD   0
        027354  005367  177772                                                          DEC     -6(PC)
        027360  001375                                                                  BNE     .-4
        027362  005367  177756                                                          DEC     -22(PC)
        027366  001367                                                                  BNE     . 20
   4259 027370  005337  003440                    DEC   TIME2
   4260 027374  001361                            BNE   7$
   4261 027376  062701  000004                  ADD     #4,R1      ;LET R1 := R1 + #4          ;POINT TO NEXT CMD.
   4262 027402  000715                            BR    3$                     ;GO CHECK NEXT CMD.
   4263 027404  004737  011172          4$:       JSR   PC,SETUP               ;GO SETUP THE COMMAND BLOCK.
```

TEST 5: EXECUTE OPERATOR SELECTED COMMAND SEQUENCE.

```
4264 027410                                50433$:   ;WHILE NCNT LT NCNT1 DO        ;WHILE THERE ARE RECORDS REMAINING:
4265 027410  023737  003412  003414                 CMP     NCNT,NCNT1
4266 027416  002103                                 BGE     50434$
4267 027420  004737  011064                            JSR PC,CMDAC                ;STORE CMD ASCII IN ERROR MSG.
4268 027424  004737  010524                            JSR PC,EXSUB                ;ISSUE CMD TO ALL,AWAIT INTS,CHECK STATUS.
4269 027430  023727  003420  100017                 CMP     CMDWRD,#GES            ;IF CMD IS GET STATUS THEN:
4270 027436  001002                                 BNE     50435$
4271 027440  004737  017412                              JSR PC,PRXST              ;PRINT EXTENDED STATUS REGISTERS.
4272
4273 027444                                50435$:
4274 027444  004737  017500                            JSR PC,CKHAE                ;CHECK HALT AFTER EACH CMD FLAG.
4275 027450  012702  000001                         MOV     #1,R2                  ;SET ALL UNITS AT BOT/EOT.
4276 027454  004737  017102                            JSR PC,FIRSTU               ;FIND FIRST UNIT.
4277 027460                                50436$:    ;WHILE DEVTBL(R5) NE #END DO        ;WHILE THERE ARE MORE UNITS:
4278 027460  026527  002604  177777                 CMP     DEVTBL(R5),#END
4279 027466  001426                                 BEQ     50437$
4280 027470  032737  000400  003420                 BIT     #MOD.CO,CMDWRD         ;IF CMD IS REVERSE THEN:
4281 027476  001406                                 BEQ     50440$
4282 027500  032765  000002  003502                 BIT     #X0.BOT,EOTFLG(R5)       ;IF NOT AT BOT THEN:
4283 027506  001001                                 BNE     50441$
4284 027510  005002                                 CLR     R2                     ;CLEAR EOT/BOT FLAG.
4285
4286 027512                                50441$:
4287 027512  000411                                 BR      50442$                         ;ELSE IF CMD IS NOT REVERSE:
4288 027514                                50440$:
4289 027514  032765  000001  003502                 BIT     #X0.EOT,EOTFLG(R5)
4290 027522  001404                                 BEQ     50443$
4291 027524  032737  000001  003420                 BIT     #CMD.CO,CMDWRD
4292 027532  001001                                 BNE     50444$
4293 027534                                50443$:
4294                                                                               ;IF NOT AT EOT OR NOT A MOTION CMD THEN:
4295 027534  005002                                 CLR     R2                     ;LET R2 :- #0              ;CLEAR EOT/BOT FLAG.
4296
4297 027536                                50444$:
4298
4299 027536                                50442$:
4300 027536  004737  017150                                JSR PC,NEXTU                ;FIND NEXT UNIT
430                                                                                ;
4?   027542  000746                                 BR      50436$
430. 027544                                50437$:
4304 027544  020227  000001                         CMP     R2,#1                  ;IF ALL UNIT ARE AT EOT/BOT THEN:
4305 027550  001016                                 BNE     50445$
4306 027552  013737  003412  003414                 MOV     NCNT,NCNT1             ;FORCE TERMINATION OF COMMAND.
4307 027560  005237  003414                         INC     NCNT1
4308 027564  105237  003524                         INCB    ALLEOT                  ;FLAG ALL UNITS AT EOT/BOT TO ALLOW VERIFY OF D
4309 027570  023727  003426  000002                 CMP     CMDLG,#2               ;WHEN WRITING IS CURRENT COMMAND
4310 027576  001002                                 BNE     50446$
4311 027600  004737  027662                                 JSR PC,T5WEOT          ;GO WRITE/READ REV ONE RECORD BEYOND EOT
4312
4313 027604                                50446$:
4314
4315 027604  000402                                 BR      50447$
4316 027606                                50445$.
4317 027606  105037  003524                         CLRB    ALLEOT                 ;WHEN NOT ALL @EOT, CLEAR FLAG
4318
4319 027612                                50447$:
4320 027612  005237  003412                         INC     NCNT                   ;UPDATE RECORD COUNT.
```

TEST 5: EXECUTE OPERATOR SELECTED COMMAND SEQUENCE.

```
4321 027616  013737  003420  003424          MOV     CMDWRD,PCMDWD   ;SAVE PREVIOUS COMMAND WORD.
4322
4323 027624  000671                          BR      50433$
4324 027626                          50434$:
4325 027626  004737  016066                    JSR     PC,VFYDAT       ;IF LAST CMD WAS A WRITE VERIFY, THEN GO
4326                                                                   ;VERIFY THE LAST N RECORDS OF DATA.
4327
4328 027632  000601                          BR      50431$
4329 027634                          50432$:
4330
4331 027634                          EXIT    TST
     027634  104432                                                                  TRAP    C$EXIT
     027636  000140                                                                  .WORD   L1000$ .
4332
4333                                 ;       SUBROUTINE TO MOVE A COMMAND FROM THE SOFTWARE P TABLE TO
4334                                 ;       THE COMMAND SEQUENCE TABLE.
4335                                 ;       INPUTS:         R2 - POINTER TO SOFT 'P' TABLE
4336                                 ;       OUTPUTS:
4337                                 ;       REGISTERS:      R3.
4338                                 ;       CALLS:
4339
4340 027640  012203                  PTCMDS::MOV     (R2)+,R3            ;R3 - COMMAND TABLE INDEX.
4341 027642  005303                          DEC     R3
4342 027644  006303                          ASL     R3
4343 027646  016321  003752                  MOV     CMDTBL(R3),(R1)+        ;MOVE COMMAND WORD.
4344 027652  012221                          MOV     (R2)+,(R1)+             ;MOVE # OF BYTES.
4345 027654  012221                          MOV     (R2)+,(R1)+             ;MOVE # OF OPERATIONS.
4346 027656  012221                          MOV     (R2)+,(R1)+             ;MOVE PATTERN CODE.
4347 027660  000207                          RTS PC
4348
4349                                 ;       SUBROUTINE TO WRITE THEN READ REVERSE ONE RECORD BEYOND EOT
4350                                 ;       INPUTS:
4351                                 ;       OUTPUTS:
4352                                 ;       REGISTERS:
4353                                 ;       CALLS:          CMDAC,EXSUB,CKHAE
4354
4355 027662  000240                  TSWEOT:: NOP
4356 027664  000240                          NOP
4357 027666  004737  010524                  JSR PC,EXSUB                ;WRITE ONE RECORD BEYOND EOT
4358 027672  004737  017500                  JSR PC,CKHAE                ;SO THAT READ SHORTER STOP DISTANCE
4359                                                                     ;SHALL POSITION HEAD IN CLEAN IRG GAP
4360 027676  012700  000002                  MOV     #2,R0               ;SET UP COUNTER FOR EOT
4361 027702  013737  003420  003424  1$:     MOV     CMDWRD,PCMDWD       ;LET PCMDWD := CMDWRD   ;REPOSITION TAPE
4362 027710  012737  104401  003420          MOV     #RDR,CMDWRD         ;LET CMDWRD := #RDR     ;BEFORE EXTRA RECORD
4363 027716  012737  000004  003426          MOV     #4,CMDLG                                    ;BY READING REVERSE
4364 027724  013737  003420  002330          MOV     CMDWRD,CMDPKT       ;LET CMDPKT := CMDWRD CLR.BY #BRF.C
4365 027732  042737  004000  002330          BIC     #BRF.C,CMDPKT
4366 027740  013737  002330  003422          MOV     CMDPKT,CMDSAV       ;LET CMDSAV := CMDPKT ;THAT RECORD TO ALLOW
4367 027746  013737  003410  002332          MOV     DATARD,CMDPKT+CP.ADL        ;NEXT COMMAND IN THE
4368 027754  004737  011064                  JSR PC,CMDAC                ;TABLE TO BE EXECUTED
4369 027760  004737  010524                  JSR PC,EXSUB
4370 027764  004737  017500                  JSR PC,CKHAE
4371 027770  005300                          DEC     R0                  ;FOUND EOT YET?
4372 027772  001343                          BNE     1$                  ;NO,KEEP GOING
4373 027774  000207                          RTS PC                      ;YES,RETURN
4374
4375                                         .EVEN
```

TEST 5: EXECUTE OPERATOR SELECTED COMMAND SEQUENCE.

```
4376
4377 027776                                    ENDTST
     027776                             L10035:
     027776  104401                                                    TRAP    CSFTST
4378
4379 030000                                    ENDMOD
4380
4381                                    .TITLE PARAMETER CODING
4382
4383                                    .SBTTL  HARDWARE PARAMETER CODING SECTION
4384
4385 030000                                    BGNMOD
4386
4387                                    ;++
4388                                    ; THE HARDWARE PARAMETER CODING SECTION CONTAINS MACROS
4389                                    ; THAT ARE USED BY THE SUPERVISOR TO BUILD P-TABLES.  THE
4390                                    ; MACROS ARE NOT EXECUTED AS MACHINE INSTRUCTIONS BUT ARE
4391                                    ; INTERPRETED BY THE SUPERVISOR AS DATA STRUCTURES.  THE
4392                                    ; MACROS ALLOW THE SUPERVISOR TO ESTABLISH COMMUNICATIONS
4393                                    ; WITH THE OPERATOR.
4394                                    ;--
4395
4396 030000                                    BGNHRD
     030000  000042                                                    .WORD L10040-L$HARD/2
     030002                             L$HARD::
4397
4398 030002                                    GPRMA   TS5ADR,0,0,160010,177564,YES
     030002  000031                                                    .WORD   T$CODE
     030004  030040                                                    .WORD   TS5ADR
     030006  160010                                                    .WORD   T$LOLIM
     030010  177564                                                    .WORD   T$HILIM
4399 030012                                    GPRMD   TS5VCT,2,0,777,60,776,YES
     030012  001032                                                    .WORD   T$CODE
     030014  030055                                                    .WORD   TS5VCT
     030016  000777                                                    .WORD   777
     030020  000060                                                    .WORD   T$LOLIM
     030022  000776                                                    .WORD   T$HILIM
4400 030024                                    GPRMD   TS5UNT,4,0,1,0,1,NC
     030024  002022                                                    .WORD   T$CODE
     030026  030064                                                    .WORD   TS5UNT
     030030  000001                                                    .WORD   1
     030032  000000                                                    .WORD   T$LOLIM
     030034  000001                                                    .WORD   T$HILIM
4401 030036                                    EXIT HRD
     030036  024004                                                    .WORD   T$CODE
4402
4403                                                   .NLIST  BEX
4404 030040     124     123     104   TS5ADR: .ASCIZ  /TSDB ADDRESS/
4405 030055     126     105     103   TS5VCT: .ASCIZ  /VECTOR/
4406 030064     123     105     114   TS5UNT: .ASCIZ  /SELECT DRIVE 0-1/
4407                                           .LIST   BEX
4408                                           .EVEN
4409
4410 030106                                    ENDHRD
                                                                       .E.E.
     030106                             L10040:
4411
```

```
                        .SBTTL  SOFTWARE PARAMETER CODING SECTION

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

                                BGNSFT
030106                                                          .WORD   -10041  L$SOFT/2
000302
030110                  L$SOFT::
                                GPRML   CLRM,0,1,YES
030110                                                          .WORD   T$CODE
000130                                                          .WORD   CLRM
030112                                                          .WORD   1
030714
030114
000001
                                GPRML   RRVM,0,400,YES
030116                                                          .WORD   T$CODE
000130                                                          .WORD   RRVM
030120                                                          .WORD   400
030733
030122
000400
                                GPRML   RCVERM,2,400,YES
030124                                                          .WORD   T$CODE
001130                                                          .WORD   RCVERM
030126                                                          .WORD   400
031036
030130
000400
                                GPRML   HAEM,2,1,YES
030132                                                          .WORD   T$CODE
001130                                                          .WORD   HAEM
030134                                                          .WORD   1
030762
030136
000001
                                GPRML   IRECM,6,400,YES
030140                                                          .WORD   T$CODE
003130                                                          .WORD   IRECM
030142                                                          .WORD   400
031112
030144
000400
                                XFERT   NEXTSP
030146                                                          .WORD   T$CODE
004024                                                          .WORD   T$CODE
                                GPRML   BADTM,4,1,YES
030150                                                          .WORD   BADTM
002130                                                          .WORD   1
030152
031006
030154
000001
                        NEXTSP: GPRML   DINTM,6,1,YES
030156                                                          .WORD   T$CODE
003130                                                          .WORD   DINTM
030160                                                          .WORD   1
031067
030162
000001
                                GPRML   IREM,12,1,YES
030164                                                          .WORD   T$CODE
005130                                                          .WORD   IREM
030166                                                          .WORD   1
031157
030170
000001
                                GPRML   CHGM,10,1,YES
030172                                                          .WORD   T$CODE
004130                                                          .WORD   CHGM
030174                                                          .WORD   1
031133
030176
000001
                                XFERF   ENDSP;
030200                                                          .WORD   T$CODE
127044
                                GPRMD   CHARM,14,0,377,0,777,YES
030202                                                          .WORD   T$CODE
006032                                                          .WORD   CHARM
030204
031210
```

SOFTWARE PARAMETER CODING SECTION

```
        030206  000377                                                  .WORD   377
        030210  000000                                                  .WORD   T$LOLIM
        030212  000777                                                  .WORD   T$HILIM
4436    030214                  GPRMD   CMD2M,16,D,37,1,33,YES
        030214  007052                                                  .WORD   T$CODE
        030216  031235                                                  .WORD   CMD2M
        030220  000037                                                  .WORD   37
        030222  000001                                                  .WORD   T$LOLIM
        030224  000033                                                  .WORD   T$HILIM
4437    030226                  GPRMD   BPCRM,20,D,-1,1,DATCNT,YES
        030226  010052                                                  .WORD   T$CODE
        030230  031243                                                  .WORD   BPCRM
        030232  177777                                                  .WORD   -1
        030234  000001                                                  .WORD   T$LOLIM
        030236  004000                                                  .WORD   T$HILIM
4438    030240                  GPRMD   NUMBM,22,D,-1,1,77777,YES
        030240  011052                                                  .WORD   T$CODE
        030242  031255                                                  .WORD   NUMBM
        030244  177777                                                  .WORD   -1
        030246  000001                                                  .WORD   T$LOLIM
        030250  077777                                                  .WORD   T$HILIM
4439    030252                  GPRMD   PATTM,24,D,17,0,10,YES
        030252  012052                                                  .WORD   T$CODE
        030254  031275                                                  .WORD   PATTM
        030256  000017                                                  .WORD   17
        030260  000000                                                  .WORD   T$LOLIM
        030262  000010                                                  .WORD   T$HILIM
4440    030264                  GPRMD   CMD3M,26,D,37,1,33,YES
        030264  013052                                                  .WORD   T$CODE
        030266  031404                                                  .WORD   CMD3M
        030270  000037                                                  .WORD   37
        030272  000001                                                  .WORD   T$LOLIM
        030274  000033                                                  .WORD   T$HILIM
4441    030276                  GPRMD   BPCRM,30,D, 1,1,DATCNT,YES
        030276  014052                                                  .WORD   T$CODE
        030300  031243                                                  .WORD   BPCRM
        030302  177777                                                  .WORD   -1
        030304  000001                                                  .WORD   T$LOLIM
        030306  004000                                                  .WORD   T$HILIM
4442    030310                  GPRMD   NUMBM,32,D, 1,1,77777,YES
        030310  015052                                                  .WORD   T$CODE
        030312  031255                                                  .WORD   NUMBM
        030314  177777                                                  .WORD   -1
        030316  000001                                                  .WORD   T$LOLIM
        030320  077777                                                  .WORD   T$HILIM
4443    030322                  GPRMD   PATTM,34,D,17,0,10,YES
        030322  016052                                                  .WORD   T$CODE
        030324  031275                                                  .WORD   PATTM
        030326  000017                                                  .WORD   17
        030330  000000                                                  .WORD   T$LOLIM
        030332  000010                                                  .WORD   T$HILIM
4444    030334                  GPRMD   CMD4M,36,D,37,1,33,YES
        030334  017052                                                  .WORD   T$CODE
        030336  031412                                                  .WORD   CMD4M
        030340  000037                                                  .WORD   37
        030342  000001                                                  .WORD   T$LOLIM
        030344  000033                                                  .WORD   T$HILIM
```

SOFTWARE PARAMETER CODING SECTION

```
4445 030346                        GPRMD   BPCRM,40,D,-1,1,DATCNT,YES
     030346  020052                                                    .WORD   T$CODE
     030350  031243                                                    .WORD   BPCRM
     030352  177777                                                    .WORD   -1
     030354  000001                                                    .WORD   T$LOLIM
     030356  004000                                                    .WORD   T$HILIM
4446 030360                        GPRMD   NUMBM,42,D, 1,1,77777,YES
     030360  021052                                                    .WORD   T$CODE
     030362  031255                                                    .WORD   NUMBM
     030364  177777                                                    .WORD   -1
     030366  000001                                                    .WORD   T$LOLIM
     030370  077777                                                    .WORD   T$HILIM
4447 030372                        GPRMD   PATTM,44,D,17,0,10,YES
     030372  022052                                                    .WORD   T$CODE
     030374  031275                                                    .WORD   PATTM
     030376  000017                                                    .WORD   17
     030400  000000                                                    .WORD   T$LOLIM
     030402  000010                                                    .WORD   T$HILIM
4448 030404                        GPRMD   CMD5M,46,D,37,1,33,YES
     030404  023052                                                    .WORD   T$CODE
     030406  031420                                                    .WORD   CMD5M
     030410  000037                                                    .WORD   37
     030412  000001                                                    .WORD   T$LOLIM
     030414  000033                                                    .WORD   T$HILIM
4449 030416                        GPRMD   BPCRM,50,D,-1,1,DATCNT,YES
     030416  024052                                                    .WORD   T$CODE
     030420  031243                                                    .WORD   BPCRM
     030422  177777                                                    .WORD   -1
     030424  000001                                                    .WORD   T$LOLIM
     030426  004000                                                    .WORD   T$HILIM
4450 030430                        GPRMD   NUMBM,52,D, 1,1,77777,YES
     030430  025052                                                    .WORD   T$CODE
     030432  031255                                                    .WORD   NUMBM
     030434  177777                                                    .WORD   -1
     030436  000001                                                    .WORD   T$LOLIM
     030440  077777                                                    .WORD   T$HILIM
4451 030442                        GPRMD   PATTM,54,D,17,0,10,YES
     030442  026052                                                    .WORD   T$CODE
     030444  031275                                                    .WORD   PATTM
     030446  000017                                                    .WORD   17
     030450  000000                                                    .WORD   T$LOLIM
     030452  000010                                                    .WORD   T$HILIM
4452 030454                        XFER    ENDSP2
     030454  002004                                                    .WORD   T$CODE
4453 030456                ENDSP1: XFER    ENDSP3
     030456  076004                                                    .WORD   T$CODE
4454 030460                ENDSP2: GPRMD   CMD6M,56,D,37,1,33,YES
     030460  027052                                                    .WORD   T$CODE
     030462  031426                                                    .WORD   CMD6M
     030464  000037                                                    .WORD   37
     030466  000001                                                    .WORD   T$LOLIM
     030470  000033                                                    .WORD   T$HILIM
4455 030472                        GPRMD   BPCRM,60,D,-1,1,DATCNT,YES
     030472  030052                                                    .WORD   T$CODE
     030474  031243                                                    .WORD   BPCRM
     030476  177777                                                    .WORD   -1
     030500  000001                                                    .WORD   T$LOLIM
```

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```
                030502  004000
4456            030504                  GPRMD   NUMBM,62,D,-1,1,77777,YES       .WORD   T$MILIM
                030504  031052                                                  .WORD   T$CODE
                030506  031255                                                  .WORD   NUMBM
                030510  177777                                                  .WORD   -1
                030512  000001                                                  .WORD   T$LOLIM
                030514  077777                                                  .WORD   T$HILIM
4457            030516                  GPRMD   PATTM,64,D,17,0,10,YES
                030516  032052                                                  .WORD   T$CODE
                030520  031275                                                  .WORD   PATTM
                030522  000017                                                  .WORD   17
                030524  000000                                                  .WORD   T$LOLIM
                030526  000010                                                  .WORD   T$HILIM
4458            030530                  GPRMD   CMD7M,66,D,37,1,33,YES
                030530  033052                                                  .WORD   T$CODE
                030532  031434                                                  .WORD   CMD7M
                030534  000037                                                  .WORD   37
                030536  000001                                                  .WORD   T$LOLIM
                030540  000033                                                  .WORD   T$HILIM
4459            030542                  GPRMD   BPCRM,70,D,-1,1,DATCNT,YES
                030542  034052                                                  .WORD   T$CODE
                030544  031243                                                  .WORD   BPCRM
                030546  177777                                                  .WORD    1
                030550  000001                                                  .WORD   T$LOLIM
                030552  004000                                                  .WORD   T$HILIM
4460            030554                  GPRMD   NUMBM,72,D,-1,1,77777,YES
                030554  035052                                                  .WORD   T$CODE
                030556  031255                                                  .WORD   NUMBM
                030560  177777                                                  .WORD   -1
                030562  000001                                                  .WORD   T$LOLIM
                030564  077777                                                  .WORD   T$HILIM
4461            030566                  GPRMD   PATTM,74,D,17,0,10,YES
                030566  036052                                                  .WORD   T$CODE
                030570  031275                                                  .WORD   PATTM
                030572  000017                                                  .WORD   17
                030574  000000                                                  .WORD   T$LOLIM
                030576  000010                                                  .WORD   T$HILIM
4462            030600                  GPRMD   CMD8M,76,D,37,1,33,YES
                030600  037052                                                  .WORD   T$CODE
                030602  031442                                                  .WORD   CMD8M
                030604  000037                                                  .WORD   37
                030606  000001                                                  .WORD   T$LOLIM
                030610  000033                                                  .WORD   T$HILIM
4463            030612                  GPRMD   BPCRM,100,D, 1,1,DATCNT,YES
                030612  040052                                                  .WORD   T$CODE
                030614  031243                                                  .WORD   BPCRM
                030616  177777                                                  .WORD    1
                030620  000001                                                  .WORD   T$LOLIM
                030622  004000                                                  .WORD   T$HILIM
4464            030624                  GPRMD   NUMBM,102,D, 1,1,77777,YES
                030624  041052                                                  .WORD   T$CODE
                030626  031255                                                  .WORD   NUMBM
                030630  177777                                                  .WORD    1
                030632  000001                                                  .WORD   T$LOLIM
                030634  077777                                                  .WORD   T$HILIM
4465            030636                  GPRMD   PATTM,104,D,17,0,10,YES
                030636  042052                                                  .WORD   T$CODE
```

SOFTWARE PARAMETER CODING SECTION

```
        030640  031275                                                          .WORD   PATTM
        030642  000017                                                          .WORD   17
        030644  000000                                                          .WORD   T$LOLIM
        030646  000010                                                          .WORD   T$HILIM
4466    030650                          XFER    ENDSP
        030650  022004                                                          .WORD   T$CODE
4467    030652                  ENDSP3: GPRML   TSMD,106,1,YES
        030652  043130                                                          .WORD   T$CODE
        030654  031305                                                          .WORD   TSMD
        030656  000001                                                          .WORD   1
4468    030660                          XFERT   ENDSP
        030660  016024                                                          .WORD   T$CODE
4469    030662                          GPRML   FAST,114,1,YES
        030662  046130                                                          .WORD   T$CODE
        030664  031375                                                          .WORD   FAST
        030666  000001                                                          .WORD   1
4470    030670                          XFERT   ENDSP4
        030670  011024                                                          .WORD   T$CODE
4471    030672                          GPRML   WTBF,112,1,YES
        030672  045130                                                          .WORD   T$CODE
        030674  031355                                                          .WORD   WTBF
        030676  000001                                                          .WORD   1
4472    030700                          XFERT   ENDSP
        030700  006024                                                          .WORD   T$CODE
4473    030702                          GPRML   RDBF,110,1,YES
        030702  044130                                                          .WORD   T$CODE
        030704  031336                                                          .WORD   RDBF
        030706  000001                                                          .WORD   1
4474    030710                  ENDSP5: XFER    ENDSP
        030710  002004                                                          .WORD   T$CODE
4475    030712                  ENDSP4: XFER    ENDSP
        030712  001004                                                          .WORD   T$CODE
4476    030714                  ENDSP:
4477    030714                          ENDSFT
                                                                                .EVEN
        030714                  L10041:
4478
4479
4480                                    .NLIST  BEX
4481    030714  103     114     105     CLRM:   .ASCIZ  /CLEAR COUNTERS/
4482    030733  122     105     123     RRVM:   .ASCIZ  /RESET RANDOM VARIABLES/
4483    030762  110     101     114     HAEM:   .ASCIZ  /HALT AFTER EACH CMD/
4484    031006  102     101     104     BADTM:  .ASCIZ  /BAD TAPE SPOT DETECTION/
4485    031036  120     122     111     RCVERM: .ASCIZ  /PRINT RECOVERABLE ERRORS/
4486    031067  104     111     123     DINTM:  .ASCIZ  /DISABLE INTERRUPTS/
4487    031112  111     116     110     IRECM:  .ASCIZ  /INHIBIT RECOVERY/
4488    031133  103     110     101     CHGM:   .ASCIZ  /CHANGE CMD SEQUENCE/
4489    031157  111     116     110     IREM:   .ASCIZ  /INHIBIT RFC ERROR REPORT/
4490    031210  103     110     101     CHARM:  .ASCIZ  /CHARACTERISTICS CODE/
4491    031235  103     115     104     CMD2M:  .ASCIZ  "CMD/2"
4492    031243  102     122     106     BPCRM:  .ASCIZ  /BRF COUNT/
4493    031255  043     040     117     NUMBM:  .ASCIZ  /# OF OPERATIONS/
4494    031275  120     101     124     PATTM:  .ASCIZ  /PATTERN/
4495    031305  104     105     106     TSMD:   .ASCIZ  /DEFAULT SWITCH SETTINGS?/
4496    031336  122     105     101     RDBF:   .ASCIZ  /READ BUFFERING/
4497    031355  127     122     111     WTBF:   .ASCIZ  /WRITE BUFFERING/
4498    031375  061     060     060     FAST:   .ASCIZ  /100IPS/
```

SOFTWARE PARAMETER CODING SECTION

```
4499                                            .LIST   BEX
4500                                            .EVEN
4501
4502                                            .NLIST  BEX
4503 031404     103     115     104    CMD3M:   .ASCIZ  'CMD/3"
4504 031412     103     115     104    CMD4M:   .ASCIZ  "CMD/4'
4505 031420     103     115     104    CMD5M:   .ASCIZ  'CMD/5'
4506 031426     103     115     104    CMD6M:   .ASCIZ  "CMD/6
4507 031434     103     115     104    CMD7M:   .ASCIZ  'CMD/7'
4508 031442     103     115     104    CMD8M:   .ASCIZ  "CMD/8"
4509                                            .LIST   BEX
4510                                            .EVEN
4511
4512
4513
4514                                    ;*****************************************************************************
4515                                    ;*****************************************************************************
4516                                    ;       PATCH AREA
4517                                    ; AND AN ADJUSTMENT TO ACCOUNT FOR THE 'LASTAD BIT7' HACK
4518                                    ; DESCRIBED IN "SUPPRG.MEM" (FOR REV C).
4519                                    ;
4520
4521 031450                             PATCH:: .BLKW   64.
4522
4524            032000                          .=.!377+1
4526
4527 032000                                      LASTAD
                                                                                        .EVEN
     032000  000000                                                                     .WORD   0
     032002  000000                                                                     .WORD   0
     032004                             L$LAST::
4528 032004                                     ENDMOD
4529
4530                                    .SBTTL  HARD CODED P-TBL
4531
4532                                    ;++
4533                                    ;DIAG IS PRE-PARAMETERIZED PER TBL
4534                                    ; -
4535
4536 032004                                     BGNSETUP 1
4537 032004                                       BGNPTAB
     032004  000000                                                                     .WORD   0
     032006  000003                                                                     .WORD   L10044 ./2-1
     032010                             L10042:
4538 032010  172522                                 172522
4539 032012  000224                                 224
4540 032014  000000                                   0
4541 032016                                       ENDPTAB
     032016                             L10044:
4542 032016                                     ENDSETUP
4543
4544            000001                  .END
```

SYMBOL TABLE

```
ACK.C = 100000 G    BTADDR  002616 G    CP.CNT= 000006 G    C$TPRI= 000013      EXPBOT  003514 G
ADR   = 000020 G    BTMSG1  015112      CRLF    005741 G    DATARD  003410 G    EXSUB   010524 G
ALLEOI  003524 G    BTMSG2  015177      CRLFSP  005744 G    DATAWT  003406 G    EXTFEA  002322 G
ASSEMB= 000010      BTMSG3  015247      CTCC    003450 G    DATCNT= 004000 G    E$END = 002100
ATTNM   004603 G    BTPT    003512 G    CVC.C = 040000 G    DATERM  005752 G    E$LOAD= 000035
AUDRPM  005114 G    BTRPT   020164 G    C$AU  = 000052      DEVTBL  002604 G    FAST    031375
AUDRUN  005146 G    BTO     003046 G    C$AUTO= 000061      DFPTBL  002174 G    FATSM   004642 G
AUTODM  023632      BT1     003120 G    C$BRK = 000022      DFTSCH= 000040 G    FIRSTU  017102 G
BADTM   031006      BT2     003172 G    C$BSEG= 000004      DIA   = 100006 G    FMT.CO= 000040 G
BADTSW  002210 G    BT3     003244 G    C$BSUB= 000002      DIABLK= 003406 G    FMT.C1= 000100 G
BENBSW  002324 G    CHAR    002220 G    C$CEFG= 000045      DIACNT= 000020 G    FTLCNT  003366 G
BFSEQ   025076 G    CHARM   031210      C$CLCK= 000062      DIAGMC= 000000      FUNRM   004622 G
BFSEQ0  025122      CHGFLG  002214 G    C$CLEA= 000012      DINT    002212 G    F$AU  = 000015
BFSEQ1  025174      CHGM    031133      C$CLOS= 000035      DINTM   031067      F$AUTO= 000020
BFSEQ2  025206      CHKERR  013210 G    C$CLP1= 000006      DLY   = 000020 G    F$BGN = 000040
BFSEQ3  025300      CH.EAI= 000040 G    C$CVEC= 000036      DLY.C = 000020 G    F$CLEA= 000007
BFSEQ4  025352      CH.ERI= 000020 G    C$DCLN= 000044      DRI   = 100013 G    F$DU  = 000016
BFSEQ5  025414      CH.ESS= 000200 G    C$DODU= 000051      DROPDM  005065 G    F$END = 000041
BFSEQ6  025466      CKDATA  016466 G    C$DRPT= 000024      DROPED  003522 G    F$HARD= 000004
BFSEQ7  025540      CKDCNT  017076      C$DU  = 000053      DROPN   017410      F$HW  = 000013
BFSEQ8  025572      CKDFF   017100      C$EDIT= 000003      DROPU   017200 G    F$INIT= 000006
BFSEQ9  025624      CKHAE   017500 G    C$ERDF= 000055      DROPUA  017324      F$JMP = 000050
BFSE10  025646      CKHRTN  017566      C$ERHR= 000056      DRORTN  017402      F$MOD = 000000
BGNFLG= 003460      CLN   = 101012 G    C$ERRO= 000060      DTAERM  005752 G    F$MSG = 000011
BINC    016052      CLRERR  012664 G    C$ERSF= 000054      DTAER2  005226 G    F$PROT= 000021
BITO  = 000001 G    CLRFLG  002204 G    C$ERSO= 000057      DTAER3  005275 G    F$PWR = 000017
BITO0 = 000001 G    CLRM    030714      C$ESCA= 000010      DTAER4  005337 G    F$RPT = 000012
BITO1 = 000002 G    CMDAC   011064 G    C$ESEG= 000005      DTAER5  005360 G    F$SEG = 000003
BITO2 = 000004 G    CMDASC  004040 G    C$ESUB= 000003      EF.CON= 000036 G    F$SOFT= 000005
BITO3 = 000010 G    CMDD    002222 G    C$ETST= 000001      EF.HSS= 000040 G    F$SRV = 000010
BITO4 = 000020 G    CMDLG   003426 G    C$EXIT= 000032      EF.NEW= 000035 G    F$SUB = 000002
BITO5 = 000040 G    CMDPKM  004346 G    C$GETB= 000026      EF.PWR= 000034 G    F$SW  = 000014
BITO6 = 000100 G    CMDPKT  002330 G    C$GETW= 000027      EF.RBO= 000020 G    F$TEST= 000001
BITO7 = 000200 G    CMDSAV  003422 G    C$GMAN= 000043      EF.RES= 000037 G    GCMDA   011136 G
BITO8 = 000400 G    CMDSEQ  003540 G    C$GPHR= 000042      EF.RWB= 000030 G    GENPAT  011556 G
BITO9 = 001000 G    CMDSE2  003550 G    C$GPLO= 000030      EF.STA= 000040 G    GES   = 100017 G
BIT1  = 000002 G    CMDTBL  003752 G    C$GPRI= 000040      EINC    016060      GETSTM  005507 G
BIT10 = 002000 G    CMDWRD  003420 G    C$INIT= 000011      END   = 177777 G    GIT     012050
BIT11 = 004000 G    CMD.CO= 000001 G    C$INLP= 000020      ENDERF= 003472      GOWAIT  012364 G
BIT12 = 010000 G    CMD.C1= 000002 G    C$MANI= 000050      ENDFLG= 003526      GSCPK   002340 G
BIT13 = 020000 G    CMD.C2= 000004 G    C$MEM = 000031      ENDSP   030714      G$CNTO= 000200
BIT14 = 040000 G    CMD.C3= 000010 G    C$MSG = 000023      ENDSP1  030456      G$DELM= 000372
BIT15 = 100000 G    CMD.C4= 000020 G    C$OPEN= 000034      ENDSP2  030460      G$DISP= 000003
BIT2  = 000004 G    CMD2M   031235      C$PNTB= 000014      ENDSP3  030652      G$EXCP= 000400
BIT3  = 000010 G    CMD3M   031404      C$PNTF= 000017      ENDSP4  030712      G$HILI= 000002
BIT4  = 000020 G    CMD4M   031412      C$PNTS= 000016      ENDSP5  030710      G$LOLI= 000001
BIT5  = 000040 G    CMD5M   031420      C$PNTX= 000015      EOTFLG  003502 G    G$NO  = 000000
BIT6  = 000100 G    CMD6M   031426      C$QIO = 000377      ERCVER  002207 G    G$OFFS= 000400
BIT7  = 000200 G    CMD7M   031434      C$RDBU= 000007      ERLOG   003466 G    G$OFSI= 000376
BIT8  = 000400 G    CMD8M   031442      C$REFG= 000047      ERRREC  003471 G    G$PRMA= 000001
BIT9  = 001000 G    CNTBGN= 002626      C$RESE= 000033      ERS   = 100411 G    G$PRMD= 000002
BOE   = 000400 G    CNTEND= 003376      C$REVI= 000003      ERSFLG  003525 G    G$PRML= 000000
BORERS  015316 G    CNTLEN= 000550 G    C$RFLA= 000021      EVL   = 000004 G    G$RADA= 000140
BPCRM   031243      CODELM  004162 G    C$RPT = 000025      EXALL   010226 G    G$RADB= 000000
BRCPK   002344 G    CP.ADH= 000004 G    C$SEFG= 000046      EXARTN  010522       G$RADD= 000040
BRFCNT  003416 G    CP.ADL= 000002 G    C$SPRI= 000041      EXCRTN  012362       G$RADL= 000120
BRF.C = 004000 G    CP.CMD= 000000 G    C$SVEC= 000037      EXCUTE  012054 G    G$RADO= 000020
```

SYMBOL TABLE

```
G$XFER= 000004        L$CCP   002106 G      L10012  023340        NSSRM   004536 G      RAWTM   026416 G
G$YES = 000010        L$CLEA  023764 G      L10013  023630        NUMBM   031255        RCVERM  031036
HAE     002206 G      L$CO    002032 G      L10014  024024        NURTY1  005422 G      RDBF    031336
HAEM    030762        L$DEPO  002011 G      L10015  024076        OFLINM  005456 G      RDBUF   002314 G
HALTM   004306 G      L$DESC  002136 G      L10016  024202        ONEFIL= 000001        RDF   = 104001 G
HELP  = 000000        L$DESP  002076 G      L10017  025670        OPFLAG  003536 G      RDR   = 104401 G
HOE   = 100000 G      L$DEVP  002060 G      L10020  024416        OPP.C = 020000 G      RECCNT  003376 G
HRDCNT  003356 G      L$DISP  002124 G      L10021  024442        O$APTS= 000000        RECLOG  003465 G
HSSW    002320 G      L$DLY   002116 G      L10022  024462        O$AU  = 000001        RECRED  007066
IBE   = 010000 G      L$DTP   002040 G      L10023  024502        O$BGNR= 000001        RECTAP  010064 G
IDU   = 000040 G      L$DTYP  002034 G      L10024  024522        O$BGNS= 000001        RECUD   013020 G
IER   = 020000 G      L$DU    024026 G      L10025  024542        O$DU  = 000001        RERM    005017 G
IE.C  = 000200 G      L$DUT   002072 G      L10026  024562        O$ERRT= 000000        RETRYC  003460 G
INIT10  021352        L$DVTY  002164 G      L10027  024602        O$GNSW= 000001        REWRT   015472 G
INIT15  021650        L$EF    002052 G      L10030  024622        O$POIN= 000001        RFBC    002726 G
INIT16  021670        L$ENVI  002044 G      L10031  024642        O$SETU= 000000        RFCERM  004521 G
INTFLG  003472 G      L$ETP   002102 G      L10032  024700        PASCNT  003326 G      RFREC   003026 G
INTPRI= 000300 G      L$EXP1  002046 G      L10033  025064        PATCH   031450 G      RFUNR   003036 G
INVRT   007724 G      L$EXP4  002064 G      L10034  026524        PATERN  003446 G      RLEXM   004556 G
IRE     003521 G      L$EXP5  002066 G      L10035  026720        PATR0   011642 G      RNF   = 125401 G
IREC    002213 G      L$HARD  030002 G      L10036  027100        PATR1   011700 G      RNOPSC= 177740 G
IRECM   031112        L$HIME  002120 G      L10037  027776        PATR2   011720 G      RNR   = 105401 G
IREM    031157        L$HPCP  002016 G      L10040  030106        PATR3   011730 G      RNYM    004753 G
ISR   = 000100 G      L$HPTP  002022 G      L10041  030714        PATR4   011754 G      RPF   = 105001 G
IXE   = 004000 G      L$HW    002174 G      L10042  032010        PATR5   011766 G      RPR   = 125001 G
I$AU  = 000041        L$ICP   002104 G      L10044  032016        PATR6   012000 G      RPTCNT  003462 G
I$AUTO= 000041        L$INIT  021324 G      MBR   = 100012 G      PATR7   012020 G      RPTFLG  003517 G
I$CLN = 000041        L$LADP  002026 G      MDSET   007466 G      PATR8   012052 G      RPT1A   020432
I$DU  = 000041        L$LAST  032004 G      MEMOM   023236        PATTBL  011620        RPT1B   020507
I$HRD = 000041        L$LOAD  002100 G      MISCFG  003531 G      PATTM   031275        RPT1C   020560
I$INIT= 000041        L$LUN   002074 G      MOD.C0= 000400 G      PCMDWD  003424 G      RPT1D   020631
I$MOD = 000041        L$MREV  002050 G      MOD.C1= 001000 G      PIRE    002216 G      RPT1E   021057
I$MSG = 000041        L$NAME  002000 G      MOD.C2= 002000 G      PNT   = 001000 G      RPT1F   020735
I$PROT= 000040        L$PRIO  002042 G      MOD.C3= 004000 G      PRI   = 002000 G      RPT1G   021006
I$PTAB= 000041        L$PROT  021316 G      MOVMSG  012734 G      PRI00 = 000000 G      RPT1I   021203
I$PWR = 000041        L$PRT   002112 G      MSGCNT= 000020 G      PRI01 = 000040 G      RPT1J   021107
I$RPT = 000041        L$REPP  002062 G      MSGPKA  002544 G      PRI02 = 000100 G      RPT1K   021174
I$SEG = 000041        L$REV   002010 G      MSGPKT  002354 G      PRI03 = 000140 G      RRANV   002205 G
I$SETU= 000041        L$RPT   017570 G      MSGPK0  002374 G      PRI04 = 000200 G      RRBC    002666 G
I$SFT = 000041        L$SOFT  030110 G      MSGPK1  002414 G      PRI05 = 000240 G      RRECL = 000020 G
I$SRV = 000041        L$SPC   002056 G      MSGPK2  002434 G      PRI06 = 000300 G      RRREC   003006 G
I$SUB = 000041        L$SPCP  002020 G      MSGPK3  002454 G      PRI07 = 000340 G      RRUNR   003016 G
I$TST = 000041        L$SPTP  002024 G      MS.RFC= 000004 G      PRXST   017412 G      RRVM    030733
JLOC    003444 G      L$STA   002030 G      MS.XS0= 000006 G      PTCMDS  027640 G      RTLE    014510 G
JLOOP   003442 G      L$SW    002204 G      MS.XS1= 000010 G      PWRFLG  003527 G      RTLRTN  014634
JMP   = 000040 G      L$TEST  002114 G      MS.XS2= 000012 G      RANB    003432 G      RWCPK   002350 G
JMP.C = 000040 G      L$TIML  002014 G      MS.XS3= 000014 G      RANBC = 153624 G      RWD   = 102010 G
J$JMP = 000167        L$UNIT  002012 G      MS.XS4= 000016 G      RANCMD  026206        RWERR   003467 G
LENMSK  003430 G      L10000  002202        NCMD.C= 177740 G      RANDOM  003515 G      R5SAVE  003452 G
LOE   = 040000 G      L10001  002326        NCNT    003412 G      RANP  = 000007 G      SCCNT   003336 G
LOG     015566 G      L10002  006116        NCNT1   003414 G      RANRD   026246 G      SCERM   004475 G
LOT   = 000010 G      L10003  007070        NEXTSP  030156        RANS    003434 G      SCH   = 140004 G
L$ACP   002110 G      L10004  010040        NEXTU   017150 G      RANSC = 032561 G      SCHBK   002474 G
L$APT   002036 G      L10005  010046        NINUSE= 177774 G      RANW    026472 G      SCHCNT= 000012 G
L$AU    024100 G      L10006  010054        NODEV   005543 G      RANWR   026360 G      SEQEND  003740 G
L$AUT   002070 G      L10007  010062        NOINTM  004670 G      RANWV   026404 G      SETCH   010162 G
L$AUTO  023342 G      L10010  021314        NRDYM   023726        RASFR   026444 G      SETDEF  007766 G
```

SYMBOL TABLE

```
SETRW   010206 G    TRAP4   023756 G    T$LAST= 000001    T1      024204 G    WRTF    014636 G
SETUP   011172 G    TSAM    004705 G    T$LOLI= 000000    T1SWB   003523 G    WRTYCT  003316 G
SFF   = 105010 G    TSBA  = 002514 G    T$LSYM= 010000    T1.1    024214      WRTYER  003464 G
SFPTBL  002204 G    TSC.FC= 177717 G    T$LTNU= 000005    T1.10   024624      WRTYFG  003463 G
SFR   = 105410 G    TSC.TC= 177761 G    T$NEST= 177777    T1.11   024644      WRUNR   002776 G
SOFINI  007072 G    TSDB    002514 G    T$NS0 = 000000    T1.12   024730      WSM   = 140006 G
SRF   = 104010 G    TSMD    031305      T$NS1 = 000005    T1.2    024420      WSMBK   002506 G
SRR   = 104410 G    TSNF    003534 G    T$NS2 = 000002    T1.3    024444      WSSR    012700 G
STAERM  006120 G    TSSR    002524 G    T$PCNT= 000000    T1.4    024464      WTBF    031355
STAER1  006436      TSSREG  003454 G    T$PTAB= 010043    T1.5    024504      WTBUF   002316 G
STAER2  006616      TSUNT   003532 G    T$PTHV= 000001    T1.6    024524      WTM   = 100011 G
STAER3  006675      TSVCT   002534 G    T$PTNU= 000001    T1.7    024544      WTMFLG  003456 G
STAER4  006733      TS.A16= 000400 G    T$SAVL= 177777    T1.8    024564      WTR   = 101011 G
STAER5  006753      TS.A17= 001000 G    T$SEGL= 177777    T1.9    024604      WTV   = 104105 G
STAER6  006562      TS.NBA= 002000 G    T$SIZE= 000005    T2      025672 G    WTVERM  004430 G
STAER7  006530      TS.NXM= 004000 G    T$SUBN= 000000    T3      026526 G    WTYBRF  015110
STAFLG  003526 G    TS.OFL= 000100 G    T$TAGL= 177777    T4      026722 G    WTYCMD  015104
SVCGBL= 000000      TS.RMR= 010000 G    T$TAGN= 010045    T5      027102 G    WTYWRD  015106
SVCINS= 000001      TS.SC = 100000 G    T$TEMP= 000000    T5WEOT  027662 G    X$ALWA= 000000
SVCSUB= 000000      TS.SPE= 020000 G    T$TEST= 000005    UAM   = 000200 G    X$FALS= 000040
SVCTAG= 000000      TS.SSR= 000200 G    T$TSTM= 177777    UNIWLK  005653      X$OFFS= 000400
SVCTST= 000000      TS.UPE= 040000 G    T$TSTS= 000001    UNL   = 100412 G    X$TRUE= 000020
SWBFLG  003520 G    TS1MD   002312 G    T$$AU = 010016    UNREC   003470 G    X0.BOT= 000002 G
SWB.C = 010000 G    TS5ADR  030040      T$$AUT= 010013    URERM   005041 G    X0.EOT= 000001 G
SWSET   004231 G    TS5CL   002564 G    T$$CLE= 010014    VFEXC   016152 G    X0.LET= 020000 G
S$LSYM= 010000      TS5INT  002554 G    T$$DAT= 010044    VFISU   016400 G    X0.ONL= 000100 G
TCCRA   013414      TS5IN0  010034 G    T$$DU = 010015    VFYCNT  003346 G    X0.RLL= 010000 G
TCC0    013434 G    TS5IN1  010042 G    T$$HAR= 010040    VFYDAT  016066 G    X0.RLS= 040000 G
TCC1    013452 G    TS5IN2  010050 G    T$$HW = 010000    VFYFLG  003516 G    X0.TMK= 100000 G
TCC2    013470 G    TS5IN3  010056 G    T$$INI= 010012    VFY.C = 000100 G    X0.WLK= 000004 G
TCC3    013600 G    TS5SW   002574 G    T$$MSG= 010003    WAITF   007204 G    X2.BFE= 000100 G
TCC4    013616 G    TS5UNT  030064      T$$PC = 000001    WLKCHK  007356 G    X2.EFE= 000200 G
TCC5    014232 G    TS5VCT  030055      T$$PRO= 010011    WLKZRO  011734      X2.OPM= 100000 G
TCC6    014330 G    T$ARGC= 000003      T$$PTA= 010043    WRBC    002626 G    X3.DCK= 000010 G
TCC7    014472 G    T$CODE= 001004      T$$RPT= 010010    WRECL = 000020 G    X3.RNY= 157400 G
TC2RTN  013576      T$ERRN= 000002      T$$SOF= 010041    WRR   = 105005 G    X4.HSS= 100000 G
TIME1   003436 G    T$EXCP= 000000      T$$SRV= 010007    WRREC   002766 G    X4.RCE= 040000 G
TIME2   003440 G    T$FLAG= 000041      T$$SUB= 010033    WRT   = 104005 G    ZROPAT  011704
TOERM   004453 G    T$FREE= 032016      T$$SW = 010001    WRTCHK  007270 G    $LSTIN= 000001
TOOMM   004727 G    T$GMAN= 000000      T$$TES= 010037    WRTCHR  007436 G    $LSTTA= 000001
TRAPD4  003530 G    T$HILI= 000010

. ABS.  032016     000
        000000     001
ERRORS DETECTED:  0

VIRTUAL MEMORY USED:  28665 WORDS  ( 112 PAGES)
DYNAMIC MEMORY:  20060 WORDS  ( 77 PAGES)
ELAPSED TIME:  00:05:29
CNTSEA0.BIC,CNTSEA0.SEQ/-SP=SVC34/ML,TSV1E,CNTSEA.MAC/EN:AMA:ABS/DS:GBL
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