

TSV05

TSV05 DATA REL
CVTSECO

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IDENTIFICATION

PRODUCT ID: AC-T178C-MC

PRODUCT TITLE: CVTSECO TSV05 DATA REL

PRODUCT DATE: 4-JUN-84

MAINTAINER: CSS/PGG DIAGNOSTICS

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1.0 GENERAL INFORMATION

1.1 PROGRAM ABSTRACT

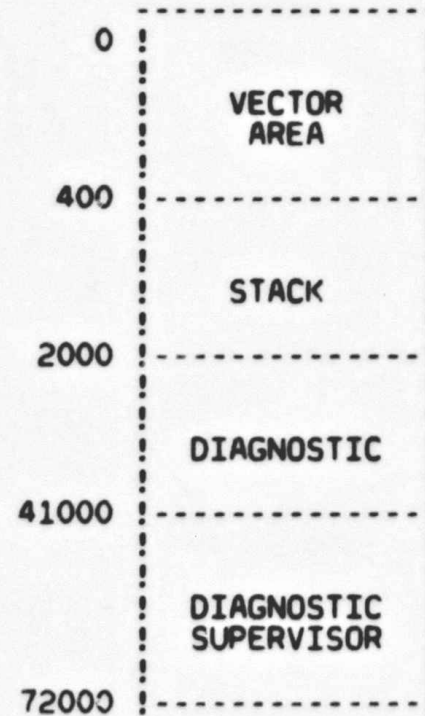
1.1.1 FUNCTIONAL DESCRIPTION

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

1.1.2 STRUCTURE OF PROGRAM

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

1.1.3 MEMORY MAP



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FREE MEMORY SPACE FOR WR/RD BFRS OR OTHER PUROSES
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

276 OPERATIONAL ONES.

277 ALGORITHM

278 A WRITE RETRY SUBROUTINE IS CALLED BY THE RECOVERABLE ERROR SUBROUTINE WHICH IS
279 ENTERED UPON DETECTION OF A WRITE RECOVERABLE ERROR.
280 THE WRITE RETRY SUBROUTINE ATTEMPTS TO REWRITE THE RECORD IN SAME SPOT ON TAPE
281 4 TIMES.

282 IF ALL 4 REPEATS ARE GOOD, THE RECORD IS CONSIDERED AS RECOVERED AND
283 A RECOVERABLE WRITE ERROR IS LOGGED AT THAT RECORD NUMBER.

284 IF ANY OF THE 4 REWRITE ATTEMPTS FAIL, THE ROUTINE WILL ERASE THE BAD RECORD, AND LO
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289 BAD SPOT AT THAT RECORD NUMBER, THE ROUTINE WILL THEN ATTEMPT TO
290 WRITE THE RECORD AGAIN 3 INCHES FURTHER DOWN TAPE AND
291 RETRY THIS SEQUENCE 4 TIMES, FOR UP TO 4 REPEATS EACH.

292 IF A RECORD CANNOT BE WRITTEN WITHOUT RECOVERABLE ERRORS AFTER 4 RETRIES,
293 THEN THE ROUTINE WILL ERASE THE RECORD AND REPORT RETRY FAILED ON BAD SPOT.

294 THE RECOVERABLE ERROR SUBROUTINE THEN CONTINUES TO CALL THE WRITE
295 RETRY SUBROUTINE, WHICH REISSUES THE GROUP OF 4 RETRIES,
296 UNTIL THE RECORD IS RECOVERED OR 20 BAD SPOTS HAVE BEEN LOGGED .

297 TWENTY (20) BAD SPOTS MAXIMUM ARE ALLOWED PER BOT TO EOT PASS OF TAPE.
298 WHEN 20 BAD SPOTS HAVE BEEN LOGGED, WHETHER ON THE SAME RECORD NUMBER OR NOT,
299 TAPE IS CONSIDERED DEFECTIVE: A BAD TAPE OVERFLOW MESSAGE IS PRINTED
300 AND THE UNIT IS REWOUND, THEN DROPPED.

301 DURING THE RECOVERY PROCESS, IT IS NECESSARY TO PERFORM SEVERAL TAPE
302 POSITIONING OPERATIONS: SPACE REVERSE, ERASE. IF A POSITION ERROR
303 IS DETECTED IN THE STATUS WORD DURING THOSE OPERATIONS, THEN THE RECOVERY ATTEMPT IS

304 AN APPROPRIATE UNRECOVERABLE ERROR MESSAGE IS PRINTED AND THE UNIT IS DROPPED.

305 ALL BADLY WRITTEN RECORDS LOGGED WITH RECOVERABLE ERRORS ARE ERASED
306 UNTIL RECOVERED, INCLUDING THE RECORD AT THE 20TH BAD SPOT,
307 SO THAT ALL RECORDS LEFT ON TAPE ARE KNOWN GOOD WRITTEN RECORDS.

308 BAD SPOTS ARE ERASED WITH ERASE GAPS FROM 3 TO 12 INCHES PER RETRY GROUP.
309 UP TO 20 FEET OF ERASE GAP COULD RESULT WHEN RETRYING TO RECOVER
310 A SINGLE RECORD.

311 THAT LONG STRETCH OF BAD TAPE WOULD THEN BE LOGGED WITH 20
312 BAD SPOTS AT SAME RECORD NUMBER AND THE TAPE CONSIDERED DEFECTIVE.

313 BAD SPOTS REPORTS

314 IF THE PRINTING OF RECOVERABLE ERRORS IS ENABLED, THE BAD SPOTS ON TAPE ARE
315 IDENTIFIED AS THEY ARE DETECTED. SINCE THE BAD RECORDS ARE ERASED UNTIL RECOVERED,
316 THE BAD SPOT ACTUALLY PRECEDES THE RECORD NUMBER THAT IDENTIFIES IT.
317 THE NUMBER OF REPEATS AND RETRIES ATTEMPTED IS PRINTED, FROM WHICH THE
318 LENGTH OF ERASE GAPS CAN BE DETERMINED: APPROXIMATELY 3 INCHES PER RETRY.

319 THE STATISTICAL REPORT PRINTED AT THE END OF TEST 2 OR UPON A "PRINT" REQUEST,
320 CONTAINS A SUMMARY OF THE BAD SPOTS LOGGED ON THE CURRENT PASS OF TAPE.
321 IN THAT REPORT, ALL COUNTS ARE CUMULATIVE FROM PASS TO PASS, EXCEPT FOR
322 THE NUMBER OF BAD SPOTS; IT RELATES TO A "BOT TO EOT TAPE PASS" ONLY.
323 FOR THIS PURPOSE, A "TAPE PASS" IS A WRITE PASS FROM BOT TO EOT, OR FROM

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ABORTED.

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LL THE TESTS REQUESTED

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

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

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

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

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

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

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

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

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358 CVTSE SFT ERR 00009 ON UNIT 00 TST 002 SUB 000 PC: 012100
359 RECOVERABLE ERROR
360 WRT CMD FAILED - UNIT 0 PASS: 1 RECORD: 6
361 PREVIOUS CMD WAS WRT
362 CMDPKT TSBA RFC TSSR TCC
363 100205 002406 000000 100210 4
364 026600
365 000000
366 003107
367 XST0 XST1 XST2 XST3 XST4
368 000350 000002 100400 000000 000000
369 SUSPECT BAD SPOT AFTER 1 RETRY, 2 REPEAT
370 SUSPECT BAD SPOT AFTER 2 RETRY, 1 REPEAT
371 SUSPECT BAD SPOT AFTER 3 RETRY, 1 REPEAT
372 SUSPECT BAD SPOT AFTER 4 RETRY, 3 REPEAT
373 RETRY FAILED ON BAD SPOT...ERASED!
374 SUSPECT BAD SPOT AFTER 1 RETRY, 1 REPEAT
375 SUSPECT BAD SPOT AFTER 2 RETRY, 1 REPEAT

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378 CVTSE SFT ERR 00009 ON UNIT 00 TST 002 SUB 000 PC: 012100
379 RECOVERABLE ERROR
380 WRT CMD FAILED - UNIT 0 PASS: 1 RECORD:10210
381 PREVIOUS CMD WAS WRT
382 CMDPKT TSBA RFC TSSR TCC
383 100205 002406 000000 100210 4
384 026600
385 000000
386 004000
387 XST0 XST1 XST2 XST3 XST4
388 000350 000002 100010 000000 000000
389 RECOVERED ON RETRY # 1


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390          †C
391          DR>PRI
392
393          UNIT 0 PASS: 1 RECORD:10210
394          BYTES WRITTEN 0,272,279,691
395          BYTES READ REV 0,301,123,654
396          BYTES READ REV 0,301,120,381
397
398          RECOVERABLE ERRORS      WRT      RDR      RDF
399          UNRECOVERABLE ERRORS    0        0        0
400          WRITE RETRIES           3
401
402          2 BAD SPOTS THIS TAPE PASS PRECEDING RECORD #:
403          6        6
404          SPEC COND  HARD  FATAL  COMPARE
405          2        0        0        0
406          DR>
407
408          THIS EXAMPLE SHOWS:
409          RECORD 6 RECOVERED ON 2ND RETRY GROUP
410          THE 2 BAD SPOTS RESIDE IN A 18 INCH ERASE GAP BETWEEN RECORDS 5 AND 6
411          RECORD 10210 RECOVERED ON 1ST RETRY OF 4 GOOD REPEATS
412          3 WRITE GROUP RETRIES ATTEMPTED, RESULTING IN:
413          1 RECOVERABLE WRT ERR FROM RECORD 10210
414          2 BAD SPOTS BETWEEN RECORDS 5 AND 6
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418          1.1.4.3.2 OPERATIONAL WRITE-ERROR-RECOVERY ALGORITHM
419
420          WHEN THIS ALGORITHM IS SELECTED, THE TSV05 WRITE RETRY COMMAND
421          IS ISSUED UP TO 16 TIMES OR UNTIL RECORD IS RECOVERED, ON
422          A WRITE RECOVERABLE ERROR. THE WRITE RETRY COMMAND CONSISTS
423          OF A SPACE REVERSE OVER THE BAD RECORD, THEN AN ERASE OF 3 INCHES
424          OF TAPE AND REWRITE OF THE RECORD. THAT COMPOSITE COMMAND
425          DOES NOT ALLOW THE DETECTION OF BAD SPOTS ON TAPE.
426          THEREFORE NO BAD TAPE SPOTS STATUS IS PRINTED.
427
428          IF RECORD CANNOT BE RECOVERED AFTER 16 WRITE RETRY COMMANDS,
429          A RETRY LIMIT EXCEEDED IS FLAGGED AND UNIT IS DROPPED.
430
431          1.1.4.4 DIAGNOSTIC TIMING ADJUSTMENT
432
433          A NUMBER OF SUPERVISOR TIMING DELAY MACROS, KNOWN AS WATCH DOG
434          DELAYS, ARE CALLED BY THE DIAGNOSTIC TO WAIT FOR VARIOUS COMMANDS
435          COMPLETION. THESE DELAYS ARE NOT CALIBRATED AND SIMPLY EXPANDS
436          INTO AN INLINE NESTED LOOP PAIR. THE COUNT FOR THE OUTER LOOP
437          COMES FROM THE VARIABLE ARGUMENT SUPPLIED BY THE DELAY CALLS.
438          THE COUNT FOR THE INNER LOOP COMES FROM THE FIXED "HEADER"
439          ELEMENT "L$DLY".
440          AS THE DIAGNOSTIC IS RUN ON DIFFERENT CPU'S, THESE DELAYS WILL
441          VARY IN LENGTH WITH MEMORY SPEED.
442
443          IF TIME-OUT OCCURS WHEN NO APPARENT MALFUNCTIONS IN THE TAPE
444          UNIT IS EVIDENT, ALL TIMINGS OF THE DIAGNOSTIC MAY BE ADJUSTED
445          TO MATCH MEMORY SPEED AND NOT RESULT IN TIME-OUTS, BY PATCHING
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THAT FIXED DELAY ELEMENT "L\$DLY".

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

1.2 SYSTEM REQUIREMENTS

1.2.1 HARDWARE REQUIREMENTS

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

1.2.2 SOFTWARE REQUIREMENTS

DIAGNOSTIC SUPERVISOR

1.3 RELATED DOCUMENTS AND STANDARDS

DIGITAL EQUIPMENT CORPORATION DOCUMENTS:

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

1.4 DIAGNOSTIC HIERARCHY PREREQUISITES

ORDER OF HOST CPU DIAGNOSTIC USAGE:

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

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1.5 ASSUMPTIONS

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

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2.0 OPERATING INSTRUCTIONS

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

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

ROOT THE DIAGNOSTIC XXDP MEDIA

```

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

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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

630 LOOPING ON ERROR. ALL FLAGS ARE CLEARED AT STARTUP AND REMAIN
 631 CLEARED UNTIL EXPLICITLY SET USING THE FLAGS SWITCH. FLAGS
 632 ARE ALSO CLEARED AFTER A START COMMAND UNLESS SET USING THE
 633 FLAG SWITCH. THE ZFLAGS COMMAND MAY ALSO BE USED TO CLEAR
 634 ALL FLAGS. WITH THE EXCEPTION OF THE START AND ZFLAGS COMMANDS,
 635 NO COMMANDS AFFECT THE STATE OF THE FLAGS; THEY REMAIN SET OR
 636 CLEARED AS SPECIFIED BY THE LAST FLAG SWITCH.
 637

638	FLAG	EFFECT
639	----	-----
640	HOE	HALT ON ERROR - CONTROL IS RETURNED TO RUNTIME SERVICES COMMAND MODE
641		
642	LOE	LOOP ON ERROR
643	IER*	INHIBIT ALL ERROR REPORTS
644	IBR*	INHIBIT ALL ERROR REPORTS EXCEPT FIRST LEVEL (FIRST LEVEL CONTAINS ERROR TYPE, NUMBER, PC, TEST AND UNIT)
645		
646		
647	IXE*	INHIBIT EXTENDED ERROR REPORTS (THOSE CALLED BY PRINTX MACRO'S)
648		
649	PRI	DIRECT MESSAGES TO LINE PRINTER
650	PNT	PRINT TEST NUMBER AS TEST EXECUTES
651	BOE	"BELL" ON ERROR
652	UAM	UNATTENDED MODE (NO MANUAL INTERVENTION)
653	ISR	INHIBIT STATISTICAL REPORTS (DOES NOT APPLY TO DIAGNOSTICS WHICH DO NOT SUPPORT STATISTICAL REPORTING)
654		
655		
656	IDR	INHIBIT PROGRAM DROPPING OF UNITS
657	ADR	EXECUTE AUTODROP CODE
658	LOT	LOOP ON TEST

659 *ERROR MESSAGES ARE DESCRIBED IN SECTION 3.1

660
 661
 662 SEE THE XXDP* USER'S MANUAL FOR MORE DETAILS ON FLAGS. YOU MAY
 663 SPECIFY MORE THAN ONE FLAG WITH THE FLAG SWITCH. FOR EXAMPLE,
 664 TO CAUSE THE PROGRAM TO LOOP ON ERROR, INHIBIT ERROR REPORTS
 665 AND TYPE A "BELL" ON ERROR, YOU MAY USE THE FOLLOWING STRING:
 666

667 /FLAGS:LOE:IER:BOE

668 2.1 HARDWARE PARAMETERS

669 -----
 670
 671 ON A "N" RESPONSE TO "CHANGE HW?", THE DIAG SHALL RUN ASSUMING
 672 ONE UNIT AT TSDB = 172520 WITH A VECTOR = 224 AND DRIVE=0.

673
 674 ON A "Y" RESPONSE TO "CHANGE HW?" QUESTION, THEN
 675 THE FOLLOWING QUESTIONS WILL BE ASKED ON A START COMMAND. THE
 676 VALUE LOCATED TO THE LEFT OF THE QUESTION MARK IS THE DEFAULT
 677 VALUE THAT WILL BE TAKEN ON A CARRIAGE RETURN RESPONSE.
 678

679 TSDB ADDRESS (0) 172520 ?

680 VECTOR (0) 224 ?

681 SELECT DRIVE 0-1 (0) ?
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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 50 SECONDS 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 FLEXIBILITY 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

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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 (D) 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
801			
802			
803			
804	1	DRI	DRIVE INITIATE.
805	2	RDF	READ FORWARD.
806	3	RDR	READ REVERSE.
807	4	WRT	WRITE.
808	5	WTV	WRITE/VERIFY. IE. WRITE N RECORDS; READ REVERSE AND CHECK
809			N RECORDS OF DATA; READ FORWARD AND CHECK N RECORDS.
810	6	SRF	SPACE RECORDS FORWARD.
811	7	SRR	SPACE RECORDS REVERSE.
812	8	RNR	READ NEXT REVERSE, IE. SPACE FWD, READ REV.
813	9	RNF	READ NEXT FORWARD, IE. READ FWD, SPACE REV.
814	10	RPF	READ PREVIOUS FWD, IE. SPACE REV, READ FWD.
815	11	RPR	READ PREVIOUS REV, IE. READ REV, SPACE FWD.
816	12	WRR	WRITE RETRY.
817	13	RWD	REWIND.
818	14	MBR	MESSAGE BUFFER RELEASE.
819	15	WTM	WRITE TAPE MARK.
820	16	WTR	WRITE TAPE MARK RETRY.
821	17	SFF	SPACE FILES FORWARD.
822	18	SFR	SPACE FILES REVERSE.
823	19	GES	GET EXTENDED STATUS.
824	20	ERS	ERASE 3 INCHES OF TAPE.
825	21	UNL	UNLOAD.
826	22	CLN	CLEAN TAPE
827	23	SCH	SET DEVICE CHARACTERISTIC. WHERE BRF=200, 40, 20, 0.
828			200 = ENABLE SKIP TAPE MARKS STOP (STOP AT LOGICAL EOT)
829			40 = ENABLE ATTENTION INTERRUPTS.
830			20 = ENABLE MESSAGE BUFFER RELEASE INTERRUPTS.
831			SEE TSV05/TS05 PROGRAMMING SPECIFICATION FOR DESCRIPTION.
832	25	JMP	JUMP TO THE NTH COMMAND IN THE COMMAND SEQUENCE
833			TABLE, WHERE N IS DEFINED IN THE BRF FIELD.
834			THE NUMBER OF JUMPS IS ENTERED IN THE # OF OPERATIONS FIELD
835	26	DLY	DELAY "N" MILLISECONDS WHERE N IS DEFINED IN
836			THE # OF OPERATIONS.
837	27	END	END OF COMMAND SEQUENCE.
838			
839			

2.2.2 DATA PATTERN LIST FOR USE IN SOFTWARE DIALOGUE.

	PATTERN #	DESCRIPTION.
840		
841		
842		
843		
844	0	INCREMENTING PATTERN. 0 - 377.
845	1	ALL "1"'S PATTERN.
846	2	ALL "0"'S PATTERN.
847	3	"1" BIT WALKING FROM R TO L IN A FIELD OF "0"'S.
848	4	"0" BIT WALKING FROM R TO L IF A FIELD OF "1"'S.
849	5	ALTERNATING "1" AND "0" BITS WITH ALTERNATE BYTES COMPLIMENTED.
850	6	ALTERNATING BYTES OF 000 AND 377.
851	7	RANDOM DATA PATTERN.
852	8	NO PATTERN GENERATION.

2.3 EXAMPLES OF SOFTWARE DIALOGUE

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

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

CHANGE SW (L) ?

2.3.1 BASIC FUNCTION AND DATA RELIABILITY WITH ALL ERROR REPORTING ENABLED

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

CHANGE SW (L) ? Y<CR>
CLEAR COUNTERS (L) N ? Y<CR>
RESET RANDOM VARIABLES (L) N ? <CR>
PRINT RECOVERABLE ERRORS (L) N ? Y<CR>
HALT AFTER EACH CMD (L) N ? <CR>
INHIBIT RECOVERY (L) N ? <CR>
BAD TAPE SPOT DETECTION (L) Y ? <CR>
DISABLE INTERRUPTS (L) N ? <CR>
INHIBIT RFC ERROR REPORT (L) N ? <CR>
CHANGE CMD SEQUENCE (L) N ? <CR>
DEFAULT SWITCH SETTINGS (L) Y ? <CR>

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

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

CHANGE SW (L) ? Y<CR>
CLEAR COUNTERS (L) N ? Y<CR>
RESET RANDOM VARIABLES (L) N ? N<CR>
PRINT RECOVERABLE ERRORS (L) N ? N<CR>
HALT AFTER EACH CMD (L) N ? N<CR>
INHIBIT RECOVERY (L) N ? N<CR>
BAD TAPE SPOT DETECTION (L) Y ? N<CR>
DISABLE INTERRUPTS (L) N ? N<CR>

911 INHIBIT RFC ERROR REPORT (L) N ? Y<CR>
 912 CHANGE CMD SEQUENCE (L) N ? N<CR>
 913 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:

922 CHANGE SW (L) ? Y<CR>
 923 CLEAR COUNTERS (L) N ? Y<CR>
 924 RESET RANDOM VARIABLES (L) N ? N<CR>
 925 PRINT RECOVERABLE ERRORS (L) N ? N<CR>
 926 HALT AFTER EACH CMD (L) N ? N<CR>
 927 INHIBIT RECOVERY (L) N ? N<CR>
 928 BAD TAPE SPOT DETECTION (L) Y ? N<CR>
 929 DISABLE INTERRUPTS (L) N ? Y<CR>
 930 INHIBIT RFC ERROR REPORT (L) N ? Y<CR>
 931 CHANGE CMD SEQUENCE (L) N ? Y<CR>
 932 CHARACTERISTICS CODE (0) 40 ? 40<CR>
 933 CMD/2 (D) 5 ? 13<CR> (REWIND)
 934 BRF COUNT (D) 2048 ? 1<CR>
 935 # OF OPERATIONS (D) 10 ? 1<CR>
 936 PATTERN (D) 7 ? 1<CR>
 937 CMD/3 (D) 5 ? 4<CR> (WRITE)
 938 BRF (D) 2048 ? 1000<CR>
 939 # OF OPERATIONS (D) 10 ? 10000<CR>
 940 PATTERN (D) 7 ? 1<CR>
 941 CMD/4 (D) 5 ? 27<CR> (END)
 942 BRF (D) 2048 ? <↑Z>

2.4 EXECUTION TIMES

2.4.1 SYSTEM CONFIGURATION

PDP11/23
 MOS MEMORY
 LA36
 TSV05/TS05

2.4.2 TEST EXECUTION TIMES (2400 FT. TAPE)

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

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

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3.0 ERROR INFORMATION

3.1 ERROR REPORTING

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

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

STANDARD ERROR REPORT FORMAT:

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

* CAUTION *

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

EXAMPLE OF AN ERROR REPORT:

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

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

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

3.1.2 ERROR #2 - TS05 NOT READY:

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

3.1.3 ERROR #3 - NO RESPONSE ERROR:

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

3.1.4 ERROR #4 - NO INTERRUPT ERROR:

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

3.1.5 SPECIAL CONDITION ERRORS:

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

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

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

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

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

THIS TCC INDICATES THAT THE DRIVE HAS UNDERGONE A STATUS CHANGE

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

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

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

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

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

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

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

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

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

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

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

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

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

1139 3.1.6 ERROR #13 - RFC NON-ZERO ERROR:
1140 IF, AFTER EXECUTION, THE RESIDUAL FRAME COUNT IS NON-ZERO, THE
1141 ERROR IS REPORTED AND A HARD ERROR IS LOGGED. THE PROGRAM THEN
1142 PROCEEDS NORMALLY. THE REPORTING AND LOGGING OF THESE ERRORS
1143 IS OPTIONAL.
1144
1145
1146 3.1.7 ERROR #14 - RETRY LIMIT EXCEEDED:
1147 ON A WRITE COMMAND THIS IS A FATAL DEVICE ERROR AND THE DEVICE
1148 WILL BE DROPPED FROM THE TEST CYCLE UNLESS THE IDU OPTION IS USED.
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1150 ON A READ COMMAND THIS ERROR IS LOGGED AS A HARD ERROR AND
1151 THE PROGRAM PROCEEDS NORMALLY.
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1154 3.1.8 ERROR #15 - TOO MANY INTERRUPTS:
1155 IF MORE THAN ONE INTERRUPT OCCURS PER COMMAND, THIS ERROR IS REPORTED.
1156 THIS IS A FATAL DEVICE ERROR AND THE DEVICE WILL BE DROPPED FROM
1157 THE TEST CYCLE UNLESS THE IDU OPTION IS USED.
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1160 3.1.9 ERROR #16 - CAPSTAN RUNAWAY:
1161 CAPSTAN DID NOT STOP WITHIN ACCEPTABLE WINDOW AFTER LAST
1162 COMMAND. THE PROGRAM WILL ISSUE A GET STATUS COMMAND BEFORE REPORTING
1163 THE ERROR SO THAT THE DEAD TRACK FIELD IN EXTENDED STATUS REGISTER 2
1164 WILL CONTAIN THE TACH COUNT WHEN THE TAPE STOPPED.
1165 THIS IS A FATAL DEVICE ERROR AND THE DEVICE WILL BE DROPPED FROM
1166 THE TEST CYCLE UNLESS THE IDU OPTION IS USED.
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1169 3.1.10 ERROR #17 - DATA COMPARE ERROR:
1170 IF A DATA VALIDATION ERROR OCCURS DURING A WRITE/VERIFY COMMAND,
1171 THE PROGRAM PRINTS WHAT THE DATA SHOULD HAVE BEEN AND WHAT THE
1172 DATA WAS, AND PRINTS THE BYTE AND RECORD NUMBER THE ERROR OCCURRED
1173 ON. ONLY THE FIRST 10 BYTES IN ERROR PER RECORD ARE PRINTED.
1174 THE TOTAL # OF BYTES IN ERROR PER RECORD IS ALSO PRINTED. A
1175 HARD ERROR IS LOGGED AND THE PROGRAM PROCEEDS NORMALLY.
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1177
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1180 3.2 ERROR HALTS
1181 -----
1182 ERROR HALTS ARE SUPPORTED PER DESCRIBED IN THE PREVIOUS SECTION
1183 WITH /FLAG:HOE. THERE ARE NO OTHER HALTS.
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1186 4.0 PERFORMANCE REPORT
1187 -----
1188 UNIT X PASS:XXXXX RECORD:XXXXX
1189 BYTES WRITTEN XXX,XXX,XXX,XXX
1190 BYTES READ REV XXX,XXX,XXX,XXX
1191 BYTES READ FWD XXX,XXX,XXX,XXX
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		WRT	RDR	RDF
RECOVERABLE ERRORS		XXXXX	XXXXX	XXXXX
UNRECOVERABLE ERRORS		XXXXX	XXXXX	XXXXX
SPEC COND	HARD	FATAL	COMPARE	
XXXXX	XXXXX	XXXXX	XXXXX	

5.0 TEST SUMMARIES

5.1 TEST 1 -

BASIC FUNCTIONS.

EXECUTES AND VERIFIES CORRECT COMPLETION OF ALL TSV05 FUNCTIONS.

SUBTEST 1 - SET CHAR, DRIVE INIT, GET STATUS.

- * SET CHARACTERISTIC 200.
- * DRIVE INITIATE.
- * SET CHARACTERISTIC 20.
- * GET STATUS
- * SET CHARACTERISTIC 40.
- * PRINT TSV05 MICROCODE LEVEL (PASS 1 ONLY)

SUBTEST 2 - REWIND.

- * REWIND.
- * REWIND AT BOT.

SUBTEST 3 - WRITE/VERIFY.

- * WRITE/VERIFY PATTERN 1.
- * WRITE/VERIFY PATTERN 2.
- * WRITE/VERIFY PATTERN 3.
- * WRITE/VERIFY PATTERN 4.
- * WRITE/VERIFY PATTERN 5.
- * WRITE/VERIFY PATTERN 6.
- * WRITE/VERIFY PATTERN 0.

SUBTEST 4 - WRITE TAPE MARK, ERASE.

- * WRITE TAPE MARK.
- * WRITE 10 RECORDS
- * ERASE 10 TIMES
- * WRITE TAPE MARK.
- * WRITE TAPE MARK RETRY.

SUBTEST 5 - SPACE FILES.

- * SPACE 2 FILES REVERSE.
- * SPACE 2 FILES FORWARD.
- * SPACE 2 FILES REVERSE.
- * SPACE 2 FILES FORWARD.

SUBTEST 6 - SPACE RECORDS.

- * REWIND.
- * SPACE 7 RECORDS FORWARD.
- * SPACE 7 RECORDS REVERSE.
- * SPACE 7 RECORDS FORWARD.

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- SPACE 7 RECORDS REVERSE.
- SUBTEST 7 - WRITE RETRY.
 - REWIND.
 - WRITE DATA.
 - WRITE RETRY.
- SUBTEST 8 - READ REV RETRY.
 - READ REVERSE.
 - READ NEXT REVERSE.
 - READ NEXT FORWARD.
- SUBTEST 9 - READ FWD RETRY.
 - READ FORWARD.
 - READ PREVIOUS FORWARD.
 - READ PREVIOUS REVERSE.
- SUBTEST 10 - CLEAN.
 - CLEAN.
 - REWIND.
- SUBTEST 11 - WRITE/VERIFY SWAPPED DATA BYTES.
 - WRITE/VERIFY EVEN LENGTH (RECORD 1).
 - WRITE/VERIFY ODD LENGTH (RECORD 2).
 - SET DATA BYTE SWAP.
 - WRITE/VERIFY EVEN LENGTH (RECORD 3).
 - WRITE/VERIFY ODD LENGTH (RECORD 4).
 - CLEAR DATA BYTE SWAP.
- SUBTEST 12 - READ SWAPPED DATA BYTES.
 - READ REV RECORD 4.
 - READ REV RECORD 3.
 - SET DATA BYTE SWAP.
 - READ REV RECORD 2.
 - READ REV RECORD 1.
 - READ FWD RECORD 1.
 - READ FWD RECORD 2.
 - CLEAR DATA BYTE SWAP.
 - READ FWD RECORD 3.
 - READ FWD RECORD 4.

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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 TSV05 TAPE SUBSYSTEM CONSISTS OF A TSV05 Q-BUS CONTROLLER CONNECTED TO A TSV05 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 - TSOB (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 TSV05 SUBSYSTEM TO FETCH THE WORD(S) WITHIN THE COMMAND PACKET. THE WORDS WITHIN THE COMMAND PACKET ARE:

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1. COMMAND WORD
2. LOW ORDER BUFFER ADDRESS
3. HIGH ORDER BUFFER ADDRESS
4. BYTE COUNT

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

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6.2 Q-BUS INTERFACE SPECIFICATIONS

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

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6.3 BIT DEFINITIONS FOR TSV05/TS05 REGISTERS

6.3.1 TSV05/TS05 REGISTER SUMMARY

	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
(R/O) TSBA	!A15!	!A14!	!A13!	!A12!	!A11!	!A10!	!A09!	!A08!	!A07!	!A06!	!A05!	!A04!	!A03!	!A02!	!A01!	!A00!
(W/O) TSDB	!P15!	!P14!	!P13!	!P12!	!P11!	!P10!	!P09!	!P08!	!P07!	!P06!	!P05!	!P04!	!P03!	!P02!	!P17!	!P16!
(R/O) TSSR	!SC!	0	!SCE!	!RMR!	!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!	!MLE!	!NEF!	!ILC!	!ILA!	!MOT!	!ONL!	!IE!	!VCK!	!PED!	!MLK!	!BOT!	!EOT!
XST1	!DLT!	0	!COR!	0	0	0	0	!RBP!	0	0	0	0	0	0	!UNC!	0
XST2	!OPM!	!RCE!	0	0	0	!MCF!	0	0	!RL7!	!RL6!	!RL5!	!RL4!	!RL3!	!RL2!	!RL1!	!RL0!
XST3	MICRO DIAGNOSTIC ERROR CODE								0	!OPI!	!REV!	!TRF!	!DCK!	0	0	!RIB!
XST4	!HSP!	!RCE!	0	0	0	0	0	0	WRITE RETRY COUNT							

TERMINATION CLASS CODES (TSSR TC0-TC2):

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

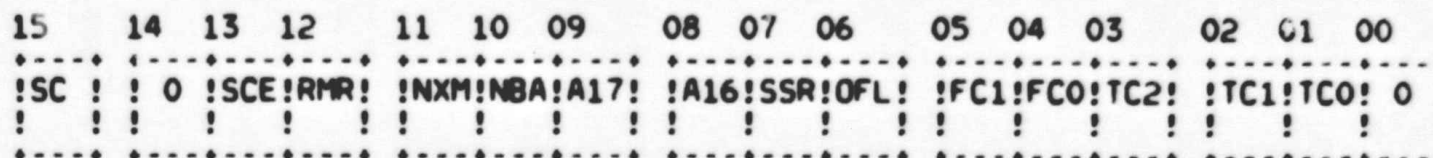
FATAL CLASS CODES (TSSR FC0-FC1):

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

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6.3.2 TSV05 STATUS REGISTER (TSSR)

Q-BUS ADDRESS + 2 - READ ONLY



BIT	NAME	TCC	DEFINITION
15	SC	S	SPECIAL CONDITION. WHEN SET, INDICATES THAT THE LAST COMMAND DID NOT COMPLETE WITHOUT INCIDENT. SPECIFICALLY, EITHER AN ERROR WAS DETECTED OR AN EXCEPTION CONDITION OCCURRED. EXCEPTION CONDITIONS CAN BE TAPE MARKS ON READ COMMANDS, REVERSE MOTION AND AT BOT, EOT WHILE WRITING, ETC. MAY ALSO BE SET BY THE ERROR BITS CONTAINED IN THE TSSR REGISTER: SCE, RMR, AND NXM. THE TERMINATION CLASS BITS ARE SOMETHING OTHER THAN 0 (UNLESS RMR IS THE ONLY ERROR - SEE RMR).
14	-	-	RESERVED (ALWAYS A 0)
13	SCE	FC0	SANITY CHECK ERROR-SETS WHEN THE CONTROLLER DETECTS AN ABNORMAL CONDITION WITHIN ITSELF DURING EXECUTION OF IT'S FUNCTIONS AND THE PROBLEM IS SERIOUS ENOUGH THAT A MESSAGE PACKET IS NOT STORED.
12	RMR	S	REGISTER MODIFICATION REFUSED. SET BY THE TSV05 WHEN A COMMAND POINTER IS LOADED INTO TSD8 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 ON A SYSTEM WITH NO BUGS, THIS BIT MAY COME UP ON AN ATTENTION MESSAGE. IF ATTNS ARE NOT ENABLED, THIS BIT COMING UP IS AN INDICATION OF EITHER A FATAL CONTROLLER ERROR OR A SOFTWARE BUG.
11	NXM	4/5	NON-EXISTENT MEMORY. SET BY THE TSV05 WHEN TRYING TO TRANSFER TO OR FROM A MEMORY LOCATION WHICH DOES NOT EXIST. MAY OCCUR WHEN FETCHING THE COMMAND PACKET, FETCHING OR STORING DATA, OR STORING THE MESSAGE PACKET.
10	NBA	S	NEED BUFFER ADDRESS. WHEN SET, INDICATES THAT THE TS05 NEEDS A MESSAGE BUFFER ADDRESS. THIS BIT IS CLEARED DURING THE SET CHARACTERISTICS

1511				COMMAND (IF A GOOD ADDRESS WAS GIVEN).
1512				
1513	09	A17	S	BUS ADDRESS BIT 17. A17 AND A16 (BIT 08) TRACK
1514				THE VALUES OF BITS 17 AND 16 OF THE TSBA
1515				REGISTER, LOADED FROM TSDB BITS 01-00 WHEN TSDB
1516				IS WRITTEN.
1517				
1518	08	A16	S	BUS ADDRESS BIT 16. SEE A17 (BIT 09).
1519				
1520	07	SSR	S	SUB-SYSTEM READY. WHEN SET, INDICATES THAT THE
1521				TSV05/TS05 SUBSYSTEM IS NOT BUSY AND IS READY TO
1522				ACCEPT A NEW COMMAND POINTER.
1523				
1524	06	OFL	S,1,3	OFF-LINE. WHEN SET, INDICATES THAT THE TS05 IS
1525				OFF-LINE AND UNAVAILABLE FOR ANY TAPE MOTION
1526				COMMANDS. THIS BIT CAN CAUSE A TERMINATION CLASS
1527				OF 1 (ON ATTN INTERRUPT) OR 3 (RESULTS IN NEF).
1528				
1529	05	FC1	7	FATAL TERMINATION CLASS 01. FC1 AND FCO (BIT
1530				04) ARE USED TO INDICATE THE TYPE OF FATAL
1531				ERROR WHICH HAS OCCURRED ON THE TS05. THESE
1532				BITS ARE VALID ONLY WHEN SC IS SET AND THE
1533				TERMINATION CLASS CODE BITS ARE ALL SET (111).
1534				
1535	04	FC0	7	FATAL TERMINATION CLASS 00. SEE FC1 (BIT 05).
1536				
1537	03	TC2	S	TERMINATION CLASS BIT 02. THIS BIT, ALONG WITH
1538				THE TC1 AND TCO BITS, ACT AS AN OFFSET VALUE
1539				WHENEVER AN ERROR OR EXCEPTION CONDITION OCCURS
1540				ON A COMMAND. EACH OF THE EIGHT POSSIBLE
1541				VALUES OF THIS FIELD REPRESENT A PARTICULAR
1542				CLASS OF ERRORS OR EXCEPTIONS. THE CONDITIONS
1543				IN EACH CLASS HAVE SIMILAR SIGNIFICANCE AND, AS
1544				APPLICABLE, RECOVERY PROCEDURES. THE CODE
1545				PROVIDED IN THIS FIELD IS EXPECTED TO BE
1546				UTILIZED AS AN OFFSET INTO A DISPATCH TABLE FOR
1547				HANDLING OF THE CONDITION.
1548				
1549	02	TC1	S	TERMINATION CLASS BIT 01. SEE TC2 (BIT 03).
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1551	01	TC0	S	TERMINATION CLASS BIT 00. SEE TC2 (BIT 03).
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1553	00	-	-	NOT USED. (ALWAYS A 0)

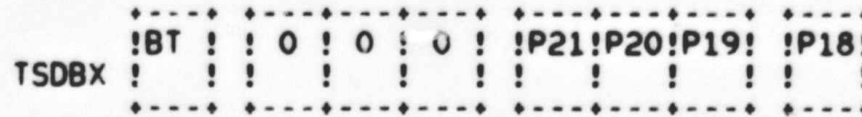
Q-BUS ADDRESS + 2 - WRITE ONLY

SUBSYSTEM INITIALIZE

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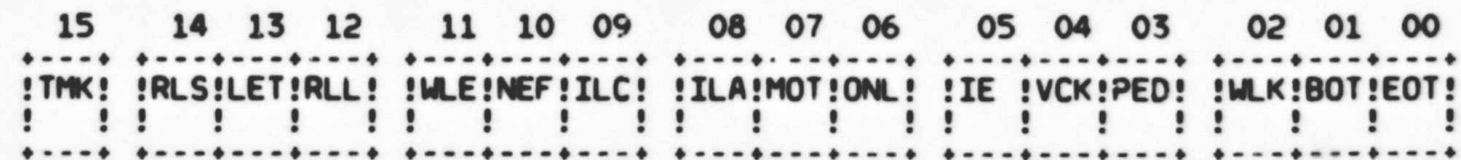
6.3.2.1 TSV05 EXTENDED DATA BUFFER REGISTER (TSDBX)



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

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

6.3.3 EXTENDED STATUS REGISTER 0 (XSTAT0)



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

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

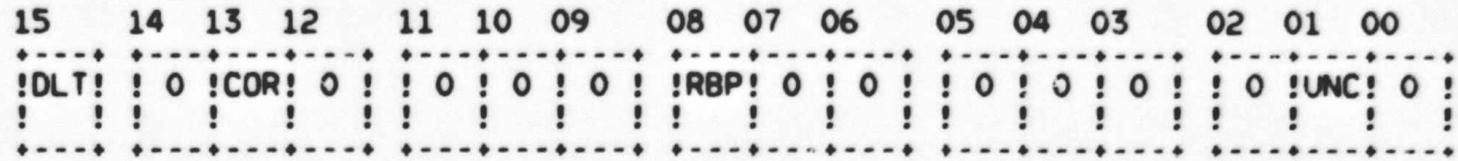
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WHEN THE VOLUME CHECK BIT IS SET.
- ANY COMMAND, EXCEPT GET STATUS OR DRIVE INITIALIZE, WHEN THE TS05 IS OFF-LINE.
- ANY WRITE COMMAND WHEN THE TAPE DOES NOT CONTAIN A WRITE ENABLE RING (WRITE LOCK STATUS - WLS).

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

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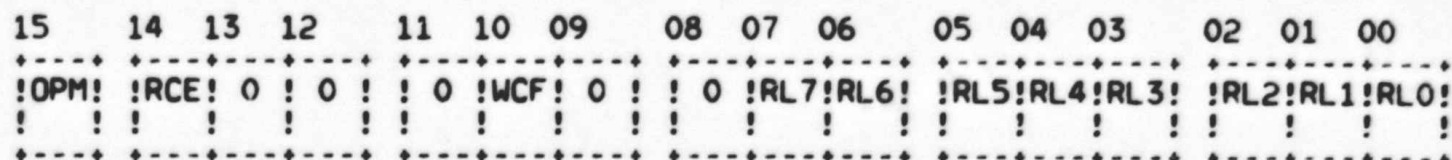
6.3.4 EXTENDED STATUS REGISTER 1 (XSTAT1)



BIT	NAME	TCC	DEFINITION
15	DLT	4	DATA LATE. SET WHEN THE FIFO IS FULL ON A READ OR EMPTY ON A WRITE. THESE CONDITIONS OCCUR WHENEVER THE Q-BUS LATENCY EXCEEDS THE DATA TRANSFER RATE OF THE TS05.
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.

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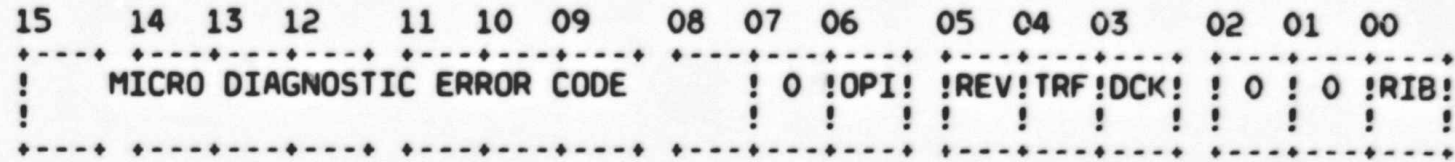
6.3.5 EXTENDED STATUS REGISTER 2 (XSTAT2)



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

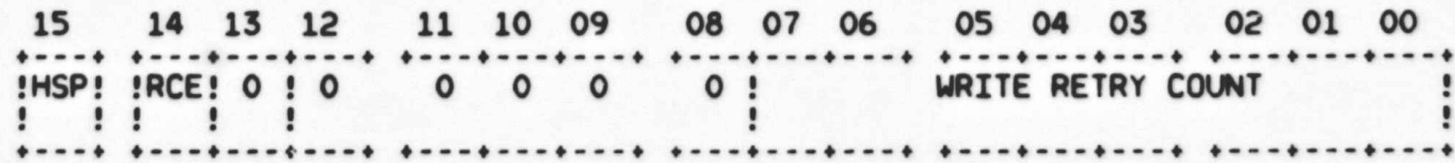
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6.3.6 EXTENDED STATUS REGISTER 3 (XSTAT3)



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

6.3.7 EXTENDED STATUS REGISTER 4 (XSTAT4)



BIT	NAME	TCC	DEFINITION
15	HSP		
14	RCE		
13			
12			
11			
10			
09			
08			
07			
06			
05			
04			
03			
02			
01			
00			

1822	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)
1823				
1824				
1825				
1826	14	RCE	6	RETRY COUNT EXCEEDED. WHEN SET, INDICATES THAT THE CONTROLLER WAS BUFFERING WRITE DATA AND COULD NOT SUCCESSFULLY OUTPUT THE BUFFERED RECORD WITHIN THE SPECIFIED NUMBER OF RETRIES. CAUSES TAPE POSITION LOST TERMINATION.
1827				
1828				
1829				
1830				
1831	13-8		-	RESERVED (ALWAYS A 0)
1832				
1833	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.
1834				
1835				
1836				
1837				
1838				
1839				
1840				

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.

REVISION C - JUN 1984

MINOR CHANGES FOR "ORION" CPU

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

```

PROGRAM HEADER AND TABLES
PROGRAM HEADER

MACRO M1113 14-JUN-84 18:32

SEQ 0039

002044	000000			.WORD	0
002046		L\$EXP1::	:EXPANSION WORD	.WORD	0
002046	000000			.WORD	0
002050		L\$MREV::	:SVC REV AND EDIT #	.BYTE	C\$REVISION
002050	003			.BYTE	C\$EDIT
002051	003				
002052		L\$EF::	:DIAG. EVENT FLAGS	.WORD	0
002052	007000			.WORD	0
002054	000000			.WORD	0
002056		L\$PC::			
002056	000000			.WORD	0
002060		L\$DEVP::	: POINTER TO DEVICE TYPE LIST	.WORD	L\$DVTYP
002060	002164			.WORD	L\$DVTYP
002062		L\$REPP::	:PTR. TO REPORT CODE	.WORD	L\$RPT
002062	017570			.WORD	L\$RPT
002064		L\$EXP4::		.WORD	0
002064	000000			.WORD	0
002066		L\$EXP5::		.WORD	0
002066	000000			.WORD	0
002070		L\$AUT::	:PTR. TO ADD UNIT CODE	.WORD	L\$AU
002070	024052			.WORD	L\$AU
002072		L\$DUT::	:PTR. TO DROP UNIT CODE	.WORD	L\$DU
002072	024000			.WORD	L\$DU
002074		L\$LUN::	:LUN FOR EXERCISERS TO FILL	.WORD	0
002074	000000			.WORD	0
002076		L\$DESP::	:POINTER TO DIAG. DESCRIPTION	.WORD	L\$DESC
002076	002136			.WORD	L\$DESC
002100		L\$LOAD::	:GENERATE SPECIAL AUTOLOAD EMT	EMT	E\$LOAD
002100	104035				
002102		L\$ETP::	:POINTER TO ERTTBL	.WORD	0
002102	000000			.WORD	0
002104		L\$ICP::	:PTR. TO INIT CODE	.WORD	L\$INIT
002104	021324			.WORD	L\$INIT
002106		L\$CCP::	:PTR. TO CLEAN-UP CODE	.WORD	L\$CLEAN
002106	023736			.WORD	L\$CLEAN
002110		L\$ACP::	:PTR. TO AUTO CODE	.WORD	L\$AUTO
002110	023314			.WORD	L\$AUTO
002112		L\$PRT::	:PTR. TO PROTECT TABLE	.WORD	L\$PROT
002112	021316			.WORD	L\$PROT
002114		L\$TEST::	:TEST NUMBER	.WORD	0
002114	000000			.WORD	0
002116		L\$DLY::	:DELAY COUNT	.WORD	0
002116	000000			.WORD	0
002120		L\$HIME::	:PTR. TO HIGH MEM	.WORD	0
002120	000000			.WORD	0


```

73      .SBTTL DISPATCH TABLE
74
75      ;**
76      ; THE DISPATCH TABLE CONTAINS THE STARTING ADDRESS OF EACH TEST.
77      ; IT IS USED BY THE SUPERVISOR TO DISPATCH TO EACH TEST.
78      ;--
79
80      DISPATCH 5
      002122      000005      .WORD      5
      002124      024156      .WORD      T1
      002126      025644      .WORD      T2
      002130      026500      .WORD      T3
      002132      026674      .WORD      T4
      002134      027054      .WORD      T5
      L#DISPATCH::

81
88
89      .SBTTL DESCRIPTIVE TEXT
90
91      ;**
92      ; 2 LINES OF TEXT PRINTED TO THE OPERATOR TO IDENTIFY THE DIAGNOSTIC AND THE DEVICE UNDER TES
93      ;--
94
95      DESCRIPT      <DATA RELIABILITY TEST>
      002136      104      101      124      L#DESC::      .ASCIZ      /DATA RELIABILITY TE
      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

96      DEVTYP      <TSV05>
      002164      124      123      126      L#DVTYP::      .ASCIZ      /TSV05/
      002167      060      065      000      .EVEN

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98      .SBTTL  DEFAULT HARDWARE P-TABLE
99
100     ;**
101     ; THE DEFAULT HARDWARE P-TABLE CONTAINS DEFAULT VALUES OF
102     ; THE TEST-DEVICE PARAMETERS.  THE STRUCTURE OF THIS TABLE
103     ; IS IDENTICAL TO THE STRUCTURE OF THE RUN-TIME P-TABLE.
104     ;--
105
106     002172      BGNHW  DFPTBL
107     002172      000003
108     002174      172520
109     002176      000224
110     002200      000000
111
112     002202      ENDHW
113     002202      L10000:
114
115
116
117     .SBTTL  SOFTWARE P-TABLE
118
119     ;**
120     ; THE SOFTWARE P-TABLE CONTAINS THE VALUES OF THE PROGRAM
121     ; PARAMETERS THAT CAN BE CHANGED BY THE OPERATOR.
122     ;--
123
124     002202      BGNSW  SFPTBL
125     002202      000051
126     002204      001
127     002205      000
128     002206      000
129     002207      000
130     002210      001
131     002211      000
132     002212      000
133     002213      000
134     002214      000
135     002215      000
136     002216      000
137     002217      000
138     002220      000040
139     002222      000015
140     002224      000001
141     002226      000001
142     002230      000007
143     002232      000004
144     002234      004000
145     002236      076400
146     002240      000007
147     002242      000003
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```

L\$HW::
 DFPTBL::

.WORD 172520 ;TSD8 ADDRESS.
 .WORD 224 ;VECTOR ADDRESS.
 .WORD 0 ;DRIVE #0 FOR DEFAULT

L10000:

.SBTTL SOFTWARE P-TABLE

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

L\$SW::
 SFPTBL::

CLRFLG:: .BYTE 1 ;CLEAR COUNTERS FLAG.
 RRANV:: .BYTE 0 ;RESET RANDOM VARIABLES EACH PASS FLAG.
 MAE:: .BYTE 0 ;HALT AFTER EACH COMMAND FLAG.
 ERCVER:: .BYTE 0 ;ENABLE RECOVERABLE ERROR PRINTS FLAG.
 BADTSW:: .BYTE 1 ;BAD TAPE SWITCH TO REWRITE ON SAME SPOT & DETECT BAD TAPE
 ;SPARE
 DINT:: .BYTE 0 ;DISABLE INTERRUPTS FLAG.
 IREC:: .BYTE 0 ;INHIBIT ERROR RECOVERY FLAG.
 CHGFLG:: .BYTE 0 ;CHANGE CMD SEQ TABLE FLAG.
 ;SPARE.
 PIRE:: .BYTE 0 ;INHIBIT RESIDUAL FRAMECOUNT ERROR REPORT FLAG.
 ;SPARE.
 CHAR:: CH.EAI ;CHARACTERISTICS CODE (DEFAULT = 40).
 CMDD:: .WORD 13. ;COMMAND 2 (DEFAULT = REWIND).
 .WORD 1 ;BYTE COUNT
 .WORD 1 ;NUMBER OF OPERATIONS
 .WORD RANP ;PATTERN
 .WORD 4 ;COMMAND 3 (DEFAULT = WRITE)
 .WORD DATCNT ;BYTE COUNT (DEFAULT = MAX BUFFER SIZE).
 .WORD 32000. ;NUMBER OF OPERATIONS (DEFAULT = 32000).
 .WORD RANP ;PATTERN (DEFAULT = RANDOM).
 .WORD 3 ;COMMAND 4 (DEFAULT = READ REV).

.WORD L10000-L\$HW/2
 .WORD L10001-L\$SW/2

PROGRAM HEADER AND TABLES
SOFTWARE P-TABLE

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SEQ 0042

154	002244	004000	.WORD	DATCNT	;BYTE COUNT (DEFAULT = MAX BUFFER SIZE).
155	002246	076400	.WORD	32000.	;NUMBER OF OPERATIONS (DEFAULT = 32,000).
156	002250	000007	.WORD	RANP	;PATTERN (DEFAULT = RANDOM).
157	002252	000002	.WORD	2	;COMMAND 5 (DEFAULT = READ FWD).
158	002254	004000	.WORD	DATCNT	;BYTE COUNT (DEFAULT = MAX BUFFER SIZE).
159	002256	076400	.WORD	32000.	;NUMBER OF OPERATIONS (DEFAULT = 32,000).
160	002260	000007	.WORD	RANP	;PATTERN (DEFAULT = RANDOM).
161	002262	000015	.WORD	13.	;COMMAND 6 (DEFAULT = REWIND).
162	002264	000001	.WORD	1	;BYTE COUNT
163	002266	000001	.WORD	1	;NUMBER OF OPERATIONS
164	002270	000007	.WORD	RANP	;PATTERN
165	002272	000033	.WORD	27.	;END OF CMD SEQ TABLE CODE (DEF) OR CMD 7
166	002274	004000	.WORD	DATCNT	;BYTE COUNT (DEFAULT = MAX BUFFER SIZE).
167	002276	076400	.WORD	32000.	;NUMBER OF OPERATIONS (DEFAULT = 32000).
168	002300	000007	.WORD	RANP	;PATTERN (DEFAULT = RANDOM).
169	002302	000033	.WORD	27.	;END OF CMD SEQ TABLE CODE (DEF) OR CMD 8
170	002304	004000	.WORD	DATCNT	;BYTE COUNT (DEFAULT = MAX BUFFER SIZE).
171	002306	076400	.WORD	32000.	;NUMBER OF OPERATIONS (DEFAULT = 32000).
172	002310	000007	.WORD	RANP	;PATTERN (DEFAULT = RANDOM).
173	002312	000001	.WORD	1	;DEFAULT SWITCH SETTING
174	002314	000000	.WORD	0	;ENABLE READ BUFFERING
175	002316	000000	.WORD	0	;ENABLE WRITE BUFFERING
176	002320	000000	.WORD	0	;RUN AT 100IPS SWITCH
177	002322	000000	.WORD	0	;EXTENDED FEATURES SOFTWARE SW 0=OFF;1=ON
178	002324	000000	.WORD	0	;BUFFER ENABLE SOFTWARE SW 0=OFF;1=ON
179					
180	002326			ENDSW	
	002326			L10001:	
181					
182	002326			ENDMOD	

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195
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207 002326
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211
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214 002326

.TITLE GLOBAL AREAS
.SBTTL GLOBAL EQUATES SECTION

      BGNMOD

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

      EQUALS

; BIT DIFINITIONS
;
100000 BIT15== 100000
040000 BIT14== 40000
020000 BIT13== 20000
010000 BIT12== 10000
004000 BIT11== 4000
002000 BIT10== 2000
001000 BIT09== 1000
000400 BIT08== 400
000200 BIT07== 200
000100 BIT06== 100
000040 BIT05== 40
000020 BIT04== 20
000010 BIT03== 10
000004 BIT02== 4
000002 BIT01== 2
000001 BIT00== 1

;
001000 BIT9== BIT09
000400 BIT8== BIT08
000200 BIT7== BIT07
000100 BIT6== BIT06
000040 BIT5== BIT05
000020 BIT4== BIT04
000010 BIT3== BIT03
000004 BIT2== BIT02
000002 BIT1== BIT01
000001 BIT0== BIT00

; EVENT FLAG DEFINITIONS
; EF32:EF17 RESERVED FOR SUPERVISOR TO PROGRAM COMMUNICATION
;
000040 EF.START== 32. ; START COMMAND WAS ISSUED
000037 EF.RESTART== 31. ; RESTART COMMAND WAS ISSUED
000036 EF.CONTINUE== 30. ; CONTINUE COMMAND WAS ISSUED
000035 EF.NEW== 29. ; A NEW PASS HAS BEEN STARTED
000034 EF.PWR== 28. ; A POWER-FAIL/POWER-UP OCCURRED

;
; PRIORITY LEVEL DEFINITIONS
;
000340 PRI07== 340
000300 PRI06== 300

```

GLOBAL AREAS MACRO M1113 14-JUN-84 18:32
 GLOBAL EQUATES SECTION

SEQ 0044

```

000240      PRI05== 240
000200      PRI04== 200
000140      PRI03== 140
000100      PRI02== 100
000040      PRI01== 40
000000      PRI00== 0
;
;OPERATOR FLAG BITS
;
000004      EVL==      4
000010      LOT==     10
000020      ADR==     20
000040      IDU==     40
000100      ISR==    100
000200      UAM==    200
000400      BOE==    400
001000      PNT==   1000
002000      PRI==   2000
004000      IXE==   4000
010000      IBE==  10000
020000      IER==  20000
040000      LOE==  40000
100000      HOE== 100000

```

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```

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

```

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235
236           ;THE FOLLOWING ARE BIT DEFINITIONS FOR THE TSSR REGISTERS.
237
238           100000      TS.SC==100000      ;SPECIAL CONDITION BIT.
239           040000      TS.UPE==40C00     ;UNIBUS PARITY ERROR
240           020000      TS.SPE==20000     ;SERIAL BUS PARITY ERROR.
241           010000      TS.RMR==10000     ;REGISTER MODIFICATION REFUSED.
242           004000      TS.NXM==4000      ;NON-EXISTENT MEMORY.
243           002000      TS.NBA==2000      ;NEED BUFFER ADDRESS.
244           001000      TS.A17==1000      ;BUS ADDRESS BIT 17.
245           000400      TS.A16==400       ;BUS ADDRESS BIT 16.
246           000200      TS.SSR==200       ;UNIT READY BIT.
247           000100      TS.OFL==100       ;OFF LINE.
248           177717      TSC.FCC==177717   ;FATAL CLASS CODE MASK.
249           177761      TSC.TCC==177761   ;TERMINATION CLASS CODE MASK.
250
251           ;THE FOLLOWING ARE BIT DEFINITIONS FOR THE COMMAND WORD
252
253           100000      ACK.C==100000     ;ACKNOWLEDGE BIT
254           040000      CVC.C==40000      ;CLEAR VOLUME CHECK.
255           020000      OPP.C==20000     ;OPPOSITE BIT
256           010000      SWB.C==10000     ;SWAP BYTE BIT
257           004000      MOD.C3==4000      ;MODE BIT 3
258           004000      BRP.C==4000      ;BYTE/RECORD/FILE COUNT FLAG BIT. NOT USED
259           002000      MOD.C2==2000      ;BY TS05 BUT USED INTERNALLY BY THIS PROGRAM ONLY.
260           001000      MOD.C1==1000      ;MODE BIT 2
261           000400      MOD.C0==400       ;MODE BIT 1
262           000200      IE.C==200        ;MODE BIT 0
263           000100      FMT.C1==100      ;INTERRUPT ENABLE
264           000100      VFY.C==100       ;FORMAT BIT 1
265           000040      FMT.C0==40       ;WRITE VERIFY FLAG BIT. INTERNAL USE ONLY.
266           000040      JMP.C==40        ;NOT USED BY TS05.
267           000040      CMD.C4==20       ;FORMAT BIT 0.
268           000020      DLY.C==20       ;JUMP BIT-TO DIRECT THIS PROGRAM TO JUMP TO
269           000020      CMD.C3==10       ;A CERTAIN LOCATION IN THE COMMAND SEQUENCE
270           000020      CMD.C2==4        ;TABLE. INTERNAL USE ONLY.
271           000010      CMD.C1==2        ;COMMAND BIT 4
272           000010      CMD.C0==1        ;INSERT DELAY. INTERNAL USE ONLY.
273           000004      CMD.C3==10       ;COMMAND BIT 3
274           000004      CMD.C2==4        ;COMMAND BIT 2
275           000002      CMD.C1==2        ;COMMAND BIT 1
276           000001      CMD.C0==1        ;COMMAND BIT 0
277
278           ;BIT DEFINITIONS FOR DEVICE CHARACTERISTICS.
279
280           000200      CH.ESS==200       ;ENABLE SKIP TAPE MARKS STOP (STOP AT LOGICAL EOT).
281           000040      CH.EAI==40       ;ENABLE ATTENTION INTERRUPTS.
282           000020      CH.ERI==20       ;ENABLE MESSAGE BUFFER RELEASE INTERRUPTS.
283           000040      DFTSCH==CH.EAI   ;DEFAULT CHARACTERISTICS CODE.

```

```

285
286           ;BIT DEFINITIONS FOR EXTENDED CONTROL WORD
287
288           000040 EF.HSS==40           ;ENABLE HIGH SPEED SELECT
289           000030 EF.RWB==30         ;ENABLE BOTH READ & WRITE BUFFERING
290           000020 EF.RBO==20         ;ENABLE READ BUFFERING ONLY
291
292           ;THE FOLLOWING INDICATES THE RELATIVE POSITIONS OF THE STATUS WORDS
293           ;IN THE MESSAGE BUFFER.
294
295           000004 MS.RFC==4           ;RESIDUAL FRAME COUNT.
296           000006 MS.XS0==6          ;EXT STATUS REG 0
297           000010 MS.XS1==10         ;EXT STATUS REG 1
298           000012 MS.XS2==12         ;EXT STATUS REG 2
299           000014 MS.XS3==14         ;EXT STATUS REG 3
300           000016 MS.XS4==16         ;EXT STATUS REG 4
301
302           ;THE FOLLOWING ARE BIT DEFINITIONS FOR EXTENDED STATUS REGISTER 0.
303
304           100000 X0.TMK==100000      ;TAPE MARK.
305           040000 X0.RLS==40000      ;RECORD LENGTH SHORT.
306           020000 X0.LET==20000      ;LOGICAL EOT.
307           010000 X0.RLL==10000      ;RECORD LENGTH LONG.
308           000100 X0.ONL==100        ;ON LINE BIT.
309           000004 X0.WLK==4          ;WRITE LOCK BIT
310           000002 X0.BOT==2          ;BOT BIT.
311           000001 X0.EOT==1          ;EOT BIT.
312
313           ;THE FOLLOWING ARE BIT DEFINITIONS FOR EXTENDED STATUS REGISTER 2.
314
315           100000 X2.OPM==100000      ;OPERATION IN PROGRESS, TAPE MOVING
316           000200 X2.EFE==200        ;EXTENDED FEATURES ENABLED
317           000100 X2.BFE==100        ;BUFFERING ENABLED
318
319           ;THE FOLLOWING ARE BIT DEFINITIONS FOR EXTENDED STATUS REGISTER 3.
320
321           000010 X3.DCK==10          ;DENSITY CHECK.
322           157400 X3.RNY==157400     ;CAPSTAN RUNAWAY UDIAG ERROR CODE.
323
324           ;THE FOLLOWING ARE BIT DEFINITIONS FOR EXTENDED STATUS REGISTER 4.
325
326           100000 X4.HSS==100000      ;HIGH SPEED SWITCH INDICATING 100IPS
327           040000 X4.RCE== 40000     ;RETRY COUNT EXCEEDED
328
329           ;THE FOLLOWING DEFINITIONS SHOW THE RELATIVE POSITIONS OF THE COMMAND
330           ;PACKET ENTRIES.
331
332
333           000000 CP.CMD==0           ;CMDPKT+0==TS05 COMMAND.
334           000002 CP.ADL==2          ;CMDPKT+2==BUFFER ADDRESS LOW.
335           000004 CP.ADH==4          ;CMDPKT+4==BUFFER ADDRESS HIGH.
336           000006 CP.CNT==6          ;CKDPKT+6==BYTE/FILE/RECORD COUNT

```

```

338
339           ;MISCELLANEOUS DEFINITIONS.
340
341           000340      INTPRI==PRI07           ;PRIORITY TO BE USED IN INTERRUPT STATE.
342           000012      SCHCNT==12             ;ARBITRARY BYTE LENGTH FOR CHARACTERISTIC
343                                     ;BUFFER LENGTH. (EVEN #)
344           000020      MSGCNT==20             ;MESSAGE BUFFER LENGTH IN BYTES. (EVEN #)
345           000020      DIACNT==20             ;DIAGNOSTIC COMMAND BUFFER EXTENT.
346           004000      DATCNT==2048.          ;MAXIMUM RECORD LENGTH IN BYTES.
347                                     ;THIS COUNT SHOULD BE A MULTIPLE OF 256 TO INSURE
348                                     ;PROPER READ/WRITE BUFFER ALLOCATION BY THE SUPER.
349           177740      RNOPSC==177740         ;RANDOM # OF OPERATIONS MASK.
350           000007      RANP==7                ;CODE TO SELECT RANDOM PATTERN.
351           000020      RRECL==16.             ;READ RECOVERY ATTEMPT LIMIT.
352           000020      WRECL==16.             ;WRITE RECOVERY ATTEMPT LIMIT.
353           153624      RANBC==153624          ;CONSTANT USED TO RESET RANDOM # GENERATOR BASE.
354           032561      RANSC==32561           ;CONSTANT USED TO RESET RANDOM # SAVE LOCATION.
355           177774      NINUSE==177774        ;NOT IN USE CODE FOR DEVICE STATE TABLE.
356           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
357                                     ;NOT "COMMAND" BITS.
358
359           ;THE FOLLOWING DEFINES THE COMMAND WORD FOR EACH TS05 COMMAND.
360
361           100013      DRI==  ACK.C!CMD.C3!CMD.C1!CMD.CO
362                                     ;DRIVE INIT.
363
364           104001      RDF==  ACK.C!BRF.C!CMD.CO
365                                     ;READ FORWARD
366
367           104401      RDR==  ACK.C!BRF.C!MOD.CO!CMD.CO
368                                     ;READ REVERSE
369
370           104005      WRT==  ACK.C!BRF.C!CMD.CO!CMD.C2
371                                     ;WRITE COMMAND
372
373           104105      WTV==  ACK.C!BRF.C!VFY.C!CMD.CO!CMD.C2
374                                     ;WRITE VERIFY
375
376           104010      SRF==  ACK.C!BRF.C!CMD.C3
377                                     ;SPACE RECORD FORWARD
378
379           104410      SRR==  ACK.C!BRF.C!MOD.CO!CMD.C3
380                                     ;SPACE RECORD REVERSE
381
382           105401      RNR==  ACK.C!BRF.C!MOD.C1!MOD.CO!CMD.CO
383                                     ;READ REV RETRY1 - REREAD NEXT REVERSE, IE. SPACE FWD, READ REVERSE
384
385           125401      RNF==  ACK.C!BRF.C!OPP.C!MOD.C1!MOD.CO!CMD.CO
386                                     ;READ REV RETRY2 - REREAD NEXT FORWARD, IE.READ FORWARD, SPACE REVERSE
387
388           105001      RPF==  ACK.C!BRF.C!MOD.C1!CMD.CO
389                                     ;READ FWD RETRY1 - REREAD PREVIOUS FORWARD, IE. SPACE REVERSE, READ FORWARD
390
391           125001      RPR==  ACK.C!BRF.C!OPP.C!MOD.C1!CMD.CO
392                                     ;READ FWD RETRY2 - REREAD PREVIOUS REVERSE, IE. READ REVERSE, SPACE FORWARD
393
394           105005      WRR==  ACK.C!MOD.C1!BRF.C!CMD.C2!CMD.CO

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395                                     ;WRITE RETRY
396
397      102010      RWD==  ACK.C!MOD.C2!CMD.C3      ;REWIND COMMAND
398
399
400      100012      MBR==  ACK.C!CMD.C3!CMD.C1      ;MESSAGE BUFFER RELEASE
401
402
403      100011      WTM==  ACK.C!CMD.C3!CMD.C0      ;WRITE TAPE MARK.
404
405
406      101011      WTR==  ACK.C!MOD.C1!CMD.C3!CMD.C0 ;WRITE TAPE MARK RETRY.
407
408
409      105010      SFF==  ACK.C!BRF.C!MOD.C1!CMD.C3 ;SPACE FILE FORWARD
410
411
412      105410      SFR==  ACK.C!BRF.C!MOD.C0!MOD.C1!CMD.C3 ;SPACE FILE REVERSE
413
414
415      100017      GES==  ACK.C!CMD.C0!CMD.C1!CMD.C2!CMD.C3 ;GET EXTENDED STATUS
416
417
418      100411      ERS==  ACK.C!MOD.C0!CMD.C3!CMD.C0 ;ERASE 3 INCHES OF TAPE
419
420
421      100412      UNL==  ACK.C!MOD.C0!CMD.C3!CMD.C1 ;UNLOAD COMMAND
422
423
424      101012      CLN==  ACK.C!MOD.C1!CMD.C3!CMD.C1 ;ERASE TAPE.
425
426
427      140004      SCH==  ACK.C!CVC.C!CMD.C2      ;SET DEVICE CHARACTERISTICS.
428
429      140006      WSM==  ACK.C!CVC.C!CMD.C2!CMD.C1 ;WRITE SUB-SYS MEM
430
431      100006      DIA==  ACK.C!CMD.C2!CMD.C1      ;DIAGNOSTICS.
432
433      000040      JMP==  JMP.C                    ;JUMP TO "N"TH COMMAND
434
435      000020      DLY==  DLY.C                    ;DELAY "N" MS.
436
437      177777      END==  177777                  ;END OF COMMAND SEQUENCES

```

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439 .SBTTL GLOBAL DATA SECTION
440 ;**
441 ; THE GLOBAL DATA SECTION CONTAINS DATA THAT ARE USED
442 ; IN MORE THAN ONE TEST.
443 ;--
444 ; COMMAND PACKET.
445 = <.+3>&177774 ;MUST BE ON MOD 4 BOUNDRY.
446 002330 000000 CNDPKT:: 0 ;1ST WORD IS TS05 COMMAND.
447 002332 000000 0 ;2ND WORD IS THE BUFFER LOW ADDRESS.
448 002334 000000 0 ;3RD WORD IS THE BUFFER HIGH ADDRESS.
449 002336 000000 0 ;4TH WORD IS THE BYTE/RECORD/FILE COUNT.
450
451 ; GET STATUS COMMAND PACKET.
452
453 = <.+3>&177774 ;MUST BE ON MOD 4 BOUNDRY.
454 002340 100017 GSCP:: .WORD GES
455
456 ; MESSAGE BUFFER RELEASE COMMAND PACKET.
457
458 = <.+3>&177774 ;MUST BE ON MOD 4 BOUNDRY.
459 002344 100012 BRCPK:: .WORD MBR
460
461 ; REWIND COMMAND PACKET (USED IN ERROR RECOVERY ONLY)
462
463 = <.+3>&177774 ;MUST BE ON MOD 4 BOUNDRY.
464 002350
465 002350 102010 RWCPK:: .WORD RWD
466 002352 000001 .WORD 1
467
468 ; WORK AREA FOR ANALYSIS OF MESSAGE PACKET CONTENTS.
469
470 002354 MSGPKT:: .BLKW 8. ;1ST WORD:: MESSAGE TYPE.
471 ;2ND WORD:: DATA FIELD LENGTH.
472 ;3RD WORD:: RESIDUAL FRAME COUNT.
473 ;4TH WORD:: XSTAT0
474 ;5TH WORD:: XSTAT1
475 ;6TH WORD:: XSTAT2
476 ;7TH WORD:: XSTAT3
477 ;8TH WORD:: XSTAT4
478
479 ; MESSAGE PACKETS.
480 002374 MSGPK0:: .BLKW 8. ;MESSAGE PACKET FOR DEVICE #0
481 002414 MSGPK1:: .BLKW 8. ;MESSAGE PACKET FOR DEVICE #1
482 002434 MSGPK2:: .BLKW 8. ;MESSAGE PACKET FOR DEVICE #2
483 002454 MSGPK3:: .BLKW 8. ;MESSAGE PACKET FOR DEVICE #3
484
485 ; SET CHARACTERISTIC BLOCK.
486 002474 002374 SCHBK:: MSGPK0 ;1ST WORD:: MSGPKT ADDR LO(SET UP BY EXECUTE ROUTINE).
487 002476 000000 0 ;2ND WORD:: MSGPKT ADDR HI.
488 002500 000020 MSGCNT ;3RD WORD:: MSG BUFFER LENGTH (BYTES)
489 002502 000040 CH.EAI ;4TH WORD:: CHARACTERISTICS WORD(SET BY SETUP ROUTINE).
490 002504 000000 0 ;5TH WORD:: MSP & BUFFER CONTROL ON EXT'D FEATURES
491
492 ; WRITE SUB-SYSTEM MEMORY CHARACTERISTIC BLOCK.
493 002506 000000 WSMBK:: 0 ;1ST WORD:: SEL 0
494 002510 000000 0 ;2ND WORD:: SEL 2
495 002512 000000 0 ;3RD WORD:: SEL 4

```

```

496
497
498 002514
499 002524
500 002534
501          002514
502
503
504 002544 002374
505 002546 002414
506 002550 002434
507 002552 002454
508
509
510 002554 010034
511 002556 010042
512 002560 010050
513 002562 010056
514
515
516 002564 000000
517 002566 000000
518 002570 000000
519 002572 000000
520
521
522 002574 000000
523 002576 000000
524 002600 000000
525 002602 000000
526
527
528
529
530 002604 177774
531 002606 177774
532 002610 177774
533 002612 177774
534 002614 177777
535
536
537
538 002616 003046
539 002620 003120
540 002622 003172
541 002624 003244

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

;          ADDRESSES OF MESSAGE PACKETS.
MSGPKA:: MSGPK0 ;DEVICE 0.
          MSGPK1 ;DEVICE 1.
          MSGPK2 ;DEVICE 2.
          MSGPK3 ;DEVICE 3.

;          ADDRESSES OF INTERRUPT HANDLING ROUTINES.
TSSINT:: TSSINO ;DEVICE 0.
          TSSIN1 ;DEVICE 1.
          TSSIN2 ;DEVICE 2.
          TSSIN3 ;DEVICE 3.

;          TS05 CODE LEVELS, WILL BE STORED AFTER SCH CMD IN BASIC FUNCTION TEST
TSSCL:: 0 ;DEVICE 0
         0 ;DEVICE 1
         0 ;DEVICE 2
         0 ;DEVICE 3

;          TS05 EXT. FEA & BUF. ENA SW'S, WILL BE STORED AFTER SCH CMD IN BASIC FUNCTION TEST
TSSSW:: 0 ;DEVICE 0
         0 ;DEVICE 1
         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.
;          RS 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

```

GLOBAL AREAS MACRO M1113 14-JUN-84 18:32
GLOBAL DATA SECTION

SEQ 0051

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543           ;          COUNTER AREA.
544
545           002626      CNTBGN=.
546 002626      WRBC:: .BLKW 20          ;BYTES WRITTEN.
547 002666      RRBC:: .BLKW 20          ;BYTES READ REV.
548 002726      RFBC:: .BLKW 20          ;BYTES READ FWD.
549 002766      WRREC:: .BLKW 4          ;RECOVERABLE WRITE ERRORS.
550 002776      WRUNR:: .BLKW 4          ;UNRECOVERABLE WRITE ERRORS.
551 003006      RRREC:: .BLKW 4          ;RECOVERABLE READ REV ERRORS.
552 003016      RRUNR:: .BLKW 4          ;UNRECOVERABLE READ REV ERRORS.
553 003026      RFREC:: .BLKW 4          ;RECOVERABLE READ FWD ERRORS.
554 003036      RFUNR:: .BLKW 4          ;UNRECOVERABLE READ FWD ERRORS.
555 003046      BTO:: .BLKW 21.          ;UNIT 0 BAT TAPE SPOTS LOG
556 003120      BT1:: .BLKW 21.          ;UNIT 1 BAT TAPE SPOTS LOG
557 003172      BT2:: .BLKW 21.          ;UNIT 2 BAT TAPE SPOTS LOG
558 003244      BT3:: .BLKW 21.          ;UNIT 3 BAT TAPE SPOTS LOG
559 003316      WRTYCT:: .BLKW 4          ;WRITE RETRY COUNTER
560 003326      PASCNT:: .BLKW 4          ;PASS COUNT.
561 003336      SCCNT:: .BLKW 4          ;SPECIAL CONDITION COUNT.
562 003346      VFYCNT:: .BLKW 4          ;COUNT OF TS05 DATA COMPARE ERRORS.
563 003356      HRDCNT:: .BLKW 4          ;COUNT OF HARD ERRORS.
564 003366      FTLCNT:: .BLKW 4          ;COUNT OF FATAL ERRORS.
565           003376      CNTEND=.          ;END OF STATICTICAL COUNTERS.
566 003376      RECCNT:: .BLKW 4          ;NUMBER OF RECORDS FROM BOT: CLEARED ON REWIND
567           ;AND WHEN RESTARTING OR CONTINUING TEST 2.
568           000550      CNTLEN==CNTEND-CNTBGN ;LENGTH OF STATISTICAL COUNTER AREA.
569
570
571           ;          THE FOLLOWING ARE THE DEFINITIONS OF VARIABLES
572           ;          USED BY THE PROGRAM.
573
574 003406 000000      DATAW:: .WORD 0          ;WRITE BUFFER ADDRESS.
575           003406      DIABLK==DATAW          ;WRITE BUFFER ALSO USED FOR DIAG CMD.
576 003410 000000      DATARD:: .WORD 0          ;READ BUFFER ADDRESS.
577 003412 000000      NCNT:: .WORD 0          ;STORAGE FOR VALUE OF N.
578 003414 000000      NCNT1:: .WORD 0          ;TEMP STORAGE FOR VALUE OF N.
579 003416 000000      BRFCNT:: .WORD 0          ;STORAGE FOR BPCR VALUE.
580 003420 177777      CMDWRD:: .WORD END          ;CONTAINS COMMAND WORD BEING EXECUTED PRESENTLY.
581 003422 177777      CMDSAV:: .WORD END          ;SAVE LOCATION FOR CMD WORD DURING ERROR RECOVERY
582 003424 177777      PCHDWD:: .WORD END          ;CONTAINS PREVIOUS COMMAND WORD.
583 003426 000000      CMDLG:: .WORD 0          ;CURRENT COMMAND LOGGING CODE.
584 003430 000000      LENPSK:: .WORD 0          ;RANDOM WRITE LENGTH MASK, TO BE SET UP BY TESTS
585 003432 153624      RANB:: .WORD 153624          ;RANDOM # GENERATOR BASE.
586 003434 032561      RANS:: .WORD 32561          ;RANDOM # SAVE LOCATION.
587 003436 000000      TIME1:: .WORD 0          ;TIME COUNT 1.
588 003440 000000      TIME2:: .WORD 0          ;TIME COUNT 2.
589 003442 000000      JLOOP:: .WORD 0          ;JMP COMMAND LOOP COUNT.
590 003444 000000      JLOC:: .WORD 0          ;JMP COMMAND LOCATION COUNT.
591 003446 000000      PATERN:: .WORD 0          ;PATTERN SELECT CODE.
592 003450 000000      CTCC:: .WORD 0          ;CURRENT TERMINATION CLASS CODE.
593 003452 000000      RSSAVE:: .WORD 0          ;LOCATION FOR SAVING CURRENT DEVICE POINTER.
594 003454 000000      TSSREG:: .WORD 0          ;CURRENT STATUS REGISTER.
595 003456 000000      WTMFLG:: .WORD 0          ;WRITE TAPE MARK FLAG

```

```

597      ;      ERROR FLAG AREA, THESE FLAGS ARE CLEARED DURING INITIALIZATION AND
598      ;      AFTER EACH COMMAND IS COMPLETED.
599
600      003460      BGNFLG=.
601 003460 000000  RETRYC:: .WORD 0      ;# OF RECOVERY ATTEMPTS EXECUTED.
602 003462 000      RPTCNT:: .BYTE 0      ;WRITE REPEAT ON SAME SPOT CNTR: 4 PER WRITE RETRY
603 003463 000      WRTYFG:: .BYTE 0      ;WRITE RETRY ON SAME SPOT IN PROGRESS FLAG
604 003464 000      WRTYER:: .BYTE 0      ;WRITE RETRY ON SAME SPOT ERROR FLAG
605 003465 000      RECLOG:: .BYTE 0      ;RECORD COUNT HAS BEEN UPDATED FOR THIS RECORD.
606 003466 000      ERLOG:: .BYTE 0      ;DATA BYTES AND ERRORS HAVE BEEN LOGGED FOR THIS RECORD.
607 003467 000      RMERR:: .BYTE 0      ;READ/WRITE ERROR HAS OCCURED.
608 003470 000      UNREC:: .BYTE 0      ;UNRECOVERABLE ERROR HAS OCCURED.
609 003471 000      ERRREC:: .BYTE 0      ;ERROR RECOVERY MODE.
610      .EVEN
611      003472      ENDERF=.
612
613
614      ;      ADDITIONAL FLAGS, THESE FLAGS ARE CLEARED DURING INITIALIZATION.
615
616 003472      INTFLG:: .BLKW 4      ;INTERRUPT OCCURRED FLAGS FOR EACH DEVICE.
617 003502      EOTFLG:: .BLKW 4      ;EOT/BOT FLAGS FOR EACH DEVICE (XSTATO).
618 003512 000000  BTPT:: .WORD 0      ;BAD TAPE SPOT POINTER TO BTO-BT3 VIA BTADDR
619 003514 000      EXPBOT:: .BYTE 0      ;BOT IS EXPECTED, DO NOT ABORT ON BOT/FUNC RTI.
620 003515 000      RANDOM:: .BYTE 0      ;RANDOM EVERYTHING FLAG.
621 003516 000      VFYFLG:: .BYTE 0      ;SET DURING WRITE/VERIFY COMMAND.
622 003517 000      RPTFLG:: .BYTE 0      ;PERFORMANCE REPORT HAS BEEN REQUESTED.
623 003520 000      SWBFLG:: .BYTE 0      ;ENABLES SWAP BYTE FUNCTION WHEN NOT EQUAL TO ZERO.
624 003521 000      IRE:: .BYTE 0      ;INHIBIT RESIDUAL FRAME COUNT ERROR REPORT.
625 003522 000      DROPED:: .BYTE 0      ;CURRENT UNIT HAS BEEN DROPPED
626 003523 000      T1SWB:: .BYTE 0      ;TEST1 SWAP BYTES FLAG
627 003524 000      ALLEOT:: .BYTE 0      ;ALL UNITS @ EOT FLAG
628 003525 000      ERSFLG:: .BYTE 0      ;ERASE FLAG: DO ERASE AFTER A SPACE REV TO DELETE
629      .EVEN      ;BADLY WRITTEN RECORD. 1 TO 4 ERASES LEAVING
630      .EVEN      ;A 3 TO 12 INCH GAP MAY RESULT.
631      .EVEN
632      003526      ENDFLG=.
633
634      ;      ADDITIONAL FLAGS, THESE FLAGS ARE CLEARED ONLY AFTER BEING CHECKED.
635
636 003526 000      STAFGL:: .BYTE 0      ;START FLAG - SET BY INIT CODE IF STARTING.
637 003527 000      PWRFLG:: .BYTE 0      ;POWER FAILURE FLAG - SET ONLY DURING INIT.
638 003530 000      TRAPD4:: .BYTE 0      ;TRAPED AT 4 FLAG
639 003531 000      MISCFG:: .BYTE 0      ;MISCELLANEOUS FLAG
640 003532 000000  TSUNT:: .WORD 0      ;NUMBER OF THE UNIT UNDER TEST PLUS HSSP&BUF
641 003534 000000  TSNP:: .WORD 0      ;FOR PRINT OUT UNIT # ONLY
642
643      ;      OPERATOR FLAG SETTINGS PASSED BY DIAG. SUPERVISOR IN A 16 BIT WORD
644      ;      SEE GLOBAL EQUATES SECTION FOR FLAG BIT LIST
645
646 003536 000000  OPFLAG:: .WORD 0      ;READ ONLY OPERATOR FLAG WORD
647      .EVEN

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649                                     ;THE FOLLOWING IS THE COMMAND SEQUENCE TABLE. THE TABLE
650                                     ;HAS DEFAULT VALUES AT PROGRAM LOAD AS SHOWN. THESE VALUES
651                                     ;CAN BE UPDATED BY A TEST OR BY OPERATOR INPUT.
652
653 003540 140004 CMDSEQ:: .WORD SCH ;SET CHARACTERISTICS.
654 003542 000040 .WORD CH.EAI
655 003544 000001 .WORD 1
656 003546 000000 .WORD 0
657 003550 102010 CMDSE2:: .WORD RWD ;REWIND.
658 003552 000001 .WORD 1 ;BYTE COUNT.
659 003554 000001 .WORD 1 ;ONCE.
660 003556 000007 .WORD RANP ;PATTERN.
661 003560 104005 .WORD WRT ;WRITE.
662 003562 004000 .WORD DATCNT ;MAX BUFFER LENGTH.
663 003564 076400 .WORD 32000. ;32,000 RECORDS.
664 003566 000007 .WORD RANP ;RANDOM PATTERN.
665 003570 104401 .WORD RDR ;READ REV.
666 003572 004000 .WORD DATCNT ;MAX BUFFER LENGTH.
667 003574 076400 .WORD 32000. ;32,000 RECORDS
668 003576 000007 .WORD RANP ;RANDOM PATTERN.
669 003600 104001 .WORD RDF ;READ FWD.
670 003602 004000 .WORD DATCNT ;MAX BUFFER LENGTH.
671 003604 076400 .WORD 32000. ;32,000 RECORDS.
672 003606 000007 .WORD RANP ;RANDOM PATTERN.
673 003610 102010 .WORD RWD ;REWIND.
674 003612 000001 .WORD 1 ;BYTE COUNT.
675 003614 000001 .WORD 1 ;ONCE.
676 003616 000007 .WORD RANP ;PATTERN.
677 003620 .BLKW 40. ;EXTENSION TO DOUBLE BUFFER SIZE
678 003740 177777 SEGEND:: .WORD END ;SOFT END OF SEQUENCE TABLE.
679 003742 177777 .WORD END
680 003744 177777 .WORD END
681 003746 177777 .WORD END
682 003750 177777 .WORD END ;HARD END OF SEQUENCE TABLE.
683                                     ;THE FOLLOWING IS THE TS05 COMMAND TABLE
684
685 003752 100013 CMDTBL:: .WORD DRI ;DRIVE INIT.
686 003754 104001 .WORD RDF ;READ FORWARD.
687 003756 104401 .WORD RDR ;READ REVERSE.
688 003760 104005 .WORD WRT ;WRITE
689 003762 104105 .WORD WTV ;WRITE/VERIFY. (WRITE ALL RECORDS, RDR AND
690                                     ;CHECK DATA ON ALL RECORDS, RDF AND
691                                     ;CHECK DATA ON ALL RECORDS.)
692 003764 104010 .WORD SRF ;SPACE "N" RECORDS FORWARD.
693 003766 104410 .WORD SRR ;SPACE "N" RECORDS REVERSE.
694 003770 105401 .WORD RNR ;READ NEXT REVERSE. I.E., SPACE FWD, READ REVERSE.
695 003772 125401 .WORD RNF ;READ NEXT FORWARD. I.E., READ FORWARD, SPACE REVERSE.
696 003774 105001 .WORD RPF ;READ PREVIOUS FORWARD. I.E., SPACE REVERSE, READ FORWARD
697 003776 125001 .WORD RPR ;READ PREVIOUS REVERSE. I.E., READ REVERSE, SPACE FORWARD
698 004000 105005 .WORD WRR ;WRITE RETRY.
699 004002 102010 .WORD RWD ;REWIND.
700 004004 100012 .WORD MBR ;MESSAGE BUFFER RELEASE
701 004006 100011 .WORD WTM ;WRITE TAPE MARK
702 004010 101011 .WORD WTR ;WRITE TAPE MARK RETRY.
703 004012 105010 .WORD SFF ;SPACE "N" FILES FORWARD.
704 004014 105410 .WORD SFR ;SPACE "N" FILES REVERSE.
705 004016 100017 .WORD GES ;GET EXTENDED STATUS.

```

706	004020	100411			.WORD	ERS		;ERASE 3 INCHES OF TAPE.
707	004022	100412			.WORD	UNL		;REWIND AND UNLOAD.
708	004024	101012			.WORD	CLN		;CLEAR TAPE.
709	004026	140004			.WORD	SCH		;SET CHARACTERISTICS.
710	004030	100006			.WORD	DIA		;DIAGNOSTIC COMMAND.
711	004032	000040			.WORD	JMP		;JUMP TO THE NTH COMMAND IN THE SEQUENCE.
712	004034	000020			.WORD	DLY		;DELAY "N" MS.
713	004036	177777			.WORD	END		;END OF COMMAND TABLE
714								
715					:		THE FOLLOWING TABLE CONTAINS THE ASCII FOR EACH COMMAND.	
716								
717	004040	104	122	111	CMDASC::	.ASCII	/DRI/	;DRIVE INIT.
718	004043	122	104	106		.ASCII	/RDF/	;READ FORWARD.
719	004046	122	104	122		.ASCII	/RDR/	;READ REVERSE.
720	004051	127	122	124		.ASCII	/WRT/	;WRITE
721	004054	127	124	126		.ASCII	/WTV/	;WRITE/VERIFY. (WRITE ALL RECORDS, RDR AND CHECK DATA
722								;ON ALL RECORDS, RDF AND CHECK DATA ON ALL RECORDS.)
723	004057	123	122	106		.ASCII	/SRF/	;SPACE "N" RECORDS FORWARD.
724	004062	123	122	122		.ASCII	/SRR/	;SPACE "N" RECORDS REVERSE.
725	004065	122	116	122		.ASCII	/RNR/	;READ NEXT REVERSE. I.E., SPACE FWD READ REVERSE.
726	004070	122	116	106		.ASCII	/RNF/	;READ NEXT FORWARD. I.E., READ FORWARD, SPACE REVERSE.
727	004073	122	120	106		.ASCII	/RPF/	;READ PREVIOUS FORWARD. IE., SPACE REVERSE, READ FORWARD
728	004076	122	120	122		.ASCII	/RPR/	;READ PREVIOUS REVERSE. IE., READ REVERSE, SPACE FORWARD
729	004101	127	122	122		.ASCII	/WRR/	;WRITE RETRY.
730	004104	122	127	104		.ASCII	/RWD/	;REWIND.
731	004107	115	102	122		.ASCII	/MBR/	;MESSAGE BUFFER RELEASE
732	004112	127	124	115		.ASCII	/WTM/	;WRITE TAPE MARK
733	004115	127	124	122		.ASCII	/WTR/	;WRITE TAPE MARK RETRY.
734	004120	123	106	106		.ASCII	/SFF/	;SPACE "N" FILES FORWARD.
735	004123	123	106	122		.ASCII	/SFR/	;SPACE "N" FILES REVERSE.
736	004126	107	105	123		.ASCII	/GES/	;GET EXTENDED STATUS.
737	004131	105	122	123		.ASCII	/ERS/	;ERASE 3 INCHES OF TAPE.
738	004134	125	116	114		.ASCII	/UNL/	;REWIND AND UNLOAD.
739	004137	103	114	116		.ASCII	/CLN/	;CLEAN TAPE.
740	004142	123	103	110		.ASCII	/SCH/	;SET CHARACTERISTICS. WHERE BRF=200, 40, 20, 0.
741								;SEE TSV05/TS05 PROGRAMMING SPECIFICATION FOR DESCRIPTION.
742	004145	104	111	101		.ASCII	/DIA/	;DIAGNOSTICS. SEE TSV05/TS05 PROGRAMMING SPECIFICATION
743								;FOR DESCRIPTION. ODT MUST BE USED TO LOAD DIAGNOSTIC DATA
744								;INTO THE WRITE BUFFER BEFORE THIS CMD IS ISSUED.
745	004150	112	115	120		.ASCII	/JMP/	;JUMP TO THE NTH COMMAND IN THE COMMAND
746								;SEQUENCE TABLE, WHERE N IS DEFINED IN
747								;THE # OF OPERATIONS.
748	004153	104	114	131		.ASCII	/DLY/	;DELAY "N" MS, WHERE N IS DEFINED IN
749								;THE # OF OPERATIONS.
750	004156	105	116	104		.ASCII	/END/	;END OF COMMAND SEQUENCE.
751						.EVEN		
752								

```

754          .SBTTL GLOBAL TEXT SECTION
755
756          ;**
757          ; THE GLOBAL TEXT SECTION CONTAINS FORMAT STATEMENTS,
758          ; MESSAGES, AND ASCII INFORMATION THAT ARE USED IN
759          ; MORE THAN ONE TEST.
760          ;--
761
762
763
764
765          ;
766          ; FORMAT STATEMENTS USED IN PRINT CALLS
767          ;
768
769          .NLIST BEX
770
771
772
773
774
775 004162      045      116      045 CODELM:: .ASCIZ /#N#AUNIT #D1#A TS05 CODE LEVEL #03#N#N/
776 004231      045      116      045 SWSET:: .ASCIZ /#N#AUNIT #D1#A TS05 SWITCH SETTINGS #03#N#N/
777          .EVEN
778 004306      130      130      130 HALTM:: .ASCIZ /XXX CMD - TYPE <CR> TO CONTINUE/
779 004346      103      115      104 CMDPKM:: .ASCIZ /CMD PACKET ADR NOT ON MODULO 4 BOUNDARY: RELOAD!/
780          .EVEN
781 004430      104      101      124 WTVERM:: .ASCIZ /DATA COMPARE ERROR/
782 004453      116      117      040 TOERM:: .ASCIZ /NO TSV05 RESPONSE/
783 004475      125      116      104 SCERM:: .ASCIZ /UNDEFINED SPEC COND/
784 004521      122      106      103 RFCERM:: .ASCIZ /RFC NON ZERO/
785 004536      124      123      126 NSSRM:: .ASCIZ /TSV05 NOT READY/
786 004556      122      105      124 RLEXM:: .ASCIZ /RETRY LIMIT EXCEEDED/
787 004603      104      122      111 ATTM:: .ASCIZ /DRIVE OFF LINE/
788 004622      106      125      116 FUNRM:: .ASCIZ /FUNCTION REJECT/
789 004642      106      101      124 FATSM:: .ASCIZ /FATAL SUBSYSTEM ERROR/
790 004670      116      117      040 NOINTM:: .ASCIZ /NO INTERRUPT/
791 004705      124      101      120 TSAM:: .ASCIZ /TAPE STATUS ALERT/
792 004727      124      117      117 TOOMM:: .ASCIZ /TOO MANY INTERRUPTS/
793 004753      103      101      120 RNYM:: .ASCIZ /CAPSTAN RUNAWAY-GET STATUS RESULTS:/
794 005017      122      105      103 RERM:: .ASCIZ /RECOVERABLE ERROR/
795 005041      125      116      122 URERM:: .ASCIZ /UNRECOVERABLE ERROR/
796 005065      045      116      045 DROPDM:: .ASCIZ /#N#ADROPPED UNIT #D1#N/
797 005114      045      116      045 AUDRPM:: .ASCIZ /#N#AALL UNITS DROPPED#N#N/
798 005146      045      116      045 AUDRUN:: .ASCIZ /#N#ADIAGNOSTIC ONLY SUPPORTS ONE CONTROLLER#N#N/
799 005226      045      116      045 DTAER2:: .ASCIZ "#N#ABYTE:#D4#S2#AWAS:#88#S2#AS/B:#88#N"
800 005275      045      104      064 DTAER3:: .ASCIZ "#D4#A BYTES IN ERROR OUT OF #D4#N"
801 005337      045      101      116 DTAER4:: .ASCIZ /#AND DATA READ#N/
802 005360      045      101      122 DTAER5:: .ASCIZ /#ARECORD TOO LONG: >#04#A BYTES#N/
803 005422      045      101      122 NURTY1:: .ASCIZ /#ARECOVERED ON RETRY #D2#N/
804 005456      045      101      104 OFLINM:: .ASCIZ /#ADRIE #D1#A OFF LINE#N/
805 005507      045      101      107 GETSTM:: .ASCIZ /#AGET STATUS CMD RESULTS:#N/
806 005543      045      116      045 NODEV:: .ASCII /#N#ABUS TRAP AT #06#N/
807 005570      045      101      111          .ASCIZ /#AINTERFACE BAD OR TSDB NOT SET TO ABOVE ADDRESS#N/
808 005653      040      052      052 UNIMLK: .ASCIZ / *****TAPE IS WRITE-LOCKED AND WILL CAUSE ERRORS*****/
809 005741      045      116      000 CRLF:: .ASCIZ /#N/
810 005744      045      116      045 CRLFSP:: .ASCIZ /#N#S7/
811          .LIST BEX
812          .EVEN

```



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814          .SBTTL GLOBAL ERROR REPORT SECTION
815
816          ;**
817          ; THE GLOBAL ERROR REPORT SECTION CONTAINS THE PRINTB AND PRINTX CALLS
818          ; THAT ARE USED IN MORE THAN ONE TEST. IT ALSO INCLUDES THE ASCII MESSAGES
819          ; THAT ARE USED BY THE PRINTB AND PRINTX CALLS..
820          ;--
821
822
823          BGNMSG DTAERM
          DTAERM: :
          DATERM: :PRINTB @STAER1,TSNP,PASCNT(R5),RECCNT(R5)
          MOV      RECCNT(R5),-(SP)
          MOV      PASCNT(R5),-(SP)
          MOV      TSNP, -(SP)
          MOV      @STAER1, -(SP)
          MOV      @4, -(SP)
          MOV      SP,R0
          TRAP    C$PNTB
          ADD     @12,SP
829          005752 016546 003376
          005752 016546 003326
          005762 016746 175546
          005766 012746 006436
          005772 012746 000004
          005776 010600
          006000 104414
          006002 062706 000012
830          006006          PRINTB @STAER7
          MOV      @STAER7, -(SP)
          MOV      @1, -(SP)
          MOV      SP,R0
          TRAP    C$PNTB
          ADD     @4,SP
          006006 012746 006530
          006012 012746 000001
          006016 010600
          006020 104414
          006022 062706 000004
831          006026 010267 001034          MOV      R2,RECRD          ;SAVE R2
832          006032 010367 175400          MOV      R3,TIME1          ;SAVE R3
833          006036 010467 175376          MOV      R4,TIME2          ;SAVE R4
834          006042 004767 002016          JSR      PC,RECTAP          ;RETRIEVE RECORD READ
835          006046 016702 001014          MOV      RECRD,R2          ;RESTORE R2
836          006052 010367 001010          MOV      R3,RECRD          ;SAVE RECORD READ
837          006056 016703 175354          MOV      TIME1,R3          ;RESTORE R3
838          006062 016704 175352          MOV      TIME2,R4          ;RESTORE R4
839          006066          PRINTB @STAER6,RECRD          ;PRINT RECORD READ
          MOV      RECRD, -(SP)
          MOV      @STAER6, -(SP)
          MOV      @2, -(SP)
          MOV      SP,R0
          TRAP    C$PNTB
          ADD     @6,SP
          006066 016746 000774
          006072 012746 006562
          006076 012746 000002
          006102 010600
          006104 104414
          006106 062706 000006
840          006112          EXIT MSG
          .WORD   J$JMP
          .WORD   L10002-2-.
          006112 000167
          006114 000000
841          .EVEN
842
843          ENDMSG
          L10002:
          TRAP    C$MSG
          006116
          006116 104423
844
845          BGNMSG STAERM
          STAERM: :
          STAERM: :PRINTB @STAER1,TSNP,PASCNT(R5),RECCNT(R5)
          MOV      RECCNT(R5), -(SP)
          MOV      PASCNT(R5), -(SP)
          MOV      TSNP, -(SP)
          MOV      @STAER1, -(SP)
846          006120
          006120 016546 003376
          006124 016546 003326
          006130 016746 175400
          006134 012746 006436

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006140	012746	000004		MOV	#4,-(SP)
006144	010600			MOV	SP,R0
006146	104414			TRAP	C#PNTB
006150	062706	000012		ADD	#12,SP
847 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
848 006174	016702	174130	MOV	CMDPKT,R2	
349 006200	042702	177740	BIC	#177740,R2	
850 006204	005302		DEC	R2	;IF CMD IS A READ
851 006206	005702		TST	R2	
852 006210	001016		BNE	50000#	
853 006212	004767	001646	JSR	PC,RECTAP	;THEN RETRIEVE
854 006216	010367	001642	MOV	R3,RECTAP	;AND
855 006222			PRINTB #STAER6,RECRED		;TYPE RECORD READ
006222	016746	000640		MOV	RECRED,-(SP)
006226	012746	006562		MOV	#STAER6,-(SP)
006232	012746	000002		MOV	#2,-(SP)
006236	010600			MOV	SP,R0
006240	104414			TRAP	C#PNTB
006242	062706	000006		ADD	#6,SP
856 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
857 006266			PRINTX #STAER3,CMDPKT,@TSDB(R5),MSGPKT+MS.RFC,TSSREG,CTCC		
006266	016746	175156		MOV	CTCC,-(SP)
006272	016746	175156		MOV	TSSREG,-(SP)
006276	016746	174056		MOV	MSGPKT+MS.RFC,-(SP)
006302	017546	002514		MOV	@TSDB(R5),-(SP)
006306	016746	174016		MOV	CMDPKT,-(SP)
006312	012746	006675		MOV	#STAER3,-(SP)
006316	012746	000006		MOV	#6,-(SP)
006322	010600			MOV	SP,R0
006324	104415			TRAP	C#PNTX
006326	062706	000016		ADD	#16,SP
858 006332			PRINTX #STAER4,CMDPKT+2,CMDPKT+4,CMDPKT+6		
006332	016746	174000		MOV	CMDPKT+6,-(SP)
006336	016746	173772		MOV	CMDPKT+4,-(SP)
006342	016746	173764		MOV	CMDPKT+2,-(SP)
006346	012746	006733		MOV	#STAER4,-(SP)
006352	012746	000004		MOV	#4,-(SP)
006356	010600			MOV	SP,R0
006360	104415			TRAP	C#PNTX
006362	062706	000012		ADD	#12,SP
859 006366			PRINTX #STAER5,MSGPKT+MS.XS0,MSGPKT+MS.XS1,MSGPKT+MS.XS2,MSGPKT+MS.XS3,MSGPKT+MS.XS		
006366	016746	174000		MOV	MSGPKT+MS.XS4,-(SP)
006372	016746	173772		MOV	MSGPKT+MS.XS3,-(SP)
006376	016746	173764		MOV	MSGPKT+MS.XS2,-(SP)
006402	016746	173756		MOV	MSGPKT+MS.XS1,-(SP)
006406	016746	173750		MOV	MSGPKT+MS.XS0,-(SP)
006412	012746	006753		MOV	#STAER5,-(SP)

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GLOBAL ERROR REPORT SECTION

SEQ 0058

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006416 012746 000006
006422 010600
006424 104415
006426 062706 000016
860 006432          EXIT  MSG
006432 000167
006434 000432
861
862
863 006436      045      101      130 STAER1: .NLIST BEX
                                .ASCIZ  /#AXXX CMD FAILED - UNIT #D1#S3#APASS:#D5#S3#ARECORD:#D5#N/
864                                .EVEN
865 006530      045      101      120 STAER7: .ASCIZ  /#APREVIOUS CMD WAS XXX /
866 006562      045      123      061 STAER6: .ASCIZ  /#S11#A* RECORD READ:#D5#A */
867 006616      045      116      045 STAER2: .ASCIZ  /#N#ACMDPKT#S2#ATSBA#S4#ARFC#S5#ATSSR#S3#ATCC#N/
868 006675      045      117      066 STAER3: .ASCIZ  /#06#S2#06#S2#06#S2#06#S2#D1#N/
869 006733      045      117      066 STAER4: .ASCII  /#06#N/
870 006740      045      117      066          .ASCII  /#06#N/
871 006745      045      117      066          .ASCIZ  /#06#N/
872 006753      045      101      130 STAERS5: .ASCII  /#AXST0#S4#AXST1#S4#AXST2#S4#AXST3#S4#AXST4#N/
873 007027      045      117      066          .ASCIZ  /#06#S2#06#S2#06#S2#06#S2#06#N/
874          .LIST  BEX
875          .EVEN
876 007066 000000 RECRED: .WORD  0          ;RECORD READ FROM TAPE
877
878 007070          ENDMSG
007070          L10003:
007070 104423          TRAP  C#MSG
879
880          .SBTTL  GLOBAL SUBROUTINES SECTION
881
882          ;**
883          ; THE GLOBAL SUBROUTINES SECTION CONTAINS THE SUBROUTINES
884          ; THAT ARE USED IN MORE THAN ONE TEST.
885          ;--
886
887
888
889          ;*
890          ;
891          ;ROUTINE TO DO A SOFT INITIALIZE OF THE CONTROLLER
892          ;BY WRITING INTO THE TSSR REGISTER. AFTER THE INIT,
893          ;THE TSSR REGISTER IS TESTED FOR ERRORS. ANY ERRORS
894          ;DETECTED SHOULD BE TREATED AS DEVICE FATAL ERRORS.
895          ;
896          ;INPUTS:
897          ;
898          ;      R5      CURRENT UNIT NUMBER
899          ;
900          ;
901          ;OUTPUTS:
902          ;
903          ;      R0      CONTENTS OF TSSR, IF ERROR
904          ;      CARRY   SET IF INIT WAS OKAY
905          ;              CLEAR IF FATAL ERROR
906          ;
907          ;CALLING SEQUENCE:
908          ;      JSR      PC,FIRSTU

```

```

909      :      JSR      PC,SOFINIT
910      :      BCS      CONTINUE
911      :      ERRDF      ;REPORT FATAL ERROR
912      :
913      :-
914
915 007072      SOFINIT::
916      :      ; (SAVREG) SAVE THE REGISTERS
917 007072 012775 000000 002524      MOV      #0,@TSSR(R5)      ; DO THE INIT.
918 007100 004767 003574      JSR      PC,WSSR      ;WAIT FOR UNIT TO BE READY
919 007104 012703 000550      MOV      #360.,R3
920 007110 004767 000070      2$:      JSR      PC,WAITF      ; WAIT FOR SSR
921 007114 103416      BCS      3$
922 007116      DELAY      250
          MOV      #250,(PC)+
          .WORD      0
          MOV      L#DLY,(PC)+
          .WORD      0
          DEC      -6(PC)
          BNE      -.4
          DEC      -22(PC)
          BNE      .-20
923 007146 005303      DEC      R3
924 007150 001357      BNE      2$
925 007152 017500 002524      3$:      MOV      @TSSR(R5),R0      ;GET THE TSSR REGISTER
926 007156 010004      MOV      R0,R4      ;TSSR CONTENTS
927 007160 042704 176277      BIC      #+C<TS.A17!TS.A16!TS.OFL>,R4
928 007164 052704 002200      BIS      #TS.SSR!TS.NBA,R4      ;R4 HAS EXPECTED CONTENTS
929 007170 020400      CMP      R4,R0      ;ONLY EXPECTED BITS SET ?
930 007172 001402      BEQ      5$      ;BRANCH IF OKAY
931 007174 000241      CLC      ;CLEAR THE CARRY FOR ERROR
932 007176 000401      BR      10$      ;GO TO EXIT
933 007200 000261      5$:      SEC      ;SET THE CARRY BIT
934 007202 000207      10$:     RTS      PC      ;RETURN TO CALLER
935
936      :
937      : SUBROUTINE TO WAIT FOR THE SUBSYSTEM READY FLAG
938      :
939      : INPUTS:
940      :
941      :      R5      CURRENT UNIT NUMBER
942      :
943      :
944      : OUTPUTS:
945      :
946      :      R0      CONTENTS OF LAST TSSR READ
947      :      CARRY    SET - READY BIT SET
948      :              CLR - TIMEOUT WAITING FOR READY
949      :
950 007204      WAITF:: BREAK      ; DO A SUPVSR BREAK FIRST.
          TRAP      C$BRK
          007204 104422
951 007206 012746 005670      MOV      #3000.,-(SP)      ; 300 MSEC TIMER.
952 007212 017500 002524      2$:      MOV      @TSSR(R5),R0      ;READ THE TSSR REGISTER
953 007216 105700      TSTB      R0      ;TEST FOR READY BIT SET
954 007220 100420      BMI      3$      ; EXIT ON STOP FLAG.
955 007222      DELAY      25      ; WAIT
          MOV      #25,(PC)+
          007222 012727 000025

```

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GLOBAL SUBROUTINES SECTION

SEQ 0060

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007226 000000
007230 016727 172662
007234 000000
007236 005367 177772
007242 001375
007244 005367 177756
007250 001367
956 007252 005316          DEC      (SP)          ;REDUCE DELAY COUNT
957 007254 001356          BNE      2$          ;RETRY UNTIL TIMER EXPIRES
958 007256 000241          CLC          ; C = 0, CONTROLLER STILL RUNNING...
959 007260 000401          BR       4$          ;...OR HUNG-UP AFTER 300 MSEC.
960 007262 000261          3$: SEC          ; C = 1, CONTROLLER IS STOPPED.
961 007264 005326          4$: DEC      (SP)+   ;RESTORE STACK WITHOUT CHANGING CARRY BIT
962 007266 000207          RTS      PC
963
964
965
966
967
968
969
970
971
972
973
974
975
976
977
978
979
980
981
982
983
984
985
986
987
988
989
990
991
992
993
994 007270
995 007270 010475 002514
996 007274 004767 177704
997 007300 103401
998 007302 000421
999 007304 005724
1000 007306 011402
1001 007310 011203
1002 007312 032763 000200 000012
1003 007320 001402
1004 007322 005267 172774
1005 007326

;+
;
;ROUTINE TO ISSUE A WRITE CHARACTERISTICS COMMAND AND CHECK FEATURES
;
;INPUT:
;
;      R4      ADDRESS OF COMMAND PACKET
;      R5      CURRENT UNIT NUMBER
;      REQUIRES A CALL TO SOFINIT BE DONE PREVIOUSLY
;
;OUTPUT:
;
;      R0      TSSR CONTENTS
;      CARRY   SET - WRITE CHARACTERISTICS COMMAND OK
;             CLR - WRITE CHARACTERISTICS FAILED
;
;IMPLICIT OUTPUT:
;
;      SOFTWARE SWITCHES SET AS FOLLOWS:
;             EXTFEA = EXTENDED FEATURES PRESENT
;             BENBSW = BUFFER ENABLE SWITCH ON OR OFF
;
;SIDE EFFECTS:
;
;
;-

WRTCHK::
10$: MOV      R4,@TSDB(R5)          ;SEND OUT COMMAND
      JSR      PC,WAITF           ;WAIT FOR SSR
      BCS     40$                ;BR, IF SSR IS SET AND OK
      BR      60$                ;BR IF TROUBLE CARRY = CLEAR
40$: TST      (R4)+              ;STEP IT
      MOV      (R4),R2           ;POINT TO WRT CHARA DATA PACKET
      MOV      (R2),R3           ;GET ADDRESS OF MESSAGE BUFFER
1002 BIT     @X2.EFE,MS.XS2(R3)   ;EXTENDED FEATURES BIT SET?
      BEQ     45$                ;BR IF NO
1004 INC     EXTFEA              ;SET EXTENDED FEATURES SW SWITCH
45$:

```

```

.WORD 0
MOV L$DLY,(PC)+
.WORD 0
DEC -6(PC)
BNE -4
DEC -22(PC)
BNE -20

```

```

1006 007326 032763 000100 000012          BIT    #X2.BFE,MS.XS2(R3)      ;BUFFER ENABLE SWITCH SET
1007 007334 001402                          BEQ    50$                      ;BR, IF SWITCH NOT SET
1008 007336 005267 172762                  INC    BENBSW                   ;SET SOFTWARE SWITCH FOR ENABLED
1009 007342                          50$:
1010 007342 000261                          55$: SEC                        ;SET CARRY NO TROUBLE
1011 007344 000401                          BR     70$                      ;EXIT
1012 007346 000241                          60$: CLC                       ;CARRY CLEAR = ERROR
1013 007350 017500 002524                  70$: MOV    @TSSR(R5),R0       ;RETURN TSSR CONTENTS
1014 007354 000207                          RTS    PC                       ;RETURN
1015
1016          ;+
1017          ;
1018          ;ROUTINE TO CHECK WRITE LOCK CONDITION
1019          ;
1020          ;INPUT:
1021          ;
1022          ;      R4      ADDRESS OF COMMAND PACKET
1023          ;      R5      CURRENT UNIT NUMBER
1024          ;
1025          ;-
1026 007356          WLKCHK::
1027 007356 010475 002514                  10$: MOV    R4,@TSDB(R5)       ;SEND OUT COMMAND
1028 007362 004767 177616                  JSR    PC,WAITF               ;WAIT FOR SSR
1029 007366 103401                          BCS    40$                    ;BR, IF SSR IS SET AND OK
1030 007370 000420                          BR     60$                    ;BR IF TROUBLE CARRY = CLEAR
1031 007372 005724                          40$: TST    (R4)+              ;STEP IT
1032 007374 011402                          MOV    (R4),R2                ;POINT TO WRT CHARA DATA PACKET
1033 007376 011203                          MOV    (R2),R3                ;GET ADDRESS OF MESSAGE BUFFER
1034 007400 032763 000004 000006          BIT    #X0.WLK,MS.XS0(R3)     ;IS UNIT WRITE LOCKED?
1035 007406 001407                          BEQ    55$                    ;NO,PROCEED WITH TESTING
1036 007410          ERRHRD 1,UNIWLK          ;TAPE IS WRITE LOCKED
1037          007410 104456          TRAP   C$ERHRD
1038          007412 000001          .WORD 1
1039          007414 005653          .WORD UNIWLK
1040          007416 000000          .WORD 0
1041 007420 004767 007554          JSR    PC,DROPU               ;DROP IT
1042 007424 000402                          BR     60$                    ;EXIT WITH CARRY=0
1043 007426 000261                          55$: SEC                        ;SET CARRY NO TROUBLE
1044 007430 000401                          BR     70$                    ;EXIT
1045 007432 000241                          60$: CLC                       ;CARRY CLEAR = ERROR
1046 007434 000207                          70$: RTS    PC                       ;RETURN
1047
1048          ;+
1049          ;
1050          ;ROUTINE TO ISSUE A WRITE CHARACTERISTICS COMMAND
1051          ;
1052          ;INPUT:
1053          ;
1054          ;      R4      ADDRESS OF COMMAND PACKET
1055          ;      R5      CURRENT UNIT NUMBER
1056          ;      REQUIRES A CALL TO SOFINIT BE DONE PREVIOUSLY
1057          ;
1058          ;OUTPUT:
1059          ;
1060          ;      R0      TSSR CONTENTS

```

```

1059      ;      CARRY  SET - WRITE CHARACTERISTICS COMMAND OK
1060      ;      CLR - WRITE CHARACTERISTICS FAILED
1061      ;
1062      ;IMPLICIT OUTPUT:
1063      ;
1064      ;
1065      ;
1066      ;SIDE EFFECTS:
1067      ;
1068      ;
1069      ;-
1070
1071 007436      WRTCHR::
1072 007436 010475 002514      10$:  MOV      R4,@TSDB(R5)      ;SEND OUT COMMAND
1073 007442 004767 177536      JSR      PC,WAITF      ;WAIT FOR SSR
1074 007446 103401      BCS      50$      ;BR, IF SSR IS SET AND OK
1075 007450 000402      BR       60$      ;BR IF TROUBLE CARRY = CLEAR
1076 007452      50$:
1077 007452 000261      SEC      ;SET CARRY NO TROUBLE
1078 007454 000401      BR       70$      ;EXIT
1079 007456 000241      60$:  CLC      ;CARRY CLEAR = ERROR
1080 007460 017500 002524      70$:  MOV      @TSSR(R5),R0      ;RETURN TSSR CONTENTS
1081 007464 000207      RTS      PC      ;RETURN
1082
1083
1084      ;+
1085      ;
1086      ;ROUTINE TO DO SET UP OF RUNNING CONDITIONS
1087      ;
1088      ;INPUTS:
1089      ;
1090      ;      R5      CURRENT UNIT NUMBER
1091      ;
1092      ;
1093      ;OUTPUTS:
1094      ;
1095      ;
1096      ;CALLING SEQUENCE:
1097      ;      JSR      PC,FIRSTU
1098      ;      JSR      PC,SOFINIT
1099      ;      BCS      CONTINUE
1100      ;      ERRDF      ;REPORT FATAL ERROR
1101      ;      JSR      PC,MDSET
1102      ;
1103      ;-
1104
1105 007466      MDSET:: BREAK      ; DO A SUPVSR BREAK FIRST.
1106 007466 104422      JSR      PC,SETDEF      TRAP      C$BRK
1107 007470 004767 000272      JSR      PC,WLKCHK      ;RESTORE DEFAULT
1108 007474 004767 177656      BCS      1$      ;CHECK WRITE LOCK
1109 007500 103416      DELAY 1      ;C=1 IS O.K.
1109 007502      ;WAIT
1109 007502 012727 000001      MOV      #1,(PC)+
1109 007506 000000      .WORD 0
1109 007510 016727 172402      MOV      L$DLY,(PC)+
1109 007514 000000      .WORD 0
1109 007516 005367 177772      DEC      -6(PC)

```

	007522	001375							BNE	.-4
	007524	005367	177756						DEC	-22(PC)
	007530	001367							BNE	.-20
1110	007532				BREAK					
	007532	104422								
1111	007534				DOCLN				TRAP	C\$BRK
	007534	104444							TRAP	C\$DCLN
1112	007536	005767	172550	1\$:	TST	TS1MD				
1113	007542	001064			BNE	10\$				
1114	007544	004767	000216		JSR	PC,SETDEF				
1115	007550	004767	177514		JSR	PC,WRTCHK				
1116	007554	005767	172540		TST	HSSW				
1117	007560	001415			BEQ	3\$				
1118	007562	052767	000040	173742	BIS	#EF.HSS,TSUNT				
1119	007570	005767	172526		TST	EXTFEA				
1120	007574	001002			BNE	2\$				
1121	007576	004767	000122		JSR	PC,INVRT				
1122	007602	004767	000160	2\$:	JSR	PC,SETDEF				
1123	007606	004767	177624		JSR	PC,WRTCHR				
1124	007612	000443			BR	11\$				
1125	007614	005767	172476	3\$:	TST	WTBUF				
1126	007620	001415			BEQ	5\$				
1127	007622	052767	000030	173702	BIS	#EF.RWB,TSUNT				
1128	007630	005767	172466		TST	EXTFEA				
1129	007634	001002			BNE	4\$				
1130	007636	004767	000062		JSR	PC,INVRT				
1131	007642	004767	000120	4\$:	JSR	PC,SETDEF				
1132	007646	004767	177564		JSR	PC,WRTCHR				
1133	007652	000423			BR	11\$				
1134	007654	005767	172434	5\$:	TST	RDBUF				
1135	007660	001415			BEQ	10\$				
1136	007662	052767	000020	173642	BIS	#EF.RBO,TSUNT				
1137	007670	005767	172426		TST	EXTFEA				
1138	007674	001002			BNE	6\$				
1139	007676	004767	000022		JSR	PC,INVRT				
1140	007702	004767	000060	6\$:	JSR	PC,SETDEF				
1141	007706	004767	177524		JSR	PC,WRTCHR				
1142	007712	000403			BR	11\$				
1143										
1144	007714	016767	173612	172562	10\$:	MOV	TSUNT,SCHBK+10			
1145										
1146	007722	000207			11\$:	RTS	PC			
1147										
1148										
1149										
1150										
1151										
1152										
1153										
1154										
1155										
1156										
1157										
1158										
1159										
1160	007724				INVRT::					
1161	007724	012767	140006	172376		MOV	#WSM,CMDPKT+CP.CMD			

GLOBAL AREAS MACRO M1113 14-JUN-84 18:32
GLOBAL SUBROUTINES SECTION

SEQ 0064

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1162 007732 012767 002506 172372      MOV    @WSMBK,CMDPKT+CP.ADL    ;MSG BUF ADDR
1163 007740 012767 000006 172370      MOV    @6,CMDPKT+CP.CNT      ;BYTE COUNT
1164 007746 012767 100010 172532      MOV    @100010,WSMBK        ;INVERT THE SWITCH
1165 007754 012704 002330              MOV    @CMDPKT,R4           ;
1166 007760 004767 177452              JSR    PC,WRTCHR            ;DO IT
1167 007764 000207                      RTS     PC                   ;RETURN
1168
1169
1170      ; SUBROUTINE TO SETUP DEFAULT SET CHAR CMD
1171      ;
1172      ; INPUTS:
1173      ;
1174      ;
1175      ;
1176      ; OUTPUTS:
1177      ;
1178      ; R4 ADDRESS OF COMMAND PACKET
1179
1180 007766      SETDEF::
1181 007766 012701 140004      MOV    @SCH,R1              ;WRITE CHAR CMD
1182 007772 010167 172332      MOV    R1,CMDPKT+CP.CMD    ;SET UP COMMAND
1183 007776 012767 002474 172326      MOV    @SCHBK,CMDPKT+CP.ADL ;SET UP ADR LO TO POINT TO MSG BUF(MSGPK0)
1184 010004 012767 000012 172324      MOV    @SCHCNT,CMDPKT+CP.CNT ;SET BUFFER EXTENT
1185 010012 012767 000040 172462      MOV    @DFTSCH,SCHBK+6     ;STORE CHARACTERISTIC CODE IN SCH BLOCK.
1186 010020 016767 173506 172456      MOV    TSUNT,SCHBK+10      ;UNIT #
1187 010026 012704 002330      MOV    @CMDPKT,R4         ;ADDRESS OF CMD PACKET
1188 010032 000207                      RTS     PC                   ;RETURN
1189
1190
1191      ; MODULES TO HANDLE TS05 INTERRUPTS.
1192
1193
1194 010034      BGNSRV TSSINO
1195 010034      TSSINO::
1196 010034 005267 173432      INC    INTFLG              ;SET INTERRUPT OCCURRED FLAG.
1197 010040      ENDSRV
1198 010040      L10004:
1199 010040      RTI
1200 010042      BGNSRV TSSIN1
1201 010042      TSSIN1::
1202 010042 005267 173426      INC    INTFLG+2           ;SET INTERRUPT OCCURRED FLAG.
1203 010046      ENDSRV
1204 010046      L10005:
1205 010046      RTI
1206 010050      BGNSRV TSSIN2
1207 010050      TSSIN2::
1208 010050 005267 173422      INC    INTFLG+4           ;SET INTERRUPT OCCURRED FLAG.
1209 010054      ENDSRV
1210 010054      L10006:
1211 010054      RTI
1212 010056      BGNSRV TSSIN3
1213 010056      TSSIN3::
1214 010056 005267 173416      INC    INTFLG+6           ;SET INTERRUPT OCCURRED FLAG.
1215 010062      ENDSRV

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010062          L10007:
010062 000002          RTI
1209
1210          :      SUBROUTINE TO RETRIEVE RECORD COUNT READ FROM TAPE FOR ERROR
1211          :      PRINTS.
1212          :      INPUTS:
1213          :      OUTPUTS:  R3 = RECORD COUNT READ
1214          :      REGISTERS:  R2, R3, R4
1215          :      CALLS:
1216
1217 010064 032767 000400 173326 RECTAP: BIT      #MOD.CO,CMDWRD          ;READ REV FETCH
1218 010072 001430          BEQ      50001$
1219 010074 016702 172260          MOV      MSGPKT+MS.RFC,R2      ;FIND LAST READ AD.
1220 010100 066702 173304          ADD      DATARD,R2
1221 010104 032702 000001          BIT      @BIT00,R2          ;ODD AD., REASSEMBLE
1222 010110 001417          BEQ      50002$
1223 010112 005202          INC      R2          ;REC COUNT STARTING
1224 010114 111203          MOVB    (R2),R3          ;WITH UPPER BYTE FETCH
1225 010116 142703 177400          BICB    @177400,R3
1226 010122 000303          SWAB   R3
1227 010124 005302          DEC      R2          ;LET R2 := R2 - #1          ;LOWER BYTE AD.
1228 010126 105767 173366          TSTB   SWBFLG          ;IFB SWBFLG NE #0 THEN
1229 010132 001401          BEQ      50003$
1230 010134 005302          DEC      R2          ;LET R2 := R2 - #1          ;LOWER BYTE AD. ON SWAP
1231
1232 010136          50003$:
1233 010136 111204          MOVB    (R2),R4          ;FETCH LOWER BYTE
1234 010140 142704 177400          BICB    @177400,R4
1235 010144 050403          BIS      R4,R3
1236 010146 000401          BR      50004$
1237 010150          50002$:
1238 010150 011203          MOV      (R2),R3          ;LET R3 := (R2)          ;EVEN AD. FETCH
1239 010152          50004$:
1240 010152 000402          BR      50005$
1241 010154          50001$:
1242 010154 017703 173230          MOV      @DATARD,R3          ;LET R3 := @DATARD          ;READ FWD FETCH
1243
1244 010160          50005$:
1245 010160 000207          RTS     PC
1246
1247          :      SUBROUTINE TO STORE A SET CHARACTERISTIC COMMAND AS
1248          :      THE FIRST ENTRY IN THE SEQUENCE TABLE.
1249          :      INPUTS:
1250          :      OUTPUTS:
1251          :      REGISTERS:
1252          :      CALLS:
1253
1254 010162          SETCH::
1255 010162 012701 003540          MOV      #CMDSEQ,R1          ;INIT CMD SEQUENCE TABLE POINTER.
1256 010166 012721 140004          MOV      #SCH,(R1)+          ;THIS CODE SETS UP A SET CHARACTERISTIC
1257 010172 012721 000040          MOV      #DFTSCH,(R1)+      ;COMMAND AS THE FIRST COMMAND IN THE
1258 010176 012721 000001          MOV      #1,(R1)+          ;SEQUENCE TABLE.
1259 010202 005721          TST     (R1)+          ;SKIP PATTERN LOCATION.
1260 010204 000207          RTS     PC
1261
1262          :      SUBROUTINE TO STORE A REWIND COMMAND IN THE SEQUENCE TABLE
1263          :      INPUTS:

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1264      :      OUTPUTS:
1265      :      REGISTERS:
1266      :      CALLS:
1267
1268 010206 012721 102010  SETRW:: MOV    #RWD,(R1).          ;CMD = REWIND.
1269 010212 012721 000001      MOV    #1,(R1).          ;BRF.
1270 010216 012721 000001      MOV    #1,(R1).          ;# OF OPERATIONS.
1271 010222 005721      TST    (R1).          ;SKIP PATTERN.
1272 010224 000207      RTS    PC          ;RETURN
1273
1274      :      SUBROUTINE TO EXECUTE ALL COMMANDS IN THE SEQUENCE TABLE ON ALL
1275      :      DEVICES.
1276      :      INPUTS:
1277      :      OUTPUTS:      R2 = TERMINATION INDICATOR (0=END OF TABLE,1=EOT)
1278      :      REGISTERS:
1279      :      CALLS:      CMDAC,SETUP,EXSUB,CKHAE,NEXTU,FIRSTU,VFYDAT.
1280
1281 010226 012701 003540  EXALL:: MOV    #CMDSEQ,R1      ;INIT SEQUENCE TABLE POINTER.
1282 010232 50006#      50006# :
1283 010232 021127 177777      CMP    (R1),#END      ;WHILE THERE ARE CMDS IN THE SEQUENCE TABLE.
1284 010236 001530      BEQ    50007#
1285 010240 004767 000726      JSR    PC,SETUP      ;GO SETUP THE COMMAND BLOCK.
1286 010244 50010#      50010# : BREAK          ; DO A SUPVSR BREAK FIRST.
1287 010244 104422      TRAP   C#BRK
1287 010246 026767 173140 173140  CMP    NCNT,NCNT1     ;WHILE THERE ARE RECORDS REMAINING:
1288 010254 002116      BGE    50011#
1289 010256 004767 000602      JSR    PC,CMDAC      ;STORE CMD ASCII IN ERROR MESSAGE.
1290 010262 105767 173227      TSTB  RANDOM          ;IF IN RANDOM MODE:
1291 010266 001435      BEQ    50012#
1292 010270 026727 173124 104005  CMP    CMDWRD,#WRT     ;IF CMD IS A WRITE THEN:
1293 010276 001031      BNE    50013#
1294 010300 105767 173212      TSTB  VFYFLG          ;IF DATA IS NOT TO BE VERIFIED THEN:
1295 010304 001026      BNE    50014#
1296 010306 066767 173122 173116  ADD    RANS,RANB       ;LET RANB := RANB * RANS ;GENERATE
1297 010314 066767 173112 173112  ADD    RANB,RANS       ;LET RANS := RANS * RANB ;RANDOM
1298 010322 016767 173106 173066  MOV    RANS,BRFCNT     ;LET BRFCNT := RANS ;LENGTH
1299 010330 046767 173074 173060  BIC    LENMSK,BRFCNT   ;MASK RANDOM LENGTH.
1300 010336 026727 173054 000022  CMP    BRFCNT,#18.    ;DO NOT ALLOW BYTE COUNT OF LESS THAN 18
1301 010344 002003      BGE    50015#
1302 010346 012767 000022 173042  MOV    #18.,BRFCNT    ;CHANGE COUNT OF 0-17 TO 18.
1303
1304 010354 50015#      50015# :
1305 010354 016767 173036 171754  MOV    BRFCNT,CMDPKT*CP.CNT ;MOVE BRF TO CMD PACKET.
1306
1307 010362 50014#      50014# :
1308
1309 010362 50013#      50013# :
1310
1311 010362 50012#      50012# :
1312 010362 004767 000136      JSR    PC,EXSUB       ;ISSUE CMD TO ALL,AWAIT INTS,CHECK STATUS.
1313 010366 004767 007106      JSR    PC,CKHAE       ;CHECK HALT AFTER EACH CMD FLAG.
1314 010372 012702 000001      MOV    #1,R2          ;LET R2 := #1 ;SET ALL UNITS AT BOT/EOT.
1315 010376 004767 006500      JSR    PC,FIRSTU     ;FIND FIRST UNIT.
1316
1317 010402 50016#      50016# :
1318 010402 026527 002604 177777  CMP    DEVTBL(R5),#END ;WHILE THERE ARE MORE UNITS:
1319 010410 001426      BEQ    50017#

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1320 010412 032767 000400 173000      BIT      @MOD.CO,CMDWRD      ;IF CMD IS REVERSE THEN:
1321 010420 001406                      BEQ      50020$
1322 010422 032765 000002 003502      BIT      @XO.BOT,EOTFLG(R5) ;IF NOT AT BOT THEN:
1323 010430 001001                      BNE      50021$
1324 010432 005002                      CLR      R2                ;LET R2 := #0 ;CLEAR EOT/BOT FLAG.
1325
1326 010434                      50021$:
1327 010434 000411                      BR       50022$           ;ELSE IF CMD IS NOT REVERSE:
1328 010436                      50020$:
1329 010436 032765 000001 003502      BIT      @XO.EOT,EOTFLG(R5)
1330 010444 001404                      BEQ      50023$
1331 010446 032767 000001 172744      BIT      @CMD.CO,CMDWRD
1332 010454 001001                      BNE      50024$
1333 010456                      50023$:
1334
1335 010456 005002                      CLR      R2                ;IF NOT AT EOT OR NOT A MOTION CMD THEN:
1336
1337 010460                      50024$:
1338
1339 010460                      50022$:
1340 010460 004767 006464                      JSR      PC,NEXTU         ;FIND NEXT UNIT
1341 010464 000746                      BR       50016$
1342 010466                      50017$:
1343 010466 020227 000001                      CMP      R2,#1           ;IF ALL UNIT ARE AT EOT/BOT THEN:
1344 010472 001001                      BNE      50025$
1345 010474 000412                      BR       EXARTN          ;RETURN WITH R2 = #1.
1346
1347 010476                      50025$:
1348 010476 005267 172710                      INC      NCNT            ;LET NCNT := NCNT + #1 ;UPDATE RECORD COUNT.
1349 010502 016767 172712 172714          MOV      CMDWRD,PCMDWD  ;SAVE PREVIOUS COMMAND WORD.
1350
1351 010510 000655                      BR       50010$
1352 010512                      50011$:
1353 010512 004767 005350                      JSR      PC,VFYDAT       ;IF LAST CMD WAS A WRITE VERIFY, THEN GO
1354
1355
1356 010516 000645                      BR       50006$
1357 010520                      50007$:
1358 010520 005002                      CLR      R2              ;LET R2 := #0 ;SET NORMAL RETURN INDICATOR.
1359 010522 000207                      EXARTN: RTS PC          ;RETURN.
1360
1361
1362
1363 ; SUBROUTINE TO ISSUE COMMAND TO ALL DEVICES. WAIT FOR
1364 ; ALL INTERRUPTS, AND CHECK ALL STATUS.
1365 ; INPUTS:
1366 ; OUTPUTS:
1367 ; REGISTERS:
1368 ; CALLS: EXCUTE,GOWAIT,NEXTU,FIRSTU.
1369
1370 010524 004767 006352                      EXSUB:: JSR      PC,FIRSTU ;SET UP FOR FIRST UNIT.
1371 010530                      50026$:
1372 010530 026527 002604 177777          CMP      DEVTBL(R5),#END ;WHILE THERE ARE MORE DEVICES:
1373 010536 001465                      BEQ      50027$
1374 010540 032767 000400 172652          BIT      @MOD.CO,CMDWRD ;IF CMD IS REVERSE THEN:
1375 010546 001421                      BEQ      50030$
1376 010550 032765 000002 003502          BIT      @XO.BOT,EOTFLG(R5) ;IF NOT AT BOT

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1377	010556	001014			BNE	50031:		
1378	010560	032765	000001	003502	BIT	#X0.EOT,EOTFLG(R5)	;BUT IF AT EOT	
1379	010566	001406			BEQ	50032:		
1380	010570	105767	172730		TSTB	ALLEOT	;AND ALL OTHERS AT EOT	
1381	010574	001402			BEQ	50033:		
1382	010576	004767	001252		JSR	PC,EXECUTE	;THEN EXECUTE REV CMD	
1383							;IF NOT ALL AT EOT, FREEZE UNIT(S) AT EOT	
1384	010602					50033:		
1385	010602	000402			BR	50034:	;IF NOT AT BOT AND	
1386	010604					50032:		
1387	010604	004767	001244		JSR	PC,EXECUTE	;NOT AT EOT, EXEC REV CMD	
1388								
1389	010610					50034:		
1390								
1391	010610					50031:		
1392	010610	000435			BR	50035:	;ELSE IF CMD IS NOT REVERSE:	
1393	010612					50030:		
1394	010612	026727	172610	000002	CMP	CMDLG,#2		
1395	010620	001011			BNE	50036:		
1396	010622	032765	000002	003502	BIT	#X0.BOT,EOTFLG(R5)		
1397	010630	001405			BEQ	50036:		
1398							;CLEAR BAD SPOT COUNTS WHEN WRITING FROM BOT	
1399	010632	016567	002616	172652	MOV	BTADDR(R5),BTPT	;LET BTPT := BTADDR(R5)	
1400	010640	005077	172646		CLR	BTPT	;LET BTPT := #0	
1401								
1402	010644					50036:		
1403	010644	032765	000001	003502	BIT	#X0.EOT,EOTFLG(R5)		
1404	010652	001404			BEQ	50037:		
1405	010654	032767	000001	172536	BIT	#CMD.CO,CMDWRD		
1406	010662	001003			BNE	50040:		
1407	010664							
1408							;IF NOT AT EOT OR NOT A MOTION CMD THEN:	
1409	010664	004767	001164		JSR	PC,EXECUTE	;ISSUE CMD TO TS05	
1410								
1411	010670	000405			BR	50041:		
1412	010672					50040:		
1413	010672	105767	172626		TSTB	ALLEOT	;IFB ALLEOT NE #0 THEN	
1414	010676	001402			BEQ	50042:		
1415	010700	004767	001150		JSR	PC,EXECUTE		
1416								
1417	010704					50042:		
1418								
1419	010704					50041:		
1420								
1421	010704					50035:		
1422	010704	004767	006240		JSR	PC,NEXTU	;FIND NEXT UNIT IN TEST CYCLE.	
1423								
1424	010710	000707			BR	50026:		
1425	010712					50027:		
1426	010712	105767	172601		TSTB	RPTFLG	;IF REPORT HAS BEEN REQUESTED THEN:	
1427	010716	001403			BEQ	50043:		
1428	010720	105067	172573		CLRB	RPTFLG	;CLR THE FLAG,	
1429	010724				DORPT		;PRINT THE PERFORMANCE REPORT.	
1430	010726	104424					TRAP C\$DRPT	
1431	010726	004767	006150		JSR	PC,FIRSTU	;SET UP FOR FIRST UNIT.	
1432	010732					50044:		


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1490 011064 016704 172330      CMDAC:: MOV      CMDWRD,R4;LET R4 := CMDWRD          ;R4 = CMD BINARY.
1491 011070 004767 000042      JSR      PC,GCMDA          ;GET CMD ASCII.
1492 011074 112367 175340      MOV      (R3)+,STAER1+2    ;MOVE CMD ASCII
1493 011100 112367 175335      MOV      (R3)+,STAER1+3    ;
1494 011104 111367 175332      MOV      (R3),STAER1+4     ;INTO MSG.
1495 011110 016704 172310      MOV      PCMDWD,R4        ;R4 = PREVIOUS CMD BINARY.
1496 011114 004767 000016      JSR      PC,GCMDA          ;GET CMD ASCII.
1497 011120 112367 175430      MOV      (R3)+,STAER7+24   ;MOVE CMD ASCII
1498 011124 112367 175425      MOV      (R3)+,STAER7+25   ;
1499 011130 111367 175422      MOV      (R3),STAER7+26   ;INTO MSG.
1500 011134 000207      RTS      PC                ;RETURN. GO EXECUTE NEXT FUNCTION.
1501
1502
1503      ;      SUBROUTINE TO FIND THE ASCII EQUIVALENT OF THE COMMAND IN R4.
1504      ;      ADDRESS OF ASCII 1ST WORD IS RETURNED IN R3.
1505      ;      INPUTS:      R4 = PRESENT COMMAND WORD.
1506      ;      OUTPUTS:     R3 = ADDRESS OF PRESENT COMMAND ASCII.
1507      ;      REGISTERS:
1508      ;      CALLS:
1509
1510 011136 005003      GCMDA:: CLR      R3;LET R3 := #0          ;INIT CMD TBL POINTER.
1511 011140 50060$:      CMP      CMTBL(R3),R4      ;UNTIL CURRENT CMD IS FOUND:
1512 011140 026304 003752      BEQ      50061$
1513 011144 001403      ADD      #2,R3             ;LET R3 := R3 + #2          ;SEARCH CMD TABLE.
1514 011146 062703 000002      BR       50060$
1515 011152 000772      50061$:
1516 011154      MOV      R3,R4            ;LET R4 := R3
1517 011154 010304      ASR      R3              ;POINT TO ASCII FOR THAT COMMAND
1518 011156 006203      NOP
1519 011160 000240      ADD      R4,R3
1520 011162 060403      ADD      #CMDASC,R3
1521 011164 062703 004040      RTS      PC                ;RETURN.
1522 011170 000207
1523
1524      ;      THIS SUBROUTINE LOADS THE TS05 COMMAND PACKET FROM ONE
1525      ;      ENTRY IN THE SEQUENCE TABLE.
1526      ;      INPUTS:
1527      ;      OUTPUTS:
1528      ;      REGISTERS:     R2, R3.
1529      ;      CALLS:      GENPAT.
1530
1531 011172 005067 172230      SETUP:: CLR      CMDLG          ;CLR CMD LOGGING CODE(DISABLES LOGGING)
1532 011176 012167 171126      MOV      (R1)+,CMDPKT      ;LOAD THE COMMAND WORD.
1533 011202 011167 171130      MOV      (R1),CMDPKT+CP.CNT ;LOAD THE BYTE/RECORD/FILE COUNT.
1534 011206 011167 172204      MOV      (R1),BRFCNT      ;SAVE BRFCNT FOR THIS COMMAND.
1535 011212 016702 171112      MOV      CMDPKT,R2        ;GET CMD.
1536 011216 042702 177740      BIC      #NCMD.C,R2       ;CLR ALL BUT CMD BITS.
1537 011222 010203      MOV      R2,R3            ;SAVE IT TWICE.
1538 011224 162703 000010      SUB      #CMD.C3,R3       ;POSITION COMMAND?
1539 011230 001003      BNE      2$              ;BR IF NOT.
1540 011232 011167 171074      MOV      (R1),CMDPKT+2    ;MOVE BPCR IN 2ND PKT WORD FOR POSITION CMD.
1541 011236 000464      BR       3$
1542 011240 026727 171064 100011 2$:  CMP      CMDPKT,#WTM      ;IF CMD IS A WRITE TAPE MARK THEN:
1543 011246 001003      BNE      50062$
1544 011250 012767 000002 172150      MOV      #2,CMDLG        ;WTM LOGGING CODE IS 2.
1545
1546 011256      50062$:

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1547	011256	010203			MOV	R2,R3			
1548	011260	162703	000001		SUB	@CMD.CO,R3			; IS IT A READ?
1549	011264	001017			BNE	1\$; BR IF NOT.
1550	011266	016767	172116	171036	MOV	DATARD,CMDPKT+CP.ADL			; IF SO, LOAD THE BUFFER ADDR.
1551	011274	032767	000400	171026	BIT	@MOD.CO,CMDPKT			; IF CMD IS A READ REV THEN:
1552	011302	001404			BEQ	50063\$			
1553	011304	012767	000004	172114	MOV	@4,CMDLG			; LOGGING CODE IS 4.
1554									; ELSE - IF CMD IS A READ FWD:
1555	011312	000403			BR	50064\$			
1556	011314						50063\$:		
1557	011314	012767	000006	172104	MOV	@6,CMDLG			; LOGGING CODE IS 6.
1558									
1559	011322						50064\$:		
1560	011322	000432			BR	3\$; CONTINUE.
1561	011324	010203			MOV	R2,R3			; IS IT
1562	011326	162703	000004		SUB	@CMD.C2,R3			; A SET CHARACTERISTICS CMD?
1563	011332	001014			BNE	4\$; BR IF NOT.
1564	011334	012767	002474	170770	MOV	@SCHBK,CMDPKT+CP.ADL			; SET UP ADR LO FOR SET CHAR.
1565	011342	012767	000012	170766	MOV	@SCHCNT,CMDPKT+CP.CNT			; SET BUFFER EXTENT
1566	011350	011167	171126		MOV	(R1),SCHBK+6			; STORE CHARACTERISTIC CODE IN SCH BLOCK.
1567	011354	016767	172152	171122	MOV	TSUNT,SCHBK+10			; UNIT #
1568	011362	000412			BR	3\$; CONTINUE.
1569	011364	010203			MOV	R2,R3			; IS IT
1570	011366	162703	000006		SUB	@CMD.C1!CMD.C2,R3			; A DIAGNOSTIC (DIA) CMD?
1571	011372	001006			BNE	3\$; BR IF NOT.
1572	011374	012767	000020	170734	MOV	@DIACNT,CMDPKT+CP.CNT			; LOAD BUFFER EXTENT.
1573	011402	012767	003406	170722	MOV	@DIABLK,CMDPKT+CP.ADL			; LOAD BUFFER ADR LOW.
1574	011410	005721			TST	(R1)+			; POINT TO N (NUMBER OF TIMES TO EXECUTE THIS INS
1575	011412	012167	171776		MOV	(R1)+,NCNT1			; SAVE NUMBER OF OPERATIONS
1576	011416	005067	171770		CLR	NCNT			; CLEAR OPERATION COUNTER.
1577	011422	012167	172020		MOV	(R1)+,PATERN			; SAVE PATTERN CODE FOR CURRENT CMD.
1578	011426	010203			MOV	R2,R3			; IS IT
1579	011430	162703	000005		SUB	@CMD.CO!CMD.C2,R3			; A WRITE?
1580	011434	001010			BNE	5\$; BR IF NOT.
1581	011436	016767	171744	170666	MOV	DATAWT,CMDPKT+CP.ADL			; LOAD WRITE BUFFER LO ORDER.
1582	011444	004767	000106		JSR	PC,GENPAT			; GO GENERATE THE WRITE PATTERN.
1583	011450	012767	000002	171750	MOV	@2,CMDLG			; WRITE LOGGING CODE IS 2.
1584	011456	032767	000100	170644	BIT	@Vfy.C,CMDPKT			; IF DATA VERIFICATION IS REQUIRED:
1585	011464	001407			BEQ	50065\$			
1586	011466	112767	000001	172022	MOVB	@1,VfyFLG			; SET VERIFY FLAG.
1587	011474	042767	000100	170626	BIC	@Vfy.C,CMDPKT			; CLEAR VERIFY BIT(NOT USED BY HARDWARE).
1588									; IF DATA VERIFICATION IS NOT REQUIRED:
1589	011502	000402			BR	50066\$			
1590	011504						50065\$:		
1591	011504	105067	172006		CLRB	VfyFLG			; CLR VERIFY FLAG.
1592									
1593	011510						50066\$:		
1594	011510	016767	171704	171706	MOV	CMDWRD,PCMDWD			; SAVE PREVIOUS CMD WORD.
1595	011516	016767	170606	171674	MOV	CMDPKT,CMDWRD			; SAVE PRESENT CMD WORD.
1596	011524	105767	171770		TSTB	SMBFLG			; IF SWAP BYTES IS ENABLED:
1597	011530	001403			BEQ	50067\$			
1598	011532	052767	010000	170570	BIS	@SMB.C,CMDPKT			; SET SWAP BIT IN COMMAND.
1599									
1600	011540						50067\$:		
1601	011540	042767	004000	170562	BIC	@BRF.C,CMDPKT			; CLR BRF BIT (INTERNAL ONLY).
1602	011546	016767	170556	171646	MOV	CMDPKT,CMDSAV			; SAVE 1ST WORD OF COMMAND PACKET.
1603	011554	000207			RTS	PC			; RETURN.


```

1604
1605      ;      THIS SUBROUTINE SETS UP AND CALLS THE APPROPRIATE SUBROUTINE TO GENERATE
1606      ;      THE DESIRED PATTERN FOR THE WRITE AND WRITE/VERIFY COMMANDS.
1607      ;      INPUTS:
1608      ;      OUTPUTS:
1609      ;      REGISTERS:      R2, R3, R4.
1610      ;      CALLS:      PATR0 - PATR7
1611
1612 011556 016703 171664      GENPAT::MOV      PATERN,R3      ;SETUP PATTERN ROUTINE POINTER
1613 011562 006303      ASL      R3
1614 011564 016704 171626      MOV      BRFCNT,R4      ;SET LENGTH OF WRITE BFR
1615 011570 005204      INC      R4
1616 011572 042704 000001      BIC      #1,R4      ;ROUNDED UP TO NEXT WORD
1617 011576 162704 000002      SUB      #2,R4      ;WITH FIRST WORD RESERVED
1618 011602 016702 171600      MOV      DATAW,R2      ;FOR RECORD COUNT
1619 011606 062702 000002      ADD      #2,R2
1620 011612 004773 011620      JSR      PC,@PATTBL(R3) ;GO GENERATE THE APPROPRIATE PATTERN.
1621 011616 000207      RTS      PC      ;RETURN TO SETUP SUBROUTINE.
1622
1623      ;TS05 WRITE PATTERN LOOKUP TABLE. USED TO JSR TO THE
1624      ;CORRECT DATA PATTERN GENERATING ROUTINE.
1625
1626 011620 011642      PATTBL: PATR0
1627 011622 011700      PATR1
1628 011624 011720      PATR2
1629 011626 011730      PATR3
1630 011630 011754      PATR4
1631 011632 011766      PATR5
1632 011634 012000      PATR6
1633 011636 012020      PATR7
1634 011640 012052      PATR8
1635
1636      ;INCREMENTING PATTERN. 0 - 377.
1637
1638 011642 012703 000400      PATR0::MOV      #400,R3;LET R3 := #400
1639 011646 162704 000002      1$: SUB      #2,R4;LET R4 := R4 - #2 ;DECREMENT WORD COUNT.
1640 011652 100411      BMI      2$      ;BR IF DONE.
1641 011654 010322      MOV      R3,(R2)+ ;STORE DATA WORD.
1642 011656 062703 001002      ADD      #1002,R3 ;UPDATE PATTERN.
1643 011662 020327 001000      CMP      R3,#1000 ;IF PATTERN HAS WRAPPED AROUND THEN:
1644 011666 001002      BNE      50070$
1645 011670 012703 000400      MOV      #400,R3      ;INIT THE PATTERN AGAIN.
1646
1647 011674      50070$:
1648 011674 000764      BR      1$      ;DO IT AGAIN.
1649
1650 011676 000207      2$: RTS      PC      ;RETURN.
1651
1652      ;ALL ONE'S PATTERN.
1653
1654 011700 012703 177777      PATR1::MOV      #-1,R3 ;ALL ONES PATTERN;.
1655 011704 162704 000002      ZROPAT: SUB      #2,R4 ;DECREMENT BYTE COUNT.
1656 011710 100402      BMI      1$      ;DONE?,BR IF YES.
1657 011712 010322      MOV      R3,(R2)+ ;IF NOT LOAD NEXT BYTE WITH PATTERN.
1658 011714 000773      BR      ZROPAT ;DO IT AGAIN.
1659
1660 011716 000207      1$: RTS      PC      ;RETURN.

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1661
1662                ;ALL ZEROES PATTERN.
1663
1664 011720 005003   PATR2:: CLR    R3                ;CLR PATTERN REGISTER.
1665 011722 004767   JSR    PC,ZROPAT           ;GO GENERATE IT.
1666 011726 000207   RTS     PC                ;RETURN.
1667
1668                ;ONE BIT WALKING FROM R TO L IN A FIELD OF ZEROES.
1669
1670 011730 012703   000401   PATR3:: MOV    #401,R3                ;INIT PATTERN REGISTER.
1671 011734 162704   000002   WLKZRO: SUB    #2,R4;LET R4 := R4 - #2 ;DECREMENT WORD COUNT.
1672 011740 100404   BMI    1$                ;BR IF DONE.
1673 011742 010322   MOV    R3,(R2)+          ;LOAD DATA.
1674 011744 006303   ASL    R3                ;SHIFT PATTERN.
1675 011746 005503   ADC    R3                ;ADD CARRY BACK INTO PATTERN.
1676 011750 000771   BR     WLKZRO            ;DO IT AGAIN.
1677 011752 000207   1$:   RTS     PC                ;RETURN.
1678
1679                ;ZERO BIT WALKING FROM R TO L IN A FIELD OF 1'S.
1680
1681 011754 012703   177376   PATR4:: MOV    #177376,R3           ;INIT PATTERN REGISTER.
1682 011760 004767   JSR    PC,WLKZRO        ;GO GENERATE ;IT.
1683 011764 000207   RTS     PC                ;RETURN.
1684
1685                ;ALTERNATING ONE AND ZERO BITS WITH ALTERNATE BYTES
1686                ;COMPLEMENTED.
1687
1688 011766 012703   125125   PATR5:: MOV    #125125,R3          ;INIT PATTERN REGISTER.
1689 011772 004767   JSR    PC,ZROPAT        ;GO GENERATE IT.
1690 011776 000207   RTS     PC                ;RETURN.
1691
1692                ;ALTERNATING BYTES OF 000 AND 377.
1693
1694 012000 012703   177400   PATR6:: MOV    #177400,R3          ;INIT PATTERN REGISTER.
1695 012004 162704   000002   1$:   SUB    #2,R4                ;DECREMENT WORD COUNT.
1696 012010 100402   BMI    2$                ;BR IF DONE.
1697 012012 010322   MOV    R3,(R2)+          ;LOAD DATA.
1698 012014 000773   BR     1$                ;DO IT AGAIN.
1699 012016 000207   2$:   RTS     PC                ;RETURN.
1700
1701                ;RANDOM PATTERN GENERATOR
1702
1703 012020 162704   000002   PATR7:: SUB    #2,R4                ;DECREMENT WORD COUNT
1704 012024 100411   BMI    GIT                ;BR IF DONE.
1705 012026 066767   171402   171376   ADD    RANS,RANB          ;GET NEW #.
1706 012034 066767   171372   171372   ADD    RANB,RANS          ;SAVE #.
1707 012042 016722   171366   MOV    RANS,(R2)+        ;CONTINUE.
1708 012046 000764   BR     PATR7            ;RETURN
1709 012050 000207   GIT:   RTS     PC
1710
1711                ; NO PATTERN GENERATION.
1712
1713 012052 000207   PATR8:: RTS     PC                ;RETURN.
1714
1715                ; THIS SUBROUTINE INITIATES TS05 COMMAND EXECUTION
1716                ; AND CHECKS FOR TS05 RESPONSE.
1717                ; INPUTS:

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1718          ;      OUTPUTS:
1719          ;      REGISTERS:      R2, R3.
1720          ;      CALLS:      DROPU, MOVMSG, FIRSTU, NEXTU, WSSR.
1721
1722 012054 012767 177777 171354 EXCUTE:: MOV    #-1,TIME1      ;INIT TIMEOUT COUNTER.
1723 012062          50071$: ;REPEAT      ;WAIT -
1724 012062 005367 171350          DEC    TIME1      ;UPDATE TIMEOUT COUNTER.
1725 012066 005767 171344          TST    TIME1      ;IF TIMED OUT:
1726 012072 001011          BNE    50072$
1727 012074 004767 000634          JSR    PC,MOVMSG      ;MOVE CURRENT PACKET MSG.
1728 012100          ERRDF  2,NSSRM,STAERM ;REPORT TS05 NOT READY
          012100 104455          TRAP   C$ERDF
          012102 000002          .WORD  2
          012104 004536          .WORD  NSSRM
          012106 006120          .WORD  STAERM
1729 012110 004767 005064          JSR    PC,DROPU      ;DROP THE UNIT.
1730 012114 000522          BR     EXCRTN      ;RETURN.
1731
1732 012116          50072$:
1733 012116 032775 000200 002524 BIT    #TS.SSR,@TSSR(R5) ;WAIT UNTIL DEVICE IS READY.
1734 012124 001756          BEQ    50071$
1735 012126 026727 171266 140004 CMP    CMDWRD,#SCH      ;IF WE ARE DOING A SET CHAR CMD THEN:
1736 012134 001022          BNE    50073$
1737 012136 010567 171310          MOV    R5,RSSAVE      ;SAVE CURRENT DEVICE POINTER.
1738 012142 004767 004734          JSR    PC,FIRSTU     ;FIND FIRST UNIT.
1739 012146          50074$:
1740 012146 026527 002604 177777 CMP    DEVTBL(R5),#END ;WHILE DEVTBL(R5) NE #END DO
1741 012154 001405          BEQ    50075$
1742 012156 004767 000516          JSR    PC,WSSR      ;WAIT FOR UNIT READY OR TIME OUT.
1743 012162 004767 004762          JSR    PC,NEXTU     ;FIND NEXT UNIT.
1744
1745 012166 000767          BR     50074$
1746 012170          50075$:
1747 012170 016705 171256          MOV    RSSAVE,R5      ;RESTORE CURRENT DEVICE POINTER.
1748 012174 016567 002544 170272 MOV    MSGPKA(R5),SCHBK ;SET UP ADR OF MSG PKT IN SCH BLOCK.
1749
1750 012202          50073$:
1751 012202 016503 002544          MOV    MSGPKA(R5),R3 ;ADR OF THIS UNIT'S MSG PACKET.
1752 012206 005002          CLR    R2            ;CLR COUNTER.
1753 012210          50076$:
1754 012210 020227 000020          CMP    R2,#MSGCNT    ;WHILE THERE ARE MORE LOCATIONS:
1755 012214 001405          BEQ    50077$
1756 012216 012723 177777          MOV    #-1,(R3)+     ;INIT THE MSG PACKET WITH ALL 1'S
1757 012222 062702 000002          ADD    #2,R2        ;UPDATE COUNTER.
1758
1759 012226 000770          BR     50076$
1760 012230          50077$:
1761 012230 105767 167756          TSTB   DINT          ;ARE INTERRUPTS DISABLED.
1762 012234 001023          BNE    1$           ;BR IF YES.
1763 012236 126527 003472 000001 CMPB   INTFLG(R5),#1 ;IF MORE THAN ONE INTERRUPT HAS OCCURED:
1764 012244 003412          BLE    50100$
1765 012246 017567 002524 171200 MOV    @TSSR(R5),TSSREG ;FREEZE THE CURRENT STATUS REG FOR PRINT
1766 012254          ERRDF  15,TOOMM,STAERM ;REPORT TOO MANY INTERRUPTS.
          012254 104455          TRAP   C$ERDF
          012256 000017          .WORD  15
          012260 004727          .WORD  TOOMM
          012262 006120          .WORD  STAERM

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1767 012264 004767 004710      JSR      PC,DROPU      ;DROP THE UNIT
1768 012270 000434      BR       EXCRTN      ;RETURN - UNIT HAS BEEN DROPPED.
1769
1770 012272      50100$:
1771 012272 005065 003472      CLR      INTFLG(R5)   ;CLR INTERRUPT FLAG FOR THIS DEV.
1772 012276 052767 000200 170024  BIS      #IE.C,CMDPKT ;SET INT ENABLE BIT.
1773 012304 105767 171161 1$:      TSTB     ERRREC;IFB ERRREC EQ #0 THEN ;IF NOT RETRYING
1774 012310 001005      BNE     50101$
1775 012312 005265 003376      INC      RECCNT(R5)   ;LET RECCNT(R5) := RECCNT(R5) + #1
1776 012316 016577 003376 171062  MOV      RECCNT(R5),@DATAWT ;THEN UPDATE REC COUNT TO WRITE IT ON TAPE
1777
1778 012324      50101$:
1779 012324 012775 002330 002514  MOV      #CMDPKT,@TSDB(R5) ;LOAD TSDB WITH CMDPKT ADDRESS
1780      ;THIS INITIATES COMMAND EXECUTION.
1781 012332 032775 000200 002524  BIT      #TS.SSR,@TSSR(R5) ;IF READY DID NOT DROP THEN:
1782 012340 001410      BEQ     50102$
1783 012342 004767 000366      JSR      PC,MOVMSG   ;MOVE CURRENT MESSAGE PACKET TO COMMON.
1784 012346      ERRDF   3,TOERM,STAERM ;REPORT NO TS05 RESPONSE.
      ;
      TRAP      C$ERDF
      .WORD     3
      .WORD     TOERM
      .WORD     STAERM
1785 012356 004767 004616      JSR      PC,DROPU      ;DROP THE UNIT
1786
1787 012362      50102$:
1788 012362 000207      EXCRTN: RTS      PC      ;RETURN.
1789
1790      ; THIS SUBROUTINE WAITS FOR THE TS05 INERRUPT OR DONE BIT TO SET AND ALLOWS THE
1791      ; OPERATOR TO TRANSFER CONTROL TO THE SUPERVISOR.
1792      ; UPON APPEARANCE OF THE INTERRUPT OR DONE, CHECK TSSR FOR STATUS ERRORS,
1793      ; LOG BYTES AND ERRORS AND PERFORM ERROR RECOVERY IF NESSASARY.
1794      ; INPUTS:
1795      ; OUTPUTS:
1796      ; REGISTERS:      R2, R3.
1797      ; CALLS:          DROPU, MOVMSG, RECUD, CHKERR, LOG, CLRERR.
1798
1799 012364 012767 177777 171044  GOWAIT:: MOV      #-1,TIME1 ;INIT TIME OUT COUNTER.
1800 012372      50103$: ;REPEAT ;REPEAT UNTIL INTERRUPT OCCURES:
1801 012372      BREAK   ;GO TO THE SUPER TO ALLOW TTY INPUT.
      ;
      TRAP      C$BRK
1802 012372 104422      1802 012374 026727 171020 102010  CMP      CMDWRD,#RWD   ;IF COMMAND WAS REWIND THEN:
1803 012402 001014      BNE     50104$
1804 012404      DELAY   10.      ;WAIT EXTRA MSECS EACH LOOP.
      ;
      MOV      #10.,(PC)+
      .WORD     0
      MOV      L$DLY,(PC)+
      .WORD     0
      DEC      -6(PC)
      BNE     -.4
      DEC      -22(PC)
      BNE     .-20
1805 012434      50104$:
1806 012434 026727 170760 105010  CMP      CMDWRD,#SFF   ;IF CMDWRD EQ #SFF OR CMDWRD EQ #SFR THEN
1807 012442 001404      BEQ     50105$
1808 012444 026727 170750 105410  CMP      CMDWRD,#SFR
1809 012452 001014      BNE     50106$
1810 012454      50105$:

```

```

1811 012454          DELAY 12.          ;ADD DELAY FOR SPACE TAPE MARK COMMANDS
      012454 012727 000014          MOV #12.,(PC)+
      012460 000000          .WORD 0
      012462 016727 167430          MOV L$DLY,(PC)+
      012466 000000          .WORD 0
      012470 005367 177772          DEC -6(PC)
      012474 001375          BNE .-4
      012476 005367 177756          DEC -22(PC)
      012502 001367          BNE .-20
1812 012504          50106$:
1813 012504 105767 167502          TSTB DINT          ;IF INTERRUPTS ARE ENABLED.
1814 012510 001003          BNE 50107$
1815 012512 016502 003472          MOV INTFLG(R5),R2 ;FETCH INTERRUPT OCCURRED FLAG.
1816
1817 012516 000406          BR 50110$
1818 012520          50107$:
1819 012520 012703 000200          MOV #TS.SSR,R3 ;SET UP A MASK FOR THE DONE BIT.
1820 012524 005103          COM R3
1821 012526 017502 002524          MOV @TSSR(R5),R2 ;FETCH DONE BIT.
1822 012532 040302          BIC R3,R2
1823
1824 012534          50110$:
1825 012534 005367 170676          DEC TIME1 ;UPDATE TIMEOUT COUNTER.
1826 012540 005702          TST R2 ;REPEAT UNTIL INTERRUPT OR READY OCCURES.
1827 012542 001003          BNE 50111$
1828 012544 005767 170666          TST TIME1
1829 012550 001310          BNE 50103$
1830 012552          50111$:
1831 012552 005767 170660          TST TIME1 ;IF TIME OUT HAS OCCURRED:
1832 012556 001022          BNE 50112$
1833 012560 016577 003376 170620          MOV RECCNT(R5),@DATAWT
1834 012566 005377 170614          DEC @DATAWT
1835 012572 004767 000136          JSR PC,MOVMSG ;MOVE CURRENT MSG PACKET TO COMMON AREA.
1836 012576          ERRDF 4,NOINTM,STAERM ;REPORT NO INTERRUPT.
      012576 104455          TRAP C$ERDF
      012600 000004          .WORD 4
      012602 004670          .WORD NOINTM
      012604 006120          .WORD STAERM
1837 012606 004767 004366          JSR PC,DROPU ;DROP THE UNIT.
1838 012612 012703 003472          MOV #ENDERF,R3 ;LET R3 := #ENDERF
1839 012616 004767 000042          JSR PC,CLRERR ;CLEAR ALL ERROR FLAGS
1840
1841 012622 000417          BR 50113$
1842 012624          50112$:
1843 012624 004767 000104          JSR PC,MOVMSG ;MOVE CURRENT MSG. PACKET TO COMMON AREA.
1844 012630 004767 000164          JSR PC,RECU ;UPDATE THE RECORD COUNT.
1845 012634 004767 000350          JSR PC,CHKERR ;CHECK FOR STATUS ERRORS.
1846 012640 105767 170617          TSTB WRTYFG ;IFB WRTYFG EQ #0 THEN
1847 012644 001006          BNE 50114$
1848 012646 004767 002714          JSR PC,LOG ;LOG BYTES AND ERRORS.
1849 012652 012703 003472          MOV #ENDERF,R3 ;LET R3 := #ENDERF
1850 012656 004767 000002          JSR PC,CLRERR ;CLEAR ALL ERROR FLAGS
1851
1852 012662          50114$:
1853
1854 012662          50113$:
1855 012662 000207          RTS PC ;RETURN IF DONE.

```

```

1856
1857 ; SUBROUTINE TO CLEAR FLAGS.
1858 ; INPUTS: R3 = LWA TO BE CLEARED * 2.
1859 ; OUTPUTS:
1860 ; REGISTERS: R2
1861 ; CALLS:
1862
1863 012664 012702 003460 CLRERR:: MOV @BGNFLG,R2 ;LET R2 := @BGNFLG
1864 012670 50115$: ;REPEAT
1865 012670 005022 CLR (R2)+ ;LET (R2)+ := #0
1866 012672 020203 CMP R2,R3 ;UNTIL R2 EQ R3
1867 012674 001375 BNE 50115$
1868 012676 000207 RTS PC
1869
1870
1871 ; SUBROUTINE TO WAIT UNTIL CURRENT UNIT IS READY OR UNTIL TIME OUT.
1872 ; INPUTS:
1873 ; OUTPUTS:
1874 ; REGISTERS:
1875 ; CALLS:
1876
1877 012700 WSSR::
1878 012700 012767 177777 170530 MOV #-1,TIME1 ;INIT TIMEOUT COUNTER.
1879 012706 50116$: ;REPEAT UNTIL DEV READY OR TIMEOUT:
1880 012706 BREAK ;BREAK TO THE SUPERVISOR. TRAP C#BRK
1881 012710 005367 170522 DEC TIME1 ;UPDATE TIMEOUT COUNTER.
1882 012714 032775 000200 002524 BIT @TS.SSR,@TSSR(R5) ;UNTIL @TS.SSR SET IN @TSSR(R5) OR TIME1 EQ #0
1883 012722 001003 BNE 50117$
1884 012724 005767 170506 TST TIME1
1885 012730 001366 BNE 50116$
1886 012732 50117$:
1887 012732 000207 RTS PC ;RETURN.
1888
1889
1890
1891 ; SUBROUTINE TO MOVE THE CURRENT MESSAGE PACKET TO THE COMMON AREA AND
1892 ; TO UPDATE THE CURRENT TERMINATION CLASS CODE.
1893 ; INPUTS:
1894 ; OUTPUTS:
1895 ; REGISTERS: R2, R3.
1896 ; CALLS:
1897
1898 012734 017567 002524 170512 MOVMSG:: MOV @TSSR(R5),TSSREG ;FREEZE THE STATUS REG CONTENTS
1899 012742 016702 170506 MOV TSSREG,R2 ;EXTRACT THE TERMINATION CLASS CODE.
1900 012746 042702 177761 BIC @TSC.TCC,R2
1901 012752 010267 170472 MOV R2,CTCC ;AND SAVE IT
1902 012756 006267 170466 ASR CTCC
1903 012762 016503 002544 MOV MSGPKA(R5),R3 ;ADR OF THIS DEVICE'S MSG.
1904 012766 005002 CLR R2 ;CLR COUNTER.
1905 012770 50120$:
1906 012770 020227 000020 CMP R2,#MSGCNT ;WHILE THERE ARE MORE LOCATIONS:
1907 012774 001405 BEQ 50121$
1908 012776 012362 002354 MOV (R3)+,MSGPKT(R2) ;MOVE MSG TO COMMON AREA.
1909 013002 062702 000002 ADD #2,R2 ;UPDATE COUNTER.
1910
1911 013006 000770 BR 50120$

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1912 013010
1913 013010 016767 167346 170464
1914 013016 000207
1915
1916
1917
1918
1919
1920
1921
1922 013020 105767 170441
1923 013024 001070
1924 013026 005365 003376
1925 013032 032767 000001 170410
1926 013040 001057
1927 013042 032767 100000 167316
1928 013050 001453
1929 013052 105267 170407
1930 013056 026727 170336 102010
1931 013064 001003
1932 013066 005065 003376
1933
1934 013072 000442
1935 013074
1936 013074 032767 004000 170316
1937 013102 001436
1938 013104 032767 000400 170306
1939 013112 001007
1940 013114 032767 000400 170302
1941 013122 001002
1942 013124 005265 003376
1943
1944 013130
1945
1946 013130 000423
1947 013132
1948 013132 032767 000400 170264
1949 013140 001417
1950 013142 032765 000002 003502
1951 013150 001013
1952 013152 105767 170313
1953 013156 001406
1954 013160 105767 170332
1955 013164 001403
1956 013166 105767 170273
1957 013172 001002
1958 013174 005365 003376
1959 013200
1960
1961 013200
1962
1963 013200
1964
1965 013200
1966
1967
1968 013200

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50121$:
MOV MSGPKT+MS.XSO,EOTFLG ;MOVE XSTATO TO EOT FLAG.
RTS PC
;
; SUBROUTINE TO ADJUST THE RECORD COUNT.
; INPUTS:
; OUTPUTS:
; REGISTERS:
; CALLS:
RECUD:: TSTB RECLOG ;IF RECORD HAS NOT BEEN LOGGED:
BNE 50122$
DEC RECCNT(R5) ;LET RECCNT(R5) := RECCNT(R5) - #1
BIT #BITO,CTCC ;IF TAPE MOVED
BNE 50123$
BIT #X2.OPM,MSGPKT+MS.XS2
BEQ 50123$
INCB RECLOG ;SET RECORD LOGGED.
CMP CMDWRD,#RWD ;IF THIS IS A REWIND CMD:
BNE 50124$
CLR RECCNT(R5) ;CLEAR RECORD COUNT.
BR 50125$
50124$:
BIT #BRF.C,CMDWRD ;IF BRF USED, UPDATE RECORD COUNT.
BEQ 50126$
BIT #MOD.CO,CMDWRD ;IF A FORWARD CMD:
BNE 50127$
BIT #MOD.CO,PCMDWD ;IF PREV CMD WAS A FWD ALSO:
BNE 50130$
INC RECCNT(R5) ;INCREMENT RECORD COUNT.
50130$:
;IF REVERSE CMD:
BR 50131$
50127$:
BIT #MOD.CO,PCMDWD ;IF PREVIOUS CMD WAS A REV ALSO:
BEQ 50132$
BIT #XO.BOT,EOTFLG(R5) ;WHEN NOT AT BOT THEN
BNE 50133$
TSTB ERRREC ;CHECK THE ERROR RETRY INDICATOR
BEQ 2$ ;BR, IF WE ARE NOT NOW IN ERROR RETRY
TSTB VFYFLG ;CHECK THE WRITE VERIFY INDICATOR
BEQ 2$ ;BR, IF WE ARE NOT IN WRT/VFY MODE
TSTB RECLOG ;CHECK IF THIS RECORD HAS BEEN COUNTED
BNE 10$ ;BR, IF HAVE ALREADY BUMPED RECORD CNTR.
DEC RECCNT(R5) ;DECREMENT RECORD COUNT.
2$:
10$:
50133$:
50132$:
50131$:
50126$:

```

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1969
1970 013200          50125$:
1971
1972 013200          50123$:
1973 013200 016577 003376 170200      MOV      RECCNT(R5),@DATAWT      ;LET @DATAWT := RECCNT(R5)
1974
1975 013206          50122$:
1976 013206 000207      RTS      PC                      ;RETURN.
1977
1978      :      THIS IS THE ERROR CHECK SUBROUTINE. AFTER INTERRUPT THIS
1979      :      SUBROUTINE IS CALLED TO CHECK THE TS05 STATUS.
1980      :      IF SPECIAL COND IS SET THEN THE TCC HANDLING SUBROUTINE IS ENTERED.
1981      :      IF THE RFC IS NON ZERO FOR A COMMAND REQUIRING A BPCR,
1982      :      THEN AN ERROR RFC IS REPORTED.
1983      :      INPUTS:
1984      :      OUTPUTS:
1985      :      REGISTERS:      R2, R4.
1986      :      CALLS:          TCC0-TCC7.
1987
1988 013210 032767 100000 170236  CHKERR:: BIT      @TS.SC,TSSREG      ;IF SPECIAL COND STATUS IS SET THEN:
1989 013216 001441          BEQ      50134$
1990 013220 026727 170224 000002      CMP      CTCC,#2          ;IF TCC IS NOT 2 THEN:
1991 013226 001405          BEQ      50135$
1992 013230 105767 170235          TSTB     ERRREC          ;IF NOT IN ERROR RECOVERY:
1993 013234 001002          BNE      50136$
1994 013236 005265 003336          INC      SCCNT(R5)      ;INC SC COUNTER.
1995
1996 013242          50136$:
1997
1998 013242          50135$:
1999 013242 032767 004000 170204      BIT      @TS.NXM,TSSREG      ;WHEN NON-EXISTANT MEMO
2000 013250 001004          BNE      50137$
2001 013252 032767 040000 170174      BIT      @TS.UPE,TSSREG
2002 013260 001412          BEQ      50140$
2003 013262          50137$:
2004 013262 032767 100000 167076      BIT      @X2.OPM,MSGPKT+MS.XS2 ;AND TAPE NOT MOVED
2005 013270 001003          BNE      50141$
2006 013272 012702 000005          MOV      #5,R2          ;SET TCC5 INDEX
2007
2008 013276 000402          BR      50142$
2009 013300          50141$:
2010 013300 012702 000004          MOV      #4,R2          ;TAPE MOVED, SET TCC4 INDEX
2011
2012 013304          50142$:
2013
2014 013304 000402          BR      50143$
2015 013306          50140$:
2016 013306 016702 170136          MOV      CTCC,R2          ;SET DETECTED TCC INDEX
2017
2018 013312          50143$:
2019 013312 006302          ASL      R2              ;CURRENT TCC X 2.
2020 013314 004772 013414          JSR      PC,@TCCRA(R2)    ;GO TO THE TCC HANDLING SUBROUTINE.
2021
2022 013320 000426          BR      50144$
2023 013322          50134$:
2024 013322 032767 004000 170070      BIT      @BRF.C,CMDWRD    ;IF BRF IS USED IN THIS CMD THEN:
2025 013330 001422          BEQ      50145$

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2026 013332 005767 167022          TST      MSGPKT+MS,RFC          ;IF THERE IS AN RFC THEN:
2027 013336 001417                    BEQ      50146$
2028 013340 105767 170151          TSTB     RANDOM                ;IFB RANDOM EQ #0 ORB VFYFLG NE #0 THEN
2029 013344 001403                    BEQ      50147$
2030 013346 105767 170144          TSTB     VFYFLG
2031 013352 001411                    BEQ      50150$
2032 013354                    50147$:
2033
2034 013354 105767 170141          TSTB     IRE                    ;IF NOT IN RANDOM OR IF CMD IS WTV:
2035 013360 001006                    BNE      50151$                ;IF RFC ERROR REPORTS ARE ALLOWED:
2036 013362 005265 003356          INC      HRDCNT(R5)            ;UPDATE HARD ERROR COUNT
2037 013366                    ERRHRD   13,RFCERM,STAERM      ;REPORT RFC ERROR
                                TRAP      C$ERHRD
                                .WORD     13
                                .WORD     RFCERM
                                .WORD     STAERM
2038
2039 013376                    50151$:
2040
2041 013376                    50150$:
2042
2043 013376                    50146$:
2044
2045 013376                    50145$:
2046
2047 013376                    50144$:
2048 013376 105767 170065          TSTB     RWERR                  ;IF A READ/WRITE ERROR HAS OCCURRED THEN:
2049 013402 001403                    BEQ      50152$
2050 013404 016767 170012 166716  MOV      CMD$AV,CMD$PKT        ;RESTORE CMD PACKET AFTER ERROR RECOV.
2051
2052 013412                    50152$:
2053 013412 000207                    RTS      PC                      ;RETURN.
2054
2055 ;      ADDRESSES OF TCC HANDLING ROUTINES FOR TERMINATION CLASS CODES 0 - 7.
2056
2057 013414 013434          TCCRA:  TCC0
2058 013416 013452          TCC1
2059 013420 013470          TCC2
2060 013422 013600          TCC3
2061 013424 013616          TCC4
2062 013426 014232          TCC5
2063 013430 014330          TCC6
2064 013432 014472          TCC7
2065
2066 ;      SUBROUTINE TO HANDLE TERMINATION CLASS CODE 0, UNDEFINED SPECIAL
2067 ;      CONDITION ERROR.
2068 ;      INPUTS:
2069 ;      OUTPUTS:
2070 ;      REGISTERS:
2071 ;      CALLS:
2072
2073 013434 005265 003356          TCC0::  INC      HRDCNT(R5)            ;UPDATE HARD ERROR COUNT.
2074 013440                    ERRHRD   5,SCERM,STAERM      ;REPORT SPECIAL CONDITION ERROR.
                                TRAP      C$ERHRD
                                .WORD     5
                                .WORD     SCERM
                                .WORD     STAERM

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2075 013450 000207          RTS PC          ;RETURN.
2076
2077
2078          ;          SUBROUTINE TO HANDLE TERMINATION CLASS CODE 1, ATTENTION CONDITION.
2079          ;          THIS TCC INDICATES THAT THE DRIVE HAS UNDERGONE A STATUS CHANGE
2080          ;          SUCH AS GOING OFFLINE OR COMING ONLINE.
2081          ;          INPUTS:
2082          ;          OUTPUTS:
2083          ;          REGISTERS:      R2,R4
2084          ;          CALLS:          DROPU
2085
2086 013452          TCC1::  ERRDF  6,ATTNM,STAERM          ;REPORT ATTENTION-UNIT OFF LINE.
          013452 104455          TRAP  C$ERDF
          013454 000006          .WORD  6
          013456 004603          .WORD  ATTNM
          013460 006120          .WORD  STAERM
2087 013462 004767 003512    JSR  PC,DROPU          ;DROP THE UNIT.
2088 013466 000207          RTS  PC          ;RETURN.
2089
2090          ;          SUBROUTINE TO HANDLE TERMINATION CLASS CODE 2, TAPE STATUS ALERT.
2091          ;          A STATUS CONDITION HAS BEEN ENCOUNTERED THAT MAY HAVE SIGNIFICANCE
2092          ;          TO THE PROGRAM. BITS OF INTEREST INCLUDE TMK, RLS, LET, RLL, BOT, EOT.
2093          ;          INPUTS:
2094          ;          OUTPUTS:
2095          ;          REGISTERS:
2096          ;          CALLS:
2097
2098 013470 032767 000002 166664  TCC2::  BIT  #X0.BOT,MSGPKT*MS.XSO
2099 013476 001404          BEQ  50153$
2100 013500 105767 170010    TSTB EXPBOT
2101 013504 001401          BEQ  50153$
2102
2103 013506 000433          BR   TC2RTN          ;IF AT BOT AND BOT IS EXPECTED:
2104
2105 013510          50153$:
2106 013510 032767 170002 166644  BIT  #X0.RLS!X0.RLL!X0.TMK!X0.LET!X0.BOT,MSGPKT*MS.XSO
2107
2108          ;IF #X0.RLS!X0.RLL!X0.TMK!X0.LET!X0.BOT SETIN MSGPKT*MS.XSO THEN
2109 013516 001427          BEQ  50154$
2110
2111 013520 105767 167771    TSTB RANDOM          ;IF TCC2 CAUSED BY ANYTHING BUT EOT:
2112 013524 001403          BEQ  50155$          ;IFB RANDOM EQ #0 ORB VFYFLG NE #0 THEN
2113 013526 105767 167764    TSTB VFYFLG
2114 013532 001421          BEQ  50156$
2115 013534          50155$:
2116
2117 013534 105767 167761    TSTB IRE          ;IF NOT IN RANDOM OR IF CMD IS WTV:
2118 013540 001016          BNE  50157$          ;IF RFC ERROR REPORTS ARE ALLOWED:
2119 013542 105767 167723    TSTB ERRREC          ;IF WE ARE IN ERROR RECOVERY THEN:
2120 013546 001403          BEQ  50160$
2121 013550 105267 167714    INCB UNREC          ;SET UNRECOVERABLE FLAG FOR LOG.
2122
2123 013554 000402          BR   50161$          ;ELSE - IF NOT IN ERROR RECOVERY:
2124 013556          50160$:
2125 013556 005265 003336    INC  SCCNT(R5)          ;INCREMENT THE SPEC COND COUNTER.
2126
2127 013562          50161$:

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2128 013562 005265 003356      INC      HRDCNT(R5)      ;UPDATE HARD ERROR COUNT.
2129 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

2130
2131 013576      501574:
2132
2133 013576      501564:
2134
2135 013576      501544:
2136
2137 013576 000207      TC2RTN:  RTS   PC      ;RETURN.
2138
2139
2140      ;      SUBROUTINE TO HANDLE TERMINATION CLASS CODE 3, FUNCTION REJECT.
2141      ;      THE SPECIFIED FUNCTION WAS NOT INITIATED. BITS OF INTEREST ARE
2142      ;      RMR, OFL, VCK, BOT, ILC, WLE, ILA, AND NBA.
2143      ;      INPUTS:
2144      ;      OUTPUTS:
2145      ;      REGISTERS:      R2,R4
2146      ;      CALLS:      DROPU
2147
2148 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

2149 013610 004767 003364      JSR      PC,DROPU      ;DROP THE UNIT.
2150 013614 000207      RTS      PC      ;RETURN.
2151
2152      ;      SUBROUTINE TO HANDLE TERMINATION CLASS CODE 4, RECOVERABLE ERROR.
2153      ;      TAPE POSITION IS ONE RECORD BEYOND WHAT ITS POSITION WAS WHEN
2154      ;      THE FUNCTION WAS INITIATED. RECOVERY PROCEDURE IS TO LOG THE
2155      ;      ERROR AND ISSUE THE APPROPRIATE RETRY COMMAND.
2156      ;      2 WRITE-ERROR-RECOVERY ALGORITHMS CAN BE SELECTED:
2157      ;      THE FIRST ONE, VIA BADTSW SWITCH, DOES DETECT BAD SPOTS ON TAPE.
2158      ;      IT CALLS A WRITE RETRY SUBR UNTIL THE RECORD IS RECOVERED
2159      ;      OR 20 BAD SPOTS HAVE BEEN LOGGED. ON REACHING 20 BAD
2160      ;      SPOTS LOGGED, A BAD TAPE OVERFLOW MSG IS PRINTED AND THE
2161      ;      UNIT DROPPED.
2162      ;      THE SECOND ALGORITHM ISSUES THE TS05 WRITE RETRY COMMAND
2163      ;      UP TO 16 TIMES BEFORE DROPPING THE UNIT OR PROCEEDING
2164      ;      WITH THE NEXT RECORD ON RECOVERY.
2165      ;      INPUTS:
2166      ;      OUTPUTS:
2167      ;      REGISTERS:      R2,R4.
2168      ;      CALLS:      RTLE, EXCUTE, GOWAIT, DROPU, WRTY
2169
2170 013616 026727 167604 000002 TCC4::  CMP      CMDLG,#2      ;IF CMDLG EQ #2 ANDB BADTSW NE #0 THEN
2171 013624 001125      BNE      501624
2172 013626 105767 166356      TSTB    BADTSW
2173 013632 001522      BEQ      501624
2174 013634 105767 167631      TSTB    ERRREC      ;IFB ERRREC EQ #0 ANDB ERCVER NE #0 THEN
2175 013640 001007      BNE      501634
2176 013642 105767 166341      TSTB    ERCVER

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2177 013646 001404 BEQ 50163$
2178 013650 ERRSOFT 9,RERM,STAERM ;
      013650 104457 TRAP C$ERSOFT
      013652 000011 .WORD 9
      013654 005017 .WORD RERM
      013656 006120 .WORD STAERM

2179
2180 013660 50163$:
2181 013660 105767 166327 TSTB IREC ;IFB IREC EQ #0 THEN
2182 013664 001102 BNE 50164$
2183 013666 105267 167577 INCB ERRREC ;RETRY FLAG FOR EXECUTE SUBR: DON'T UPDATE REC CN
2184 013672 105267 167566 INCB WRTYER ;REWRITE ERROR FLAG FOR WRTY SUBR
2185 013676 105767 167561 TSTB WRTYFG ;FIRST RETRY ON THIS RECORD: SUBSEQUENT
2186 013702 001072 BNE 50165$
2187 ;RETRIES WITH TCC4 ERRORS BY-PASS THIS SECTION
2188 013704 016767 167510 001174 MOV CMDWRD,WTYWRD ;SAVE WRITE COMMAND PACKET
2189 013712 016767 166412 001164 MOV CNDPKT,WTYCMD
2190 013720 016767 166412 001162 MOV CNDPKT*CP.CNT,WTYBRF
2191 013726 105267 167535 INCB RWERR ;LOG SUBR FLAG: COUNT WRT ERRORS
2192 013732 105267 167525 INCB WRTYFG ;RETRY IN PROGRESS FLAG
2193
2194 013736 50166$: ;REPEAT
2195 013736 005265 003316 INC WRTYCT(R5) ;COUNT GLOBAL WRITE RETRIES
2196 013742 005067 167512 CLR RETRYC ;CLEAR # OF RETRIES PER RECORD
2197 013746 105067 167510 CLRB RPTCNT ;CLEAR # OF REPEATS
2198 013752 004767 000660 JSR PC,WRTY ;CALL WRITE RETRY
2199 013756 105767 167502 TSTB WRTYER ;REPEAT RETRIES ON SAME RECORD
2200 013762 001404 BEQ 50167$
2201 013764 027727 167522 000050 CMP #BTPT,#40.
2202 013772 103761 BLO 50166$
2203 013774 50167$:
2204 ;UNTIL RECOVERED OR 20 BAD SPOTS
2205 013774 027727 167512 000050 CMP #BTPT,#40. ;WHEN 20 BAD SPOTS LOGGED
2206 014002 103423 BLO 50170$
2207 014004 PRINTB #BTMSG2 ;PRINT BAD TAPE OVERFLOW MSG
      014004 012746 015177 MOV #BTMSG2,-(SP)
      014010 012746 000001 MOV #1,-(SP)
      014014 010600 MOV SP,RO
      014016 104414 TRAP C$PNTB
      014020 062706 000004 ADD #4,SP
2208 014024 004767 001266 JSR PC,BORERS ;ERASE BAD RECORD
2209 014030 005365 003376 DEC RECCNT(R5)
2210 014034 004767 003140 JSR PC,DROPU ;DROP UNIT
2211 014040 005065 003376 CLR RECCNT(R5)
2212 014044 012775 002350 002514 MOV #RWCPK,#TSDB(R5) ;REWIND UNIT
2213
2214 014052 50170$:
2215 014052 105067 167405 CLRB WRTYFG ;RETRY COMPLETE FLAG
2216 014056 105267 167447 INCB MISCFG ;DO NOT HALT ON THIS CMD FLG
2217 014062 016767 001020 167334 MOV WTYWRD,PCMDWD ;RESTORE ORIGINAL WRT CMD AFTER RECOVERY
2218
2219 014070 50165$:
2220
2221 014070 000402 BR 50171$
2222 014072 50164$:
2223 014072 105267 167372 INCB UNREC ;LET UNREC :B= UNREC + #1 ;
2224

```

```

2225 014076          50171$:
2226
2227 014076 000454          BR      50172$
2228 014100          50162$:
2229 014100 004767 000404          JSR      PC,RTLE          ;CHECK FOR RETRY LIMIT EXCEEDED.
2230 014104 026727 167316 000002          CMP      CMDLG,#2          ;IF READ CMD THEN:
2231 014112 003411          BLE      50173$
2232 014114 012702 000020          MOV      @RRECL,R2          ;R2=READ RETRY COUNT LIMIT / 2
2233 014120 006202          ASR      R2
2234 014122 026702 167332          CMP      RETRYC,R2          ;IF RETRY COUNT IS MORE THAN HALF LIMIT:
2235 014126 002403          BLT      50174$
2236 014130 052767 020000 166172          BIS      @OPP.C,CMDPKT          ;SET OPPOSITE BIT FOR RETRY2.
2237
2238 014136          50174$:
2239
2240 014136          50173$:
2241 014136 005767 167316          TST      RETRYC          ;IF THIS IS THE ORIGINAL ERROR THEN:
2242 014142 001007          BNE      50175$
2243 014144 105767 166037          TSTB     ERVER
2244 014150 001404          BEQ      50175$
2245 014152          ERRSOFT 9,RERM,STAERM          ;REPORT RECOVERABLE ERROR
2246
2247 014152 104457          TRAP     C$ERSOFT
2248 014154 000011          .WORD   9
2249 014156 005017          .WORD   RERM
2250 014160 006120          .WORD   STAERM
2251
2252
2253
2254
2255
2256
2257
2258
2259
2260
2261
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2277

```

; PROVIDED OPERATOR HAS ENABLED THE REPORT
; UPDATE RETRY COUNT.
; SET RETRY BIT IN CMD PACKET.
; IF ERROR RECOVERY ENABLED:
; SET ERROR RECOVERY FLAG.
; POP 2 RTN ADRS FROM STACK.
; GO EXECUTE THE RETRY COMMAND.
; GO WAIT FOR INTERRUPT * CHECK STATUS.
; ELSE IF ERROR RECOVERY IS NOT ENABLED:

```

2246 014162          50175$:
2247 014162 005267 167272          INC      RETRYC          ;UPDATE RETRY COUNT.
2248 014166 052767 001000 166134          BIS      @MOD.C1,CMDPKT          ;SET RETRY BIT IN CMD PACKET.
2249 014174 105767 166013          TSTB     IREC          ;IF ERROR RECOVERY ENABLED:
2250 014200 001011          BNE      50176$
2251 014202 105267 167263          INCB     ERRREC          ;SET ERROR RECOVERY FLAG.
2252 014206 012602          MOV      (SP)+,R2          ;POP 2 RTN ADRS FROM STACK.
2253 014210 012602          MOV      (SP)+,R2
2254 014212 004767 175636          JSR      PC,EXCUTE
2255 014216 000167 176142          JMP      GOWAIT          ;GO EXECUTE THE RETRY COMMAND.
2256
2257
2258 014222 000402          BR      50177$          ;GO WAIT FOR INTERRUPT * CHECK STATUS.
2259 014224          50176$:
2260 014224 105267 167240          INCB     UNREC          ;SET UNRECOVERABLE ERROR FLAG.
2261
2262 014230          50177$:
2263
2264 014230          50172$:
2265 014230 000207          RTS      PC          ;RETURN
2266
2267
2268
2269
2270
2271
2272
2273
2274
2275 014232 004767 000252          TCC5:: JSR      PC,RTLE          ;CHECK FOR RETRY LIMIT EXCEEDED
2276 014236 005767 167216          TST      RETRYC          ;IF THIS IS THE ORIGINAL ERROR THEN:
2277 014242 001004          BNE      50200$

```

; SUBROUTINE TO HANDLE TERMINATION CLASS CODE 5, RECOVERABLE ERROR.
; TAPE POSITION HAS NOT CHANGED. RECOVERY PROCEDURE IS TO LOG THE
; ERROR AND RE-ISSUE THE ORIGINAL COMMAND.
; INPUTS:
; OUTPUTS:
; REGISTERS: R2,R4.
; CALLS: RTLE, EXCUTE, GOWAIT, DROPUP.

```

2278 014244 ERRSFT 10,RERM,STAERM ;REPORT RECOVERABLE ERROR.
      014244 104457 TRAP C$ERSFT
      014246 000012 .WORD 10
      014250 005017 .WORD RERM
      014252 006120 .WORD STAERM
2279 014254 50200$:
2280 014254 005267 167200 INC RETRYC ;UPDATE RETRY COUNTER.
2281 014260 105767 165727 TSTB IREC ;IF ERROR RECOVERY IS ENABLED:
2282 014264 001016 BNE 50201$
2283 014266 105267 167177 INCB ERRREC ;SET ERROR RECOVERY FLAG.
2284 014272 005265 003376 INC RECNT(R5) ;UPDATE REC COUNT
2285 014276 016577 003376 167102 MOV RECNT(R5),@DATAWT ;AND INSERT IT INTO WRT BFR
2286 014304 012602 MOV (SP)+,R2 ;POP 2 RTN ADRS FROM STACK.
2287 014306 012602 MOV (SP)+,R2
2288 014310 004767 175540 JSR PC,EXCUTE ;GO RE-ISSUE THE COMMAND.
2289 014314 000167 176044 JMP GOWAIT ;GO WAIT FOR INTERRUPT + CHECK STATUS.
2290 ;ELSE IF ERROR RECOVERY IS NOT ENABLED:
2291 014320 000402 BR 50202$
2292 014322 50201$:
2293 014322 105267 167142 INCB UNREC ;SET UNRECOVERABLE ERROR FLAG.
2294
2295 014326 50202$:
2296 014326 000207 RTS PC ;RETURN.
2297
2298
2299 ; SUBROUTINE TO HANDLE TERMINATION CLASS CODE 6, UNRECOVERABLE ERROR.
2300 ; TAPE POSITION HAS BEEN LOST. THE ONLY VALID RECOVERY PROCEDURE
2301 ; IS TO REWIND AND START OVER AT BOT UNLESS THE TAPE HAS LABELS OR
2302 ; SEQUENCE NUMBERS. THIS DIAGNOSTIC WILL REWIND AND RETRY THE
2303 ; COMMAND ONLY IF DENSITY CHECK IS SET, OTHERWISE THE UNIT WILL BE
2304 ; DROPPED FROM THE TEST SEQUENCE.
2305 ; INPUTS:
2306 ; OUTPUTS:
2307 ; REGISTERS: R2, R4
2308 ; CALLS: RTLE, WSSR, EXCUTE, GOWAIT, DROPU
2309
2310 014330 036767 163454 166032 TCC6:: BIT X3.DCK,MSGPKT+MS.XS3;IF X3.DCK NOTSETIN MSGPKT+MS.XS3 THEN
2311 014336 001016 BNE 50203$
2312 ;IF THERE IS NO DENSITY CHECK THEN:
2313 014340 005767 167062 TST CMDLG ;IF CMD IS A READ OR WRITE THEN:
2314 014344 001404 BEQ 50204$
2315 014346 105267 167115 INCB RWERR ;SET RD/WR ERROR FLAG.
2316 014352 105267 167112 INCB UNREC ;SET UNRECOVERABLE ERROR FLAG.
2317
2318 014356 50204$:
2319 014356 ERRDF 11,URERM,STAERM ;REPORT UNRECOVERABLE ERROR.
      014356 104455 TRAP C$ERDF
      014360 000013 .WORD 11
      014362 005041 .WORD URERM
      014364 006120 .WORD STAERM
2320 014366 004767 002606 JSR PC,DROPU ;REPORT ERROR + DROP UNIT.
2321 ;ELSE-IF THERE IS DENSITY CHECK:
2322 014372 000436 BR 50205$
2323 014374 50203$:
2324 014374 004767 000110 JSR PC,RTLE ;CHECK FOR RETRY LIMIT EXCEEDED.
2325 014400 005767 167054 TST RETRYC ;IF THIS IS THE ORIGINAL ERROR THEN:
2326 014404 001004 BNE 50206$

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2327 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

2328
2329 014416 50206$:
2330 014416 005267 167036 INC RETRYC ;UPDATE RETRY COUNT.
2331 014422 105767 167073 TSTB IRE ;IF ERROR RECOVERY IS ENABLED THEN:
2332 014426 001016 BNE 50207$
2333 014430 105267 167035 INCB ERRREC ;SET ERROR RECOVERY FLAG,
2334 014434 012775 002350 002514 MOV @RWCPK,@TSDB(R5) ;ISSUE A REWIND COMMAND,
2335 014442 004767 176232 JSR PC,WSSR ;WAIT FOR SUBSYSTEM READY,
2336 014446 012602 MOV (SP)+,R2 ;POP 2 RTN ADRS FROM STACK.
2337 014450 012602 MOV (SP)+,R2
2338 014452 004767 175376 JSR PC,EXCUTE ;REISSUE THE COMMAND,
2339 014456 000167 175702 JMP GOWAIT ;WAIT FOR INTERRUPT
2340 ;ELSE-IF ERR REC DISABLED:
2341 014462 000402 BR 50210$
2342 014464 50207$:
2343 014464 105267 167000 INCB UNREC ;SET UNRECOVERABLE ERROR FLAG.
2344
2345 014470 50210$:
2346
2347 014470 50205$:
2348 014470 000207 RTS PC ;RETURN
2349
2350 ;
2351 ; SUBROUTINE TO HANDLE TERMINATION CLASS CODE 7, FATAL SUBSYSTEM
2352 ; ERROR. THE SUBSYSTEM IS INCAPABLE OF PROPERLY PERFORMING
2353 ; COMMANDS OR AT LEAST ITS INTEGRITY IS SERIOUSLY QUESTIONABLE.
2354 ; REFER TO THE FATAL CLASS CODE FIELD IN THE TSSR REGISTER FOR
2355 ; ADDITIONAL INFORMATION ON THE TYPE OF FATAL ERROR.
2356 ;
2357 ; INPUTS:
2358 ;
2359 ; OUTPUTS:
2360 ;
2361 ; REGISTERS: R2, R4
2362 ;
2363 ; CALLS:
2364
2365 TCC7:: ERRDF 12,FATSM,STAERM ;REPORT FATAL SUBSYSTEM ERROR.
      014472 104455 TRAP C$ERDF
      014474 000014 .WORD 12
      014476 004642 .WORD FATSM
      014500 006120 .WORD STAERM
2361 014502 004767 002472 JSR PC,DROPU ;DROP THE UNIT.
2362 014506 000207 RTS PC ;RETURN.
2363
2364
2365 ;
2366 ; SUBROUTINE TO CHECK FOR RETRY LIMIT EXCEEDED. PRINTS ERROR MESSAGE
2367 ; IF EXCEEDED AND DROP UNIT UNLESS COMMAND IS A READ.
2368 ;
2369 ; INPUTS:
2370 ;
2371 ; OUTPUTS:
2372 ;
2373 ; REGISTERS: R2, R4.
2374 ;
2375 ; CALLS: DROPU
2376
2377 RTLE:: TST CMDLG ;IF CMD IS NOT A READ OR WRITE THEN:
      014510 005767 166712 BNE 50211$
      014514 001010 ERRDF 11,URERM,STAERM ;REPORT UNRECOVERABLE ERROR.
      014516 104455 TRAP C$ERDF

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014520 000013 .WORD 11
014522 005041 .WORD URERM
014524 006120 .WORD STAERM
2375 014526 004767 002446 JSR PC,DROPU ;DROP THE UNIT.
2376 014532 012602 MOV (SP)+,R2 ;POP RTN ADRS FROM STACK.
2377 014534 000437 BR RTLRTN ;AND RETURN.
2378
2379 014536 50211$: INCB RWERR ;SET READ/WRITE ERROR FLAG.
2380 014536 105267 166725 CMP CMDLG,#2 ;IF CMD IS A WRT OR WTM:
2381 014542 026727 166660 000002 BNE 50212$
2382 014550 001016 CMP RETRYC,#WRECL ;IF RETRY COUNT HAS REACHED LIMIT:
2383 014552 026727 166702 000020 BNE 50213$
2384 014560 001011 INCB UNREC ;SET UNRECOVERABLE FLAG
2385 014562 105267 166702 ERRDF 14,RLEXM,STAERM ;REPORT RETRY LIMIT EXCEEDED.
2386 014566 104455 TRAP C$ERDF
014570 000016 .WORD 14
014572 004556 .WORD RLEXM
014574 006120 .WORD STAERM
2387 014576 004767 002376 JSR PC,DROPU ;DROP THE UNIT.
2388 014602 012602 MOV (SP)+,R2 ;POP 2 RTN ADRS FROM STACK.
2389 014604 50213$: ;ELSE - CMD IS A READ:
2390
2391 014604 000413 BR 50214$
2392 014606 50212$: CMP RETRYC,#RRECL ;IF RETRY COUNT HAS REACHED LIMIT:
2393 014606 026727 166646 000020 BNE 50215$
2394 014614 001007 INCB UNREC ;SET UNRECOVERABLE FLAG
2395 014616 105267 166646 ERRHRD 14,RLEXM,STAERM ;REPORT RECOVERABLE ERROR.
2396 014622 104456 TRAP C$ERHRD
014624 000016 .WORD 14
014626 004556 .WORD RLEXM
014630 006120 .WORD STAERM
2397 014632 012602 MOV (SP)+,R2 ;POP 2 RTN ADRS FROM STACK.
2398 014634 50215$:
2399
2400 014634 50214$:
2401 014634 000207 RTLRTN: RTS PC ;RETURN
2402
2403 ; SUBR TO REWRITE A BAD, BUT RECOVERABLE WRITTEN RECORD.
2404 ; REWRITE RECORD ON SAME SPOT: REPEAT 4 TIMES.
2405 ; IF ALL 4 REPEATS GOOD, RECORD IS RECOVERED
2406 ; AND A RECOVERABLE WRITE ERROR IS LOGGED.
2407 ; IF ANY OF 4 REPEATS BAD, ERASE BAD RECORD, LOG SUSPECTED
2408 ; BAD SPOT, RETRY AGAIN, RETRY 4 TIMES, UP TO 4 REPEATS EACH.
2409 ; IF RECORD NOT GOOD AFTER 4 RETRIES, ERASE IT, EXIT WITH
2410 ; ERROR FLAG WRTYER SET, PRINTING RETRY FAILED.
2411 ; THIS ALL SCHEME IS REENTERED 20 TIMES MAX, IE 20 BAD
2412 ; SPOTS MAX ARE ALLOWED.
2413 ;
2414 ; INPUTS:
2415 ; OUTPUTS:
2416 ; REGISTERS: R3,R4
2417 ; CALLS: BORERS, REWRT
2418
2419 014636 WRTY:: ;BEGIN RETRY ;REPEAT
2420

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2421 014636          50217$:
2422                ;BEGIN REPEAT                ;REPEAT
2423
2424 014636          50221$:
2425 014636 004767 000454      JSR      PC,BORERS      ;BACKSPACE/ERASE ONE RECORD
2426 014642 105067 166616      CLR      WRTYER        ;CLEAR WRITE RETRY ERROR
2427 014646 004767 000620      JSR      PC,REWRT      ;REWRITE RECORD ON SAME SPOT
2428 014652 105267 166604      INCB     RPTCNT        ;COUNT REPEATS
2429 014656 126727 166600 000004  CMPB     RPTCNT,#4     ;LIMIT: 4 REPEATS OR RECOVERED
2430 014664 001403                BEQ      50222$
2431 014666 105767 166572      TSTB     WRTYER
2432 014672 001761                BEQ      50221$
2433 014674
2434
2435 014674          50222$:
2436 014674 005267 166560      ;END REPEAT
2437 014700 105767 166560      50220$:
2438 014704 001001                INC      RETRYC        ;COUNT RETRIES
2439 014706 000457                TSTB     WRTYER
2440
2441 014710          50223$:
2442 014710 105767 165273      BNE     50223$
2443 014714 001415                PRINTB   #BTMSG1,RETRYC,<B,RPTCNT> ;PRINT SUSPECTED BAD SPOT
2444 014716
2445 014716 005046                CLR      -(SP)
2446 014720 156716 166536      BISB     RPTCNT,(SP)
2447 014724 016746 166530      MOV      RETRYC,-(SP)
2448 014730 012746 015112      MOV      #BTMSG1,-(SP)
2449 014734 012746 000003      MOV      #3,-(SP)
2450 014740 010600                MOV      SP,R0
2451 014742 104414                TRAP     C#PNTB
2452 014744 062706 000010      ADD      #10,SP
2453 014750          50225$:
2454 014750 026727 166504 000001  CMP      RETRYC,#1     ;ON FIRST RETRY, LOGG BAD SPOT
2455 014756 001021                BNE     50226$
2456 014760 016567 002616 166524  MOV      BTADDR(R5),BTPT ;BTPT IS BOTH THE BAD SPOT COUNTER
2457 014766 017704 166520      MOV      #BTPT,R4     ;AND THE LOGGING INDEX
2458 014772 062704 000002      ADD      #2,R4
2459 014776 010477 166510      MOV      R4,#BTPT
2460 015002 020427 000050      CMP      R4,#40       ;IF R4 LOS #40. THEN
2461 015006 101005                BHI     50227$
2462 015010 016703 166476      MOV      BTPT,R3     ;STORE FIRST 20 BAD SPOTS
2463 015014 060304                ADD     R3,R4         ;LET R4 := R4 + R3
2464 015016 016514 003376      MOV      RECCNT(R5),(R4) ;LET (R4) := RECCNT(R5)
2465
2466 015022          50227$:
2467
2468 015022          50226$:
2469 015022 105267 166477      INCB     ERSFLG        ;ERASE FLAG TO ERASE BAD RECORD
2470 015026 105067 166435      CLR      RWERR        ;CANCELL "LCG" ERROR FLAG ON FAILING RET
2471 015032 105067 166424      CLR      RPTCNT      ;CLEAR REPEAT COUNT FOR NEXT RETRY
2472
2473 015036          50224$:
2474 015036 026727 166416 000004  CMP      RETRYC,#4     ;LIMIT: 4 RETRIES
2475 015044 001274                BNE     50217$
2476
2477 015046          50216$:
2478

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2470 015046 105767 166412          TSTB  WRTYER ;IFB WRTYER NE #0 THEN
2471 015052 001413          BEQ   50230$
2472 015054 105767 165127          TSTB  ERCVER ;IFB ERCVER NE #0 THEN
2473 015060 001410          BEQ   50231$
2474 015062          PRINTB #BTMSG3          ;PRINT RETRY FAILED
      015062 012746 015247          MOV   #BTMSG3,-(SP)
      015066 012746 000001          MOV   #1,-(SP)
      015072 010600          MOV   SP,RO
      015074 104414          TRAP  C$PNTB
      015076 062706 000004          ADD   #4,SP

2475
2476 015102          50231$:
2477
2478 015102          50230$:
2479 015102 000207          RTS   PC
2480
2481 015104 000000          WTYCMD: .WORD 0          ;STORAGE FOR WRITE CMD WHILE RETRYING
2482 015106 000000          WTYWRD: .WORD 0          ;STORAGE FOR WRITE CMD WORD WHILE RETRYING
2483 015110 000000          WTYBRF: .WORD 0          ;STORAGE FOR WRITE BPCR WHILE RETRYING
2484
2485 015112          045          101          123          BTMSG1: .ASCIZ /#ASUSPECT BAD SPOT AFTER #D1#A RETRY, #D1#A REPEAT#N/
      015115          125          123          120
      015120          105          103          124
      015123          040          102          101
      015126          104          040          123
      015131          120          117          124
      015134          040          101          106
      015137          124          105          122
      015142          040          045          104
      015145          061          045          101
      015150          040          122          105
      015153          124          122          131
      015156          054          040          045
      015161          104          061          045
      015164          101          040          122
      015167          105          120          105
      015172          101          124          045
      015175          116          000
2486 015177          045          116          045          BTMSG2: .ASCIZ /#N#ABAD TAPE OVERFLOW: CHANGE TAPE!#N#N/
      015202          101          102          101
      015205          104          040          124
      015210          101          120          105
      015213          040          117          126
      015216          105          122          106
      015221          114          117          127
      015224          072          040          103
      015227          110          101          116
      015232          107          105          040
      015235          124          101          120
      015240          105          041          045
      015243          116          045          116
      015246          000
2487 015247          045          101          122          BTMSG3: .ASCIZ /#ARETRY FAILED ON BAD SPOT...ERASED!#N/
      015252          105          124          122
      015255          131          040          106
      015260          101          111          114
      015263          105          104          040

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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	
2488				.EVEN
2489				
2490				: SUBR TO BACSPACE ONE RECORD
2491				: IF THE ERASE FLAG IS SET, THEN ERASE THAT RECORD
2492				: INPUTS: ERSFLG 1 = DO ERASE
2493				: OUTPUTS:
2494				: REGISTERS:
2495				: CALLS: EXCUTE, GOWAIT, CKHAE
2496				
2497	015316	016767	166076	166100 BORERS:: MOV CMDWRD,PCMDWD ;SET COMMAND TO SPACE REV
2498	015324	012767	104410	166066 MOV @SRR,CMDWRD ;LET CMDWRD := @SRR ;
2499	015332	016767	166062	164770 MOV CMDWRD,CMDPKT ;LET CMDPKT := CMDWRD CLR.BY @BRF.C ;
2500	015340	042767	004000	164762 BIC @BRF.C,CMDPKT
2501	015346	016767	164756	166046 MOV CMDPKT,CMDSAV ;LET CMDSAV := CMDPKT ;
2502	015354	012767	000001	164750 MOV @1,CMDPKT*CP.ADL ;LET CMDPKT*CP.ADL := @1 ;
2503	015362	005067	166040	CLR CMDLG ;LET CMDLG := #0 ;
2504	015366	004767	173472	JSR PC,CMDAC ;
2505	015372	004767	174456	JSR PC,EXCUTE ;
2506	015376	004767	174762	JSR PC,GOWAIT ;
2507	015402	004767	002072	JSR PC,CKHAE ;
2508	015406	105767	166113	TSTB ERSFLG ;WHEN ERASE FLAG IS SET, DO ERASE
2509	015412	001426		BEQ 50232\$
2510	015414	016767	166000	166002 MOV CMDWRD,PCMDWD ;LET PCMDWD := CMDWRD ;
2511	015422	012767	100411	165770 MOV @ERS,CMDWRD ;LET CMDWRD := @ERS ;
2512	015430	016767	165764	164672 MOV CMDWRD,CMDPKT ;LET CMDPKT := CMDWRD ;
2513	015436	016767	164666	165756 MOV CMDPKT,CMDSAV ;LET CMDSAV := CMDPKT ;
2514	015444	004767	173414	JSR PC,CMDAC ;
2515	015450	004767	174400	JSR PC,EXCUTE ;
2516	015454	004767	174704	JSR PC,GOWAIT ;
2517	015460	004767	002014	JSR PC,CKHAE ;
2518	015464	105067	166035	CLRB ERSFLG ;LET ERSFLG :B= #0
2519				
2520	015470			50232\$: RTS PC
2521	015470	000207		
2522				
2523				: SUBR TO REWRITE A BADLY WRITTEN RECORD
2524				
2525	015472	016767	165722	165724 REWRT:: MOV CMDWRD,PCMDWD ;RESTORE WRITE COMMAND PACKET
2526	015500	016767	177402	165712 MOV WTYWRD,CMDWRD ;LET CMDWRD := WTYWRD ;
2527	015506	016767	177372	164614 MOV WTYCMD,CMDPKT ;LET CMDPKT := WTYCMD ;
2528	015514	016767	164610	165700 MOV CMDPKT,CMDSAV ;LET CMDSAV := CMDPKT ;
2529	015522	016767	165660	164602 MOV DATAWT,CMDPKT*CP.ADL ;LET CMDPKT*CP.ADL := DATAWT ;
2530	015530	016767	177354	164600 MOV WTYBRF,CMDPKT*CP.CNT ;LET CMDPKT*CP.CNT := WTYBRF ;
2531	015536	012767	000002	165662 MOV @2,CMDLG ;LET CMDLG := @2 ;
2532	015544	004767	173314	JSR PC,CMDAC ;
2533	015550	004767	174300	JSR PC,EXCUTE ;RE-WRITE RECORD
2534	015554	004767	174604	JSR PC,GOWAIT ;
2535	015560	004767	001714	JSR PC,CKHAE ;
2536	015564	000207		RTS PC

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2545 015566 105767 165674
2546 015572 001126
2547 015574 105267 165666
2548 015600 016704 165622
2549 015604 005704
2550 015606 001520
2551 015610 162704 000002
2552 015614 010502
2553 015616 066402 016052
2554 015622 062702 002626
2555 015626 066712 165564
2556 015632 026767 164522 165556
2557 015640 101002
2558 015642 166712 164512
2559
2560 015646
2561 015646 010203
2562 015650 062703 000010
2563
2564 015654
2565 015654 021227 001747
2566 015660 003404
2567 015662 162712 001750
2568 015666 005213
2569
2570 015670 000771
2571 015672
2572 015672 010302
2573 015674 062702 000010
2574 015700
2575 015700 021327 001747
2576 015704 003404
2577 015706 162713 001750
2578 015712 005212
2579
2580 015714 000771
2581 015716
2582 015716 010203
2583 015720 062703 000010
2584 015724
2585 015724 021227 001747
2586 015730 003404
2587 015732 162712 001750
2588 015736 005213
2589
2590 015740 000771
2591 015742
2592 015742 105767 165521
2593 015746 001440

: SUBROUTINE TO LOG BYTES READ/Written.
: ALSO UPDATES READ/WRITE ERROR COUNTERS.
: INPUTS:
: OUTPUTS:
: REGISTERS: R2, R3, R4.
: CALLS:

LOG:: TSTB ERLOG ;IF DATA AND ERRORS HAVE NOT BEEN LOGGED THEN:
      BNE 50233$
      INCB ERLOG ;SET LOG DONE FLAG.
      MOV CMDLG,R4 ;GET CURRENT CMD LOGGING CODE.
      TST R4 ;IF THERE IS A CODE THEN:
      BEQ 50234$
      SUB #2,R4 ;ADJUST THE CODE FOR TABLE INDEX.
      MOV R5,R2 ;R2 = ADR OF BYTE COUNT LSW.
      ADD BINC(R4),R2
      ADD @CNTBGN,R2
      ADD BRFCNT,(R2) ;ADD BRFCNT TO LSW.
      CMP MSGPKT*MS.RFC,BRFCNT ;IF THE RFC IS LOWER OR THE SAME AS BRFCNT THEN
      BHI 50235$
      SUB MSGPKT*MS.RFC,(R2) ;SUBTRACT RFC FROM EXPECTED BRFCNT.

50235$:
      MOV R2,R3 ;R3 = ADR OF 2ND WORD.
      ADD #10,R3

50236$: ;WHILE (R2) GT #999. DO
      CMP (R2),#999.
      BLE 50237$
      SUB #1000.,(R2) ;UPDATE BYTE COUNT
      INC (R3) ;LET (R3) := (R3) + #1 ;2ND WORD.

      BR 50236$

50237$:
      MOV R3,R2 ;LET R2 := R3 + #10 ;R2 = ADR OF 3RD WORD.
      ADD #10,R2

50240$: ;WHILE (R3) GT #999. DO
      CMP (R3),#999.
      BLE 50241$
      SUB #1000.,(R3) ;UPDATE BYTE COUNT
      INC (R2) ;LET (R2) := (R2) + #1 ;3RD WORD.

      BR 50240$

50241$:
      MOV R2,R3 ;LET R3 := R2 + #10 ;R3 = ADR OF 4TH WORD.
      ADD #10,R3

50242$: ;WHILE (R2) GT #999. DO
      CMP (R2),#999.
      BLE 50243$
      SUB #1000.,(R2) ;UPDATE BYTE COUNT
      INC (R3) ;LET (R3) := (R3) + #1 ;4TH WORD.

      BR 50242$

50243$:
      TSTB RWERR ;IF R/W ERROR, UPDATE ERROR COUNT.
      BEQ 50244$

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```

2594 015750 010502      MOV      R5,R2          ;R2 = ADR OF COUNTER.
2595 015752 066402 016060  ADD      EINC(R4),R2
2596 015756 062702 002766  ADD      @WRREC,R2
2597 015762 105767 165502  TSTB    UNREC          ;IS THE ERROR UNRECOVERABLE?
2598 015766 001404      BEQ      50245#
2599 015770 062702 000010  ADD      @10,R2        ;YES, POINT TO NEXT COUNTER.
2600 015774 005212      INC      (R2)          ;UPDATE THE ERROR COUNTER
2601                                     ;ELSE - IF ERROR IS RECOVERABLE:
2602 015776 000424      BR       50246#
2603 016000      50245# :
2604 016000 005212      INC      (R2)          ;UPDATE THE ERROR COUNTER
2605 016002 105767 164205  TSTB    IREC          ;IF ERROR RECOVERY IS ENABLED:
2606 016006 001020      BNE     50247#
2607 016010 105767 165506  TSTB    DROPED        ;IF UNIT HAS NOT BEEN DROPPED:
2608 016014 001015      BNE     50250#
2609 016016 105767 164165  TSTB    ERCVER
2610 016022 001412      BEQ     50250#
2611 016024      PRINTB @NURTY1,RETRYC ;PRINT # OF RETRIES TO RECOVER
2612 016024 016746 165430      MOV     RETRYC,-(SP)
2613 016030 012746 005422      MOV     @NURTY1,-(SP)
2614 016034 012746 000002      MOV     @2,-(SP)
2615 016040 010600      MOV     SP,RO
2616 016042 104414      TRAP   C#PNTB
2617 016044 062706 000006      ADD     @6,SP
2618                                     ;PROVIDED PRINT HAS BEEN ENABLED
2619
2620 016050      50250# :
2621
2622 016050      50247# :
2623
2624 016050      50246# :
2625 016050 000207      50244# :
2626
2627 016050      50234# :
2628 016050      50233# :
2629 016052 000000      RTS     PC
2630 016054 000040      ;
2631 016056 000100      ; INDEXES TO BYTE COUNTERS.
2632 016060 000000      BINC: 0 ;WRITE.
2633 016062 000020      40 ;READ REV.
2634 016064 000040      100 ;READ FWD.
2635                                     ; INDEXES TO READ/WRITE ERROR COUNTERS.
2636                                     ;WRITE.
2637                                     ;READ REV.
2638                                     ;READ FWD.
2639                                     ; IF A WRITE/VERIFY COMMAND IS ISSUED, CONTROL IS THEN
2640                                     ; TRANSFERRED TO THIS SUBROUTINE TO READ REVERSE, CHECK DATA,
2641                                     ; READ FORWARD, CHECK DATA, THEN CONTINUE TO NEXT COMMAND.
2642                                     ; INPUTS:
2643                                     ; OUTPUTS:
2644                                     ; REGISTERS:
2645                                     ; CALLS: VFEXC.
2646 016066 105767 165424  VFYDAT:;TSTB VFYFLG ;IF DATA IS TO BE VERIFIED:

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2645 016072 001426          BEQ      50251$
2646 016074 016767 165320 165322      MOV      CMDWRD,PCMDWD      ;SAVE THE PREVIOUS COMMAND WORD.
2647 016102 012767 104401 165310      MOV      @RDR,CMDWRD      ;COMMAND IS READ REV.
2648 016110 012767 000004 165310      MOV      #4,CMDLG         ;SET UP CMD LOGGING INDEX.
2649 016116 004767 000030          JSR      PC,VFEXC         ;GO READ ALL THE RECORDS REV.
2650 016122 016767 165272 165274      MOV      CMDWRD,PCMDWD      ;SAVE THE PREVIOUS COMMAND WORD.
2651 016130 012767 104001 165262      MOV      @RDF,CMDWRD      ;COMMAND IS READ FWD.
2652 016136 012767 000006 165262      MOV      #6,CMDLG         ;SET UP CMD LOGGING INDEX.
2653 016144 004767 000002          JSR      PC,VFEXC         ;GO READ ALL RECORDS FWD.
2654
2655 016150          50251$:
2656 016150 000207          RTS      PC      ;RETURN.
2657
2658
2659
2660
2661          ;      SUBROUTINE TO EXECUTE THE READ AND VERIFY, FORWARD OR REVERSE.
2662          ;      INPUTS:
2663          ;      OUTPUTS:
2664          ;      REGISTERS:      R2
2665          ;      CALLS:      CMDAC, FIRSTU, VFISU, NEXTU, CKHAE.
2666
2667 016152 016767 165242 164150 VFEXC:: MOV      CMDWRD,CMDPKT      ;COMMAND PACKET = READ REV OR FWD.
2668 016160 042767 004000 164142      BIC      @BRF.C,CMDPKT
2669 016166 105767 165326          TSTB     SWBFLG           ;IF BYTES ARE TO BE SWAPPED:
2670 016172 001403          BEQ      50252$
2671 016174 052767 010000 164126      BIS      @SWB.C,CMDPKT      ;SET SWAB BIT IN CMD PACKET.
2672
2673 016202          50252$:
2674 016202 016767 164122 165212      MOV      CMDPKT,CMDSAV      ;SAVE COMMAND PACKET 1ST WORD.
2675 016210 016767 165174 164114      MOV      DATARD,CMDPKT+CP.ADL ;SAVE BUFFER START ADDRESS.
2676 016216 005067 165170          CLR      NCNT             ;CLEAR NUMBER OF OPERATIONS.
2677
2678 016222          50253$: ;WHILE NCNT LT NCNT1 DO ;WHILE THERE ARE RECORDS REMAINING:
2679 016222 026767 165164 165164      CMP      NCNT,NCNT1
2680 016230 002062          BGE      50254$
2681 016232 004767 172626          JSR      PC,CMDAC         ;STORE CMD ASCII IN ERROR MSG.
2682 016236 004767 000640          JSR      PC,FIRSTU        ;SET UP FOR FIRST UNIT.
2683 016242          50255$: ;WHILE DEVTBL(R5) NE #END DO ;WHILE THERE ARE DEVICES REMAINING:
2684 016242 026527 002604 177777      CMP      DEVTBL(R5),#END
2685 016250 001442          BEQ      50256$
2686 016252 032767 000400 165140      BIT      @MOD.CO,CMDWRD      ;IF CMD IS REVERSE THEN:
2687 016260 001421          BEQ      50257$
2688 016262 032765 000002 003502      BIT      @X0.BOT,EOTFLG(R5) ;IF NOT AT BOT
2689 016270 001014          BNE      50260$
2690 016272 032765 000001 003502      BIT      @X0.EOT,EOTFLG(R5) ;BUT IF AT EOT
2691 016300 001406          BEQ      50261$
2692 016302 105767 165216          TSTB     ALLEOT          ;AND ALL OTHERS AT EOT
2693 016306 001402          BEQ      50262$
2694 016310 004767 000064          JSR      PC,VFISU        ;THEN READ VERIFY
2695          ;IF NOT ALL AT EOT, FREEZE UNIT(S)
2696 016314          50262$:
2697          ;IF NOT AT BOT AND
2698 016314 000402          BR      50263$
2699 016316          50261$:
2700 016316 004767 000056          JSR      PC,VFISU        ;NOT AT EOT, READ VFY
2701

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2702 016322          50263$:
2703
2704 016322          50260$:
2705 016322 000412          BR      50264$          ;ELSE IF CMD IS NOT REVERSE:
2706 016324          50257$:
2707 016324 032765 000001 003502          BIT      @X0.EOT,EOTFLG(R5)
2708 016332 001404          BEQ      50265$
2709 016334 032767 000001 165056          BIT      @CMD.CO,CMDWRD
2710 016342 001002          BNE      50266$
2711 016344          50265$:
2712
2713 016344 004767 000030          JSR      PC,VFISU          ;IF NOT AT EOT OR NOT A MOTION CMD THEN:
2714
2715 016350          50266$:
2716
2717 016350          50264$:
2718 016350 004767 000574          JSR      PC,NEXTU          ;GO FIND THE NEXT UNIT.
2719
2720 016354 000732          BR      50255$
2721 016356          50256$:
2722 016356 004767 001116          JSR      PC,CKHAE          ;CHECK FOR HALT AFTER EACH CMD.
2723 016362 005267 165024          INC      NCNT          ;UPDATE THE RECORD COUNT.
2724 016366 016767 165026 165030          MOV      CMDWRD,PCMDWD          ;SAVE PREVIOUS COMMAND WORD.
2725
2726 016374 000712          BR      50253$
2727 016376          50254$:
2728 016376 000207          RTS      PC          ;RETURN.
2729
2730          :      SUBROUTINE TO ISSUE COMMAND, AWAIT INTERRUPT,
2731          :      CHECK STATUS, CHECK DATA.
2732          :      INPUTS:
2733          :      OUTPUTS:
2734          :      REGISTERS:      R2
2735          :      CALLS:      EXECUTE, GOWAIT, CKDATA.
2736
2737 016400 016702 165004          VFISU:: MOV      DATARD,R2          ;INIT READ BUFFER POINTER.
2738 016404 062702 000010          ADD      @8.,R2
2739 016410          50267$:      ;WHILE R2 NE DATARD DO          ;UNTIL 8 BYTES HAVE BEEN SET.
2740 016410 020267 164774          CMP      R2,DATARD
2741 016414 001403          BEQ      50270$
2742 016416 012742 177777          MOV      @-1,-(R2)          ;INIT READ BUFFER.
2743
2744 016422 000772          BR      50267$
2745 016424          50270$:
2746 016424 004767 173424          JSR      PC,EXECUTE          ;GO EXECUTE THE COMMAND.
2747 016430 105767 165066          TSTB     DROPED          ;IF UNIT HAS NOT BEEN DROPPED THEN:
2748 016434 001002          BNE      50271$
2749 016436 004767 173722          JSR      PC,GOWAIT          ;GO WAIT FOR DONE BIT.
2750
2751 016442          50271$:
2752 016442 105767 165054          TSTB     DROPED          ;IF UNIT HAS NOT BEEN DROPPED THEN:
2753 016446 001006          BNE      50272$
2754 016450 032765 000002 003502          BIT      @X0.BOT,EOTFLG(R5)          ;WHEN NOT REVERSED INTO BOT, THEN
2755 016456 001002          BNE      50273$
2756 016460 004767 000002          JSR      PC,CKDATA          ;GO VERIFY DATA.
2757
2758 016464          50273$:

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2759
2760 016464
2761 016464 000207
2762
2763
2764
2765
2766
2767
2768
2769
2770
2771 016466 016703 164724
2772 016472 166703 163662
2773 016476 005703
2774 016500 001015
2775 016502
    016502 104456
    016504 000021
    016506 004430
    016510 005752
2776 016512
    016512 012746 005337
    016516 012746 000001
    016522 010600
    016524 104414
    016526 062706 000004
2777 016532 000560
2778 016534
2779 016534 020367 164656
2780 016540 101417
2781 016542
    016542 104456
    016544 000021
    016546 004430
    016550 005752
2782 016552
    016552 016746 163560
    016556 012746 005360
    016562 012746 000002
    016566 010600
    016570 104414
    016572 062706 000006
2783
2784 016576 000536
2785 016600
2786 016600 010367 000272
2787 016604 005367 000266
2788 016610 005067 000264
2789 016614 005002
2790 016616 016703 164564
2791 016622 016704 164562
2792 016626 105767 164671
2793 016632 001401
2794 016634 000313
2795
2796 016636

50272$: RTS PC

; SUBROUTINE TO COMPARE DATA BETWEEN READ AND WRITE BUFFERS
; AND PRINT ERROR MESSAGE ON MISCOMPARE.
; INPUTS:
; OUTPUTS:
; REGISTERS: R2, R3, R4.
; CALLS: GCMDA

CKDATA: MOV BRFCNT,R3 ; COMPUTE REC LENGTH READ
        SUB MSGPKT+MS.RFC,R3
        TST R3 ; WHEN NO DATA RECEIVED
        BNE 50274$
        ERRHRD 17,WTVERM,DTAERM ; PRINT ERROR AND EXIT
                                TRAP C$ERHRD
                                .WORD 17
                                .WORD WTVERM
                                .WORD DTAERM

2776 016512 PRINTB #DTAER4 ; COMPARE ROUTINE
                                MOV #DTAER4,-(SP)
                                MOV #1,-(SP)
                                MOV SP,RO
                                TRAP C$PNTB
                                ADD #4,SP

50274$: BR 50275$

        CMP R3,BRFCNT ; WHEN REC READ IS LONGER
        BLOS 50276$
        ERRHRD 17,WTVERM,DTAERM ; THAN EXPECTED, PRINT
                                TRAP C$ERHRD
                                .WORD 17
                                .WORD WTVERM
                                .WORD DTAERM

        PRINTB #DTAERS,CMDPKT+CP.CNT ; AN ERROR MESSAGE
                                MOV CMDPKT+CP.CNT,-(SP)
                                MOV #DTAERS,-(SP)
                                MOV #2,-(SP)
                                MOV SP,RO
                                TRAP C$PNTB
                                ADD #6,SP

; AND EXIT ROUTINE

50276$: BR 50277$

        MOV R3,CKDCNT ; SAVE VERIFICATION LENGTH - 1.
        DEC CKDCNT
        CLR CKDFF ; CLEAR # OF BYTES IN ERROR COUNTER.
        CLR R2 ; INIT BYTE COUNTER
        MOV DATAWT,R3 ; GET WRITE BUFFER ADDRESS.
        MOV DATARD,R4 ; GET READ BUFFER ADDRESS.
        TSTB T1SWB ; WHEN RUNNING TEST1-SUB 12.
        BEQ 50300$
        SWAB (R3) ; SWAP FIRST WORD OF WRT BFR
                                ; WHICH CONTAINS THE RECORD COUNT

50300$:

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2797                                ;REPEAT                                ;REPEAT UNTIL ALL DATA IS COMPARED:
2798 016636 50301$:                                ;IF THIS IS THE LAST BYTE THEN:
2799 016636 020267 000234  CMP R2,CKDCNT                                ;IF BYTE SWAPPING IS ENABLED THEN:
2800 016642 001011  BNE 50302$                                ;IF RECORD LENGTH IS ODD THEN:
2801 016644 105767 164650  TSTB SWBFLG                                ;LAST BYTE WILL BE IN
2802 016650 001406  BEQ 50303$                                ;THE UPPER BYTE.
2803 016652 032767 000001 000216  BIT #BIT00,CKDCNT
2804 016660 001002  BNE 50304$
2805 016662 105723  TSTB (R3)+
2806 016664 105724  TSTB (R4)+
2807
2808 016666 50304$:
2809
2810 016666 50303$:
2811
2812 016666 50302$:
2813 016666 121314  CMPB (R3),(R4)                                ;ARE THEY EQUAL.
2814 016670 001452  BEQ 3$                                ;BR IF SO.
2815 016672 005767 000202  TST CKDFF                                ;1 ST TIME THRU?
2816 016676 001010  BNE 2$                                ;BR IF NOT.
2817 016700 005265 003346  INC VFYCNT(R5)                                ;INC THE VERIFY ERROR COUNTER.
2818 016704 005265 003356  INC HRDCNT(R5)                                ;INC THE HARD ERROR COUNT.
2819 016710  ERRHRD 17,WTVERM,DTAERM                                ;REPORT WRITE/VERIFY ERROR.
                                TRAP C$ERHRD
                                .WORD 17
                                .WORD WTVERM
                                .WORD DTAERM
2820 016720 005267 000154 2$: INC CKDFF;LET CKDFF := CKDFF + #1 ;INCREMENT # OF BYTES IN ERROR.
2821 016724 111467 164506  MOVB (R4),TIME1                                ;SAVE WAS DATA FOR TYPOUT.
2822 016730 042767 177400 164500  BIC #177400,TIME1                                ;CLEAR GARBAGE.
2823 016736 111367 164476  MOVB (R3),TIME2                                ;SAVE SHOULD BE DATA FOR TYPOUT.
2824 016742 042767 177400 164470  BIC #177400,TIME2                                ;CLEAR GARBAGE.
2825 016750 026727 000124 000013  CMP CKDFF,#11.                                ;IF ERROR BYTE COUNT IS LESS THAN 11:
2826 016756 002017  BGE 50305$
2827 016760 005046  PRINTX #DTAER2,R2,<B,TIME1>,<B,TIME2>;PRINT ACTUAL & EXPECTED DATA
                                CLR -(SP)
                                BISB TIME2,(SP)
                                CLR -(SP)
                                BISB TIME1,(SP)
                                MOV R2,-(SP)
                                MOV #DTAER2,-(SP)
                                MOV #4,-(SP)
                                MOV SP,R0
                                TRAP C$PNTX
                                ADD #12,SP
2828 017016 50305$:
2829
2830 017016 105723 3$: TSTB (R3)+                                ;UPDATE WRITE BUFFER ADDRESS.
2831 017020 105724  TSTB (R4)+                                ;UPDATE READ BUFFER ADDRESS.
2832 017022 105722  TSTB (R2)+                                ;UPDATE BYTE COUNTER.
2833 017024 020267 000046  CMP R2,CKDCNT                                ;END OF DATA COMPARE REPEAT LOOP.
2834 017030 003702  BLE 50301$
2835 017032 005267 000040  INC CKDCNT                                ;CKDCNT EQUALS RECORD LENGTH.
2836 017036 005767 000036  TST CKDFF                                ;IF COMPARE ERROR HAS OCCURED THEN:
2837 017042 001414  BEQ 50306$
2838 017044 016746 000026  PRINTB #DTAER3,CKDFF,CKDCNT                                ;PRINT # OF BYTES IN ERROR.
                                MOV CKDCNT,-(SP)

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```

017050 016746 000024
017054 012746 005275
017060 012746 000003
017064 010600
017066 104414
017070 062706 000010
2839
2840 017074          50306$:
2841
2842 017074          50277$:
2843
2844 017074          50275$:
2845 017074 000207      RTS      PC          ;OTHERWISE, RETURN.
2846
2847 017076 000000      CKDCNT: .WORD 0          ;# OF BYTES TO BE VERIFIED -1.
2848 017100 000000      CKDFF:  .WORD 0          ;# OF BYTES IN ERROR COUNTER.
2849
2850          ;      SUBROUTINE TO FIND THE FIRST DEVICE IN THE TEST SEQUENCE.
2851          ;
2852          ;      INPUTS:
2853          ;      OUTPUTS:
2854          ;      REGISTERS:
2855          ;      CALLS:
2856 017102 105067 164414  FIRSTU:: CLR B   DROPE          ;CLR UNIT DROPPED FLAG
2857 017106 005005          CLR   R5          ;CLR DEVICE POINTER.
2858 017110 026527 002604 177774 50307$: CMP   DEVTBL(R5),#NINUSE ;WHILE DEVICES ARE NOT IN USE:
2859 017116 001003          BNE   50310$
2860 017120 062705 000002          ADD   #2,R5          ;LET R5 := R5 + #2          ;POINT TO NEXT DEVICE.
2861 017124 000771          BR    50307$
2862 017126          50310$:
2863 017126 026527 002604 177777 50310$: CMP   DEVTBL(R5),#END ;IF ALL UNITS HAVE BEEN DROPPED THEN:
2864 017134 001001          BNE   50311$
2865 017136          DOCLN          ;DO CLEAN CODE AND TERMINATE PASS.
2866          017136 104444          TRAP  C#DCLN
2867 017140          50311$:
2868 017140 016567 002604 162726 50311$: MOV   DEVTBL(R5),L#LUN ;SET UNIT # IN "HEADER" FOR ERROR REPORT
2869 017146 000207          RTS   PC          ;RETURN WITH 1ST DEVICE IN R5.
2870
2871
2872          ;      SUBROUTINE TO FIND THE NEXT UNIT IN THE TEST CYCLE.
2873          ;
2874          ;      INPUTS:
2875          ;      OUTPUTS:
2876          ;      REGISTERS:
2877          ;      CALLS:
2878 017150 105067 164346  NEXTU:: CLR B   DROPE          ;CLR UNIT DROPPED FLAG
2879          ;REPEAT          ;REPEAT UNTIL THE NEXT DEVICE IS FOUND.
2880 017154          50312$:
2881 017154 062705 000002          ADD   #2,R5          ;UPDATE DEVICE TABLE POINTER.
2882 017160 026527 002604 177774 50312$: CMP   DEVTBL(R5),#NINUSE ;UNTIL DEVTBL(R5) NE #NINUSE
2883 017166 001772          BEQ   50312$
2884 017170 016567 002604 162676 50312$: MOV   DEVTBL(R5),L#LUN ;SET UNIT # IN "HEADER" FOR ERROR REPORT
2885 017176 000207          RTS   PC          ;RETURN.
2886
2887
2888          ;      SUBROUTINE TO DROP A DEVICE FROM THE TEST SEQUENCE.

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2889          ;      INPUTS:
2890          ;      OUTPUTS:
2891          ;      REGISTERS:
2892          ;      CALLS:          MOVMSG, PRXST, LOG
2893
2894 017200 005265 003366      DROPU:: INC      FTLCNT(R5)          ;INCREMENT THE FATAL ERROR COUNT.
2895 017204 016704 163160      MOV      MSGPKT+MS.XS3,R4 ;GET UDIAG ERROR CODE FROM XSTAT3.
2896 017210 042704 000377      BIC      #377,R4
2897 017214 016503 002544      MOV      MSGPKA(R5),R3 ;ADR OF THIS UNIT'S MSG PACKET.
2898 017220 005002      CLR      R2          ;LET R2 := #0          ;CLR COUNTER.
2899 017222      50313$: ;WHILE R2 NE #MSGCNT DO          ;WHILE THERE ARE MORE LOCATIONS:
2900 017222 020227 000020      CMP      R2,#MSGCNT
2901 017226 001405      BEQ      50314$
2902 017230 012723 177777      MOV      #-1,(R3)+      ;INIT THE MSG PACKET WITH ALL 1'S
2903 017234 062702 000002      ADD      #2,R2          ;LET R2 := R2 + #2          ;UPDATE COUNTER.
2904
2905 017240 000770      BR      50313$
2906 017242      50314$:
2907 017242 012775 002340 002514      MOV      #GSCPK,@TSDB(R5) ;INITIATE A GET STATUS COMMAND.
2908 017250 004767 173424      JSR      PC,WSSR          ;WAIT A WHILE FOR SSR=1
2909 017254 004767 173454      JSR      PC,MOVMSG        ;MOVE MSG PACKET TO COMMON AREA.
2910 017260 020427 157400      CMP      R4,#X3.RNY      ;IF WE HAVE A CAPSTAN RUNAWAY THEN:
2911 017264 001005      BNE      50315$
2912 017266      ERRDF      16,RNYM,STAERM ;REPORT CAPSTAN RUNAWAY WITH TACH CNT.
                                TRAP      C#ERDF
                                .WORD     16
                                .WORD     RNYM
                                .WORD     STAERM
2913                                ;ELSE-IF NOT A RUNAWAY:
2914 017276 000402      BR      50316$
2915 017300      50315$:
2916 017300 004767 000106      JSR      PC,PRXST          ;PRINT EXTENDED STATUS REGISTERS.
2917
2918 017304      50316$:
2919 017304 105767 164155      TSTB     RECLOG          ;IF THE RECORD HAS BEEN LOGGED THEN:
2920 017310 001404      BEQ      50317$
2921 017312 105267 164204      INCB     DROPED          ;SET UNIT DROPPED FLAG.
2922 017316 004767 176244      JSR      PC,LOG          ;LOG DATA BYTES + RD/WR ERRORS.
2923
2924 017322      50317$:
2925 017322      DORPT          ;PRINT PERFORMANCE REPORT
                                TRAP      C#DRPT
2926 017324 005765 003326      DROPUA: TST     PASCNT(R5) ;IF PASCNT(R5) NE #0 THEN
2927 017330 001402      BEQ      50320$
2928 017332 005365 003326      DEC      PASCNT(R5)      ;LET PASCNT(R5) := PASCNT(R5) - #1
2929
2930 017336      50320$:
2931 017336 016767 164172 000044      MOV      TSNP,DROPN      ;SAVE # OF UNIT TO BE DROPPED.
2932 017344 016700 164164      MOV      TSNP,R0        ;R0=LOGICAL DEVICE NUMBER
2933 017350      DODU      R0 ;DROP THE UNIT
                                TRAP      C#DODU
2934                                ;EXEC BGNDU-ENDDUJ CODE IF IDU = 0
2935
2936 017352 026527 002604 177774      CMP      DEVTBL(R5),#NINUSE ;IF UNIT NOT DROPPED
2937 017360 001410      BEQ      50321$
2938 017362 105767 162625      TSTB     IREC          ;IF RECOVERY IS ENABLED THEN:
2939 017366 001005      BNE      50322$

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2940 017370 000240      NOP
2941 017372 000240      NOP
2942 017374 000240      NOP
2943 017376 105267 164124  INCB  STAF LG      ;SET START FLAG TO ENABLE REWIND,
2944
2945 017402      50322$:
2946
2947 017402      50321$:
2948 017402 105267 164114  DRORTN: INCB  DROPE D      ;SET UNIT DROPPED FLAG.
2949 017406 000207      RTS  PC      ;RETURN.
2950
2951 017410 000000      DROPN: .WORD  0      ;# OF UNIT TO BE DROPPED
2952
2953      ; SUBROUTINE TO PRINT EXTENDED STATUS REGISTERS.
2954      ; INPUTS:
2955      ; OUTPUTS:
2956      ; REGISTERS:
2957      ; CALLS:
2958
2959 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
4 2960 017432      PRINTX #STAERS,MSGPKT+MS.XS0,MSGPKT+MS.XS1,MSGPKT+MS.XS2,MSGPKT+MS.XS3,MSGPKT+MS.XS
      017432 016746 162734      MOV  MSGPKT+MS.XS4,-(SP)
      017436 016746 162726      MOV  MSGPKT+MS.XS3,-(SP)
      017442 016746 162720      MOV  MSGPKT+MS.XS2,-(SP)
      017446 016746 162712      MOV  MSGPKT+MS.XS1,-(SP)
      017452 016746 162704      MOV  MSGPKT+MS.XS0,-(SP)
      017456 012746 006753      MOV  #STAERS,-(SP)
      017462 012746 000006      MOV  #6,-(SP)
      017466 010600      MOV  SP,R0
      017470 104415      TRAP C#PNTX
      017472 062706 000016      ADD  #16,SP
2961 017476 000207      RTS PC
2962
2963      ; SUBROUTINE TO HALT AFTER EACH COMMAND.
2964      ; INPUTS:
2965      ; OUTPUTS:
2966      ; REGISTERS: R3, R4
2967      ; CALLS:
2968
2969 017500 105767 162502      CKHAE:: TSTB  HAE,IFB HAE NE #0 THEN      ;IF HALT FLAG IS SET:
2970 017504 001430      BEQ  50323$
2971 017506 105767 164017      TSTB  MISCFG      ;IFB MISCFG EQ #0 THEN      ;
2972 017512 001023      BNE  50324$
2973 017514      MANUAL      ;IS MANUAL INTERVENTION ALLOWED?
      017514 104450      ;BR IF NOT.      TRAP  C#MANI
2974 017516      BNCOMPLETE CKHRTN
      017516 103023      BCC  CKHRTN      ;COMMAND WORD.
2975 017520 016704 163674      MOV  CMDWRD,R4      ;LET R4 := CMDWRD
2976 017524 004767 171406      JSR  PC,GCMDA      ;FETCH ADR OF CMD ASCII.
2977 017530 112367 164552      MOVB (R3)+,HALTM      ;MOVE CMD ASCII
2978 017534 112367 164547      MOVB (R3)+,HALTM+1      ;LET HALTM+1 :B= (R3)+
2979 017540 111367 164544      MOVB (R3),HALTM+2      ;INTO MESSAGE.

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2980 017544          GMANIL HALTM,TIME1,1,YES      ;HALT - WAIT FOR AN OEPRAATOR 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$:
2981 017560          10000$:
2982
2983 017560 000402          BR        50325$
2984 017562          50324$:
2985 017562 105067 163743  CLR      MISCFCG      ;LET MISCFCG :B= #0      ;
2986
2987 017566          50325$:
2988
2989 017566          50323$:
2990 017566 000207  CKHRTN: RTS      PC          ;RETURN
2991                      .EVEN
2992
2993 017570          ENDMOD
2994
2995
2996          .TITLE MISCELLANEOUS SECTIONS
2997          .SBTTL REPORT CODING SECTION
2998
2999
3000
3001          ;++
3002          ; THE REPORT CODING SECTION CONTAINS THE
3003          ; "PRINTS" CALLS THAT GENERATE STATISTICAL REPORTS.
3004          ;--
3005 017570          BGNRPT
      017570          L#RPT::
3006 017570 010567 163656  MOV      R5,RSSAVE          ;SAVE CURRENT DEVICE POINTER.
3007 017574 004767 177302  JSR      PC,FIRSTU         ;FIND THE FIRST UNIT.
3008 017600          50326$: ;WHILE DEVTBL(R5) NE #END DO      ;WHILE THERE ARE MORE DEVICES:
3009 017600 026527 002604 177777  CMP      DEVTBL(R5),#END
3010 017606 001562          BEQ      50327$
3011 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
3012 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 C10600          MOV      SP,R0
      017676 104416          TRAP    C#PNTS

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3013	017700	062706	000014				ADD	#14,SP
	017704			PRINTS	#RPT1C,RRBC+30(R5),RRBC+20(R5),RRBC+10(R5),RRBC(R5)		MOV	RRBC(R5),-(SP)
	017710	016546	002666				MOV	RRBC+10(R5),-(SP)
	017714	016546	002706				MOV	RRBC+20(R5),-(SP)
	017720	016546	002716				MOV	RRBC+30(R5),-(SP)
	017724	012746	020560				MOV	#RPT1C, -(SP)
	017730	012746	000005				MOV	#5, -(SP)
	017734	010600					MOV	SP,R0
	017736	104416					TRAP	C#PNTS
3014	017740	062706	000014				ADD	#14,SP
	017744			PRINTS	#RPT1D,RFBC+30(R5),RFBC+20(R5),RFBC+10(R5),RFBC(R5)		MOV	RFBC(R5),-(SP)
	017750	016546	002736				MOV	RFBC+10(R5),-(SP)
	017754	016546	002746				MOV	RFBC+20(R5),-(SP)
	017760	016546	002756				MOV	RFBC+30(R5),-(SP)
	017764	012746	020631				MOV	#RPT1D, -(SP)
	017770	012746	000005				MOV	#5, -(SP)
	017774	010600					MOV	SP,R0
	017776	104416					TRAP	C#PNTS
3015	020000	062706	000014				ADD	#14,SP
	020004			PRINTS	#RPT1F,WRREC(R5),RRREC(R5),RFREC(R5)		MOV	RFREC(R5),-(SP)
	020010	016546	003026				MOV	RRREC(R5),-(SP)
	020014	016546	002766				MOV	WRREC(R5),-(SP)
	020020	012746	020735				MOV	#RPT1F, -(SP)
	020024	012746	000004				MOV	#4, -(SP)
	020030	010600					MOV	SP,R0
	020032	104416					TRAP	C#PNTS
3016	020034	062706	000012				ADD	#12,SP
	020040			PRINTS	#RPT1G,WRUNR(R5),RRUNR(R5),RFUNR(R5)		MOV	RFUNR(R5),-(SP)
	020044	016546	003036				MOV	RRUNR(R5),-(SP)
	020050	016546	002776				MOV	WRUNR(R5),-(SP)
	020054	012746	021006				MOV	#RPT1G, -(SP)
	020060	012746	000004				MOV	#4, -(SP)
	020064	010600					MOV	SP,R0
	020066	104416					TRAP	C#PNTS
	020070	062706	000012				ADD	#12,SP
3017	020074	105767	162110	TSTB	BADTSW	;IFB BADTSW NE #0 THEN		
3018	020100	001402		BEQ	50330\$			
3019	020102	004767	000056	JSR	PC,BTRPT	;GO PRINT BAD TAPE SPOTS WHEN ENABLED		
3020								
3021	020106				50330\$:			
3022	020106			PRINTS	#RPT1I,SCCNT(R5),HRDCNT(R5),FTLCNT(R5),VFYCNT(R5)		MOV	VFYCNT(R5),-(SP)
	020106	016546	003346				MOV	FTLCNT(R5),-(SP)
	020112	016546	003366				MOV	HRDCNT(R5),-(SP)
	020116	016546	003356				MOV	SCCNT(R5),-(SP)
	020122	016546	003336				MOV	#RPT1I, -(SP)
	020126	012746	021203				MOV	#5, -(SP)
	020132	012746	000005				MOV	SP,R0
	020136	010600					TRAP	C#PNTS
	020140	104416					ADD	#14,SP
3023	020142	062706	000014					
	020146	004767	176776	JSR	PC,NEXTU	;FIND THE NEXT UNIT.		
3024								
3025	020152	000612		BR	50326\$			

MISCELLANEOUS SECTIONS
REPORT CODING SECTION

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SEQ 0102

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3026 020154          50327$:
3027 020154 016705 163272      MOV    R5SAVE,R5          ;RESTORE CURRENT DEVICE POINTER.
3028 020160          EXIT    RPT
      020160 000167          .WORD  J$JMP
      020162 001130          .WORD  L10010-2-.
3029
3030          ;          SUBR TO PRINT BAD TAPES SPOTS DURING THE REPORT PRINTS
3031          ;          WRITE RETRIES: CUMULATIVE COUNT
3032          ;          BAD TAPE SPOTS: COUNT PER TAPE PASS ONLY, NOT CUMULATIVE.
3033          ;          COUNT OF RECOVERABLE WRITE ERRORS EXCLUDES BAD TAPE SPOTS.
3034
3035 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$PNTS
      020204 062706 000006          ADD    #6,SP
3036 020210 016567 002616 163274      MOV    BTADDR(R5),BTPT          ;BTPT IS BOTH THE BAD TAPE SPOT COUNTER
3037 020216 017703 163270          MOV    @BTPT,R3          ;AND THE LOGGING INDEX
3038 020222 006203          ASR    R3
3039 020224          PRINTS  @RPT1J,R3          ;PRINT # OF BAD TAPE SPOTS
      020224 010346          MOV    R3,-(SP)
      020226 012746 021107          MOV    @RPT1J,-(SP)
      020232 012746 000002          MOV    #2,-(SP)
      020236 010600          MOV    SP,R0
      020240 104416          TRAP  C$PNTS
      020242 062706 000006          ADD    #6,SP
3040 020246 005703          TST    R3          ;PRINT RECORD # IF BAD SPOTS DETECTED
3041 020250 001457          BEQ    50331$
3042 020252 020327 000024          CMP    R3,#20.          ;IF R3 HI #20. THEN
3043 020256 101402          BLOS  50332$
3044 020260 012703 000024          MOV    #20.,R3          ;20 BAD SPOTS IS THE LIMIT
3045
3046 020264          50332$:
3047 020264          PRINTS  @CRLFSP          ;
      020264 012746 005744          MOV    @CRLFSP,-(SP)
      020270 012746 000001          MOV    #1,-(SP)
      020274 010600          MOV    SP,R0
      020276 104416          TRAP  C$PNTS
      020300 062706 000004          ADD    #4,SP
3048 020304 016704 163202          MOV    BTPT,R4          ;LET R4 := BTPT + #2 ;FETCH A BAD SPOT ID
3049 020310 062704 000002          ADD    #2,R4
3050 020314 005002          CLR    R2          ;R2 = PRINT COUNT PER LINE: 10 MAX
3051 020316          50333$: ;REPEAT
3052 020316          PRINTS  @RPT1K,(R4)          ;PRINT A BAD SPOT ID
      020316 011446          MOV    (R4),-(SP)
      020320 012746 021174          MOV    @RPT1K,-(SP)
      020324 012746 000002          MOV    #2,-(SP)
      020330 010600          MOV    SP,R0
      020332 104416          TRAP  C$PNTS
      020334 062706 000006          ADD    #6,SP
3053 020340 005202          INC    R2          ;LET R2 := R2 + #1 ;COUNT PRINTS
3054 020342 062704 000002          ADD    #2,R4          ;LET R4 := R4 + #2 ;NEXT
3055 020346 020227 000012          CMP    R2,#10.          ;IF R2 EQ #10. THEN
3056 020352 001014          BNE  50334$
3057 020354          PRINTS  @CRLFSP          ;GO TO NEXT PRINT LINE PAST 10 PRINTS

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MISCELLANEOUS SECTIONS
REPORT CODING SECTION

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SEQ 0103

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020354 012746 005744
020360 012746 000001
020364 010600
020366 104416
020370 062706 000004
3058 020374 162703 000012          SUB   #10.,R3          ;LET R3 := R3 - #10.      ;ADJUST BAD SPOT COUNT
3059 020400 162702 000012          SUB   #10.,R2          ;LET R2 := R2 - #10.      ;ADJUST PRINT COUNT
3060
3061 020404          50334$:
3062 020404 020203          CMP   R2,R3          ;UNTIL R2 EQ R3          ;LIMIT: # OF BAD SPOTS
3063 020406 001343          BNE  50333$
3064
3065 020410          50331$:
3066 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
3067 020430 000207          RTS  PC
3068
3069          .NLIST  BEX
3070 020432 045 116 045 RPT1A: .ASCIZ /#N#AUNIT #D1#S3#APASS:#D5#S3#ARECORD:#D5#N/
3071 020507 045 101 102 RPT1B: .ASCIZ /#ABYTES WRITTEN #D3#A,#Z3#A,#Z3#A,#Z3#N/
3072 020560 045 101 102 RPT1C: .ASCIZ /#ABYTES READ REV #D3#A,#Z3#A,#Z3#A,#Z3#N/
3073 020631 045 101 102 RPT1D: .ASCII /#ABYTES READ FWD #D3#A,#Z3#A,#Z3#A,#Z3#N/
3074 020701 045 123 062 .ASCIZ /#S23#AWRT#S4#ARDR#S4#ARDF#N/
3075 020735 045 101 122 RPT1F: .ASCIZ /#ARECOVERABLE ERRORS #D5#S2#D5#S2#D5#N/
3076 021006 045 101 125 RPT1G: .ASCIZ /#AUNRECOVERABLE ERRORS #D5#S2#D5#S2#D5#N/
3077 021057 045 101 127 RPT1E: .ASCIZ /#AWRITE RETRIES#S8#D5#N/
3078 021107 045 116 045 RPT1J: .ASCIZ /#N#D2#A BAD SPOTS THIS TAPE PASS PRECEDING RECORD #:/
3079 021174 045 104 065 RPT1K: .ASCIZ /#D5#S1/
3080 021203 045 101 123 RPT1I: .ASCII "#ASPEC COND#S3#AHARD#S3#AFATAL#S3#ACOMPARE#N"
3081 021257 045 123 063 .ASCIZ /#S3#D5#S3#D5#S3#D5#S3#D5#N#N/
3082          .LIST  BEX
3083          .EVEN
3084
3085 021314          ENDRPT
021314          L10010:
021314 104425          TRAP  C#RPT
3086
3087          .SBTTL  LOAD DEVICE PROTECTION TABLE
3088
3089          ;**
3090          ;TABLE FOR SUPERVISOR TO IDENTIFY THE P-TBL FOR THE LOAD DEV
3091          ;THE SUPERVISOR USES THE TBL TO WARN THE OPERATOR WHEN HE TRIES TO TEST THE LOAD DEV
3092          ;--
3093
3094 021316          BGNPROT
021316          L#PROT::
3095
3096 021316 000000          .WORD 0          ;P-TBL OFFSET OF TSD8
3097 021320 177777          .WORD -1         ;P-TBL OFFSET OF MASS BUS UNIT #: -1 = NOT A MASS BUS DE
3098 021322 177777          .WORD -1         ;P-TBL OFFSET OF DRIVE #: -1 = NONE, THREE DRIVES PER CONTRO
LLER
3099 021324          ENDPROT
3100
3101          .SBTTL  INITIALIZE SECTION

```



```

3102
3103
3104
3105
3106
3107
3108 021324      BGNINIT
      021324      L$INIT::
3109
3110 021324 032727 000003 002330 INIT10: BIT    #BIT0!BIT1,#CMDPKT ;IF CMD PACKET IS NOT ON MODULO 4 BOUNDRY:
3111 021332 001421      BEQ    50335$
3112 021334      ERRSF 1,CMDPKM ;PRINT ERROR MSG,
      021334 104454      TRAP    C$ERSF
      021336 000001      .WORD  1
      021340 004346      .WORD  CMDPKM
      021342 000000      .WORD  0
3113 021344      DELAY 200. ;GO TO SUPERVISOR, WAIT 2 SECONDS.
      021344 012727 000310      MOV    #200.,(PC)+
      021350 000000      .WORD  0
      021352 016727 160540      MOV    L$DLY,(PC)+
      021356 000000      .WORD  0
      021360 005367 177772      DEC    -6(PC)
      021364 001375      BNE    -4
      021366 005367 177756      DEC    -22(PC)
      021372 001367      BNE    -20
3114 021374 000753      BR    INIT10 ;
3115
3116 021376      50335$:
3117
3118 021376 105767 160602      TSTB  CLRFLG ;IF CLR COUNTERS FLAG SET:
3119 021402 001413      BEQ    50336$
3120 021404 105067 160574      CLR   CLRFLG ;INIT CLR FLAG.
3121 021410 005002      CLR   R2 ;LET R2 := #0
3122 021412      50337$: ;WHILE R2 NE #CNTLEN DO
3123 021412 020227 000550      CMP   R2,#CNTLEN
3124 021416 001405      BEQ    50340$
3125 021420 005062 002626      CLR   WRBC(R2) ;CLR ALL STATISTICAL COUNTERS.
3126 021424 062702 000002      ADD   #2,R2 ;LET R2 := R2 + #2
3127
3128 021430 000770      BR    50337$
3129 021432      50340$:
3130
3131 021432      50336$:
3132
3133 021432 105767 160547      TSTB  RRANV ;IF RESET RANDOM VARIABLE FLAG IS SET THEN:
3134 021436 001406      BEQ    50341$
3135 021440 012767 153624 161764      MOV   #RANBC,RANB ;RESET RANDOM BASE #.
3136
3137 021446 012767 032561 161760      MOV   #RANSC,RANS ;RESET RANDOM SAVE LOCATION.
3138
3139 021454      50341$:
3140 021454      READF #EF.START ;READ START COMMAND EVENT FLAG.
      021454 012700 000040      MOV   #EF.START,RO
      021460 104447      TRAP  C$REFG
3141 021462      BNCOMPLETE INIT15 ;BRANCH IF NOT STARTING.
3142 021462 103057      BCC   INIT15
      021464 105267 162036      INCB  STAFLG ;SET START COMMAND FLAG.

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MISCELLANEOUS SECTIONS
INITIALIZE SECTION

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SEQ 0105

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3143 021470 012705 000006      MOV      #6,R5      ;LET R5 := #6
3144 021474      50342: ;REPEAT
3145 021474 012765 177774 002604  MOV      #NINUSE,DEVTBL(R5) ;INITIATE UNIT NUMBER TABLE
3146 021502 162705 000002      SUB      #2,R5      ;LET R5 := R5 - #2 ;BY STORING NOT IN USE IN EACH LOCATION.
3147 021506 005705      TST      R5        ;UNTIL R5 EQ #0
3148 021510 001371      BNE      50342:
3149 021512 022767 000001 160272  CMP      #1,L#UNIT ;ONLY ONE UNIT ALLOWED
3150 021520 001425      BEQ      5034:
3151 021522      PRINTF  #AUDRUN    ;OK
                                ;TELL THE MAN
                                MOV      #AUDRUN,-(SP)
                                MOV      #1,-(SP)
                                MOV      SP,R0
                                TRAP     C#PNTF
                                ADD      #4,SP
3152 021542      DELAY  25          ;WAIT
                                MOV      #25,(PC)
                                .WORD   0
                                MOV      L#DLY,(PC)
                                .WORD   0
                                DEC      -6(PC)
                                BNE      -.4
                                DEC      -22(PC)
                                BNE      -.20
                                TRAP     C#DCLN
3153 021572      DOCLN          ;ABORT
3154 021574 016705 160212 5034: MOV      L#UNIT,R5      ;LET R5 := L#UNIT SHIFT 1
3155 021600 006305      ASL      R5
3156 021602      50343: ;REPEAT ;STORE ALL UNIT
3157 021602 162705 000002  SUB      #2,R5      ;LET R5 := R5 - #2 ;NUMBERS IN DEVTBL.
3158 021606 010565 002604  MOV      R5,DEVTBL(R5) ;LET DEVTBL(R5) := R5 SHIFT -1
3159 021612 006265 002604  ASR      DEVTBL(R5)
3160 021616 005705      TST      R5        ;UNTIL R5 EQ #0
3161 021620 001370      BNE      50343:
3162
3163 021622      INIT15: READEF #EF.PWR ;HAS THERE BE A POWER FAILURE?
3164 021622 012700 000034      MOV      #EF.PWR,R0
3165 021626 104447      TRAP     C#REFG
3166 021630      BNCOMPLETE INIT16 ;BRANCH IF NOT.
3167 021630 103004      BCC      INIT16
3168 021632 105267 161670      INCB     STAF LG ;IF SO - SET THE START FLAG.
3169 021636 105267 161665      INCB     PWRFLG ;IF SO - SET THE POWER FAIL FLAG.
3170
3171 021642      INIT16: RFLAGS OPFLAG ;READ AND STORE FLAGS SET BY OPERATOR
3172 021642 104421      TRAP     C#RFLA
3173 021644 010067 161666      MOV      R0,OPFLAG
3174 021650 005003      CLR      R3        ;LET R3 := #0 ;CLEAR EVENT FLAG
3175 021652 105767 161651      TSTB    PWRFLG    ;IF POWER FAIL HAS NOT OCCURRED THEN:
3176 021656 001020      BNE      50344:
3177 021660      READEF #EF.NEW    ;UPDATE PASS COUNT WHEN
3178 021660 012700 000035      MOV      #EF.NEW,R0
3179 021664 104447      TRAP     C#REFG
3180 021666 103014      BCC      50345:
3181 021670 105767 161632      TSTB    STAF LG ;SUPERVISOR IS IN NEW PASS
3182 021674 001010      BNE      50346: ;AND DIAG WAS NEITHER STARTED
3183 021676      READEF #EF.RES    ;NOR
3184 021702 012700 000037      MOV      #EF.RES,R0
3185 021702 104447      TRAP     C#REFG

```

MISCELLANEOUS SECTIONS
INITIALIZE SECTION

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SEQ 0106

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3177 021704 103402          BCS 50347$      ;IFCOND CC THEN      ;RESTARTED
3178 021706 005103          COM R3          ;LET R3 := COMP R3  ;DO IT
3179
3180 021710 000401          BR 50350$
3181 021712 50347$:         INC R3          ;SET 1ST PASS IF NEW PASS AND
3182 021712 005203          ;RESTARTING
3183
3184 021714 50350$:
3185
3186 021714 000401          BR 50351$
3187 021716 50346$:         INC R3          ;SET 1ST PASS IF NEW PASS AND
3188 021716 005203          ;STARTING
3189
3190 021720 50351$:         ;DO NOT UPDATE IT ON CONTINUE
3191
3192 021720 50345$:         ;OR ON POWER FAIL
3193
3194 021720 50344$:
3195 021720 004767 175156    JSR PC,FIRSTU      ;INIT DEVICE POINTER.
3196 021724 005002          CLR R2          ;LET R2 := #0      ;INIT DEVICE COUNTER.
3197 021726 50352$:         ;WHILE DEVTBL(R5) NE #END DO
3198 021726 026527 002604 177777  CMP DEVTBL(R5),#END
3199 021734 001456          BEQ 50353$
3200 021736 005202          INC R2          ;LET R2 := R2 + #1
3201 021740 010500          MOV R5,R0      ;LET R0 := R5 SHIFT -1
3202 021742 006200          ASR R0
3203 021744          GPHARD R0,R0      ;GET HARDWARE P TABLE FROM SUPER.
3204 021744 104442          TRAP C#GPHRD
3205 021750 011065 002514    BCC 50354$      ;IFCOND CS THEN
3206 021754 012065 002524    MOV (R0),TSDB(R5) ;SAVE TSDB ADDRESS.
3207 021760 062765 000002 002524  MOV (R0)+,TSSR(R5) ;SAVE TSSR ADDRESS.
3208 021766 012065 002534    ADD #2,TSSR(R5)
3209 021772 011065 003532    MOV (R0)+,TSVCT(R5) ;SAVE INTERRUPT VECTOR ADDRESS.
3210 021776 011067 161532    MOV (R0),TSUNT(R5) ;SAVE NUMBER OF DRIVE
3211 022002          MOV (R0),TSNP      ;SAVE FOR PRINT OUT'S
3212 022002          SETVEC TSVCT(R5),TSSINT(R5),#INTPRI
3213 022002          MOV #INTPRI,-(SP)
3214 022006          MOV TSSINT(R5),-(SP)
3215 022012          MOV TSVCT(R5),-(SP)
3216 022016          MOV #3,-(SP)
3217 022022          TRAP C#SVEC
3218 022024          ADD #10,SP
3219 022030          ;SET UP INTERUPT PROCESSING CONDITIONS.
3220 022030 005065 003472    CLR INTFLG(R5)  ;CLEAR INTERRUPT FLAGS.
3221 022034 005703          TST R3          ;ACTUAL PASSCOUNT UPDATE PER R3
3222 022036 001410          BEQ 50355$
3223 022040 005703          TST R3          ;IF R3 LT #0 THEN
3224 022042 002003          BGE 50356$
3225 022044 005265 003326    INC PASCNT(R5)  ;LET PASCNT(R5) := PASCNT(R5) + #1
3226 022050          BR 50357$
3227 022052 50356$:         MOV #1,PASCNT(R5) ;LET PASCNT(R5) := #1
3228 022052 012765 000001 003326
3229 022060          50357$:
3230 022060          50355$:

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MISCELLANEOUS SECTIONS MACRO M1113 14-JUN-84 18:32
INITIALIZE SECTION

SEQ 0107

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3227
3228 022060          50354$:
3229 022060 005065 003376      CLR   RECCNT(R5)      ;CLEAR RECORD COUNT
3230 022064 004767 175060      JSR   PC,NEXTU        ;DO IT FOR ALL DEVICES.
3231
3232 022070 000716          BR    50352$
3233 022072          50353$:
3234
3235 022072 005702          TST   R2              ;IF THERE ARE NO UNITS:
3236 022074 001026          BNE   50360$
3237 022076          PRINTF #AUDRPM      ;PRINT ALL UNITS DROPPED,
                                MOV   #AUDRPM,-(SP)
                                MOV   #1,-(SP)
                                MOV   SP,R0
                                TRAP  C#PNTF
                                ADD   #4,SP
3238 022116          DELAY 200.         ;GO TO SUPERVISOR, WAIT 2 SECONDS.
                                MOV   #200..(PC)+
                                .WORD 0
                                MOV   L#DLY,(PC)+
                                .WORD 0
                                DEC   -6(PC)
                                BNE   -.4
                                DEC   -22(PC)
                                BNE   -.20
3239 022146          BREAK             ;GO TO SUPERVISOR, CHECK TTY.
                                TRAP  C#BRK
3240 022150          DOCLN             ;DO CLEAN CODE + ABORT PASS.
                                TRAP  C#DCLN
3241
3242 022152          50360$:
3243
3244
3245 022152          SETPRI #PRI00      ;LOWER CPU PRIORITY TO 0
                                MOV   #PRI00,R0
                                TRAP  C#SPRI
3246 022160 012700 000000          TSTB  IREC           ;IF ERROR RECOVERY IS ENABLED
3247 022164 105767 160027          BNE   1$
3248 022166 032767 0C0020 161342  BIT   #ADR,OPFLAG
3249 022174 001027          BNE   1$
3250 022176 004767 174700          JSR   PC,FIRSTU      ;AND AUTO-DROP NOT CALLED, THEN SET UP FOR FIRST
3251 022202          50362$:          ;WHILE THERE ARE MORE DEVICES:
3252 022202 026527 002604 177777  CMP   DEVTBL(R5),#END
3253 022210 001421          BEQ   1$
3254 022212 105067 161312          CLRB  TRAPD4        ;CLEAR TRAP FLAG
3255 022216          SETVEC #4,#TRAP4,#INTPRI ;SET VECTOR 4,PRIORITY #6
                                MOV   #INTPRI,-(SP)
                                MOV   #TRAP4,-(SP)
                                MOV   #4,-(SP)
                                MOV   #3,-(SP)
                                TRAP  C#SVEC
                                ADD   #10,SP
3256
3257 022244 012767 000001 161164  MOV   #1,TIME1      ;START 3.5 MINUTE COUNTER
3258 022252 000404          BR    50365$        ;INCR TIME1 FROM #1 TO #25 BY #1
3259 022254 000167 000622 1$:     JMP   50363$
3260

```

MISCELLANEOUS SECTIONS
INITIALIZE SECTION

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SEQ 0108

```

3261 022260          50366$:
3262 022260 005267 161152          INC      TIME1
3263 022264          50365$:
3264 022264 026727 161146 000025  CMP      TIME1,#25
3265 022272 003134          BGT      4$
3266 022274 012775 002340 002514  MOV      @GSCP,#TSDB(R5) ;AND GET UNITS STATUS
3267 022302          DELAY      25 ;WAIT
      022302 012727 000025          MOV      #25,(PC)+
      022306 000000          .WORD    0
      022310 016727 157602          MOV      L$DLY,(PC)+
      022314 000000          .WORD    0
      022316 005367 177772          DEC      -6(PC)
      022322 001375          BNE      -.4
      022324 005367 177756          DEC      -22(PC)
      022330 001367          BNE      -.20
3268 022332          CLRVEC   #4 ;CLEAR VECTOR AT 4
      022332 012700 000004          MOV      #4,R0
      022336 104436          TRAP     C$CVEC
3269 022340          TSTB     TRAPD4 ;IFB TRAPD4 NE #0 THEN
3270 022344 001423          BEQ      2$
3271 022346 005265 003366          INC      FTLCNT(R5) ;LET FTLCNT(R5) := FTLCNT(R5) + #1
3272 022352          PRINTF   @NODEV,TSSR(R5) ;PRINT ERROR
      022352 016546 002524          MOV      TSSR(R5),-(SP)
      022356 012746 005543          MOV      @NODEV, -(SP)
      022362 012746 000002          MOV      #2, -(SP)
      022366 010600          MOV      SP,R0
      022370 104417          TRAP     C$PNTF
      022372 062706 000006          ADD      #6,SP
3273 022376 016567 002604 175004  MOV      DEVTBL(R5),DROPN ;SAVE # OF UNIT TO BE DROPPED.
3274 022404 010500          MOV      R5,R0 ;R0=LOGICAL DEVICE NUMBER
3275 022406 006200          ASR      R0
3276 022410          DODU     R0 ;DROP THE UNIT
      022410 104451          TRAP     C$DODU
3277          ; EXEC BGNDU-ENDDU CODE IF IDU = 0
3278 022412          DOCLN ;DO CLEAN &ABORT
      022412 104444          TRAP     C$DCLN
3279          2$:
3280 022414 105067 161110          CLRB     TRAPD4 ;CLEAR TRAP FLAG
3281 022420          SETVEC   #4,@TRAP4,@INTPRI ;SET VECTOR 4,PRIORITY @6
      022420 012746 000340          MOV      @INTPRI, -(SP)
      022424 012746 023730          MOV      @TRAP4, -(SP)
      022430 012746 000004          MOV      #4, -(SP)
      022434 012746 000003          MOV      #3, -(SP)
      022440 104437          TRAP     C$SVEC
      022442 062706 000010          ADD      #10,SP
3282 022446 005775 002524          TST      @TSSR(R5) ;CHECK FOR ADDRESS
3283 022452          DELAY      25 ;WAIT
      022452 012727 000025          MOV      #25,(PC)+
      022456 000000          .WORD    0
      022460 016727 157432          MOV      L$DLY,(PC)+
      022464 000000          .WORD    0
      022466 005367 177772          DEC      -6(PC)
      022472 001375          BNE      -.4
      022474 005367 177756          DEC      -22(PC)
      022500 001367          BNE      -.20
3284 022502          CLRVEC   #4 ;CLEAR VECTOR AT 4
      022502 012700 000004          MOV      #4,R0

```

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SEQ 0109

```

022506 104436
3285 022510 105767 161014      TSTB  TRAPD4      ;IFB TRAPD4 NE #0 THEN      TRAP      C#CVEC
3286 022514 001424              BEQ      3#
3287 022516 005265 003366      INC      FTLCNT(R5)      ;LET FTLCNT(R5) := FTLCNT(R5) + #1
3288 022522              PRINTF  #NODEV,TSSR(R5)      ;PRINT ERROR
022522 016546 002524              MOV      TSSR(R5),-(SP)
022526 012746 005543              MOV      #NODEV,-(SP)
022532 012746 000002              MOV      #2,-(SP)
022536 010600              MOV      SP,R0
022540 104417              TRAP     C#PNTF
022542 062706 000006              ADD      #6,SP
3289 022546 016567 002604 174634  MOV      DEVTBL(R5),DROPN      ;SAVE # OF UNIT TO BE DROPPED.
3290 022554 010500              MOV      R5,R0      ;R0=LOGICAL DEVICE NUMBER
3291 022556 006200              ASR      R0
3292 022560              DODU     R0      ;DROP THE UNIT
022560 104451              TRAP     C#DODU
3293              ; EXEC BGN DU-END DU CODE IF IDU = 0
3294 022562              DOCLN
3294 022562 104444              TRAP     C#DCLN
3295
3296 022564 003127              4# :    BGT      50367#
3297
3298 022566 004767 165174              3# :    JSR      PC,SETDEF      ;SET UNIT NUMBER
3299 022572 010475 002514              MOV      R4,@TSDB(R5)
3300 022576              DELAY    25
022576 012727 000025              MOV      #25,(PC)+
022602 000000              .WORD   0
022604 016727 157306              MOV      L#DLY,(PC)+
022610 000000              .WORD   0
022612 005367 177772              DEC      -6(PC)
022616 001375              BNE      -.4
022620 005367 177756              DEC      -22(PC)
022624 001367              BNE      -.20
3301 022626 012775 002340 002514  MOV      #GSCP,#@TSDB(R5)      ;AND GET UNITS STATUS
3302 022634              DELAY    25      ;WAIT
022634 012727 000025              MOV      #25,(PC)+
022640 000000              .WORD   0
022642 016727 157250              MOV      L#DLY,(PC)+
022646 000000              .WORD   0
022650 005367 177772              DEC      -6(PC)
022654 001375              BNE      -.4
022656 005367 177756              DEC      -22(PC)
022662 001367              BNE      -.20
3303 022664 032775 000200 002524  BIT      #TS.SSR,@TSSR(R5)      ;IF #TS.SSR SET IN @TSSR(R5) THEN
3304 022672 001420              BEQ      50370#
3305 022674 032775 000100 002524  BIT      #TS.OFL,@TSSR(R5)      ;IF #TS.OFL NOT SET IN @TSSR(R5) THEN
3306 022702 001001              BNE      50371#
3307 022704 000457              BR       50364#
3308
3309 022706              50371# :
3310 022706              PRINTF  #OFLINM,TSNP      ;PRINT UNIT OFF LINE EVERY 10 SEC
022706 016746 160622              MOV      TSNP,-(SP)
022712 012746 005456              MOV      #OFLINM,-(SP)
022716 012746 000002              MOV      #2,-(SP)
022722 010600              MOV      SP,R0
022724 104417              TRAP     C#PNTF
022726 062706 000006              ADD      #6,SP

```

MISCELLANEOUS SECTIONS
INITIALIZE SECTION

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SEQ 0110

```

3311
3312 022732          50372$:
3313
3314 022732 000412          BR      50373$
3315 022734          50370$:
3316 022734          PRINTF #NRDYM,DEVTBL(R5)
      022734 016546 002604          MOV      DEVTBL(R5),-(SP)
      022740 012746 023700          MOV      #NRDYM, -(SP)
      022744 012746 000002          MOV      #2, -(SP)
      022750 010600          MOV      SP,R0
      022752 104417          TRAP     C$PNTF
      022754 062706 000006          ADD      #6, SP
3317
3318 022760          50373$:
3319 022760 012767 000001 160452  MOV      #1, TIME2          ;INCR TIME2 FROM #1 TO #13 BY #1
3320 022766 000402          BR      50374$
3321 022770          50375$:
3322 022770 005267 160444          INC      TIME2
3323 022774          50374$:
3324 022774 026727 160440 000013  CMP      TIME2, #13
3325 023002 003016          BGT     50376$
3326 023004          DELAY 100.          ;WAIT FOR UNIT TO BE SET ON-LINE
      023004 012727 000144          MOV      #100.,(PC)+
      023010 000000          .WORD 0
      023012 016727 157100          MOV      L$DLY,(PC)+
      023016 000000          .WORD 0
      023020 005367 177772          DEC     -6(PC)
      023024 001375          BNE     .-4
      023026 005367 177756          DEC     -22(PC)
      023032 001367          BNE     .-20
3327 023034          BREAK          ;ALLOW TERMINAL INTERRUPT
      023034 104422          TRAP     C$BRK
3328 023036 000754          BR      50375$
3329 023040          50376$:
3330 023040 000167 177214          JMP     50366$
3331 023044          50367$:
3332 023044          50364$:
3333 023044          CLRVEC #4          ;CLEAR VECTOR AT 4
      023044 012700 000004          MOV      #4,R0
      023050 104436          TRAP     C$CVEC
3334 023052 026727 160360 000025  CMP      TIME1, #25          ;IF OFF LINE FOR 3.5 MINUTES
3335 023060 003404          BLE     50377$
3336 023062 004767 167646          JSR PC,MOVMSG          ;GET MESSAGE PACKET
3337 023066 004767 170360          JSR PC,TCC1          ;PRINT ERROR AND DROP OFF LINE UNIT
3338
3339 023072          50377$:
3340
3341 023072 004767 174052          JSR PC,NEXTU          ;REPEAT UNTIL ON LINE OR TIMED OUT.
3342
3343 023076 000167 177100          JMP     50362$          ;SET UP FOR NEXT UNIT.
3344
3345 023102          50363$:
3346 023102          50361$:
3347 023102 105767 160421          TSTB   PWRFLG          ;IFB PWRFLG EQ #0 THEN
3348 023106 001026          BNE     50400$
3349 023110          MEMORY DATAW          ;REQUEST MEMORY FROM SUPER FOR RD/WR BUFFERS.
      023110 104431          TRAP     C$MEM

```

MISCELLANEOUS SECTIONS
INITIALIZE SECTION

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SEQ 0111

```

3350 023112 010067 160270                                MOV      RO,DATAWT
3351 023116 016767 160264 160264                      MOV      DATAWT, DATARD ;SET RD BFR ADDRESS
3352 023124 062767 004000 160256                      ADD      @DATCNT, DATARD
3353 023132 027727 160250 004000                      CMP      @DATAWT, @DATCNT ;WHEN NOT ENOUGH FREE MEMO AVAILABLE
3354 023140 002011                                      BGE      50401$
3354 023142                                      PRINTF @MEMOM ;WARN OPERATOR
3354 023142 012746 023210                                MOV      @MEMOM, -(SP)
3354 023146 012746 000001                                MOV      #1, -(SP)
3354 023152 010600                                      MOV      SP, RO
3354 023154 104417                                      TRAP    C$PNTF
3354 023156 062706 000004                                ADD      #4, SP
3355 023162                                      DOCLN ;AND ABORT PASS
3355 023162 104444                                      TRAP    C$DCLN
3356                                      ;DIAG MUST BE RE-LOADED IN A CPU WITH LARGER MEMO
3357 023164 50401$:
3358
3359 023164 50400$:
3360
3361 023164 105067 157024                      CLRB    CHGFLG ;CLR CHANGE CMD SEQ TBL FLAG.
3362 023170 012703 003526                      MOV     @ENDFLG, R3 ;LET R3 := @ENDFLG
3363 023174 004767 167464                      JSR     PC, CLRERR ;CLEAR ALL FLAGS.
3364 023200 105067 160323                      CLRB    PWRFLG ;CLEAR THE POWER FAIL FLAG.
3365
3366 023204                                      EXIT     INIT
3366 023204 104432                                      TRAP    C$EXIT
3366 023206 000104                                      .WORD   L10012-.
3367 023210 045 101 106 MEMOM: .ASCII /%AFREE MEMO TOO SMALL FOR RD-WR BFRS#N/
3367 023213 122 105 105
3367 023216 040 115 105
3367 023221 115 117 040
3367 023224 124 117 117
3367 023227 040 123 115
3367 023232 101 114 114
3367 023235 040 106 117
3367 023240 122 040 122
3367 023243 104 055 127
3367 023246 122 040 102
3367 023251 106 122 123
3367 023254 045 116
3368 023256 045 101 122 .ASCIZ /%ARE-LOAD IN LARGER MEMO#N/
3368 023261 105 055 114
3368 023264 117 101 104
3368 023267 040 111 116
3368 023272 040 114 101
3368 023275 122 107 105
3368 023300 122 040 115
3368 023303 105 115 117
3368 023306 045 116 000
3369
3370 .EVEN
3371 023312 ENDINIT
3371 023312 L10012:
3371 023312 104411 TRAP    C$INIT
3372
3373 .SBTTL AUTO DROP SECTION
3374
3375 ;**

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```

3376 ;SECTION EXECUTED AFTER THE INIT CODE WHEN "ADR" FLAG IS SET BY OPERATOR
3377 ;SECTION CHEKS FOR A VALID INTERFACE LOCATION. DROPS UNIT IF NO RESPONSE
3378 ;FROM INTERFACE
3379 ;--
3380
3381 023314 BGNAUTO
023314 L$AUTO::
3382
3383 023314 004767 173562 JSR PC,FIRSTU ;FIND FIRST UNIT
3384 023320 50402$: ;WHILE DEVTBL(R5) NE #END DO ;
3385 023320 026527 002604 177777 CMP DEVTBL(R5),#END
3386 023326 001525 BEQ 50403$
3387 023330 105067 160174 CLRB TRAPD4 ;LET TRAPD4 :B= #0 ;
3388 023334 SETVEC #4,#TRAP4,#INTPRI ;SET VECTOR 4 ;
023334 012746 000340 MOV #INTPRI,-(SP)
023340 012746 023730 MOV #TRAP4,-(SP)
023344 012746 000004 MOV #4,-(SP)
023350 012746 000003 MOV #3,-(SP)
023354 104437 TRAP C$SVEC
023356 062706 000010 ADD #10,SP
3389 023362 017502 002514 MOV @TSDB(R5),R2 ;ADDRESS TS05 INTERFACE
3390 023366 CLRVEC #4 ;CLEAR VECTOR AT 4
023366 012700 000004 MOV #4,R0
023372 104436 TRAP C$CVEC
3391 023374 105767 160130 TSTB TRAPD4 ;IFB TRAPD4 NE #0 THEN
3392 023400 001423 BEQ 50404$
3393 023402 005265 003366 INC FTLCNT(R5) ;LET FTLCNT(R5) := FTLCNT(R5) + #1
3394 023406 PRINTF #AUTODM,TSDB(R5) ;PRINT ERROR
023406 016546 002514 MOV TSDB(R5),-(SP)
023412 012746 023604 MOV #AUTODM,-(SP)
023416 012746 000002 MOV #2,-(SP)
023422 010600 MOV SP,R0
023424 104417 TRAP C$PNTF
023426 062706 000006 ADD #6,SP
3395 023432 016567 002604 173750 MOV DEVTBL(R5),DROPN ;SAVE # OF UNIT TO BE DROPPED.
3396 023440 010500 MOV R5,R0 ;R0=LOGICAL DEVICE NUMBER
3397 023442 006200 ASR R0
3398 023444 DODU R0 ;DROP THE UNIT: EXEC BGNDU-ENDDU CODE IF IDU = 0
023444 104451 TRAP C$DODU
3399
3400 023446 000452 BR 50405$
3401 023450 50404$:
3402 023450 012775 002340 002514 MOV #GSCP#K,@TSDB(R5) ;SEND GET STATUS COMMAND
3403 023456 004767 167216 JSR PC,WSSR ;WAIT
3404 023462 032775 000200 002524 BIT #TS.SSR,@TSSR(R5) ;IF #TS.SSR SETIN @TSSR(R5) THEN
3405 023470 001423 BEQ 50406$
3406 023472 032775 000100 002524 BIT #TS.OFL,@TSSR(R5) ;IF #TS.OFL SETIN @TSSR(R5) THEN
3407 023500 001416 BEQ 50407$
3408 023502 005265 003366 INC FTLCNT(R5) ;LET FTLCNT(R5) := FTLCNT(R5) + #1
3409 023506 PRINTF #OFLINM,TSNP
023506 016746 160022 MOV TSNP,-(SP)
023512 012746 005456 MOV #OFLINM,-(SP)
023516 012746 000002 MOV #2,-(SP)
023522 010600 MOV SP,R0
023524 104417 TRAP C$PNTF
023526 062706 000006 ADD #6,SP
3410 023532 004767 173566 JSR PC,DROPUA

```

```

3411
3412 023536          50407$:
3413
3414 023536 000416          BR      50410$
3415 023540          50406$:
3416 023540 005265 003366          INC      FTLCNT(R5)          ;LET FTLCNT(R5) := FTLCNT(R5) + #1
3417 023544          PRINTF #NRDYM,DEVTBL(R5)
      023544 016546 002604          MOV      DEVTBL(R5),-(SP)
      023550 012746 023700          MOV      #NRDYM, -(SP)
      023554 012746 000002          MOV      #2, -(SP)
      023560 010600          MOV      SP,R0
      023562 104417          TRAP    C#PNTF
      023564 062706 000006          ADD     #6,SP
3418 023570 004767 173530          JSR PC,DROPUA
3419
3420 023574          50410$:
3421
3422 023574          50405$:
3423 023574 004767 173350          JSR PC,NEXTU
3424
3425 023600 000647          BR      50402$
3426 023602          50403$:
3427
3428 023602          ENDAUTO
      023602          L10013:
      023602 104461          TRAP    C#AUTO
3429
3430 023604 045 101 102 AUTODM: .ASCII /#ABUS TRAP AT #06#N/
      023607 125 123 040
      023612 124 122 101
      023615 120 040 101
      023620 124 040 045
      023623 117 066 045
      023626 116
3431 023627 045 101 111 .ASCIZ /#AINTERFACE BAD OR NOT SET TO ABOVE AD#N/
      023632 116 124 105
      023635 122 106 101
      023640 103 105 040
      023643 102 101 104
      023646 040 117 122
      023651 040 116 117
      023654 124 040 123
      023657 105 124 040
      023662 124 117 040
      023665 101 102 117
      023670 126 105 040
      023673 101 104 045
      023676 116 000
3432 023700 045 101 125 NRDYM: .ASCIZ /#AUNIT #D1#A NOT RDY#N/
      023703 116 111 124
      023706 040 045 104
      023711 061 045 101
      023714 040 116 117
      023717 124 040 122
      023722 104 131 045
      023725 116 000
3433          .EVEN

```

```

3434
3435      ;      DEVICE BUS TRAP HANDLER
3436      ;      OUTPUT: TRAPD4 BYTE  1: TRAPED AT 4
3437      ;      0: NO TRAP
3438
3439 023730 105267 157574 TRAP4:: INCB   TRAPD4;LET TRAPD4 :B= TRAPD4 + #1
3440 023734 000002      RTI
3441
3442
3443      .SBTTL  CLEANUP CODING SECTION
3444
3445      ;++
3446      ; THE CLEANUP CODING SECTION CONTAINS THE CODING THAT IS PERFORMED
3447      ; AT THE END OF EACH PASS.
3448      ;--
3449
3450 023736      BGNCLN
      023736 L$CLEAN::
3451
3452 023736 004767 173140      JSR    PC,FIRSTU      ;FIND FIRST UNIT.
3453 023742      50411$: ;WHILE DEVTBL(R5) NE #END DO
3454 023742 026527 002604 177777 CMP    DEVTBL(R5),#END
3455 023750 001410      BEQ    50412$
3456 023752 004767 166722      JSR PC,WSSR      ;WAIT FOR UNIT READY OR TIMEOUT.
3457 023756      CLRVEC   TSVCT(R5) ;RELEASE INTERRUPT VECTORS FOR ALL DEV.
      023756 016500 002534      MOV    TSVCT(R5),R0
      023762 104436      TRAP   C$CVEC
3458 023764 004767 173160      JSR    PC,NEXTU      ;FIND NEXT UNIT.
3459
3460 023770 000764      BR     50411$
3461 023772      50412$:
3462
3463 023772      EXIT    CLN
      023772 104432      TRAP   C$EXIT
      023774 000002      .WORD  L10014-.
3464
3465      .EVEN
3466 023776      ENDCLN
      023776 L10014:
      023776 104412      TRAP   C$CLEAN
3467
3468      .SBTTL  DROP UNIT SECTION
3469
3470      ;++
3471      ; THE DROP-UNIT SECTION CONTAINS THE CODING THAT CAUSES A DEVICE
3472      ; TO NO LONGER BE TESTED. THAT CODE SHALL BE EXECUTED WHEN DODU
3473      ; MACRO IS CALLED WHILE IDU FLAG IS NOT SET BY OPERATOR
3474      ;--
3475
3476 024000      BGNDU
      024000 L$DU::
3477
3478 024000 010005      MOV    R0,R5      ;R5 = LOGICAL DEVICE NUMBER X 2.
3479 024002 006305      ASL   R5
3480 024004 012765 177774 002604 MOV    #NINUSE,DEVTBL(R5) ;SET NOT IN USE FLAG FOR THE DEVICE.
3481 024012      CLRVEC   TSVCT(R5) ;RELEASE THE INTERRUPT VECTOR.
      024012 016500 002534      MOV    TSVCT(R5),R0

```

MISCELLANEOUS SECTIONS MACRO M1113 14-JUN-84 18:32
 DROP UNIT SECTION

SEQ 0115

```

3482 024016 104436
      024020          PRINTF #DROPDM,DROPN          ;PRINT DROP DEVICE MESSAGE
      024020 016746 173364
      024024 012746 005065
      024030 012746 000002
      024034 010600
      024036 104417
      024040 062706 000006
3483 024044          EXIT      DU
      024044 000167
      024046 000000
3484          .EVEN
3485
3486 024050          ENDDU
      024050          L10015:
      024050 104453
3487
3488          .SBTTL  ADD UNIT SECTION
3489
3490          ;**
3491          ; THE ADD-UNIT SECTION CONTAINS THE CODING THAT CAUSES A DEVICE
3492          ; TO BE (A) TESTED FOR THE FIRST TIME, OR (B) RESUMED IN TESTING.  IF
3493          ; "EF.AUNIT" IS SET, THE UNIT WILL BE TESTED AS A NEW UNIT.
3494          ;--
3495
3496 024052          BGNAU
      024052          L$AU::
3497 024052 010005          MOV      R0,R5          ;R5 = LOGICAL DEVICE NUMBER X 2.
3498 024054 006305          ASL      R5
3499 024056 010065 002604          MOV      R0,DEVTBL(R5)          ;STORE UNIT # IN DEVICE TABLE.
3500 024062          GPHARD  R0,R0          ;GET HARDWARE P TABLE FROM SUPER.
      024062 104442
3501 024064 011065 002514          MOV      (R0),TSDB(R5)          ;SAVE TSDB ADDRESS.
3502 024070 012065 002524          MOV      (R0)+,TSSR(R5)          ;SAVE TSSR ADDRESS.
3503 024074 062765 000002 002524          ADD      #2,TSSR(R5)
3504 024102 011065 002534          MOV      (R0),TSVCT(R5)          ;SAVE INTERRUPT VECTOR ADDRESS.
3505 024106 011065 003532          MOV      (R0),TSUNT(R5)          ;SAVE NUMBER OF DRIVE
3506 024112 011067 157416          MOV      (R0),TSNP          ;SAVE FOR PRINT OUT'S
3507 024116          SETVEC  TSVCT(R5),TSSINT(R5),#INTPRI
      024116 012746 000340
      024122 016546 002554
      024126 016546 002534
      024132 012746 000003
      024136 104437
      024140 062706 000010
3508
3509 024144 005065 003472          CLR      INTFLG(R5)          ;SET UP INTERRUPT PROCESSING CONDITIONS.
3510
3511 024150          EXIT      AU          ;CLEAR INTERRUPT FLAGS.
      024150 000167
      024152 000000
3512
3513          .EVEN
3514
3515 024154          ENDAU
      024154          L10016:
      024154 104452
  
```

```

3516
3517
3518
3519          .TITLE HARDWARE TESTS
3520          .SBTTL TEST 1: BASIC FUNCTIONS.
3521
3522          ;++
3523          ; TEST TO EXECUTE ALL TS05 FUNCTIONS.
3524          ;--
3525
3526
3527 024156          BGNMOD
3528
3529 024156          BGNTST
3530          T1::
3531 024156 105067 157333          CLRB RANDOM          ;CLR THE RANDOM OPERATIONS FLAG.
3532 024162 105067 157326          CLRB EXPBOT          ;CLR EXPECT BOT FLAG.
3533
3534 024166          BGNSUB          ;SUBTEST 1 - SET CHAR, DRIVE INIT, GET STATUS.
3535          T1.1:
3536 024166 104402          TRAP C#BSUB
3537 024170 004767 172706          JSR PC,FIRSTU          ;FIND THE FIRST UNIT.
3538 024174 004767 162672          JSR PC,SOFINIT        ;INIT DEVICE
3539 024200 103404          BCS 11$
3540 024202          ERRDF 2,NSSRM,STAERM          ;REPORT TS05 NOT READY
3541 024202 104455          TRAP C#ERDF
3542 024204 000002          .WORD 2
3543 024206 004536          .WORD NSSRM
3544 024210 006120          .WORD STAERM
3545
3546 024212 004767 163250          11$: JSR PC,MDSET          ;GO DO SETUP'S
3547 024216 012702 025074          MOV #BFSEQ0,R2          ;ADR OF CMD SEQ.
3548 024222 004767 000622          JSR PC,BFSEQ          ;SET UP CMD SEQ.
3549 024226 004767 163774          JSR PC,EXALL          ;EXECUTE CMD SEQ ON ALL DEVICES.
3550 024232 004767 172644          JSR PC,FIRSTU          ;FIND THE FIRST UNIT.
3551 024236          50413$: ;WHILE DEVTBL(R5) NE #END DO          ;WHILE THERE ARE MORE DEVICES:
3552 024236 026527 002604 177777          CMP DEVTBL(R5),#END
3553 024244 001451          BEQ 50414$
3554 024246 016502 002544          MOV MSGPKA(R5),R2          ;GET MSG PACKET ADR,
3555 024252 062702 000012          ADD #12,R2          ;LET R2 := R2 + #12          ;GET XSTAT2 ADR,
3556 024256 011265 002564          MOV (R2),TS5CL(R5)          ;STORE CODE LEVEL FROM DTR BYTE.
3557 024262 042765 177700 002564          BIC #177700,TS5CL(R5)
3558 024270 011265 002574          MOV (R2),TS5SW(R5)          ;STORE SWITCH SETTINGS
3559 024274 042765 177477 002574          BIC #177477,TS5SW(R5)
3560 024302          PRINTF #CODELM,DEVTBL(R5),TS5CL(R5)
3561 024302 016546 002564          MOV TS5CL(R5),-(SP)
3562 024306 016546 002604          MOV DEVTBL(R5),-(SP)
3563 024312 012746 004162          MOV #CODELM, -(SP)
3564 024316 012746 000003          MOV #3, -(SP)
3565 024322 010600          MOV SP,R0
3566 024324 104417          TRAP C#PNTF
3567 024326 062706 000010          ADD #10,SP
3568
3569          ;PRINT THE TS05 MICROCODE LEVEL.
3570 024332          PRINTF #SWSET,DEVTBL(R5),TS5SW(R5)
3571 024332 016546 002574          MOV TS5SW(R5),-(SP)

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HARDWARE TESTS MACRO M1113 14-JUN-84 18:32
 TEST 1: BASIC FUNCTIONS.

SEQ 0117

024336	016546	002604				MOV	DEVTBL(R5),-(SP)
024342	012746	004231				MOV	#SWSET, -(SP)
024346	012746	000003				MOV	#3, -(SP)
024352	010600					MOV	SP, R0
024354	104417					TRAP	C#PNTF
024356	062706	000010				ADD	#10, SP
3558							;PRINT THE TS05 SWITCH SETTINGS.
3559	024362		50415#:				;FIND NEXT UNIT.
3560	024362	004767	172562			JSR	PC, NEXTU
3561							
3562	024366	000723				BR	50413#
3563	024370		50414#:				
3564							
3565	024370					ENDSUB	
	024370		L10020:				
	024370	104403					TRAP C#ESUB
3566							
3567	024372					BGNSUB	;SUBTEST 2 - REWIND.
	024372		T1.2:				
	024372	104402					TRAP C#BSUB
3568							
3569	024374	012702	025146			MOV	#BFSEQ1, R2
3570	024400	004767	000444			JSR	PC, BFSEQ
3571	024404	004767	163616			JSR	PC, EXALL
3572	024410	105067	157112			CLRB	STAFLG
3573	024414					ENDSUB	;ADR OF CMD SEQ.
	024414		L10021:				;SET UP CMD SEQ.
	024414	104403					;EXECUTE CMD SEQ ON ALL DEVICES.
							;CLEAR START FLAG
3574							TRAP C#ESUB
3575	024416					BGNSUB	;SUBTEST 3 - WRITE/VERIFY.
	024416		T1.3:				
	024416	104402					TRAP C#BSUB
3576							
3577	024420	012702	025160			MOV	#BFSEQ2, R2
3578	024424	004767	000420			JSR	PC, BFSEQ
3579	024430	004767	163572			JSR	PC, EXALL
3580	024434					ENDSUB	;ADR OF CMD SEQ.
	024434		L10022:				;SET UP CMD SEQ.
	024434	104403					;EXECUTE CMD SEQ ON ALL DEVICES.
							TRAP C#ESUB
3581							
3582	024436					BGNSUB	;SUBTEST 4 - WRITE TAPE MARK, ERASE.
	024436		T1.4:				
	024436	104402					TRAP C#BSUB
3583							
3584	024440	012702	025252			MOV	#BFSEQ3, R2
3585	024444	004767	000400			JSR	PC, BFSEQ
3586	024450	004767	163552			JSR	PC, EXALL
3587	024454					ENDSUB	;ADR OF CMD SEQ.
	024454		L10023:				;SET UP CMD SEQ.
	024454	104403					;EXECUTE CMD SEQ ON ALL DEVICES.
							TRAP C#ESUB
3588							
3589	024456					BGNSUB	;SUBTEST 5 - SPACE FILES.
	024456		T1.5:				
	024456	104402					TRAP C#BSUB
3590							
3591	024460	012702	025324			MOV	#BFSEQ4, R2
3592	024464	004767	000360			JSR	PC, BFSEQ

HARDWARE TESTS MACRO M1113 14-JUN-84 18:32
 TEST 1: BASIC FUNCTIONS.

SEQ 0118

3593	024470	004767	163532		JSR	PC,EXALL		;EXECUTE CMD SEQ ON ALL DEVICES.
3594	024474			L10024:	ENDSUB			
	024474							
	024474	104403						TRAP C#ESUB
3595								
3596	024476			T1.6:	BGNSUB			;SUBTEST 6 - SPACE RECORDS.
	024476							
	024476	104402						TRAP C#BSUB
3597								
3598	024500	012702	025366		MOV	#BFSEQ5,R2		;ADR OF CMD SEQ.
3599	024504	004767	000340		JSR	PC,BFSEQ		;SET UP CMD SEQ.
3600	024510	004767	163512		JSR	PC,EXALL		;EXECUTE CMD SEQ ON ALL DEVICES.
3601	024514			L10025:	ENDSUB			
	024514							
	024514	104403						TRAP C#ESUB
3602								
3603	024516			T1.7:	BGNSUB			;SUBTEST 7 - WRITE RETRY.
	024516							
	024516	104402						TRAP C#BSUB
3604								
3605	024520	012702	025440		MOV	#BFSEQ6,R2		;ADR OF CMD SEQ.
3606	024524	004767	000320		JSR	PC,BFSEQ		;SET UP CMD SEQ.
3607	024530	004767	163472		JSR	PC,EXALL		;EXECUTE CMD SEQ ON ALL DEVICES.
3608	024534			L10026:	ENDSUB			
	024534							
	024534	104403						TRAP C#ESUB
3609								
3610	024536			T1.8:	BGNSUB			;SUBTEST 8 - READ REV RETRY.
	024536							
	024536	104402						TRAP C#BSUB
3611								
3612	024540	012702	025512		MOV	#BFSEQ7,R2		;ADR OF CMD SEQ.
3613	024544	004767	000300		JSR	PC,BFSEQ		;SET UP CMD SEQ.
3614	024550	004767	163452		JSR	PC,EXALL		;EXECUTE CMD SEQ ON ALL DEVICES.
3615	024554			L10027:	ENDSUB			
	024554							
	024554	104403						TRAP C#ESUB
3616								
3617	024556			T1.9:	BGNSUB			;SUBTEST 9 - READ FWD RETRY.
	024556							
	024556	104402						TRAP C#BSUB
3618								
3619	024560	012702	025544		MOV	#BFSEQ8,R2		;ADR OF CMD SEQ.
3620	024564	004767	000260		JSR	PC,BFSEQ		;SET UP CMD SEQ.
3621	024570	004767	163432		JSR	PC,EXALL		;EXECUTE CMD SEQ ON ALL DEVICES.
3622	024574			L10030:	ENDSUB			
	024574							
	024574	104403						TRAP C#ESUB
3623								
3624	024576			T1.10:	BGNSUB			;SUBTEST 10- CLEAN.
	024576							
	024576	104402						TRAP C#BSUB
3625								
3626	024600	012702	025576		MOV	#BFSEQ9,R2		;ADR OF CMD SEQ.
3627	024604	004767	000240		JSR	PC,BFSEQ		;SET UP CMD SEQ.
3628	024610	004767	163412		JSR	PC,EXALL		;EXECUTE CMD SEQ ON ALL DEVICES.
3629	024614				ENDSUB			

HARDWARE TESTS MACRO M1113 14-JUN-84 18:32
 TEST 1: BASIC FUNCTIONS.

SEQ 0119

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024614          L10031:
024614 104403          TRAP      C#ESUB
3630
3631 024616          BGNSUB          ;SUBTEST 11 - WTV SWAPPED DATA BYTES.
024616          T1.11:
024616 104402          TRAP      C#BSUB
3632 024620 012702 025620          MOV      #BFSE10,R2          ;ADR OF CMD SEQ.
3633 024624 004767 000220          JSR      PC,BFSEQ          ;SET UP CMD SEQ.
3634 024630 004767 163372          JSR      PC,EXALL          ;WRITE/VERIFY RECORDS 1 AND 2.
3635 024634 112767 000001 156656          MOV      #1,SMBFLG          ;ENABLE BYTE SWAPPING.
3636 024642 004767 163360          JSR      PC,EXALL          ;WRITE/VERIFY RECORDS 3 AND 4.
3637 024646 105067 156646          CLR      SMBFLG          ;DISABLE BYTE SWAPPING.
3638 024652          ENDSUB
024652          L10032:
024652 104403          TRAP      C#ESUB
3639 024654 016702 156526          MOV      DATAW,R2          ;INIT WRITE BUFFER POINTER.
3640 024660 062702 000012          ADD      #10.,R2
3641 024664          504164: ;WHILE R2 NE DATAW DO ;UNTIL 10 BYTES HAVE BEEN SWAPPED.
3642 024664 020267 156516          CMP      R2,DATAW
3643 024670 001402          BEQ      504174
3644 024672 000342          SWAB    -(R2)          ;SWAP DATA BYTES IN WRITE BUFFER.
3645
3646 024674 000773          BR      504164
3647 024676          504174:
3648 024676 105267 156621          INCB    T1SWB          ;SET T1 SWAP BYTES FLAG FOR "CKDATA" SUBR
3649
3650 024702          BGNSUB          ;SUBTEST 12 - READ SWAPPED DATA BYTES.
024702          T1.12:
024702 104402          TRAP      C#BSUB
3651 024704 012767 104401 156506          MOV      #RDR,CMDWRD          ;CMD IS READ REV.
3652 024712 004767 171234          JSR      PC,VFEXC          ;VERIFY ODD LENGTH SWAP (RECORD 4).
3653 024716 012767 000012 155412          MOV      #12,CMDPKT*CP.CNT          ;CHANGE BYTE COUNT TO 10.
3654 024724 004767 171222          JSR      PC,VFEXC          ;VERIFY EVEN LENGTH SWAP (RECORD 3).
3655 024730 112767 000001 156562          MOV      #1,SMBFLG          ;ENABLE BYTE SWAPPING.
3656 024736 012767 000011 155372          MOV      #11,CMDPKT*CP.CNT          ;CHANGE BYTE COUNT TO 9.
3657 024744 004767 171202          JSR      PC,VFEXC          ;VERIFY ODD LENGTH SWAP (RECORD 2).
3658 024750 012767 000012 155360          MOV      #12,CMDPKT*CP.CNT          ;CHANGE BYTE COUNT TO 10.
3659 024756 004767 171170          JSR      PC,VFEXC          ;VERIFY EVEN LENGTH SWAP (RECORD 1).
3660 024762 012767 104001 156430          MOV      #RDF,CMDWRD          ;CMD IS READ FWD.
3661 024770 004767 171156          JSR      PC,VFEXC          ;VERIFY EVEN LENGTH SWAP (RECORD 1).
3662 024774 012767 000011 155334          MOV      #11,CMDPKT*CP.CNT          ;CHANGE BYTE COUNT TO 9.
3663 025002 004767 171144          JSR      PC,VFEXC          ;VERIFY ODD LENGTH SWAP (RECORD 2).
3664 025006 105067 156506          CLR      SMBFLG          ;DISABLE BYTE SWAPPING.
3665 025012 012767 000012 155316          MOV      #12,CMDPKT*CP.CNT          ;CHANGE BYTE COUNT TO 10.
3666 025020 004767 171126          JSR      PC,VFEXC          ;VERIFY EVEN LENGTH SWAP (RECORD 3).
3667 025024 012767 000011 155304          MOV      #11,CMDPKT*CP.CNT          ;CHANGE BYTE COUNT TO 9.
3668 025032 004767 171114          JSR      PC,VFEXC          ;VERIFY ODD LENGTH SWAP (RECORD 4).
3669
3670 025036          ENDSUB
025036          L10033:
025036 104403          TRAP      C#ESUB
3671
3672 025040 105067 156457          CLR      T1SWB          ;CLEAR T1 SWAP BYTES FLAG
3673
3674 025044          EXIT      TST
025044 104432          TRAP      C#EXIT
025046 000574          .WORD    L10017-

```



```

3675
3676      ;      SUBROUTINE TO MOVE A COMMAND SEQUENCE TO THE SEQUENCE TABLE.
3677      ;      INPUTS:          R2 = FWA OF COMMAND SEQUENCE.
3678      ;      OUTPUTS:
3679      ;      REGISTERS:
3680      ;      CALLS:
3681
3682 025050 012701 003540  BFSEQ:: MOV    #CMDSEQ,R1          ;INIT SEQ TABLE ADDRESS.
3683 025054          50420$: ;WHILE (R2) NE #END DO    ;WHILE THERE ARE MORE COMMANDS:
3684 025054 021227 177777  CMP    (R2),#END
3685 025060 001402          BEQ    50421$
3686 025062 012221          MOV    (R2)+,(R1)+      ;MOVE COMMANDS TO SEQ TABLE.
3687
3688 025064 000773          BR     50420$
3689 025066          50421$:
3690 025066 012711 177777  MOV    #END,(R1)      ;STORE END OF SEQUENCE CODE.
3691 025072 000207          RTS    PC              ;RETURN.
3692
3693
3694      ;      BASIC FUNCTION COMMAND SEQUENCE
3695
3696 025074 140004  BFSEQ0: .WORD  SCH          ;SET CHAR. 200.      (1)
3697 025076 000200          200
3698 025100 000001          1
3699 025102 000000          0
3700 025104 100013          DRI          ;DRIVE INIT.      (2)
3701 025106 000001          1
3702 025110 000001          1
3703 025112 000000          0
3704 025114 140004          SCH          ;SET CHAR. 20      (3)
3705 025116 000020          20
3706 025120 000001          1
3707 025122 000000          0
3708 025124 100017          GES          ;GET STATUS.      (4)
3709 025126 000001          1
3710 025130 000001          1
3711 025132 000000          0
3712 025134 140004          SCH          ;SET CHAR. 40.      (5)
3713 025136 000040          40
3714 025140 000001          1
3715 025142 000000          0
3716 025144 177777          .WORD  END
3717
3718 025146 102010  BFSEQ1:          RWD          ;REWIND TWICE.      (6)
3719 025150 000001          1
3720 025152 000002          2
3721 025154 000000          0
3722 025156 177777          .WORD  END
3723
3724 025160 104105  BFSEQ2:          WTV          ;WRITE/VERIFY PAT 1. (7)
3725 025162 004000          DATCNT
3726 025164 000001          1
3727 025166 000001          1
3728 025170 104105          WTV          ;WTV PAT 2.      (8)
3729 025172 004000          DATCNT
3730 025174 000001          1
3731 025176 000002          2

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HARDWARE TESTS MACRO M1113 14-JUN-84 18:32
 TEST 1: BASIC FUNCTIONS.

SEQ 0121

3732	025200	104105		WTV		;WTV PAT 3.	(9)
3733	025202	004000		DATCNT			
3734	025204	000001		1			
3735	025206	000003		3			
3736	025210	104105		WTV		;WTV PAT 4.	(10)
3737	025212	004000		DATCNT			
3738	025214	000001		1			
3739	025216	000004		4			
3740	025220	104105		WTV		;WTV PAT 5.	(11)
3741	025222	004000		DATCNT			
3742	025224	000001		1			
3743	025226	000005		5			
3744	025230	104105		WTV		;WTV PAT 6.	(12)
3745	025232	004000		DATCNT			
3746	025234	000001		1			
3747	025236	000006		6			
3748	025240	104105		WTV		;WTV PAT 0.	(13)
3749	025242	004000		DATCNT			
3750	025244	000001		1			
3751	025246	000000		0			
3752	025250	177777	.WORD	END			
3753							
3754	025252	100011	BFSEQ3:	WTM		;WRITE TAPE MARK.	(14)
3755	025254	000001		1			
3756	025256	000001		1			
3757	025260	000000		0			
3758	025262	104005		WRT		;WRITE 10 RECORDS.	(15)
3759	025264	004000		DATCNT			
3760	025266	000010		10			
3761	025270	000001		1			
3762	025272	100411		ERS		;ERASE 10 TIMES.	(16)
3763	025274	000001		1			
3764	025276	000010		10			
3765	025300	000000		0			
3766	025302	100011		WTM		;WRITE TAPE MARK.	(17)
3767	025304	000001		1			
3768	025306	000001		1			
3769	025310	000000		0			
3770	025312	101011		WTR		;WTM RETRY	(18)
3771	025314	000001		1			
3772	025316	000001		1			
3773	025320	000000		0			
3774	025322	177777	.WORD	END			
3775							
3776	025324	105410	BFSEQ4:	SFR		;SPACE 2 FILES REV.	(19)
3777	025326	000002		2			
3778	025330	000001		1			
3779	025332	000000		0			
3780	025334	105010		SFF		;SPACE 2 FILES FWD.	(20)
3781	025336	000002		2			
3782	025340	000001		1			
3783	025342	000000		0			
3784	025344	105410		SFR		;SPACE 2 FILES REV.	(21)
3785	025346	000001		1			
3786	025350	000002		2			
3787	025352	000000		0			
3788	025354	105010		SFF		;SPACE 2 FILES FWD.	(22)

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 TEST 1: BASIC FUNCTIONS.

SEQ 0122

3789	025356	000001		1		
3790	025360	000002		2		
3791	025362	000000		0		
3792	025364	177777	.WORD	END		
3793						
3794	025366	102010	BFSEQ5:	RWD	;REWIND.	(23)
3795	025370	000001		1		
3796	025372	000001		1		
3797	025374	000000		0		
3798	025376	104010		SRF	;SPACE 7 RECORDS FWD.	(24)
3799	025400	000007		7		
3800	025402	000001		1		
3801	025404	000000		0		
3802	025406	104410		SRR	;SPACE 7 RECORDS REV.	(25)
3803	025410	000007		7		
3804	025412	000001		1		
3805	025414	000000		0		
3806	025416	104010		SRF	;SPACE 7 RECORDS FWD.	(26)
3807	025420	000001		1		
3808	025422	000007		7		
3809	025424	000000		0		
3810	025426	104410		SRR	;SPACE 7 RECORDS REV.	(27)
3811	025430	000001		1		
3812	025432	000007		7		
3813	025434	000000		0		
3814	025436	177777	.WORD	END		
3815						
3816	025440	102010	BFSEQ6:	RWD	;REWIND.	(28)
3817	025442	000001		1		
3818	025444	000001		1		
3819	025446	000000		0		
3820	025450	104005		WRT	;WRITE.	(29)
3821	025452	004000		DATCNT		
3822	025454	000001		1		
3823	025456	000001		1		
3824	025460	105005		WRR	;WRITE RETRY.	(30)
3825	025462	004000		DATCNT		
3826	025464	000001		1		
3827	025466	000001		1		
3828	025470	100011		WTR	;WRITE TAPE MARK.	
3829	025472	000001		1		
3830	025474	000001		1		
3831	025476	000000		0		
3832	025500	105410		SFR	;SPACE 1 FILE REV.	
3833	025502	000001		1		
3834	025504	000001		1		
3835	025506	000000		0		
3836	025510	177777	.WORD	END		
3837						
3838	025512	104401	BFSEQ7:	RDR	;READ REV.	(31)
3839	025514	004000		DATCNT		
3840	025516	000001		1		
3841	025520	000001		1		
3842	025522	105401		RNR	;READ NEXT REV.	(32)
3843	025524	004000		DATCNT		
3844	025526	000001		1		
3845	025530	000001		1		


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3900 025666 004767 161200      JSR    PC,SOFINIT      ;INIT DEVICE
3901 025672 103404              BCS    11$
3902 025674              ERRDF  2,NSSRM,STAERM ;REPORT TS05 NOT READY
                                TRAP    C$ERDF
                                .WORD   2
                                .WORD   NSSRM
                                .WORD   STAERM
3903
3904 025704 004767 161556      11$: JSR    PC,MDSET      ;GO DO SETUP'S
3905 025710 012702 004000      MOV    #DATCNT,R2      ;SET UP THE RECORD LENGTH MASK.
3906 025714 005302              DEC    R2
3907 025716 010267 155506      MOV    R2,LENMSK       ;ALLOW MAXIMUM BUFFER.
3908 025722 005167 155502      COM    LENMSK
3909 025726 004767 162230      JSR    PC,SETCH        ;CMD 1 = SET CHARACTERISTIC.
3910 025732 105767 155570      TSTB  STAFLG ;IFB STAFLG NE #0 THEN ;IF STARTING THEN:
3911 025736 001417              BEQ    50424$
3912 025740 004767 162242      JSR    PC,SETRW        ;CMD2=REWIND
3913 025744 105067 155556      CLRB  STAFLG ;LET STAFLG :B= #0 ;CLR START FLAG.
3914
3915 025750              50422$:
3916 025750 012721 104105      MOV    #WTV,(R1)+
3917 025754 012721 004000      MOV    #DATCNT,(R1)+
3918 025760 012702 177740      MOV    #RNOPSC,R2
3919 025764 005102              COM    R2
3920 025766 010221              MOV    R2,(R1)+
3921 025770 012721 000007      MOV    #RANP,(R1)+
3922
3923 025774              50423$: BREAK ; DO A SUPVSR BREAK FIRST.
                                TRAP    C$BRK
                                025774 104422
3924
3925 025776              50424$: ;FILL SEQ TBL WITH RANDOM CMDS.
3926 025776 020127 003740      CMP    R1,#SEQEND
3927 026002 002012              BGE    50425$
3928 026004 066767 155422 155422 ADD    RANB,RANS ;LET RANS := RANS + RANB
3929 026012 016702 155416      MOV    RANS,R2
3930 026016 042702 177741      BIC    #177741,R2
3931 026022 004772 026160      JSR    PC,#RANCMD(R2) ;SET UP A RANDOM CMD + BRK.
3932
3933 026026 000763              BR     50424$
3934 026030              50425$:
3935 026030 012711 177777      MOV    #END,(R1) ;STORE END OF SEQUENCE CODE IN TABLE.
3936 026034 004767 162166      JSR    PC,EXALL ;GO EXECUTE ALL CMDS IN SEQUENCE TABLE.
3937
3938 026040 012701 003540      MOV    #CMDSEQ,R1 ;INIT CMD SEQ TBL POINTER,
3939 026044 005702              TST   R2 ;REPEAT UNTIL EOT IS REACHED
3940 026046 001752              BEQ   50423$
3941 026050 105267 155450      INCB  ALLEOT ;FLAG ALL UNITS @ EOT
3942 026054 000240              NOP
3943 026056 000240              NOP
3944 026060 000240              NOP
3945 026062 004767 001546      JSR    PC,TSWEOT ;WRITE ONE RECORD BEYOND EOT ON ALL UNITS
3946 ;SO THAT SHORTER READ STOP DISTANCE
3947 ;SHALL POSITION HEAD IN CLEAN IRG GAP
3948 ;READ REV THAT EXTRA REC TO RE-POSITION THE TAPE
3949 026066 004767 000126      JSR    PC,RANRD ;SET UP READ REV/FWD CMDS,
3950 026072 012767 177740 155444 MOV    #RNOPSC,CMDSEQ+4 ;# OF RECORDS FOR READ REV.
3951 026100 005167 155440      COM    CMDSEQ+4

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TEST 2: DATA RELIABILITY.

SEQ 0125

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3952 026104 016767 155434 155442      MOV      CMDSEQ+4,CMDSEQ+14      ;# OF RECORDS FOR READ FORWARD.
3953 026112 012711 177777              MOV      #END,(R1)              ;STORE END OF SEQUENCE CODE IN SEQ TABLE.
3954 026116 004767 162104              JSR      PC,EXALL               ;GO EXECUTE READ REV/FWD OF LAST N RECORDS.
3955 026122 105067 155376              CLR      ALLEOT                 ;CLEAR ALL UNITS @ EOT FLAG
3956 026126 112767 000001 155363      MOV      #1,RPTFLG             ;REQUEST PERFORMANCE REPORT DURING REWIND.
3957 026134 012701 003540              MOV      #CMDSEQ,R1            ;INIT SEQ TBL POINTER,
3958 026140 004767 162042              JSR      PC,SETRW              ;STORE REWIND IN SEQ TBL.
3959 026144 012711 177777              MOV      #END,(R1)            ;STORE END IN SEQ TBL,
3960 026150 004767 162052              JSR      PC,EXALL              ;EXECUTE REWIND CMD ON ALL UNITS
3961
3962 026154                                EXIT      TST
      026154 104432                                TRAP      C$EXIT
      026156 000320                                .WORD    L10034-.

3963
3964      ;      ADDRESSES OF SUBROUTINES USED TO SET UP RANDOM OPERATIONS IN
3965      ;      THE DATA RELIABILITY TEST.
3966
3967 026160 026356      RANCMD: RANWV      ;WRITE
3968 026162 026332      RANWR      ;WRITE.
3969 026164 026332      RANWR      ;WRITE.
3970 026166 026332      RANWR      ;WRITE.
3971 026170 026332      RANWR      ;WRITE.
3972 026172 026332      RANWR      ;WRITE.
3973 026174 026332      RANWR      ;WRITE.
3974 026176 026332      RANWR      ;WRITE.
3975 026200 026220      RANRD      ;READ.
3976 026202 026220      RANRD      ;READ.
3977 026204 026220      RANRD      ;READ.
3978 026206 026220      RANRD      ;READ.
3979 026210 026220      RANRD      ;READ.
3980 026212 026220      RANRD      ;READ.
3981 026214 026220      RANRD      ;READ.
3982 026216 026220      RANRD      ;READ.
3983
3984
3985      ;      SUBROUTINE TO SET UP READ COMMANDS IN SEQUENCE TABLE.
3986      ;      INPUTS:
3987      ;      OUTPUTS:
3988      ;      REGISTERS:      R2
3989      ;      CALLS:
3990
3991 026220 005767 155232      RANRD:: TST      WTMFLG      ;WAS LAST CMD A WRITE?
3992 026224 001406              BEQ      1$                  ;NO,GO AHEAD
3993 026226 004767 000136              JSR      PC,RAWTH            ;YES PUT DOWN TAPE MARK
3994 026232 004767 000160              JSR      PC,RASFR            ;AND SPACE FILE REV
3995 026236 005067 155214              CLR      WTMFLG              ;THEN CLEAR THE FLAG
3996 026242 020127 003740      1$:  CMP      R1,#SEQEND
3997 026246 002030              BGE      2$
3998 026250 012721 104401              MOV      #RDR,(R1)+          ;STORE READ REV CMD.
3999 026254 012721 004000              MOV      #DATCNT,(R1)+       ;SET BRF TO MAX FOR READ RANDOM LENGTHS.
4000 026260 066767 155150 155144      ADD      RANS,RANB           ;LET RANB := RANB + RANS
4001 026266 016702 155140              MOV      RANB,R2             ;LET R2 := RANB CLR.BY #RNOPSC
4002 026272 042702 177740              BIC      #RNOPSC,R2
4003 026276 010221              MOV      R2,(R1)+            ;SET RANDOM # OF OPERATIONS.
4004 026300 012721 000007              MOV      #RANP,(R1)+         ;RANDOM PATTERN.
4005 026304 020127 003740              CMP      R1,#SEQEND
4006 026310 002007              BGE      2$

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4007 026312 012721 104001      MOV    #RDF,(R1)+    ;STORE READ FWD CMD.
4008 026316 012721 004000      MOV    #DATCNT,(R1)+ ;SET BRF TO MAX TO READ RANDOM LENGTHS.
4009 026322 010221                MOV    R2,(R1)+    ;SET RANDOM # OF OPERATIONS.
4010 026324 012721 000007      MOV    #RANP,(R1)+  ;RANDOM PATTERN.
4011 026330 000207      2$:   RTS PC
4012
4013      ;   SUBROUTINE TO SET UP A WRITE COMMAND IN THE SEQUENCE TABLE,
4014      ;   THEN A WRITE TAPE MARK AND SPACE FILE REVERSE.
4015      ;
4016      ;   INPUTS:
4017      ;   OUTPUTS:
4018      ;   REGISTERS:
4019      ;   CALLS:
4020
4021 026332 012721 104005      RANWR:: MOV    #WRT,(R1)+    ;STORE WRITE CMD.
4022 026336 004767 000102      JSR PC,RANW          ;STORE BRF, # OF OPERATIONS, PATTERN.
4023 026342 005767 155110      TST    WTMFLG        ;LAST CMD A WRT?
4024 026346 001002                BNE    1$            ;YES,RETURN
4025 026350 005267 155102      INC    WTMFLG        ;NO,SET THE FLAG
4026 026354 000207      1$:   RTS PC
4027
4028
4029      ;   SUBROUTINE TO SET UP A WRITE/VERIFY COMMAND IN THE SEQUENCE TABLE.
4030      ;   INPUTS:
4031      ;   OUTPUTS:
4032      ;   REGISTERS:
4033      ;   CALLS:
4034
4035 026356 012721 104105      RANWV:: MOV    #WTV,(R1)+    ;STORE WRITE/VERIFY CMD.
4036 026362 004767 000056      JSR PC,RANW          ;STORE BRF, # OF OPERATIONS, PATTERN.
4037 026366 000207      RTS    PC
4038
4039
4040      ;   SUBROUTINE TO SET UP A WRITE TAPE MARK IN THE SEQUENCE TABLE.
4041      ;   INPUTS:
4042      ;   OUTPUTS:
4043      ;   REGISTERS:
4044      ;   CALLS:
4045
4046 026370 020127 003740      RAWTM:: CMP    R1,#SEQEND
4047 026374 002007                BGE    1$
4048 026376 012721 100011      MOV    #WTM,(R1)+    ;STORE WRITE TAPE MARK CMD.
4049 026402 012721 000001      MOV    #1,(R1)+    ;BRF
4050 026406 012721 000001      MOV    #1,(R1)+    ;# OF OPERATIONS
4051 026412 005721                TST    (R1)+        ;SKIP PATTERNS
4052 026414 000207      1$:   RTS PC
4053
4054      ;   SUBROUTINE TO SET UP A SPACE FILE REVERSE IN THE SEQUENCE TABLE.
4055      ;   INPUTS:
4056      ;   OUTPUTS:
4057      ;   REGISTERS:
4058      ;   CALLS:
4059
4060 026416 020127 003740      RASFR:: CMP    R1,#SEQEND
4061 026422 002007                BGE    1$
4062 026424 012721 105410      MOV    #SFR,(R1)+    ;STORE SPACE FILE REVERSE
4063 026430 012721 000001      MOV    #1,(R1)+    ;BRF

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4064 026434 012721 000001      MOV    #1,(R1)+      ;# OF OPERATIONS
4065 026440 005721             TST    (R1)+        ;SKIP PATTERNS
4066 026442 000207             1$:   RTS    PC
4067
4068
4069 :                           ; SUBROUTINE TO STORE BR# , # OF OPERATIONS, PATTERN IN COMMAND
4070 :                           ; SEQUENCE TABLE FOR WRITE AND WRITE/VERIFY COMMANDS.
4071 :                           ; INPUTS:
4072 :                           ; OUTPUTS:
4073 :                           ; REGISTERS:      R2
4074 :                           ; CALLS:
4075
4076 026444 012721 004000      RANW:: MOV    #DATCNT,(R1)+      ;SET BR# TO MAX FOR PATTERN GENERATION.
4077 :                           ;RANDOM BR# WILL BE GENERATED FOR EACH RECORD.
4078 026450 066767 154760 154754  ADD    RANS,RANB      ;LET RANB := RANB + RANS
4079 026456 016702 154750      MOV    RANB,R2       ;LET R2 := RANB CLR.BY #RNOPSC
4080 026462 042702 177740      BIC    #RNOPSC,R2
4081 026466 010221             MOV    R2,(R1)+      ;SET RANDOM # OF OPERATIONS.
4082 026470 012721 000007      MOV    #RANP,(R1)+  ;RANDOM PATTERN.
4083 026474 000207             RTS    PC            ;RETURN.
4084
4085 :                           ;.EVEN
4086 :
4087 026476             L10034:  ENDTST
      026476             TRAP    C#ETST
      026476 104401
4088
4089 :.SBTTL TEST 3: WRITE COMPATABILITY/WRITE UTILITY.
4090
4091 :++
4092 : TEST TO WRITE RECORDS FROM BOT TO EOT.
4093 :--
4094
4095 026500             BGNTST
      026500      T3::
4096
4097 026500 112767 000001 155007  MOVB   #1,RANDOM      ;SET THE RANDOM OPERATIONS FLAG.
4098 026506 105067 155002      CLRB   EXPBOT ;LET EXPBOT :B= #0 ;CLEAR EXPECT BOT FLAG.
4099
4100 026512 004767 170364      JSR    PC,FIRSTU      ;FIND THE FIRST UNIT.
4101 026516 004767 160350      JSR    PC,SOFINIT    ;INIT DEVICE
4102 026522 103404             BCS    11$
4103 026524             ERDF   2,NSSRM,STAERM ;REPORT TS05 NOT READY
      026524 104455             TRAP    C#ERDF
      026526 000002             .WORD  2
      026530 004536             .WORD  NSSRM
      026532 006120             .WORD  STAERM
4104
4105 026534 004767 160726      11$:  JSR    PC,M0SET      ;GO DO SETUP'S
4106 026540 012702 004000      MOV    #DATCNT,R2    ;SET UP THE RECORD LENGTH MASK.
4107 026544 005302             DEC    R2
4108 026546 010267 154656      MOV    R2,LENMSK     ;ALLOW MAXIMUM BUFFER.
4109 026552 005167 154652      COM    LENMSK
4110 026556 004767 161400      JSR    PC,SETCH      ;CMD 1 = SET CHARACTERISTIC.
4111 026562 004767 161420      JSR    PC,SETRW     ;CMD2=REWIND
4112 026566 105067 154734      CLRB   STAFLG ;LET STAFLG :B= #0 ;CLEAR START FLAG
4113 026572      50426$: BREAK ; DO A SUPVSR BREAK FIRST.

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026572 104422                                TRAP    C$BRK
4114
4115 026574                                50427$: ;WHILE THERE IS MORE ROOM IN SEQ TABLE:
4116 026574 020127 003740                    CMP     R1,#SEQEND
4117 026600 002003                            BGE     50430$
4118 026602 004767 177524                    JSR     PC,RANWR                ;STORE A WRITE CMD IN SEQUENCE TABLE.
4119 026606 000772                            BR      50427$
4120 026610                                50430$:
4121 026610 012711 177777                    MOV     #END,(R1)                ;STORE END OF SEQUENCE CODE IN TABLE.
4122 026614 004767 161406                    JSR     PC,EXALL                ;EXECUTE ALL CMDS IN SEQ TBL ON UNITS.
4123 026620 012701 003540                    MOV     #CMDSEQ,R1                ;INIT SEQ TBL POINTER,
4124 026624 005702                            TST     R2                        ;REPEAT UNTIL EOT IS REACHED
4125 026626 001761                            BEQ     50426$
4126 026630 105267 154670                    INCB    ALLEOT                    ;SET ALL UNITS @ EOT FLAG
4127 026634 000240                            NOP
4128 026636 000240                            NOP
4129 026640 000240                            NOP
4130 026642 004767 000766                    JSR     PC,TSWEOT                ;WRITE ONE RECORD BEYOND EOT ON ALL UNITS
4131                                                ;SO THAT SHORTER READ STOP DISTANCE
4132                                                ;SHALL POSITION HEAD IN CLEAN IRG GAP
4133 ;READ REV THAT EXTRA REC TO RE-POSITION TAPE
4134 026646 105067 154652                    CLRB    ALLEOT                    ;CLEAR ALL UNITS @ EOT FLAG
4135 026652 004767 161330                    JSR     PC,SETRW                ;STORE REWIND IN SEQ TBL.
4136 026656 012711 177777                    MOV     #END,(R1)                ;STORE END IN SEQ TBL.
4137 026662 004767 161340                    JSR     PC,EXALL                ;EXECUTE REWIND CMD ON ALL UNITS
4138
4139
4140 026666                                EXIT    TST
026666 104432                                TRAP    C$EXIT
026670 000002                                .WORD  L10035-.
4141
4142                                .EVEN
4143
4144 026672                                ENDTST
026672                                L10035:
026672 104401                                TRAP    C$ETST
4145
4146
4147                                .SBTTL TEST 4: READ COMPATABILITY/READ UTILITY.
4148
4149                                ;++
4150                                ; TEST TO READ ENTIRE TAPE FORWARD AND REVERSE.
4151                                ;--
4152
4153 026674                                BGNTST
026674                                T4::
4154
4155 026674 112767 000001 154613                    MOVB    #1,RANDOM                ;SET THE RANDOM OPERATIONS FLAG.
4156 026702 112767 000001 154604                    MOVB    #1,EXPBOT                ;SET EXPECT BOT FLAG.
4157
4158 026710 004767 170166                    JSR     PC,FIRSTU                ;FIND THE FIRST UNIT.
4159 026714 004767 160152                    JSR     PC,SOFINIT                ;INIT DEVICE
4160 026720 103404                            BCS     11$
4161 026722                                ERRDF  2,NSSRM,STAERM            ;REPORT TS05 NOT READY
026722 104455                                TRAP    C$ERDF
026724 000002                                .WORD  2
026726 004536                                .WORD  NSSRM

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026730 006120                                .WORD  STAERM
4162
4163 026732 004767 160530      11$:  JSR    PC,MDSET      ;GO DO SETUP'S
4164 026736 004767 161220      JSR PC,SETCH      ;CMD 1 = SET CHARACTERISTIC.
4165 026742 004767 161240      JSR PC,SETRW     ;CMD2=REWIND.
4166 026746 105067 154554      CLRB   STAFLG ;LET STAFLG :B= #0 ;CLEAR START FLAG
4167 026752 012721 104001      MOV    #RDF,(R1)+ ;CMD3 = READ FORWARD.
4168 026756 012721 004000      MOV    #DATCNT,(R1)+ ;SET LENGTH TO MAX FOR UNKNOWN LENGTHS.
4169 026762 012721 077777      MOV    #77777,(R1)+ ;SET RECORD COUNT TO MAX FOR WHOLE TAPE.
4170 026766 012721 000007      MOV    #RANP,(R1)+ ;PATTERN = RANDOM.
4171 026772 012711 177777      MOV    #END,(R1)   ;STORE END OF SEQUENCE CODE IN TABLE.
4172 026776 004767 161224      JSR    PC,EXALL   ;EXECUTE ALL CMDS IN SEQ TBL ON ALL UNITS.
4173 027002 105267 154516      INCB  ALLEOT     ;FLAG TO ALLOW ALL UNITS AT EOT TO READ REV
4174 027006 012701 003540      MOV    #CMDSEQ,R1 ;INIT CMD SEQ TBL POINTER.
4175 027012 012721 104401      MOV    #RDR,(R1)+ ;CMD1 = READ REVERSE.
4176 027016 012721 004000      MOV    #DATCNT,(R1)+ ;SET LENGTH TO MAX FOR UNKNOWN LENGTHS.
4177 027022 012721 077777      MOV    #77777,(R1)+ ;RECORD COUNT = MAX FOR WHOLE TAPE.
4178 027026 012721 000007      MOV    #RANP,(R1)+ ;PATTERN = RANDOM.
4179 027032 012711 177777      MOV    #END,(R1)   ;STORE END OF SEQUENCE CODE IN TABLE.
4180 027036 004767 161164      JSR    PC,EXALL   ;GO EXECUTE READ REV. OF ENTIRE TAPE.
4181 027042 105067 154456      CLRB  ALLEOT     ;CLEAR ALL UNITS @ EOT FLAG
4182
4183 027046                EXIT   TST
      027046 104432                TRAP   C$EXIT
      027050 000002                .WORD  L10036-.
4184
4185                .EVEN
4186
4187 027052                ENDTST
      027052                L10036:
      027052 104401                TRAP   C$ETST
4188
4189                .SBTTL  TEST 5: EXECUTE OPERATOR SELECTED COMMAND SEQUENCE.
4190
4191                ;++
4192                ; TEST TO EXECUTE OPERATOR SELECTED COMMAND SEQUENCE.
4193                ;--
4194
4195 027054                BGNTST
      027054                T5::
4196
4197 027054 105067 154435                CLRB  RANDOM      ;CLEAR RANDOM MODE FLAG.
4198 027060 112767 000001 154426      MOVB  #1,EXPBOT   ;SET EXPECT BOT FLAG.
4199
4200 027066 004767 170010                JSR    PC,FIRSTU   ;FIND THE FIRST UNIT.
4201 027072 004767 157774                JSR    PC,SOFINIT ;INIT DEVICE
4202 027076 103404                BCS   11$
4203 027100                ERRDF 2,NSSRM,STAERM ;REPORT TS05 NOT READY
      027100 104455                TRAP   C$ERDF
      027102 000002                .WORD  2
      027104 004536                .WORD  NSSRM
      027106 006120                .WORD  STAERM
4204
4205 027110 004767 160352      11$:  JSR    PC,MDSET      ;GO DO SETUP'S
4206 027114 116767 153076 154377      MOVB  PIRE,IRE    ;MOVE INHIBIT RFC ERROR REPORT FLAG.
4207 027122 004767 161034      JSR    PC,SETCH   ;CMD 1 = SET CHARACTERISTIC.
4208 027126 016767 153066 154406      MOV    CHAR,CMDSEQ+2 ;MOVE CHAR CODE FROM P TBL TO SEQ TBL.

```

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 TEST 5: EXECUTE OPERATOR SELECTED COMMAND SEQUENCE.

SEQ 0130

```

4209 027134 012702 002222      MOV      #CMD2,R2      ;R2 POINTS TO CMD2 IN SOFT P TABLE.
4210 027140 004767 000446      JSR      PC,PTCMDS    ;MOVE CMD 2 FROM P TBL TO SEQ TBL.
4211 027144 004767 000442      JSR      PC,PTCMDS    ;MOVE CMD 3 FROM P TBL TO SEQ TBL.
4212 027150 004767 000436      JSR      PC,PTCMDS    ;MOVE CMD 4 FROM P TBL TO SEQ TBL.
4213 027154 004767 000432      JSR      PC,PTCMDS    ;MOVE CMD 5 FROM P TBL TO SEQ TBL.
4214 027160 004767 000426      JSR      PC,PTCMDS    ;MOVE CMD 6 FROM P TBL TO SEQ TBL.
4215 027164 004767 000422      JSR      PC,PTCMDS    ;MOVE CMD 7 FROM P TBL TO SEQ TBL.
4216 027170 004767 000416      JSR      PC,PTCMDS    ;MOVE END CMD FROM P TBL TO SEQ TBL.
4217 027174 005067 154242      CLR      JLOOP        ;CLEAR JMP CMD LOOP COUNT.
4218 027200 105067 154322      CLRB     STAFLG        ;CLEAR START FLAG
4219 027204 012701 003540      MOV      #CMDSEQ,R1   ;INIT SEQUENCE TABLE POINTER.
4220 027210          3$:      ;WHILE (R1) NE #END DO ;WHILE THERE ARE CMDS LEFT IN SEQUENCE TBL:
4221 027210          50431$:
4222 027210 021127 177777      CMP      (R1),#END
4223 027214 001574          BEQ      50432$
4224 027216 022711 000040      CMP      #JMP.C,(R1)  ;IS THIS A JUMP CMD?
4225 027222 001024          BNE      6$           ;BR IF NOT.
4226 027224 062701 000002      ADD      #2,R1        ;LET R1 := R1 + #2 ;POINT TO BRF.
4227 027230 012167 154210      MOV      (R1)+,JLOC   ;SAVE BRF (LOCATION).
4228 027234 022167 154202      CMP      (R1)+,JLOOP  ;HAS LOOP COUNT BE SATISFIED?
4229 027240 001003          BNE      1$           ;IF NOT, JMP AGAIN.
4230 027242 062701 000002      ADD      #2,R1        ;IF SO, ADJUST SEQ PUNTER
4231 027246 000760          BR       3$           ;AND GO TO NEXT COMMAND.
4232 027250 005267 154166      1$:      INC      JLOOP        ;UPDATE THE LOOP COUNT.
4233 027254 012701 003540      MOV      #CMDSEQ,R1  ;INIT CMD SEQ TABLE POINTER.
4234 027260 005367 154160      2$:      DEC      JLOC         ;DECR LOCATION COUNTER.
4235 027264 001751          BEQ      3$           ;IF THIS IS THE RIGHT LOCATION TO JMP TO, GO SET
4236 027266 062701 000010      ADD      #10,R1      ;IF NOT, UPDATE SEQ POINTER TO NEXT CMD.
4237 027272 000772          BR       2$           ;DO IT AGAIN.
4238
4239 027274 022711 000020      6$:      CMP      #DLY.C,(R1)  ;DELAY?
4240 027300 001026          BNE      4$           ;BR IF NOT.
4241 027302 062701 000004      ADD      #4,R1        ;R1 = LOCATION OF N COUNT.
4242 027306 011167 154126      MOV      (R1),TIME2  ;SAVE N COUNT.
4243 027312          7$:      DELAY 1 ;GO TO SUPER-WAIT 1 MSEC.
      MOV      #1,(PC)+
      .WORD 0
      MOV      L#DLY,(PC)+
      .WORD 0
      DEC      -6(PC)
      BNE      -.4
      DEC      -22(PC)
      BNE      .-20
4244 027342 005367 154072      DEC      TIME2
4245 027346 001361          BNE      7$
4246 027350 062701 000004      ADD      #4,R1        ;LET R1 := R1 + #4 ;POINT TO NEXT CMD.
4247 027354 000715          BR       3$           ;GO CHECK NEXT CMD.
4248 027356 004767 161610      4$:      JSR      PC,SETUP    ;GO SETUP THE COMMAND BLOCK.
4249 027362          50433$:      ;WHILE NCNT LT NCNT1 DO ;WHILE THERE ARE RECORDS REMAINING:
4250 027362 026767 154024 154024      CMP      NCNT,NCNT1
4251 027370 002103          BGE      50434$
4252 027372 004767 161466      JSR      PC,CMDAC     ;STORE CMD ASCII IN ERROR MSG.
4253 027376 004767 161122      JSR      PC,EXSUB     ;ISSUE CMD TO ALL,AWAIT INTS,CHECK STATUS.
4254 027402 026727 154012 100017      CMP      CMDWRD,#GES  ;IF CMD IS GET STATUS THEN:
4255 027410 001002          BNE      50435$
4256 027412 004767 167774      JSR      PC,PRXST    ;PRINT EXTENDED STATUS REGISTERS.
4257

```

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 TEST 5: EXECUTE OPERATOR SELECTED COMMAND SEQUENCE.

SEQ 0131

```

4258 027416
4259 027416 004767 170056
4260 027422 012702 000001
4261 027426 004767 167450
4262 027432
4263 027432 026527 002604 177777
4264 027440 001426
4265 027442 032767 000400 153750
4266 027450 001406
4267 027452 032765 000002 003502
4268 027460 001001
4269 027462 005002
4270
4271 027464
4272 027464 000411
4273 027466
4274 027466 032765 000001 003502
4275 027474 001404
4276 027476 032767 000001 153714
4277 027504 001001
4278 027506
4279
4280 027506 005002
4281
4282 027510
4283
4284 027510
4285 027510 004767 167434
4286
4287 027514 000746
4288 027516
4289 027516 020227 000001
4290 027522 001016
4291 027524 016767 153662 153662
4292 027532 005267 153656
4293 027536 105267 153762
4294 027542 026727 153660 000002
4295 027550 001002
4296 027552 004767 000056
4297
4298 027556
4299
4300 027556 000402
4301 027560
4302 027560 105067 153740
4303
4304 027564
4305 027564 005267 153622
4306 027570 016767 153624 153626
4307
4308 027576 000671
4309 027600
4310 027600 004767 166262
4311
4312
4313 027604 000601
4314 027606

50435:
JSR PC,CKHAE ;CHECK HALT AFTER EACH CMD FLAG.
MOV #1,R2 ;SET ALL UNITS AT BOT/EOT.
JSR PC,FIRSTU ;FIND FIRST UNIT.
;WHILE DEVTBL(R5) NE #END DO ;WHILE THERE ARE MORE UNITS:
50436: CMP DEVTBL(R5),#END
BEQ 50437
BIT #MOD.CO,CMDWRD ;IF CMD IS REVERSE THEN:
BEQ 50440 ;IF NOT AT BOT THEN:
BIT #X0.BOT,EOTFLG(R5)
BNE 50441 ;CLEAR EOT/BOT FLAG.
CLR R2

50441:
BR 50442 ;ELSE IF CMD IS NOT REVERSE:

50440: BIT #X0.EOT,EOTFLG(R5)
BEQ 50443
BIT #CMD.CO,CMDWRD
BNE 50444

50443:
CLR R2 ;IF NOT AT EOT OR NOT A MOTION CMD THEN:
;LET R2 := #0 ;CLEAR EOT/BOT FLAG.

50444:

50442: JSR PC,NEXTU ;FIND NEXT UNIT
;

BR 50436

50437: CMP R2,#1 ;IF ALL UNIT ARE AT EOT/BOT THEN:
BNE 50445 ;FORCE TERMINATION OF COMMAND.
MOV NCNT,NCNT1 ;FLAG ALL UNITS AT EOT/BOT TO ALLOW VERIFY OF D
INC NCNT1 ;WHEN WRITING IS CURRENT COMMAND
INCB ALLEOT ;GO WRITE/READ REV ONE RECORD BEYOND EOT
CMP CMDLG,#2
BNE 50446
JSR PC,TSWEOT

50446:

BR 50447

50445: CLRB ALLEOT ;WHEN NOT ALL SEOT, CLEAR FLAG

50447: INC NCNT ;UPDATE RECORD COUNT.
MOV CMDWRD,PCMDWD ;SAVE PREVIOUS COMMAND WORD.

BR 50433

50434: JSR PC,VFYDAT ;IF LAST CMD WAS A WRITE VERIFY, THEN GO
;VERIFY THE LAST N RECORDS OF DATA.

BR 50431

50432:

```

HARDWARE TESTS MACRO M1113 14-JUN-84 18:32
 TEST 5: EXECUTE OPERATOR SELECTED COMMAND SEQUENCE.

SEQ 0132

```

4315
4316 027606          EXIT   TST
      027606 104432
      027610 000140          TRAP   C$EXIT
                                .WORD L10037-.
4317
4318 ;               SUBROUTINE TO MOVE A COMMAND FROM THE SOFTWARE P TABLE TO
4319 ;               THE COMMAND SEQUENCE TABLE.
4320 ;               INPUTS:          R2 = POINTER TO SOFT "P" TABLE
4321 ;               OUTPUTS:
4322 ;               REGISTERS:       R3.
4323 ;               CALLS:
4324
4325 027612 012203  PTCMDS::MOV   (R2)+,R3          ;R3 = COMMAND TABLE INDEX.
4326 027614 005303      DEC   R3
4327 027616 006303      ASL   R3
4328 027620 016321 003752  MOV   CMDTBL(R3),(R1)+      ;MOVE COMMAND WORD.
4329 027624 012221      MOV   (R2)+,(R1)+        ;MOVE # OF BYTES.
4330 027626 012221      MOV   (R2)+,(R1)+        ;MOVE # OF OPERATIONS.
4331 027630 012221      MOV   (R2)+,(R1)+        ;MOVE PATTERN CODE.
4332 027632 000207      RTS  PC
4333
4334 ;               SUBROUTINE TO WRITE THEN READ REVERSE ONE RECORD BEYOND EOT
4335 ;               INPUTS:
4336 ;               OUTPUTS:
4337 ;               REGISTERS:
4338 ;               CALLS:          CMDAC,EXSUB,CKHAE
4339
4340 027634 000240  TSWEOT::NOP
4341 027636 000240      NOP
4342 027640 004767 160660  JSR  PC,EXSUB          ;WRITE ONE RECORD BEYOND EOT
4343 027644 004767 167630  JSR  PC,CKHAE         ;SO THAT READ SHORTER STOP DISTANCE
4344 ;               ;SHALL POSITION HEAD IN CLEAN IRG GAP
4345 027650 012700 000002  MOV   #2,R0           ;SET UP COUNTER FOR EOT
4346 027654 016767 153540 153542 1# : MOV   CMDWRD,PCMDWD      ;LET PCMDWD := CMDWRD ;REPOSITION TAPE
4347 027662 012767 104401 153530  MOV   #RDR,CMDWRD    ;LET CMDWRD := #RDR ;BEFORE EXTRA RECORD
4348 027670 012767 000004 153530  MOV   #4,CMDLG       ;BY READING REVERSE
4349 027676 016767 153516 152424  MOV   CMDWRD,CMDPKT  ;LET CMDPKT := CMDWRD CLR.BY #BRF.C
4350 027704 042767 004000 152416  BIC   #BRF.C,CMDPKT
4351 027712 016767 152412 153502  MOV   CMDPKT,CMDSAV  ;LET CMDSAV := CMDPKT ;THAT RECORD TO ALLOW
4352 027720 016767 153464 152404  MOV   DATARD,CMDPKT+CP.ADL ;NEXT COMMAND IN THE
4353 027726 004767 161132      JSR  PC,CMDAC        ;TABLE TO BE EXECUTED
4354 027732 004767 160566      JSR  PC,EXSUB
4355 027736 004767 167536      JSR  PC,CKHAE
4356 027742 005300      DEC   R0           ;FOUND EOT YET?
4357 027744 001343      BNE  1#           ;NO,KEEP GOING
4358 027746 000207      RTS  PC           ;YES,RETURN
4359
4360 ;               .EVEN
4361
4362 027750          ENDTST
      027750          L10037:
      027750 104401          TRAP   C$ETST
4363
4364 027752          ENDMOD
4365
4366 ;               .TITLE PARAMETER CODING
4367

```

```

4368          .SBTTL  HARDWARE PARAMETER CODING SECTION
4369
4370 027752          BGNMOD
4371
4372          ;**
4373          ; THE HARDWARE PARAMETER CODING SECTION CONTAINS MACROS
4374          ; THAT ARE USED BY THE SUPERVISOR TO BUILD P-TABLES.  THE
4375          ; MACROS ARE NOT EXECUTED AS MACHINE INSTRUCTIONS BUT ARE
4376          ; INTERPRETED BY THE SUPERVISOR AS DATA STRUCTURES.  THE
4377          ; MACROS ALLOW THE SUPERVISOR TO ESTABLISH COMMUNICATIONS
4378          ; WITH THE OPERATOR.
4379          ;--
4380
4381 027752          BGNHRD
4382 027752 000042          .WORD  L10040-L$HARD/2
4383 027754          L$HARD::
4384 027754 000031          GPRMA  TSSADR,0,0,160010,177564,YES          .WORD  T$CODE
4385 027756 030012          .WORD  TSSADR
4386 027760 160010          .WORD  T$LLOLIM
4387 027762 177564          .WORD  T$HILIM
4388 027764 001032          GPRMD  TSSVCT,2,0,777,60,776,YES          .WORD  T$CODE
4389 027766 030027          .WORD  TSSVCT
4390 027770 000777          .WORD  777
4391 027772 000060          .WORD  T$LLOLIM
4392 027774 000776          .WORD  T$HILIM
4393 027776 002022          GPRMD  TSSUNT,4,0,1,0,1,NO          .WORD  T$CODE
4394 030000 030036          .WORD  TSSUNT
4395 030002 000001          .WORD  1
4396 030004 000000          .WORD  T$LLOLIM
4397 030006 000001          .WORD  T$HILIM
4398 030010          EXIT HRD
4399 030010 024004          .WORD  T$CODE
4400
4401          .NLIST  BEX
4402 030012          124      123      104  TSSADR: .ASCIZ  /TSDB ADDRESS/
4403 030027          126      105      103  TSSVCT: .ASCIZ  /VECTOR/
4404 030036          123      105      114  TSSUNT: .ASCIZ  /SELECT DRIVE 0-1/
4405          .LIST  BEX
4406          .EVEN
4407          ENDRD
4408          .EVEN
4409 030060          L10040:
4410          .SBTTL  SOFTWARE PARAMETER CODING SECTION
4411
4412          ;**
4413          ; THE SOFTWARE PARAMETER CODING SECTION CONTAINS MACROS
4414          ; THAT ARE USED BY THE SUPERVISOR TO BUILD P-TABLES.  THE
4415          ; MACROS ARE NOT EXECUTED AS MACHINE INSTRUCTIONS BUT ARE
4416          ; INTERPRETED BY THE SUPERVISOR AS DATA STRUCTURES.  THE
4417          ; MACROS ALLOW THE SUPERVISOR TO ESTABLISH COMMUNICATIONS
4418          ; WITH THE OPERATOR.
    
```

```

4406      ; --
4407
4408 030060      BGNSFT
      030060      000302
      030062      L$SOFT::
4409 030062      GPRML  CLRM,0,1,YES
      030062      000130
      030064      030666
      030066      000001
4410 030070      GPRML  RRVM,0,400,YES
      030070      000130
      030072      030705
      030074      000400
4411 030076      GPRML  RCVERM,2,400,YES
      030076      001130
      030100      031010
      030102      000400
4412 030104      GPRML  HAEM,2,1,YES
      030104      001130
      030106      030734
      030110      000001
4413 030112      GPRML  IRECM,6,400,YES
      030112      003130
      030114      031064
      030116      000400
4414 030120      XFERT  NEXTSP
      030120      004024
4415 030122      GPRML  BADTM,4,1,YES
      030122      002130
      030124      030760
      030126      000001
4416 030130      NEXTSP: GPRML  DINTM,6,1,YES
      030130      003130
      030132      031041
      030134      000001
4417 030136      GPRML  IREM,12,1,YES
      030136      005130
      030140      031131
      030142      000001
4418 030144      GPRML  CHGM,10,1,YES
      030144      004130
      030146      031105
      030150      000001
4419 030152      XFERF  ENDSP1
      030152      127044
4420 030154      GPRMD  CHARM,14,0,377,0,777,YES
      030154      006032
      030156      031162
      030160      000377
      030162      000000
      030164      000777
4421 030166      GPRMD  CMD2M,16,D,37,1,33,YES
      030166      007052
      030170      031207
      030172      000037
      030174      000001
      030176      000033

```

.WORD L10041-L\$SOFT/2

.WORD T\$CODE
.WORD CLRM
.WORD 1.WORD T\$CODE
.WORD RRVM
.WORD 400.WORD T\$CODE
.WORD RCVERM
.WORD 400.WORD T\$CODE
.WORD HAEM
.WORD 1.WORD T\$CODE
.WORD IRECM
.WORD 400

.WORD T\$CODE

.WORD T\$CODE
.WORD BADTM
.WORD 1.WORD T\$CODE
.WORD DINTM
.WORD 1.WORD T\$CODE
.WORD IREM
.WORD 1.WORD T\$CODE
.WORD CHGM
.WORD 1

.WORD T\$CODE

.WORD T\$CODE
.WORD CHARM
.WORD 377.WORD T\$LOLIM
.WORD T\$HILIM.WORD T\$CODE
.WORD CMD2M
.WORD 37.WORD T\$LOLIM
.WORD T\$HILIM

4422	030200		GPRMD	BPCRM,20,D,-1,1,DATCNT,YES		.WORD	T\$CODE
	030200	010052				.WORD	BPCRM
	030202	031215				.WORD	-1
	030204	177777				.WORD	T\$LOLIM
	030206	000001				.WORD	T\$HILIM
	030210	004000					
4423	030212		GPRMD	NUMBM,22,D,-1,1,77777,YES		.WORD	T\$CODE
	030212	011052				.WORD	NUMBM
	030214	031227				.WORD	-1
	030216	177777				.WORD	T\$LOLIM
	030220	000001				.WORD	T\$HILIM
	030222	077777					
4424	030224		GPRMD	PATTM,24,D,17,0,10,YES		.WORD	T\$CODE
	030224	012052				.WORD	PATTM
	030226	031247				.WORD	17
	030230	000017				.WORD	T\$LOLIM
	030232	000000				.WORD	T\$HILIM
	030234	000010					
4425	030236		GPRMD	CMD3M,26,D,37,1,33,YES		.WORD	T\$CODE
	030236	013052				.WORD	CMD3M
	030240	031356				.WORD	37
	030242	000037				.WORD	T\$LOLIM
	030244	000001				.WORD	T\$HILIM
	030246	000033					
4426	030250		GPRMD	BPCRM,30,D,-1,1,DATCNT,YES		.WORD	T\$CODE
	030250	014052				.WORD	BPCRM
	030252	031215				.WORD	-1
	030254	177777				.WORD	T\$LOLIM
	030256	000001				.WORD	T\$HILIM
	030260	004000					
4427	030262		GPRMD	NUMBM,32,D,-1,1,77777,YES		.WORD	T\$CODE
	030262	015052				.WORD	NUMBM
	030264	031227				.WORD	-1
	030266	177777				.WORD	T\$LOLIM
	030270	000001				.WORD	T\$HILIM
	030272	077777					
4428	030274		GPRMD	PATTM,34,D,17,0,10,YES		.WORD	T\$CODE
	030274	016052				.WORD	PATTM
	030276	031247				.WORD	17
	030300	000017				.WORD	T\$LOLIM
	030302	000000				.WORD	T\$HILIM
	030304	000010					
4429	030306		GPRMD	CMD4M,36,D,37,1,33,YES		.WORD	T\$CODE
	030306	017052				.WORD	CMD4M
	030310	031364				.WORD	37
	030312	000037				.WORD	T\$LOLIM
	030314	000001				.WORD	T\$HILIM
	030316	000033					
4430	030320		GPRMD	BPCRM,40,D,-1,1,DATCNT,YES		.WORD	T\$CODE
	030320	020052				.WORD	BPCRM
	030322	031215				.WORD	-1
	030324	177777				.WORD	T\$LOLIM
	030326	000001				.WORD	T\$HILIM
	030330	004000					
4431	030332		GPRMD	NUMBM,42,D,-1,1,77777,YES		.WORD	T\$CODE
	030332	021052				.WORD	NUMBM
	030334	031227					

	030336	177777				.WORD	-1
	030340	000001				.WORD	T\$LOLIM
	030342	077777				.WORD	T\$HILIM
4432	030344		GPRMD	PATTM,44,D,17,0,10,YES			
	030344	022052				.WORD	T\$CODE
	030346	031247				.WORD	PATTM
	030350	000017				.WORD	17
	030352	000000				.WORD	T\$LOLIM
	030354	000010				.WORD	T\$HILIM
4433	030356		GPRMD	CMD5M,46,D,37,1,33,YES			
	030356	023052				.WORD	T\$CODE
	030360	031372				.WORD	CMD5M
	030362	000037				.WORD	37
	030364	000001				.WORD	T\$LOLIM
	030366	000033				.WORD	T\$HILIM
4434	030370		GPRMD	BPCRM,50,D,-1,1,DATCNT,YES			
	030370	024052				.WORD	T\$CODE
	030372	031215				.WORD	BPCRM
	030374	177777				.WORD	-1
	030376	000001				.WORD	T\$LOLIM
	030400	004000				.WORD	T\$HILIM
4435	030402		GPRMD	NUMBM,52,D,-1,1,77777,YES			
	030402	025052				.WORD	T\$CODE
	030404	031227				.WORD	NUMBM
	030406	177777				.WORD	-1
	030410	000001				.WORD	T\$LOLIM
	030412	077777				.WORD	T\$HILIM
4436	030414		GPRMD	PATTM,54,D,17,0,10,YES			
	030414	026052				.WORD	T\$CODE
	030416	031247				.WORD	PATTM
	030420	000017				.WORD	17
	030422	000000				.WORD	T\$LOLIM
	030424	000010				.WORD	T\$HILIM
4437	030426		XFER	ENDSP2			
	030426	002004				.WORD	T\$CODE
4438	030430		ENDSP1: XFER	ENDSP3			
	030430	076004				.WORD	T\$CODE
4439	030432		ENDSP2: GPRMD	CMD6M,56,D,37,1,33,YES			
	030432	027052				.WORD	T\$CODE
	030434	031400				.WORD	CMD6M
	030436	000037				.WORD	37
	030440	000001				.WORD	T\$LOLIM
	030442	000033				.WORD	T\$HILIM
4440	030444		GPRMD	BPCRM,60,D,-1,1,DATCNT,YES			
	030444	030052				.WORD	T\$CODE
	030446	031215				.WORD	BPCRM
	030450	177777				.WORD	-1
	030452	000001				.WORD	T\$LOLIM
	030454	004000				.WORD	T\$HILIM
4441	030456		GPRMD	NUMBM,62,D,-1,1,77777,YES			
	030456	031052				.WORD	T\$CODE
	030460	031227				.WORD	NUMBM
	030462	177777				.WORD	-1
	030464	000001				.WORD	T\$LOLIM
	030466	077777				.WORD	T\$HILIM
4442	030470		GPRMD	PATTM,64,D,17,0,10,YES			
	030470	032052				.WORD	T\$CODE

	030472	031247			.WORD	PATTM
	030474	000017			.WORD	17
	030476	000000			.WORD	T\$LOLIM
	030500	000010			.WORD	T\$HILIM
4443	030502		GPRMD	CMD7M,66,D,37,1,33,YES		
	030502	033052			.WORD	T\$CODE
	030504	031406			.WORD	CMD7M
	030506	000037			.WORD	37
	030510	000001			.WORD	T\$LOLIM
	030512	000033			.WORD	T\$HILIM
4444	030514		GPRMD	BPCRM,70,D,-1,1,DATCNT,YES		
	030514	034052			.WORD	T\$CODE
	030516	031215			.WORD	BPCRM
	030520	177777			.WORD	-1
	030522	000001			.WORD	T\$LOLIM
	030524	004000			.WORD	T\$HILIM
4445	030526		GPRMD	NUMBM,72,D,-1,1,77777,YES		
	030526	035052			.WORD	T\$CODE
	030530	031227			.WORD	NUMBM
	030532	177777			.WORD	-1
	030534	000001			.WORD	T\$LOLIM
	030536	077777			.WORD	T\$HILIM
4446	030540		GPRMD	PATTM,74,D,17,0,10,YES		
	030540	036052			.WORD	T\$CODE
	030542	031247			.WORD	PATTM
	030544	000017			.WORD	17
	030546	000000			.WORD	T\$LOLIM
	030550	000010			.WORD	T\$HILIM
4447	030552		GPRMD	CMD8M,76,D,37,1,33,YES		
	030552	037052			.WORD	T\$CODE
	030554	031414			.WORD	CMD8M
	030556	000037			.WORD	37
	030560	000001			.WORD	T\$LOLIM
	030562	000033			.WORD	T\$HILIM
4448	030564		GPRMD	BPCRM,100,D,-1,1,DATCNT,YES		
	030564	040052			.WORD	T\$CODE
	030566	031215			.WORD	BPCRM
	030570	177777			.WORD	-1
	030572	000001			.WORD	T\$LOLIM
	030574	004000			.WORD	T\$HILIM
4449	030576		GPRMD	NUMBM,102,D,-1,1,77777,YES		
	030576	041052			.WORD	T\$CODE
	030600	031227			.WORD	NUMBM
	030602	177777			.WORD	-1
	030604	000001			.WORD	T\$LOLIM
	030606	077777			.WORD	T\$HILIM
4450	030610		GPRMD	PATTM,104,D,17,0,10,YES		
	030610	042052			.WORD	T\$CODE
	030612	031247			.WORD	PATTM
	030614	000017			.WORD	17
	030616	000000			.WORD	T\$LOLIM
	030620	000010			.WORD	T\$HILIM
4451	030622		XFER	ENDSP		
	030622	022004			.WORD	T\$CODE
4452	030624		ENDSP3: GPRML	TSMD,106,1,YES		
	030624	043130			.WORD	T\$CODE
	030626	031257			.WORD	TSMD

	030630	000001										.WORD	1
4453	030632					XFERT	ENDSP						
	030632	016024										.WORD	T\$CODE
4454	030634					GPRML	FAST,114,1,YES						
	030634	046130										.WORD	T\$CODE
	030636	031347										.WORD	FAST
	030640	000001										.WORD	1
4455	030642					XFERT	ENDSP4						
	030642	011024										.WORD	T\$CODE
4456	030644					GPRML	WTBF,112,1,YES						
	030644	045130										.WORD	T\$CODE
	030646	031327										.WORD	WTBF
	030650	000001										.WORD	1
4457	030652					XFERT	ENDSP						
	030652	006024										.WORD	T\$CODE
4458	030654					GPRML	RDBF,110,1,YES						
	030654	044130										.WORD	T\$CODE
	030656	031310										.WORD	RDBF
	030660	000001										.WORD	1
4459	030662					ENDSP5: XFER	ENDSP						
	030662	002004										.WORD	T\$CODE
4460	030664					ENDSP4: XFER	ENDSP						
	030664	001004										.WORD	T\$CODE
4461	030666					ENDSP:							
4462	030666					ENDSFT							
	030666					L10041:						.EVEN	
4463						.EVEN							
4464													
4465						.NLIST	BEX						
4466	030666	103	114	105	CLRM:	.ASCIZ	/CLEAR COUNTERS/						
4467	030705	122	105	123	RRVM:	.ASCIZ	/RESET RANDOM VARIABLES/						
4468	030734	110	101	114	HAEM:	.ASCIZ	/HALT AFTER EACH CMD/						
4469	030760	102	101	104	BADTM:	.ASCIZ	/BAD TAPE SPOT DETECTION/						
4470	031010	120	122	111	RCVERM:	.ASCIZ	/PRINT RECOVERABLE ERRORS/						
4471	031041	104	111	123	DINTM:	.ASCIZ	/DISABLE INTERRUPTS/						
4472	031064	111	116	110	IRECM:	.ASCIZ	/INHIBIT RECOVERY/						
4473	031105	103	110	101	CHGM:	.ASCIZ	/CHANGE CMD SEQUENCE/						
4474	031131	111	116	110	IREM:	.ASCIZ	/INHIBIT RFC ERROR REPORT/						
4475	031162	103	110	101	CHARM:	.ASCIZ	/CHARACTERISTICS CODE/						
4476	031207	103	115	104	CMD2M:	.ASCIZ	"CMD/2"						
4477	031215	102	122	106	BPCRM:	.ASCIZ	/BRF COUNT/						
4478	031227	043	040	117	NUMBM:	.ASCIZ	/# OF OPERATIONS/						
4479	031247	120	101	124	PATTM:	.ASCIZ	/PATTERN/						
4480	031257	104	105	106	TSMD:	.ASCIZ	/DEFAULT SWITCH SETTINGS?/						
4481	031310	122	105	101	RDBF:	.ASCIZ	/READ BUFFERING/						
4482	031327	127	122	111	WTBF:	.ASCIZ	/WRITE BUFFERING/						
4483	031347	061	060	060	FAST:	.ASCIZ	/100IPS/						
4484						.LIST	BEX						
4485						.EVEN							
4486													
4487						.NLIST	BEX						
4488	031356	103	115	104	CMD3M:	.ASCIZ	"CMD/3"						
4489	031364	103	115	104	CMD4M:	.ASCIZ	"CMD/4"						
4490	031372	103	115	104	CMD5M:	.ASCIZ	"CMD/5"						
4491	031400	103	115	104	CMD6M:	.ASCIZ	"CMD/6"						
4492	031406	103	115	104	CMD7M:	.ASCIZ	"CMD/7"						

PARAMETER CODING
SYMBOL TABLE

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SEQ 0140

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
ALLEOT 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 031347
AUDRUN 005146 G	BT0 003046 G	C#AUTO= 000061	DFPTBL 002174 G	FATSM 004642 G
AUTODM 023604	BT1 003120 G	C#BRK = 000022	DFTSCH= 000040 G	FIRSTU 017102 G
BADTM 030760	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 025050 G	CHARM 031162	C#CLCK= 000062	DIAGMC= 000000	FUNRM 004622 G
BFSEQ0 025074	CHGFLG 002214 G	C#CLEA= 000012	DINT 002212 G	F#AU = 000015
BFSEQ1 025146	CHGM 031105	C#CLOS= 000035	DINTM 031041	F#AUTO= 000020
BFSEQ2 025160	CHKERR 013210 G	C#CLP1= 000006	DLY = 000020 G	F#BGN = 000040
BFSEQ3 025252	CH.EAI= 000040 G	C#CVEC= 000036	DLY.C = 000020 G	F#CLEA= 000007
BFSEQ4 025324	CH.ERI= 000020 G	C#DCLN= 000044	DRI = 100013 G	F#DU = 000016
BFSEQ5 025366	CH.ESS= 000200 G	C#DODU= 000051	DROPHM 005065 G	F#END = 000041
BFSEQ6 025440	CKDATA 016466 G	C#DRPT= 000024	DROPEP 003522 G	F#HARD= 000004
BFSEQ7 025512	CKDCNT 017076	C#DU = 000053	DROPN 017410	F#HW = 000013
BFSEQ8 025544	CKDFF 017100	C#EDIT= 000003	DROPU 017200 G	F#INIT= 000006
BFSEQ9 025576	CKHAE 017500 G	C#ERDF= 000055	DROPUA 017324	F#JMP = 000050
BFSE10 025620	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
BIT0 = 000001 G	CLRFLG 002204 G	C#ERSO= 000057	DTAER3 005275 G	F#PWR = 000017
BIT00 = 000001 G	CLRM 030666	C#ESCA= 000010	DTAER4 005337 G	F#RPT = 000012
BIT01 = 000002 G	CMDAC 011064 G	C#ESEG= 000005	DTAER5 005360 G	F#SEG = 000003
BIT02 = 000004 G	CMDASC 004040 G	C#ESUB= 000003	EF.CON= 000036 G	F#SOFT= 000005
BIT03 = 000010 G	CMDDD 002222 G	C#ETST= 000001	EF.HSS= 000040 G	F#SRV = 000010
BIT04 = 000020 G	CMDLG 003426 G	C#EXIT= 000032	EF.NEW= 000035 G	F#SUB = 000002
BIT05 = 000040 G	CMDPKM 004346 G	C#GETB= 000026	EF.PWR= 000034 G	F#SW = 000014
BIT06 = 000100 G	CMDPKT 002330 G	C#GETW= 000027	EF.RBO= 000020 G	F#TEST= 000001
BIT07 = 000200 G	CMDSAV 003422 G	C#GMAN= 000043	EF.RES= 000037 G	GCMDA 011136 G
BIT08 = 000400 G	CMDSEQ 003540 G	C#GPHR= 000042	EF.RWB= 000030 G	GENPAT 011556 G
BIT09 = 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	GSCPCK 002340 G
BIT13 = 020000 G	CMD.C2= 000004 G	C#MEM = 000031	ENDSP 030666	G#CNT0= 000200
BIT14 = 040000 G	CMD.C3= 000010 G	C#MSG = 000023	ENDSP1 030430	G#DELM= 000372
BIT15 = 100000 G	CMD.C4= 000020 G	C#OPEN= 000034	ENDSP2 030432	G#DISP= 000003
BIT2 = 000004 G	CMD2M 031207	C#PNTB= 000014	ENDSP3 030624	G#EXCP= 000400
BIT3 = 000010 G	CMD3M 031356	C#PNTF= 000017	ENDSP4 030664	G#HILI= 000002
BIT4 = 000020 G	CMD4M 031364	C#PNTS= 000016	ENDSP5 030662	G#LOLI= 000001
BIT5 = 000040 G	CMD5M 031372	C#PNTX= 000015	EOTFLG 003502 G	G#NO = 000000
BIT6 = 000100 G	CMD6M 031400	C#QIO = 000377	ERCVER 002207 G	G#OFFS= 000400
BIT7 = 000200 G	CMD7M 031406	C#RDBU= 000007	ERLOG 003466 G	G#OFFSI= 000376
BIT8 = 000400 G	CMD8M 031414	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 031215	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

PARAMETER CODING
SYMBOL TABLE

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SEQ 0141

G\$XFER=	000004	L\$CCP	002106	G	L10012	023312	NSSRM	004536	G	RAWTM	026370	G
G\$YES =	000010	L\$CLEA	023736	G	L10013	023602	NUMBM	031227		RCVERM	031010	
HAEM	002206	L\$CO	002032	G	L10014	023776	NURTY1	005422	G	RDBF	031310	
HAEM	030734	L\$DEPO	002011	G	L10015	024050	OFLINM	005456	G	RDBUF	002314	G
HALTM	004306	L\$DESC	002136	G	L10016	024154	ONEFIL =	000001		RDF	= 104001	G
HELP =	000000	L\$DESP	002076	G	L10017	025642	OPFLAG	003536	G	RDR	= 104401	G
HOE =	100000	L\$DEVP	002060	G	L10020	024370	OPP.C =	020000	G	RECCNT	003376	G
HRDCNT	003356	L\$DISP	002124	G	L10021	024414	O\$APTS=	000000		RECLOG	003465	G
HSSW	002320	L\$DLY	002116	G	L10022	024434	O\$AU =	000001		RECRED	007066	
IBE =	010000	L\$DTP	002040	G	L10023	024454	O\$BGNR=	000001		RECTAP	010064	G
IDU =	000040	L\$DTYP	002034	G	L10024	024474	O\$BGNS=	000001		RECUD	013020	G
IER =	020000	L\$DU	024000	G	L10025	024514	O\$DU =	000001		RERM	005017	G
IE.C =	000200	L\$DUT	002072	G	L10026	024534	O\$ERRT=	000000		RETRYC	003460	G
INIT10	021324	L\$DVTY	002164	G	L10027	024554	O\$GNSW=	000001		REWRT	015472	G
INIT15	021622	L\$EF	002052	G	L10030	024574	O\$POIN=	000001		RFBC	002726	G
INIT16	021642	L\$ENVI	002044	G	L10031	024614	O\$SETU=	000000		RFCERM	004521	G
INTFLG	003472	L\$ETP	002102	G	L10032	024652	PASCNT	003326	G	RFREC	003026	G
INTPRI=	000340	L\$EXP1	002046	G	L10033	025036	PATCH	031422	G	RFUNR	003036	G
INVRT	007724	L\$EXP4	002064	G	L10034	026476	PATERN	003446	G	RLEXM	004556	G
IRE	003521	L\$EXP5	002066	G	L10035	026672	PATRO	011642	G	RNF	= 125401	G
IREC	002213	L\$HARD	027754	G	L10036	027052	PATR1	011700	G	RNOPSC=	177740	G
IRECM	031064	L\$HIME	002120	G	L10037	027750	PATR2	011720	G	RNR	= 105401	G
IREM	031131	L\$HPCP	002016	G	L10040	030060	PATR3	011730	G	RNYM	004753	G
ISR =	000100	L\$HPTP	002022	G	L10041	030666	PATR4	011754	G	RPF	= 105001	G
IXE =	004000	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	PATR7	012020	G	RPTFLG	003517	G
I\$CLN =	000041	L\$LADP	002026	G	MDSET	007466	PATR8	012052	G	RPT1A	020432	
I\$DU =	000041	L\$LAST	032004	G	MEMOM	023210	PATTBL	011620		RPT1B	020507	
I\$HRD =	000041	L\$LOAD	002100	G	MISCFG	003531	PATTH	031247		RPT1C	020560	
I\$INIT=	000041	L\$LUN	002074	G	MOD.CO=	000400	PCMDWD	003424	G	RPT1D	020631	
I\$MOD =	000041	L\$MREV	002050	G	MOD.C1=	001000	PIRE	002216	G	RPT1E	021057	
I\$MSG =	000041	L\$NAME	002000	G	MOD.C2=	002000	PNT	= 001000	G	RPT1F	020735	
I\$PROT=	000040	L\$PRIO	002042	G	MOD.C3=	004000	PRI	= 002000	G	RPT1G	021006	
I\$PTAB=	000041	L\$PROT	021316	G	MOVMSG	012734	PRI00	= 000000	G	RPT1H	021203	
I\$PMR =	000041	L\$PRT	002112	G	MSGCNT=	000020	PRI01	= 000040	G	RPT1I	021107	
I\$RPT =	000041	L\$REPP	002062	G	MSGPKA	002544	PRI02	= 000100	G	RPT1J	021174	
I\$SEG =	000041	L\$REV	002010	G	MSGPKT	002354	PRI03	= 000140	G	RRANV	002205	G
I\$SETU=	000041	L\$RPT	017570	G	MSGPK0	002374	PRI04	= 000200	G	RRBC	002666	G
I\$SFT =	000041	L\$SOFT	030062	G	MSGPK1	002414	PRI05	= 000240	G	RRECL =	000020	G
I\$SRV =	000041	L\$SPC	002056	G	MSGPK2	002434	PRI06	= 000300	G	RRREC	003006	G
I\$SUB =	000041	L\$SPCP	002020	G	MSGPK3	002454	PRI07	= 000340	G	RRUNR	003016	G
I\$TST =	000041	L\$SPTP	002024	G	MS.RFC=	000004	PRXST	017412	G	RRVM	030705	
JLOC	003444	L\$STA	002030	G	MS.XS0=	000006	PTCMDS	027612	G	RTL	014510	G
JLOOP	003442	L\$SW	002204	G	MS.XS1=	000010	PWRFLG	003527	G	RTLRTN	014634	
JMP =	000040	L\$TEST	002114	G	MS.XS2=	000012	RANB	003432	G	RWCPK	002350	G
JMP.C =	000040	L\$TIML	002014	G	MS.XS3=	000014	RANBC =	153624	G	RWD	= 102010	G
J\$JMP =	000167	L\$UNIT	002012	G	MS.XS4=	000016	RANCMD	026160		RWERR	003467	G
LENMSK	003430	L10000	002202		NCMD.C=	177740	RANDOM	003515	G	RSSAVE	003452	G
LOE =	040000	L10001	002326		NCNT	003412	RANP =	000007	G	SCCNT	003336	G
LOG	015566	L10002	006116		NCNT1	003414	RANRD	026220	G	SCERM	004475	G
LOT =	000010	L10003	007070		NEXTSP	030130	RANS	003434	G	SCH =	140004	G
L\$ACP	002110	L10004	010040		NEXTU	017150	RANSC =	032561	G	SCHBK	002474	G
L\$APT	002036	L10005	010046		NINUSE=	177774	RANW	026444	G	SCHCNT=	000012	G
L\$AU	024052	L10006	010054		NGDEV	005543	RANWR	026332	G	SEQEND	003740	G
L\$AUT	002070	L10007	010062		NOINTM	004670	RANWV	026356	G	SETCH	010162	G
L\$AUTO	023314	L10010	021314		NRDYM	023700	RASFR	026416	G	SETDEF	007766	G

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SYMBOL TABLE

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SEQ 0142

SETRW	010206	G	TRAP4	023730	G	T\$LAST=	000001	T1	024156	G	WRTY	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	024166		WRTYER	003464	G
SFPTBL	002204	G	TSC.FC=	177717	G	T\$LTNO=	000005	T1.10	024576		WRTYFG	003463	G
SFR	= 105410	G	TSC.TC=	177761	G	T\$NEST=	177777	T1.11	024616		WRUNR	002776	G
SOFINI	007072	G	TSDB	002514	G	T\$NS0 =	000000	T1.12	024702		WSM	= 140006	G
SRF	= 104010	G	TSMD	031257		T\$NS1 =	000005	T1.2	024372		WSMBK	002506	G
SRR	= 104410	G	TSNP	003534	G	T\$NS2 =	000002	T1.3	024416		WSSR	012700	G
STAERM	006120	G	TSSR	002524	G	T\$PCNT=	000000	T1.4	024436		WTBF	031327	
STAER1	006436		TSSREG	003454	G	T\$PTAB=	010043	T1.5	024456		WTBUF	002316	G
STAER2	006616		TSUNT	003532	G	T\$PTHV=	000001	T1.6	024476		WTM	= 100011	G
STAER3	006675		TSVCT	002534	G	T\$PTNU=	000001	T1.7	024516		WTMFLG	003456	G
STAER4	006733		TS.A16=	000400	G	T\$SAVL=	177777	T1.8	024536		WTR	= 101011	G
STAER5	006753		TS.A17=	001000	G	T\$SEGL=	177777	T1.9	024556		WTV	= 104105	G
STAER6	006562		TS.NBA=	002000	G	T\$SIZE=	000005	T2	025644	G	WTVERM	004430	G
STAER7	006530		TS.NXM=	004000	G	T\$SUBN=	000000	T3	026500	G	WTYBRF	015110	
STAF LG	003526	G	TS.OFL=	000100	G	T\$TAGL=	177777	T4	026674	G	WTYCMD	015104	
SVCGBL=	000000		TS.RMR=	010000	G	T\$TAGN=	010045	T5	027054	G	WTYWRD	015106	
SVCINS=	000001		TS.SC =	100000	G	T\$TEMP=	000000	TSWEOT	027634	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	TSSADR	030012		T\$AUT=	010013	URERM	005041	G	X0.EOT=	000001	G
SWSET	004231	G	TSSCL	002564	G	T\$CLE=	010014	VFEXC	016152	G	X0.LET=	020000	G
S\$LSYM=	010000		TSSINT	002554	G	T\$DAT=	010044	VFISU	016400	G	X0.ONL=	000100	G
TCCRA	013414		TSSINO	010034	G	T\$DU =	010015	VFYCNT	003346	G	X0.RLL=	010000	G
TCC0	013434	G	TSSIN1	010042	G	T\$HAR=	010040	VFYDAT	016066	G	X0.RLS=	040000	G
TCC1	013452	G	TSSIN2	010050	G	T\$HW =	010000	VFYFLG	003516	G	X0.TMK=	100000	G
TCC2	013470	G	TSSIN3	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	030036		T\$PC =	000001	WLKCHK	007356	G	X2.EFE=	000200	G
TCC5	014232	G	TS5VCT	030027		T\$PRO=	010011	WLKZRO	011734		X2.OPM=	100000	G
TCC6	014330	G	T\$ARGC=	000003		T\$PPTA=	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	
TOOIM	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: 26207 WORDS (103 PAGES)

DYNAMIC MEMORY: 20614 WORDS (79 PAGES)

ELAPSED TIME: 00:17:01

CVTSEC,CVTSEC/-SP=SVC/ML,TSV1E,CVTSEC.SRC