

TC11/TU56

TC5-TC11 TEST 5
MD-11-DZTCE-D

EP-DZTCE-D-DL-D
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DEC 1977
digital
MADE IN USA

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DZTCED.P11

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TCS - TC11 TEST 5

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IDENTIFICATION

PRODUCT CODE: MAINDEC-11-DZTCE-D-D

PRODUCT NAME: TCS-TC11 TEST 5

DATE: AUGUST 1977

MAINTAINER: DIAGNOSTIC ENGINEERING

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MAYNARD, MASS 01754

REVISED BY: PRODUCT ENHANCEMENT

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1. ABSTRACT

TC5 - TC11 TEST 5 IS PART 5 OF A FIVE PROGRAM PACKAGE USED TO TEST THE TC11 DECTAPE CONTROL. TC5 EXERCISES THE TC11 CONTROL AND FROM ONE TO EIGHT SELECTED TRANSPORTS. ALL AVAILABLE CORE STORAGE UP TO 28K IS USED IN ORDER TO EXECUTE THE MAXIMUM NUMBER OF DATA TRANSFERS POSSIBLE.

ALL EXECUTION TIMES QUOTED ARE TYPICAL OF A 11/20 SYSTEM.
EXECUTION TIMES IN OTHER PDP-11 SYSTEMS WILL VARY.

2. REQUIREMENTS

2.1 EQUIPMENT

- A. PDP-11 SYSTEM (4K CORE).
- B. ASR33/35 TELETYPE.
- C. TC11 DECTAPE CONTROL AND AT LEAST ONE TUS6 DUAL TRANSPORT.
- D. ONE STANDARD PDP-11 FORMAT DECTAPE FOR EACH TRANSPORT TO BE TESTED. OF THE TAPE BLOCKS MUST BE ZERO. IF NECESSARY, REFORMAT THE TAPE.

THE TELETYPE AND TC11 CONTROL MUST HAVE THEIR STANDARD PERIPHERAL ADDRESSES, INTERRUPT LEVELS, AND INTERRUPT VECTOR ADDRESSES. REFER TO SECTION 7.2 IF YOUR SYSTEM DOES NOT HAVE STANDARD PERIPHERAL ADDRESSES.

2.2 STORAGE

THIS PROGRAM USES LOCATIONS 000000 THROUGH 010120. ALL REMAINING CORE STORAGE UP TO 28K IS USED FOR DEVICE BUFFER AREAS.

3. LOADING PROCEDURE

THIS PROGRAM'S OBJECT TAPE IS PUNCHED IN ABSOLUTE FORMAT. THE ABS LOADER IS USED TO LOAD THE PROGRAM.

4. USE PROCEDURE

- A. LOAD UNITS TO BE TESTED WITH STANDARD FORMAT DECTAPE. SET TO REMOTE/WRITE ENABLE.
- B. SET WRTM SWITCH OFF, WALL SWITCH TO OFF.
- C. LOAD ADDRESS 000200.
- D. PRESS START.
- E. THE PROGRAM IDENTIFIES ITSELF, TYPES SETUP INSTRUCTIONS, AND HALTS.
- F. PERFORM SETUP (STEPS A AND B), AND SET SR SWITCHES 0 THROUGH 7 TO INDICATE THE UNITS TO BE TESTED, (SR0 FOR UNIT 0, SR1 FOR UNIT 1, ETC).
- G. THE PROGRAM TYPES SR OPTIONS MESSAGE. SET DESIRED SR OPTIONS IF ANY. NORMAL SR IS 000000. PRESS CONT.

THIS PROGRAM'S SR OPTIONS ARE:

SR15 = 1	HALT ON ERROR
SR14 = 1	ENTER SCOPE MODE
SR13 = 1	INHIBIT ERROR PRINTOUT
SR11 = 1	INHIBIT ITERATION
SR10 = 1	HALT AT END OF TEST CURRENTLY EXECUTING
SR9 = 1	SELECT THE TEST SPECIFIED BY SR7 THROUGH SR0
SR7 THROUGH SR0 - NUMBER OF TEST TO BE SELECTED	

SECTION 7.1 GIVES A COMPLETE EXPLANATION OF SR OPTIONS.

- H. THE PROGRAM BEGINS EXECUTION.
- I. AT THE END OF EACH PASS THE TELETYPE BELL RINGS ONCE, AND THE CHARACTER "*" IS TYPED.
- J. REFER TO SECTION 6.2 IF ERROR PRINTOUTS OCCUR.

EXECUTION TIME:

- A. ONE NORMAL ERROR FREE PASS TAKES APPROXIMATELY 1 HOUR.
- B. ONE SINGLE ITERATION PASS (SR11=1) TAKES ABOUT 5 MINUTES.

4.1 RESTART PROCEDURE

TO RESTART THE PROGRAM WITHOUT GENERATING THE INITIAL PRINTOUTS PROCEED AS FOLLOWS: (TRANSPORTS UNDER TEST REMAIN THE SAME)

- A. LOAD ADDRESS 001000
- B. DO UNIT SETUP AS DESCRIBED IN STEPS A AND B OF USE PROCEDURE.
- C. SELECT ANY DESIRED OPTIONS.
- D. PRESS START.
- E. GO TO STEP H OF USE PROCEDURE.

5. PROGRAM AND/OR OPERATOR ACTION
-----5.1 NORMAL HALTS

LOC 002464 COMMON HALT. THIS HALT IS CALLED BY THOSE PARTS
OF THE PROGRAM THAT REQUIRE THAT THE PROCESSOR STOP.
THIS HALT NORMALLY OCCURS UPON COMPLETION OF NON-ERROR
PRINTOUTS. THE CONSOLE DATA LIGHTS DISPLAY THE ADDRESS OF
INSTRUCTION THAT GENERATED THE HALT REQUEST.

LOC 002016 ROUTINE END HALT. THIS HALT OCCURS UPON COMPLETION
OF THE CURRENT TEST ROUTINE IF SR10 IS SET. THE
CONSOLE DATA LIGHTS DISPLAY THE NUMBER OF THE TEST
JUST COMPLETED.

5.2 NORMAL PRINTOUTS

ALL NON-ERROR PRINTOUTS ARE NORMAL PRINTOUTS. INSTRUCTION,
TITLE, AND USER ERROR PRINTOUTS ARE NORMAL PRINTOUTS.

6. ERRORS

ERRORS ARE REPORTED IN THIS PROGRAM BY THE FOLLOWING METHODS:

- A. UNCONDITIONAL ERROR HALTS, OR
- B. ERROR PRINTOUT FOLLOWED BY OPTIONAL ERROR HALT.

6.1 UNCONDITIONAL ERROR HALTS

AN UNCONDITIONAL ERROR HALT WILL OCCUR AT THE ADDRESSES LISTED BELOW IF THROUGH HARDWARE OR SOFTWARE FAILURE, PROGRAM CONTROL IS TRANSFERRED TO AN UNEXPECTED AREA BETWEEN 000000 AND 000176.

000002 RESERVED AREA
000006 ERROR TRAP
000012 RESERVED INSTRUCTION TRAP
000016 DEBUG TRAP
000022 IOT TRAP
000026 POWER FAIL TRAP
000040 THROUGH 000176 - SYSTEM SOFTWARE AND INTERRUPT VECTOR AREA,
EXCEPT FOR TC11 AND TTY VECTORS.

TO FIND OUT WHERE THE PROGRAM WAS AT THE TIME THE FAILURE OCCURRED,

- A. EXAMINE CONTENTS OF REGISTER 6. (ADDRESS 177706).
- B. TRANSFER THE CONTENTS OF REG 6 TO THE SR, LOAD ADDRESS AND EXAMINE.
- C. THE DATA SHOWN IN THE DATA LIGHTS IS THE VALUE OF THE PC WHEN THE FAILURE OCCURRED.
- D. LOCATE IN PROGRAM LISTING THE DISPLAYED PC VALUE.
- E. THE INSTRUCTION THAT IMMEDIATELY PRECEDES THE ONE REFERENCED BY THE DISPLAYED PC VALUE IS THE INSTRUCTION THAT WAS/WAS BEING EXECUTED WHEN THE FAILURE OCCURRED.

AN UNCONDITIONAL ERROR HALT FAILURE IS AN ABNORMAL CONDITION INDICATING A HARDWARE FAILURE, OR MOST UNLIKELY, A PROGRAM FAILURE. THIS PROGRAM ASSUMES THAT THE PROCESSOR IS IN OPERATING CONDITION IN ORDER TO PERFORM ITS TESTS.

6.2 ERROR PRINTOUTS

ERROR PRINTOUTS ARE GENERATED BY THE "ERRN" SUBROUTINE. THE "ERRN" SUBROUTINE IS CALLED BY AN "ERRORN" STATEMENT. AN ERROR PRINTOUT LOOKS AS FOLLOWS:

T XXX PC DYYYYY ICNT ZZZZ. UNIT W
XFRONT XXXXXX WADDR YYYYYY RADDR ZZZZZZ FPC DVVVVV
UP TO 2 ADDITIONAL LINES OF ERROR INFORMATION.

WHERE:

T XXX IS THE NUMBER OF FAILING ROUTINE (OCTAL),

PC DYYYYY IS THE ADDRESS OF ERROR CALL,

ICNT ZZZZ. IS THE ITERATION COUNT AT TIME OF FAILURE.

XFRONT XXXXXX WADDR YYYYYY AND RADDR ZZZZZZ INDICATE THE PARAMETERS IN USE AT TIME OF FAILURE.

FPC DVVVVV IS TYPED WHEN THE ERROR CALL IS GENERATED BY A SUBROUTINE, AND IT IS NECESSARY TO INDICATE WHERE THE SUBROUTINE WAS CALLED FROM.

AFTER THE PRINTOUT IS COMPLETED, THE PROGRAM WILL HALT AT COMMON ERROR HALT AT LOC 002500 IF SR15 IS SET.

WHEN AN ERROR PRINTOUT OCCURS:

- A. LOOK UP THE ADDRESS REFERENCED BY PC DYYYYY IN THE LISTING.
- B. OPPOSITE THE PC VALUE AN ERRORN STATEMENT WILL BE FOUND, AND IN THE COMMENTS SECTION, A DESCRIPTION OF THE ERROR.
- C. AT THE BEGINNING OF THE TEST ROUTINE A DESCRIPTION OF THE TEST WILL BE FOUND.

UP TO 2 LINES OF ADDITIONAL ERROR INFORMATION MAY APPEAR ON AN ERROR PRINTOUT. SOME OF THE ITEMS THAT MAY APPEAR ARE:

- A. BLKRQ XXXX. BLKRQ REPRESENTS THE INITIAL BLOCK NUMBER USED WHEN AN OPERATION WAS INITIATED. (IN A 2 OR MORE BLOCK TRANSFER, BLKRQ REPRESENTS THE INITIAL BLOCK NUMBER. EVEN THOUGH A FAILURE MAY NOT HAVE OCCURRED UNTIL A SUBSEQUENT BLOCK.
- B. IN A DATA ERROR PRINTOUT THE "WORD #" THAT FAILED REPRESENTS THE POSITION OF THE CORRECT WORD IN THE WRITE BUFFER, AND IT IS NOT MEANT TO DESCRIBE THE WORD'S POSITION IN A DECTAPE BLOCK.

7. MISCELLANEOUS

7.1 SR OPTIONS

THE STANDARD SR OPTIONS ARE DESCRIBED HERE.

- SR15 HALT ON ERROR. WITH SR15 SET TO A 1, THE PROGRAM WILL HALT AFTER AN ERROR OCCURS. PRESSING CONT WILL CAUSE PROGRAM TO RESUME OPERATION.
- SR14 SCOPE. THIS OPTION CAUSES THE PROGRAM TO REMAIN IN THE CURRENT TEST ROUTINE. WHEN THE OPTION IS REMOVED, THE PROGRAM WILL COMPLETE THE CURRENT ROUTINE, AND WILL THEN GO ON TO THE NEXT ROUTINE.
- SR13 INHIBIT ERROR PRINTOUT. THIS OPTION REMOVES ALL ERROR PRINTOUTS.

*****NOTE*****

SCOPE MODE OPERATION IS ACHIEVED BY LOCKING THE PROGRAM IN THE CURRENT ROUTINE, INHIBITING ERROR PRINTOUTS, AND BYPASSING ERROR HALTS.

- SR11 INHIBIT ITERATION. SETTING THIS OPTION WILL CAUSE THE PROGRAM TO EXECUTE EACH TEST ONLY ONCE, INSTEAD OF THE NORMAL NUMBER OF ITERATIONS SELECTED FOR EACH TEST. TWO POSSIBLE USES OF THIS OPTION ARE:
- A. QUICK PASS. EACH TEST IS RUN ONLY ONCE.
- B. TO SKIP OVER A FAILING ROUTINE.
- SR10 HALT AT END OF CURRENT ROUTINE. WITH THE OPTION SET, THE PROGRAM WILL HALT AT THE END OF EACH TEST, AND DISPLAY IN DATA LIGHTS THE NUMBER OF THE TEST JUST COMPLETED. THREE POSSIBLE USES OF THIS OPTION ARE:
- A. TO STEP THROUGH THE PROGRAM ONE ROUTINE AT A TIME.
- B. WHEN THE PROGRAM HAS BEEN RUNNING FOR A WHILE, TO FIND OUT HOW FAR IT HAS PROGRESSED.
- C. IN CASE OF A BLOW UP, ETC. TO STEP THROUGH ONE TEST AT A TIME UNTIL THE FAILURE REOCCURS. THE ROUTINE FOLLOWING THE PREVIOUSLY COMPLETED ROUTINE WOULD BE THE FAILING ROUTINE.
- SR9 SELECT ROUTINE. WITH SR9 SET, THE PROGRAM WILL GO AND EXECUTE THE ROUTINE INDICATED BY SR7 THROUGH SR0, AFTER THE CURRENT ROUTINE HAS BEEN COMPLETED. IF THE OPTION IS REMOVED, THE PROGRAM WILL PROCEED TO EXECUTE THE ROUTINES FOLLOWING THE SELECTED ROUTINE.

7.2 TESTING TC11 AT NON-STANDARD ADDRESSES AND/OR VECTORS

THIS PROGRAM CAN TEST THE TC11 AT NON-STANDARD ADDRESSES AND VECTORS PROVIDED THOSE ADDRESSES AND VECTORS ARE PROVIDED TO THE PROGRAM AS FOLLOWS:

- A. AFTER LOADING PROGRAM REFER TO PROGRAM LISTING AND CHANGE LOCATIONS 001004 THROUGH 001020 TO REFLECT THE NEW TC11 ADDRESSES AND VECTORS.
- B. IF THE TELETYPE IS ALSO AT NON STANDARD ADDRESSES, CHANGE LOCATIONS 001022 AND 001024 ALSO.
- C. PROCEED TO USE THE PROGRAM, OR
- D. USING STANDARD DUMP ROUTINES, DUMP OUT THE ENTIRE PROGRAM IN ABSOLUTE FORMAT TO HAVE AN OBJECT TAPE THAT REFLECTS YOUR SYSTEM, OR
- E. DUMP OUT ONLY LOCATIONS 001004 THROUGH 001024 IN ABSOLUTE FORMAT, AND LOAD IT ALSO AFTER LOADING THE MAIN PROGRAM.

B. DESCRIPTION

THIS PROGRAM IS ORGANIZED INTO THREE MAIN SECTIONS:

- A. CONTROL ROUTINE,
- B. TEST ROUTINES,
- C. COMMON SUBROUTINES

B.1 CONTROL ROUTINE

THE CONTROL ROUTINE ASSUMES CONTROL WHEN THE PROGRAM IS STARTED. IT HAS THE FOLLOWING FUNCTIONS:

- A. CONTROLS SEQUENCE OF TEST ROUTINES.
- B. MONORS AND ACTS ON SR OPTIONS.

THE CONTROL ROUTINE IS CALLED FROM A TEST ROUTINE BY THE "SCOPE" STATEMENT.

8.2 TEST ROUTINES

THE ACTUAL TESTING IS PERFORMED BY A SET OF TEST ROUTINES THAT ARE NUMBERED SEQUENTIALLY FROM 0 TO 10 (OCTAL). EACH TEST ROUTINE IS PRECEDED BY A TEST HEADER THAT IS USED BY THE CONTROL ROUTINE IN ORDER TO PROPERLY SEQUENCE THROUGH THE TESTS. THE HEADER LOOKS AS FOLLOWS: (EXAMPLE)

```
*****
T10: 10          ;ROUTINE NUMBER 10.          *
      11         ;ADDRESS OF NEXT ROUTINE      *
      10         ;TEST ITERATION COUNT        *
      BAGA       ;SCOPE ENTRY POINT            *
*****
```

THE FIRST 2 ITEMS ARE SELF EXPLANATORY. THE TEST ITERATION COUNT INDICATES TO THE CONTROL ROUTINE THE NUMBER OF TIMES THE TEST SHOULD BE PERFORMED BEFORE GOING ON TO THE NEXT ROUTINE.

THE SCOPE ENTRY POINT INDICATES TO THE CONTROL ROUTINE THE ADDRESS IT SHOULD RETURN TO AFTER THE FIRST ITERATION. THE ADDRESS MAY NOT NECCESARILY POINT TO THE FIRST INSTRUCTION OF THE TEST.

8.3 COMMON SUBROUTINES

ALL SUBROUTINES NEEDED BY EITHER THE CONTROL ROUTINE OR TEST ROUTINES ARE GROUPED TOGETHER. THE MOST SIGNIFICANT SUBROUTINE IS THE "ERRN" SUBROUTINE, WHICH IS CALLED BY AN "ERRORN" STATEMENT AND TYPES THE TEST NUMBER AND PC VALUE WHEN A FAILURE OCCURS.

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SEG 0010

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388      .LIST      SEQ,BIN,ME
389      .NLIST     MC,MD
390      .ABS
391      ;
392      .=0
393      .+2      ;UNASSIGNED TRAP
394      HALT
395      MACHER: .+2      ;SP OVERFLOW, BUS ERROR TRAP
396      HALT
397      .+2      ;RESERVED INSTRUCTION TRAP
398      HALT
399      TRCV:   SVSS      ;TRACE TRAP
400      .+2
401      IOTV:   RSTS      ;TRAP TO CALL IOX
402      PRTY7
403      .+2      ;POWER FAIL TRAP
404      HALT
405      EMTV:   EMTINT     ;EMT TRAP
406      PRTY7
407      TRPV:   DLY        ;TRAP TRAP. SIMILAR TO EMT
408      PRTY0
409      ;LOC 40 THROUGH 376 ARE FILLED WITH .+2 AND HALT EXCEPT LOC 46 AND 52.
410      ;EQUATE STATEMENTS
411      SR=177570
412      PSW=177776
413      SPB01=1000
414      NOP=240
415      OPEN=0
416      MANUAL=BIT15
417      BIT15=100000
418      BIT14=40000
419      BIT13=20000
420      BIT12=10000
421      BIT11=4000
422      BIT10=2000
423      BIT9=1000
424      BIT8=400
425      BIT7=200
426      BIT6=100
427      BIT5=40
428      BIT4=20
429      BIT3=10
430      BIT2=4
431      BIT1=2
432      BIT0=1
433      R0=%0
434      R1=%1
435      R2=%2
436      R3=%3
437      R4=%4
438      R5=%5
439      R6=%6
440      R7=%7
441      PC=%7

```


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SEQ 0011

44	005746	PUSH=005746
45	024646	PUSH2=024646
46	005726	POPSP=005726
47	022626	POPSP2=022626
48	000340	PRTY7=340
49	000300	PRTY6=300
50	000240	PRTY5=240
51	000200	PRTY4=200
52	000140	PRTY3=140
53	000100	PRTY2=100
54	000040	PRTY1=40
55	000000	PRTY0=0
56	000007	BELL=007
57	177777	TLAST=-1
58	000003	TRC=3
59	000040	I=40
60	177777	X=-1
61	100000	A=BIT15
62	040000	B=BIT14
63	020000	C=BIT13
64	000000	V0=0
65	000004	V1=4
66	000010	V2=10
67	000014	V3=14
68	000020	V4=20
69	000024	V5=24
70	000030	V6=30
71	000034	V7=34
72	020000	MAINT=BIT13
73	010000	DINH=BIT12
74	004000	REV=BIT11
75	000000	FWD=0
76	000000	U0=0
77	000400	U1=BIT8
78	001000	U2=BIT9
79	001400	U3=BIT9:BIT8
80	002000	U4=BIT10
81	002400	U5=BIT10:BIT8
82	003000	U6=BIT10:BIT9
83	003400	U7=BIT10:BIT9:BIT8
84	000100	IE=BIT6
85	000000	SAT=0
86	000002	RNUM=BIT1
87	000004	RDATA=BIT2
88	000006	RALL=BIT2:BIT1
89	000010	SST=BIT3
90	000012	WRTM=BIT3:BIT1
91	000014	WDATA=BIT3:BIT2
92	000016	WALL=BIT3:BIT2:BIT1
93	000001	DO=BIT0
94	000200	UPS=BIT7
95	010000	ILO=BIT12
96	004000	SELE=BIT11
97	000000	EMTX=0
	000003	SAVSS=3
	000004	RSTSS=4

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SEQ 0012

498		104400		DELAY=TRAP		
499		000050		=46		
500	000046	002054		LOGIC		
501		000052		=52		
502	000052	040000		40000		
503		000200		=200		
504	000200	000167	001054	JMP	START	;GO TO START OF PROGRAM.
505		001000		=1000		
506	001000	000167	000576	JMP	GETROY	;BYPASS INITIAL PRINTOUTS.
507	001004	177340		TCST:		;TC11 STATUS REGISTER.
508	001006	177342		TCCM:		;TC11 COMMAND REGISTER.
509	001010	177344		TCWC:		;TC11 WORD COUNT REGISTER.
510	001012	177346		TCBA:		;TC11 BUS ADDRESS REGISTER.
511	001014	177350		TCDT:		;TC11 DATA REGISTER.
512	001016	000214		TCVTR:		;TC11 INTERRUPT VECTOR
513	001020	000300		TCLVL:		;TC11 INTERRUPT PRIORITY LEVEL.
514	001022	177564		TPS:		;LSP CSR
515	001024	177566		TPB:		;LSP BUFFER
516	001026	000000		ICTR:	OPEN	;CONTAINS CURRENT ITERATION COUNT
517	001030	000000		ICNT:	OPEN	;CONTAINS ACCUMULATED ITERATION COUNT.
518	001032	006062		KSTART:	TO	;CONTAINS STARTING ROUTINE ADDR.
519	001034	000000		SCOptr:	OPEN	;CONTAINS CURRENT SCOPE POINTER.
520	001036	000000		RTNNO:	OPEN	
521	001040	000000		NXTST:	OPEN	
522	001042	000000		CURTST:	OPEN	
523	001044	000000		CTRA:	OPEN	
524	001046	000000		TCCMT:	OPEN	
525	001050	000000		TCSTT:	OPEN	
526	001052	000000		TCDDT:	OPEN	
527	001054	000000		TCWCT:	OPEN	
528	001056	000000		TCBAT:	OPEN	
529	001060	000000		BLKRQ:	OPEN	
530	001062	000000		BLKRQS:	OPEN	
531	001064	000000		UNIT:	OPEN	
532	001066	000000		UNITN:	OPEN	
533	001070	000000		UNITS:	OPEN	
534	001072	000000		COMND:	OPEN	
535	001074	000000		TEMP:	OPEN	
536	001076	000000		FPC:	OPEN	
537	001100	000000		RBFLIM:	OPEN	
538	001102	000000		WBFLIM:	OPEN	
539	001104	000000		BFSIZE:	OPEN	
540	001106	000000		XFRcnt:	OPEN	
541	001110	000000		WADDR:	OPEN	
542	001112	000000		RADDR:	OPEN	
543	001114	000000		VFBKLN:	OPEN	
544	001116	000000		VRBLKN:	OPEN	
545	001120	000005		ERRLIM:	5	
546	001122			EMTTAB:		
547	001122	001730		.WORD	CHAINN	;POINTER FOR EMT CALL SCOPE
548	001124	002436		.WORD	SRSETT	;POINTER FOR EMT CALL SRESET
549	001126	002162		.WORD	SV03	;POINTER FOR EMT CALL SAV03
550	001130	002262		.WORD	RS03	;POINTER FOR EMT CALL RST03
551	001132	002212		.WORD	SV05	;POINTER FOR EMT CALL SAV05
552	001134	002312		.WORD	RS05	;POINTER FOR EMT CALL RST05
553	001136	002202		.WORD	SV05S	;POINTER FOR EMT CALL SAV05S

554	001149	002306	.WORD	BSS	: POINTER FOR EMT CALL BSS
555	001149	002742	.WORD	TYP	: POINTER FOR EMT CALL TYPE
556	001144	003040	.WORD	TYP	: POINTER FOR EMT CALL TYPES
557	001146	002504	.WORD	ERRN	: POINTER FOR EMT CALL ERRORN
558	001150	003220	.WORD	OACNVV	: POINTER FOR EMT CALL OACNV
559	001152	003312	.WORD	BDCNVV	: POINTER FOR EMT CALL BDCNV
560	001154	003560	.WORD	RNGN	: POINTER FOR EMT CALL RNDNUM
561	001156	003636	.WORD	INRNDN	: POINTER FOR EMT CALL INRAND
562	001160	003270	.WORD	BMOVV	: POINTER FOR EMT CALL BMOVE
563	001162	002460	.WORD	CHLT	: POINTER FOR EMT CALL CHALT
564	001164	002472	.WORD	EHLT	: POINTER FOR EMT CALL EHALT
565	001166	002416	.WORD	STTCV	: POINTER FOR EMT CALL SVECTR
566	001170	004354	.WORD	STCOM	: POINTER FOR EMT CALL SETCOM
567	001172	004314	.WORD	STATS	: POINTER FOR EMT CALL STATUS
568	001174	004450	.WORD	STOPD	: POINTER FOR EMT CALL STOPDT
569	001176	004460	.WORD	CKERZ	: POINTER FOR EMT CALL CKERRZ
570	001200	004524	.WORD	NOINTR	: POINTER FOR EMT CALL NOINT
571	001202	005160	.WORD	SRCFFF	: POINTER FOR EMT CALL SRCFH
572	001204	005166	.WORD	SRCRR	: POINTER FOR EMT CALL SRCHR
573	001206	005630	.WORD	WDATF	: POINTER FOR EMT CALL WDATAF
574	001210	005700	.WORD	WDATR	: POINTER FOR EMT CALL WDATAR
575	001212	005654	.WORD	RDAF	: POINTER FOR EMT CALL RDATAF
576	001214	005724	.WORD	RDATR	: POINTER FOR EMT CALL RDATAR
577	001216	005060	.WORD	CWCBA	: POINTER FOR EMT CALL CKWCBA
578	001220	005006	.WORD	CLEAR	: POINTER FOR EMT CALL CLEAR
579	001222	005026	.WORD	BINFLL	: POINTER FOR EMT CALL BINFIL
580	001224	004616	.WORD	DATCHK	: POINTER FOR EMT CALL DATCHK
581	001226	004600	.WORD	DTCKI	: POINTER FOR EMT CALL DATCKI
582	001230	003122	.WORD	INBIN	: POINTER FOR EMT CALL INBIN
583	001232	003154	.WORD	GTBN1	: POINTER FOR EMT CALL GETBN1
584	001234	003676	.WORD	RNDRVV	: POINTER FOR EMT CALL RNDRIV
585	001236	003726	.WORD	SELDR	: POINTER FOR EMT CALL SELDRV
586	001240	003770	.WORD	RNDXFF	: POINTER FOR EMT CALL RNDXFR
587	001242	004032	.WORD	XFRSTT	: POINTER FOR EMT CALL XFRSET
588	001244	004166	.WORD	RNDFBB	: POINTER FOR EMT CALL RNDFBK
589	001246	004220	.WORD	RNRBB	: POINTER FOR EMT CALL RNRBK
590	001250	004136	.WORD	DRVFL	: POINTER FOR EMT CALL DRVFIL
591	001252	004556	.WORD	DTCKSS	: POINTER FOR EMT CALL DATCKS
592	001254	004262	.WORD	RNDFL	: POINTER FOR EMT CALL RNDFIL
593	001256	003654	.WORD	SQDRV	: POINTER FOR EMT CALL SEQDRV
594					

595	001260	012706	001000	START:	MOV	%SPBOT,R6	:SET BOTTOM OF SP STACK.
596	001264	104010			TYPE		:TYPE TITLE.
597	001266	007145			PCTIT		
598	001270	004767	002126		JSR	PC,CORSTP	:GO ASSIGN BUFFER SPACE.
599	001274	104043			INBIN		:INIT BINARY COUNT PATTERN.
600	001276	104016			INRND		:INIT RANDOM NUMBER GENERATOR.
601	001300	005737	000042		TST	%R0	:PROGRAM LOADED VIA MONITOR?
602	001304	001524			BEG		:BR IF NOT.
603				:ROUTINE TO DETERMINE TRANSPORTS	STRTA		:AVAILABLE FOR TEST.
604					MOV	%R02,ERRNO	:DISABLE ERROR PRINTOUTS.
605	001306	012767	000402	001376	MOV	%R02,ERRNO	:DISABLE ERROR PRINTOUTS.
606	001314	112767	000376	177546	MOVB	%R02,UNITS	:ASSUME DRIVES 1-7 AVAILABLE.
607	001322	012700	000010		MOV	%R0,RO	:SET UP TO TEST 8 TIMES.
608	001326	005267	000010		INC	SQDRV1	
609	001332	042767	177770	000002	BIC	%R177770,SQDRV1	
610	001340	104046			SELDV		:SELECT A TRANSPORT.
611	001342	000000			OPEN		:TRANSPORT 8.
612	001344	000431			BR	DTRMNA	:UNIT NOT AVAILABLE RETURN.
613	001346	104023			SETCOM		:REWIND TO REVERSE END ZONE.
614	001350	004002			RNUM+REV		
615	001352	000437			BR	DTRMNB	:ERROR RETURN.
616	001354	005777	177426		TST	%TCCM	:WAIT.
617	001360	100375			BPL	-4	
618	001362	005777	177416		TST	%TCCM	:END ZONE?
619	001366	100031			BPL	DTRMNB	:BR IF NOT.
620	001370	012777	010210	177414	MOV	%CODEND,%TCCB	:SET CURRENT ADDR.
621	001376	012777	177777	177404	MOV	%-1,%TCCW	:SET WORD COUNT.
622	001404	104023			SETCOM		:YES. ISSUE WRITE DATA COMMAND.
623	001406	000015			WDATA+FWD+DO		
624	001410	000420			BR	DTRMNB	:ERROR RETURN.
625	001412	032777	100200	177366	BIT	%BIT15+BIT7,%TCCM	:WAIT FOR ERROR/READY.
626	001420	001774			BEG		
627	001422	005777	177360		TST	%TCCM	:ERROR?
628	001426	100411			BMI	DTRMNB	:BR IF YES.
629	001430	104025			STOPDT		:STOP DECTAPE.
630	001432	005300			DEC	%R0	:DONE 8 TIMES?
631	001434	001334			BNE	DTRMNB	:BR IF NOT.
632	001436	105767	177426		TSTB	UNITS	:ANY UNITS AVAILABLE?
633	001442	001015			BNE	DTRMNC	:BR IF YES.
634	001444	104010			TYPE		:TYPE NON AVAILABLE MESSAGE.
635	001446	010125			NOUNIT		
636	001450	000575			BR	CHNC	:GO EXIT.
637	001452	032777	014000	177324	BIT	%BIT12+BIT11,%TCCM	:ILO OR SELE ERROR?
638	001460	001763			BEG	DTRMNA	:BR IF NOT.
639	001462	016701	177654		MOV	SQDRV1,R1	
640	001466	146167	003760	177374	BICB	UNTAB(1),UNITS	:DESELECT NON AVAILABLE TRANSPORT.
641	001474	000755			BR	DTRMNA	
642	001476	104010			TYPE		:TYPE UNITS TO BE TESTED.
643	001500	010152			GOOD		
644	001502	012767	000001	000010	MOV	%1,CPENA	
645	001510	012767	000007	177326	MOV	%7,CTRA	:CHECK UP TO 7 UNITS.
646	001516	104046			SELDV		:SELECT DRIVE.
647	001520	000000			OPEN		:UNIT TO BE SELECTED.
648	001522	000407			BR	CPENB	:UNIT NOT AVAILABLE.
649	001524	016700	177336		MOV	UNITN,R0	:SUCCESS.
650	001530	116067	010200	006437	MOVB	GTAB(0),GTAPES	:GET ASCII 8 FOR GOOD TAPE.

707	002030	022767	177777	177002	CMP	8-1,NXTST	:LAST TEST?
708	002036	001267			BNE	GTADYX	:BRANCH IF NOT LAST TEST.
709	002040	104010			TYPE		:TYPE PROGRAM END BELL.
710	002042	007453			APGEND		
711	002044	013700	000042		CHNC:	MOV 3842,RO	:GET CONTENTS OF 42.
712	002050	001410			BEG	HERE	:BR IF 0.
713	002052	000005			RESET		:NOT 0. ISSUE RESET.
714	002054	004710			LOGIC:	JSR PC(0)	:RETURN TO MONITOR.
715	002056	000240	000240		WORD	NOP,NOP,NOP	
716	002064	105767	177000		TSTB	UNITS	:ANY UNITS AVAILABLE FOR TESTING?
717	002070	001765			BEG	CHNC	:BR IF NOT.
718	002072	000643			HERE:	GETROY	:GO REPEAT PROGRAM.
719	002074	016705	176740		FORWD:	MOV NXTST,RS	:ADDR OF NEXT ROUTINE TO RS.
720	002100	012567	176732		MOV	(5)+,RTNNO	:GET NEXT ROUTINE NUMBER.
721	002104	012567	176730		MOV	(5)+,NXTST	:GET ADDR OF NEXT "NEXT" ROUTINE.
722	002110	012567	176712		MOV	(5)+,ICTR	:GET ITERATION COUNT.
723	002114	012567	176714		MOV	(5)+,SCOPT	:GET SCOPE LOOP ENTRY POINTER.
724	002120	010567	176716		FORWDA:	MOV RS,CURTST	:ADDR OF NOW CURRENT TEST TO CURTST.
725	002124	012767	000001	176676	MOV	81,ICNT	:PRESET ICNT TO 1.
726	002132	016767	176700	175430	MOV	RTNNO,SR	:DISPLAY ROUTINE #.
727	002140	000207			RTS	R7	:EXIT FORWD SUBROUTINE.
728					:EMT INTERPRETER ROUTINE.		
729	002142	010046			EMTINT:	MOV RO,-(6)	:PUSH RO.
730	002144	016600	000002		MOV	2(6),RO	:GET EMT PC.
731	002150	014000			MOV	-(0),RO	:GET EMT CALL.
732	002152	006300			ASL	RO	:TIMES 2.
733	002154	016000	171122		MOV	EMTTAB-10000(0),RO	:FORM EMT ADDR.
734	002160	000200			RTS	RO	:GO TO EMT RTN. RESTORE RO.
735					:SAVE REGS 0 TO 3 SUBROUTINE.		
736	002162	012666	177766		SV03:	MOV (6)+,-10.(6)	:MOVE PC UPSTACK.
737	002166	012666	177766		MOV	(6)+,-10.(6)	:MOVE STATUS UPSTACK.
738	002172	012767	000002	000046	MOV	8RTI,SV05C	
739	002200	000415			BR	SV05B	
740					:SUB TO SAVE REGS 0 TO 5 AND PLACE EMT PC IN RS.		
741	002202	012767	000240	000036	SV05S:	MOV 8NOP,SV05C	
742	002210	000403			BR	SV05A	
743					:SUB TO SAVE REGS 0 TO 5.		
744	002212	012767	000002	000026	SV05:	MOV 8RTI,SV05C	
745	002220	012666	177762		SV05A:	MOV (6)+,-14.(6)	:MOVE PC AND PSW UPSTACK.
746	002224	012666	177762		MOV	(6)+,-14.(6)	
747	002230	010546			MOV	RS,-(6)	
748	002232	010446			MOV	R4,-(6)	
749	002234	010346			SV05B:	MOV R3,-(6)	
750	002236	010246			MOV	R2,-(6)	
751	002240	010146			MOV	R1,-(6)	
752	002242	010046			MOV	RO,-(6)	
753	002244	024646			PUSH2		
754	002246	000002			SV05C:	RTI	:RTI OR NOP.
755	002250	016605	000020		MOV	16.(6),RS	:EMT PC TO RS.
756	002254	010504			MOV	RS,R4	
757	002256	005744			TST	-(4)	
758	002260	000002			RTI		:EXIT.
759					:RESTORE REGS 0 TO 3 SUBROUTINE.		
760	002262	022626			RS03:	POPSP2	
761	002264	012600			MOV	(6)+,RO	:RESTORE REGS 0 TO 4.
762	002266	012601			MOV	(6)+,R1	

763	002270	012602		MOV	(6)+,R2	
764	002272	012603		MOV	(6)+,R3	
765	002274	016646	177766	MOV	-10.(6),-(6)	;MOVE PC AND PSW DOWN STACK.
766	002300	016646	177766	MOV	-10.(6),-(6)	
767	002304	000002		RTI		;EXIT
768				:SUB TO SET R5 IN EMT PC AND RESTORE REGS 0 TO 5.		
769	002306	010566	000020	RSOVS: MOV	R5,16.(6)	;SET EMT PC TO R5 CONTENTS.
770				:SUB TO RESTORE REGS 0 TO 5.		
771	002312	022626		RSOS: POPSP2		
772	002314	012600		MOV	(6)+,R0	
773	002316	012601		MOV	(6)+,R1	
774	002320	012602		MOV	(6)+,R2	
775	002322	012603		MOV	(6)+,R3	
776	002324	012604		MOV	(6)+,R4	
777	002326	012605		MOV	(6)+,R5	
778	002330	016646	177762	MOV	-14.(6),-(6)	;MOVE PC AND PSW DOWNSTACK.
779	002334	016646	177762	MOV	-14.(6),-(6)	
780	002340	000002		RTI		;EXIT.
781	002342	012666	177772	SVSS: MOV	(6)+,-6(6)	;PC AND PSW UPSTACK.
782	002346	012666	177772	MOV	(6)+,-6(6)	
783	002352	010546		MOV	R5,-(6)	;SAVE R5.
784	002354	010446		MOV	R4,-(6)	;SAVE R4.
785	002356	024646		PUSH2		
786	002360	016605	000010	MOV	8.(6),R5	;EMT PC TO R5.
787	002364	010504		MOV	R5,R4	;EMT PC TO R4.
788	002366	005744		TST	-(4)	
789	002370	000002		RTI		;EXIT EMT SUB.
790	002372	010566	000010	RSSS: MOV	R5,8.(6)	;R5 TO EMT PC.
791	002376	022626		POPSP2		
792	002400	012604		MOV	(6)+,R4	;RESTORE R4.
793	002402	012605		MOV	(6)+,R5	;RESTORE R5.
794	002404	016646	177772	MOV	-6(6),-(6)	
795	002410	016646	177772	MOV	-6(6),-(6)	
796	002414	000002		RTI		;EXIT.
797				:ROUTINE TO SET TC11 INTERRUPT VECTOR AND PRIORITY		
798	002416	104006		STTCV: SAVOSS		
799	002420	016701	176372	MOV	TCVTR,R1	;VECTOR TO R1.
800	002424	012521		MOV	(5)+,(1)+	;SET DESIRED VECTOR.
801	002426	016721	176366	MOV	TCLVL,(1)+	;SET TC11 PRIORITY.
802	002432	104007		RSTOSS		
803	002434	000002		RTI		
804				:ROUTINE TO ISSUE RESET.		
805	002436	010046		SRSETT: MOV	R0,-(6)	;PUSH R0.
806	002440	012700	052525	MOV	#52525,R0	;DATA TO R0.
807	002444	005100		COM	R0	;COMPLEMENT (R0).
808	002446	010067	177770	MOV	R0,SRSETT+4	; (R0) TO SRSETT+4.
809	002452	000005		RESET		;ISSUE RESET. (R0) IS
810	002454	012600		MOV	(6)+,R0	;RESTORE R0.
811	002456	000002		RTI		;DISPLAYED. EXIT.
812				:COMMON HALT ROUTINE		
813	002460	104006		CHLT: SAVOSS		
814	002462	010400		MOV	R4,R0	;DEVELOP ADDR OF CALLER.
815	002464	000000		HALT		;HALT CALL ADDR IN DATA LIGTHS.
816	002466	104007		RSTOSS		
817	002470	000002		RTI		;EXIT.
818				:CONDITIONAL ERROR HALT ROUTINE.		

Address	Code	Label	Operation	Register	Comment
819	002472	005767	TST	SR	:CHECK FOR HALT ON ERROR.
820	002476	100001	BPL	EHLTA	:BRANCH IF NO HALT DESIRED.
821	002500	000000	HALT		:HALT.
822	002502	000002	RTI		:IN DATA LIGHTS.
823	002504	104025	STOPDT		:ALL STOP.
824	002506	010467	MOV	R4,FPC	:CONVERT CALL ADDR OF SUB CALLING.
825	002512	104013	OACNV		
826	002514	001076	FPC		
827	002516	010011	AFPC		
828	002520	000006	6		
829	002522	000003	SAVSS		:SAVE REG 55
830	002524	010567	MOV	R5,ERRB	:DETERMINE CALLING ADDR.
831	002530	162767	SUB	#2,ERRB	
832	002536	104013	OACNV		:CONVERT CALLING ADDR TO ASCII.
833	002540	002716	ERRB		
834	002542	007020	APC		
835	002544	000006	6		
836	002546	104013	OACNV		:CONVERT TEST # TO ASCII.
837	002550	001036	RTNNO		
838	002552	007010	ATNUMB		
839	002554	000003	3		
840	002556	104014	BDCNV		:CONVERT ICNT TO DECIMAL ASCII.
841	002560	001030	ICNT		
842	002562	007035	AICNT		
843	002564	000005	5		
844	002566	104013	OACNV		:CONVERT UNIT # TO ASCII.
845	002570	001066	UNITN		
846	002572	007051	AUNIT		
847	002574	000001	1		
848	002576	104013	OACNV		:CONVERT BLKRQ TO ASCII.
849	002600	001060	BLKRQ		
850	002602	007601	ABLKRG		
851	002604	000006	6		
852	002606	104013	OACNV		:CONVERT TCST TO ASCII.
853	002610	001050	TCSTT		
854	002612	007533	ATCST		
855	002614	000006	6		
856	002616	104013	OACNV		:CONVERT TCCM TO ASCII.
857	002620	001046	TCCMT		
858	002622	007517	ATCCM		
859	002624	000006	6		
860	002626	104013	OACNV		:CONVERT TCWC TO ASCII.
861	002630	001054	TCWCT		
862	002632	007465	ATCWC		
863	002634	000006	6		
864	002636	104013	OACNV		:CONVERT TCBA TO ASCII.
865	002640	001056	TCBAT		
866	002642	007502	ATCBA		
867	002644	000006	6		
868	002646	104013	OACNV		:CONVERT TRANSFER COUNT TO ASCII.
869	002650	001106	XFCNT		
870	002652	007063	AXFCNT		
871	002654	000006	6		
872	002656	104013	OACNV		:CONVERT WRITE ADDR TO ASCII.
873	002660	001110	WADDR		
874	002662	007101	AWADDR		


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875 002664 000006      6
876 002666 104013      OACNV
877 002670 001112      RADDR
878 002672 007117      ARADDR
879 002674 000006      6
880 002676 012767 007004 000012      MOV      #EMO,ERRB      ;TYPE ERR HEADER MSG IF NOT INHIBITED.
881 002704 032767 020000 174656      ERRNA: BIT      #BIT13,SR      ;INHIBIT ERR PRINT?
882 002712 001002      ERRND: BNE      ERRNB      ;BR TO INHIBIT.
883 002714 104010      TYPE MSG.
884 002716 000000      ERRB: OPEN      ;DESIRED MSG ADDR GOES HERE.
885 002720 012567 177772 177764      ERRNB: MOV      (5)+,ERRB      ;GET ADDR OF NEXT MSG.
886 002724 022767 177777      CMP      #-1,ERRB      ;TERMINATOR?
887 002732 001364      BNE      ERRNA      ;GO TYPE IF NOT TERMINATOR.
888 002734 104021      ERRNC: EHALT      ;END OF MSGS. HALT IF REQUIRED.
889 002736 000004      RSTSS      ;RESTORE REG 55.
890 002740 000002      RTI      ;EXIT EMT SUB.
891      ;SUBROUTINE TO OUTPUT ASCII MESSAGE ON TELETYPE PRINTER.
892 002742 104006      TYP: SAVOSS
893 002744 012500      MOV      (5)+,R0      ;ADDRESS OF MESSAGE TO R0.
894 002746 112001      TYPA: MOV      (0)+,R1      ;GET CHARACTER
895 002750 001006      BNE      TYPC      ;BRANCH IF NOT TERMINATOR..
896 002752 112701 000177      MOV      #177,R1      ;OUTPUT RUBOUT.
897 002756 004767 000020      JSR      R7,TYPD
898 002762 104007      RSTOSS
899 002764 000002      RTI
900 002766 122701 000045      TYPC: CMP      #45,R1      ;TERMINATOR CHAR. DONE. EXIT.
901 002772 001411      BEQ      TYPF      ;CHECK FOR "%".
902 002774 004767 000002      JSR      R7,TYPD      ;BRANCH IF "%".
903 003000 000762      BR      TYPA      ;TYPE CHAR IN R1
904 003002 110177 176016      TYPD: MOV      R1,TYPB      ;OUTPUT CHARACTER TO PRINTER
905 003006 105777 176010      TSTB      #TYPB      ;WAIT FOR DONE FLAG.
906 003012 100375      BPL      -4
907 003014 000207      RTS      R7
908 003016 112701 000015      TYPF: MOV      #15,R1      ;EXIT
909 003022 004767 177754      JSR      R7,TYPD      ;MOVE CARRIAGE RETURN CODE TO R1
910 003026 112701 000012      TYPG: MOV      #12,R1      ;GO TYPE CHAR.
911 003032 004767 177744      JSR      R7,TYPD      ;MOVE LF CODE TO R1.
912 003036 000743      BR      TYPA      ;GO TYPE CHAR.
913      ;SUBROUTINE TO OUTPUT A SERIES OF ASCII MESSAGES ON TELETYPE PRINTER
914 003040 000003      TYPs: SAVSS
915 003042 012567 000016      MOV      (5)+,TYPsB      ;ADDR OF MESSAGE TO TYPsB.
916 003046 022767 177777 000010      CMP      #-1,TYPsB      ;CHECK FOR TERMINATOR
917 003054 001002      BNE      TYPsA      ;BRANCH IF NOT TERMINATOR.
918 003056 000004      RSTSS
919 003060 000002      RTI
920 003062 104010      TYPsA: TYPE
921 003064 000000      TYPsB: OPEN
922 003066 000765      BR      TYPs+2      ;TERMINATOR, EXIT
923      ;SUBROUTINE TO DELAY.
924 003074      DLYRO=DLY+4
925 003102      DLYR1=DLYA+4
926 003070 012727 000310 000000      DLY: MOV      #200.,#0
927 003076 012727 001750 000000      DLYA: MOV      #1000.,#0      ;DELAY COUNT TO DLYR1.
928 003104 005367 177772      DLYB: DEC      DLYR1
929 003110 001375      BNE      DLYB
930 003112 005367 177756      DEC      DLYRO

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931 003116 001367      BNE      DLYA
932 003120 000002      RTI
933                                     ;SUBROUTINE TO INITIALIZE BINARY COUNT PATTERNS
934 003122 012767 177777 000016 INBINN: MOV      #-1,RIND      ;SET ALL VARIABLES
935 003130 016767 000012 000012      MOV      RIND,PTO
936 003136 016767 000004 000006      MOV      RIND,PT1
937 003144 000002      RTI
938 003146 000000      RIND: OPEN
939 003150 000000      PTO: OPEN
940 003152 000000      PT1: OPEN
941                                     ;SPECIAL BINARY COUNT PATTERN SUBROUTINE
942 003154 016767 177770 177770 GTBIN1: MOV      PTO,PT1      ;PREVIOUS BIN CHAR TO PT1
943 003162 005167 177764      COM      PT1
944 003166 005167 177754      COM      RIND
945 003172 001002      BNE      +6
946 003174 005267 177752      INC      PT1
947 003200 016767 177746 177742      MOV      PT1,PTO      ;SAVE BIN CHAR IN PTO
948 003206 000003      SAVSS
949 003210 016725 177736      MOV      PT1,(5)+
950 003214 000004      RSTSS
951 003216 000002      RTI
952                                     ;EMT SUB TO CONVERT OCTAL TO ASCII
953 003220 104006      OACNVV: SAVOSS
954 003222 013500      MOV      3(5)+,R0      ;SAVE REGS.
955 003224 012501      MOV      (5)+,R1      ;GET OCTAL VALUE.
956 003226 012502      MOV      (5)+,R2      ;GET DESTINATION ADDR.
957 003230 060201      ADD      R2,R1      ;GET CONVERT COUNT.
958 003232 010003      OACNVA: MOV      R0,R3      ;DEVELOP ADDR TO STORE 1ST CHAR.
959 003234 042703 177770      BIC      #177770,R3
960 003240 062703 000060      ADD      #60,R3      ;ISOLATE LEAST SIGNIFICANT DIGIT.
961 003244 110341      MOV      R3,-(1)      ;CONVERT DIGIT TO ASCII.
962 003246 042700 000007      BIC      #7,R0      ;STORE ASCII CHARACTER.
963 003252 006000      ROR      R0
964 003254 006000      ROR      R0
965 003256 006000      ROR      R0
966 003260 005302      DEC      R2
967 003262 001363      BNE      OACNVA      ;DONE ALL DIGITS?
968 003264 104007      RSTOSS      ;BRANCH IF NOT DONE.
969 003266 000002      RTI      ;RESTORE REGS.
970                                     ;EMT SUB TO MOVE VARIABLE NUMBER OF BYTES
971 003270 104006      BMOVV: SAVOSS
972 003272 012501      MOV      (5)+,R1      ;SAVE REGS.
973 003274 012502      MOV      (5)+,R2      ;GET FROM ADDRESS
974 003276 012503      MOV      (5)+,R3      ;GET TO ADDRESS
975 003300 112122      BMOVA: MOV      (1)+,(2)+      ;GET COUNT
976 003302 005303      DEC      R3      ;MOVE BYTE
977 003304 001375      BNE      BMOVA      ;DECREMENT COUNT
978 003306 104007      RSTOSS      ;BRANCH IF NOT DONE.
979 003310 000002      RTI      ;RESTORE REGS.
980                                     ;EMT SUB TO CONVERT BINARY TO DECIMAL ASCII
981 003312 104006      BDCNVV: SAVOSS
982 003314 013501      MOV      3(5)+,R1      ;SAVE REGS.
983 003316 012700 003414      MOV      #DECVAL,R0      ;GET BINARY VALUE.
984 003322 012702 003402      MOV      #TENPWR,R2      ;ADDR OF DECVAL TO R0.
985 003326 012703 000005      MOV      #5,R3      ;ADDR OF 10 POWER TO R2.
986 003332 005004      BDCNVA: CLR      R4      ;SET UP FOR 5 CONVERSIONS.
                                     ;CLEAR RESULT.

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987 003334 161201 BDCNVB: SUB (2),R1 ;10 POWER FROM VALUE.
988 003336 103402 BDCNVC BCS BDCNVC ;BR IF UNSUCCESSFUL.
989 003340 005204 INC R4 ;1 TO RESULT.
990 003342 000774 BR BDCNVB ;DO IT AGAIN.
991 003344 061201 BDCNVC: ADD (2),R1 ;RESTORE SUBTRACTED VALUE.
992 003346 062704 000060 ADD #60,R4 ;CONVERT RESULT TO ASCII.
993 003352 110420 MOVB R4,(0)+ ;STORE RESULT.
994 003354 005722 TST (2)+ ;UPDATE 10 POWER ADDR.
995 003356 005303 DEC R3 ;DONE 5 TIMES?
996 003360 001364 BNE BDCNVA ;BR IF NOT.
997 003362 012501 MOV (5)+,R1 ;GET ADDR TO STORE ASCII.
998 003364 012502 MOV (5)+,R2 ;GET # OF DIGITS REQUIRED.
999 003366 060201 ADD R2,R1 ;START WITH LSD.
1000 003370 114041 BDCNVD: MOVB -(0),-(1) ;TRANSFER CHARACTER.
1001 003372 005302 DEC R2 ;DONE?
1002 003374 001375 BNE BDCNVD ;BR IF NOT.
1003 003376 104007 RSTOSS ;RESTORE REGS.
1004 003400 000002 RTI ;EXIT.
1005 003402 023420 TENPWR: 10000.
1006 003404 001750 1000.
1007 003406 000144 100.
1008 003410 000012 10.
1009 003412 000001 1.
1010 003414 040 040 DECVAL: .BYTE 040,040,040,040,040,040
1011 003417 040 040
1012
1013 003422 012767 003552 174354 ;SUBROUTINE TO ASSIGN BUFFER AREAS PER AVAILABLE CORE.
1014 003430 005737 000042 CORSTP: MOV #CORSTB,MACHER ;SET UP BUS ERROR TRAP POINTER.
1015 003434 001407 TST #42 ;LOADED VIA MONITOR?
1016 003436 022737 002054 000042 BEQ CORSTF ;BR IF NOT.
1017 003444 001403 CMP #LOGIC,#42 ;42=LOGIC?
1018 003446 012701 172000 BEQ CORSTF ;BR IF YES.
1019 003452 000402 MOV #172000,R1 ;172000 TO INITIAL TEST ADDR.
1020 003454 012701 177500 BR CORSTA
1021 003460 162701 020000 CORSTF: MOV #177500,R1 ;177500 TO INITIAL TEST ADDR.
1022 003464 062711 000000 CORSTA: SUB #20000,R1 ;SUBTRACT 20000 FROM TEST ADDR.
1023 003470 012767 000006 174306 ADD #0,(1) ;REFERENCE TEST ADDR.
1024 003476 010167 175376 CORSTD: MOV #6,MACHER ;IF NO TRAP CORE IS AVAILABLE.
1025 003502 162701 010210 SUB R1,RBFLIM ;SET READ BUFFER UPPER LIMIT.
1026 003506 006001 ROR R1 ;COMPUTE AVAILABLE BUFFER SPACE.
1027 003510 006001 ROR R1 ;COMPUTE BUFFER SIZE (READ OR WRITE).
1028 003512 042701 000001 BIC #BIT0,R1
1029 003516 010167 175362 MOV R1,BFSIZE ;COMPUTED BUFFER SIZE TO BFSIZE.
1030 003522 006301 ASL R1
1031 003524 062701 010210 ADD #CODEND,R1 ;COMPUTE WRITE BUFFER UPPER LIMIT.
1032 003530 010167 175346 MOV R1,WBFLIM ;AND MOVE TO WBFLIM.
1033 003534 104013 OACNV ;TYPEOUT HIGHEST TEST ADDR.
1034 003536 001100 RBFLIM
1035 003540 007444 ACRLIM
1036 003542 000006 6
1037 003544 104010 TYPE
1038 003546 007410 HADRM
1039 003550 000207 RTS PC
1040 003552 012716 003460 CORSTB: MOV #CORSTA,(6) ;EXIT.
1041 003556 000002 RTI ;SET UP TRAP EXIT.
1042 ;EXIT BUS ERROR TRAP.
;EMT RANDOM NUMBER GENERATOR. NUMBER IS STORED AT LOC AFTER SUB CALL.

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1043	003560	104006				RNGEN: SAVOSS	
1044	003562	016700	000044			MOV	RP1,RO
1045	003566	006100				ROL	RO
1046	003570	006100				ROL	RO
1047	003572	066700	000036			ADD	RP2,RO
1048	003576	010067	000030			MOV	RO,RP1
1049	003602	006100				ROL	RO
1050	003604	006100				ROL	RO
1051	003606	066700	000022			ADD	RP2,RO
1052	003612	006100				ROL	RO
1053	003614	006100				ROL	RO
1054	003616	010067	000012			MOV	RO,RP2
1055	003622	016725	000004			MOV	RP1,(5)+
1056	003626	104007				RSTOSS	;STORE # AT LOC AFTER SUB CALL.
1057	003630	000002				RTI	;EXIT.
1058	003632	001233				RP1: 1233	
1059	003634	007622				RP2: 7622	
1060						;EMT SUB TO INITIALIZE RANDOM NUMBER GENERATOR.	
1061	003636	012767	001233	177766		INRNDN: MOV	#1233,RP1
1062	003644	012767	007622	177762		MOV	#7622,RP2
1063	003652	000002				RTI	;EXIT.
1064						;EMT SUB TO SELECT SEQUENTIAL DECTAPE UNIT.	
1065	003654	005267	000010			SQDRV: INC	SQDRVA
1066	003660	042767	177770	000002		BIC	#177770,SQDRVA
1067	003666	104046				SELDRA	;SELECT TRANSPORT.
1068	003670	000000				SQDRVA: OPEN	;TRANSPORT NUMBER.
1069	003672	000770				BR	SQDRV
1070	003674	000002				RTI	;TRANSPORT NOT AVAILABLE RETURN.
1071						;TRANSPORT SELECTED. EXIT.	
1072						;EMT SUB TO SELECT RANDOM DECTAPE UNIT.	
1073	003676	104015				CALL: RNDRV	;GET RANDOM NUMBER.
1074	003700	000000				RNDRVV: RNDNUM	;# IS STORED HERE.
1075	003702	042767	177770	177770		RNDRVA: OPEN	;LIMIT TO 3 LSB.
1076	003710	016767	177764	000002		BIC	#177770,RNDRVA
1077	003716	104046				MOV	RNDRVA,RNDRVB
1078	003720	000000				SELDRA	;SELECT RANDOM UNIT
1079	003722	000765				RNDRVB: OPEN	;NUMBER OF UNIT TO BE SELECTED.
1080	003724	000002				BR	RNDRVV
1081						RTI	;UNIT NOT AVAILABLE FOR TESTING RETURN.
1082						;EXIT. UNIT IS SELECTED.	
1083						;EMT SUB TO SELECT DECTAPE UNIT SPECIFIED IF AVAILABLE FOR TESTING.	
1084						CALL: SELDRV	;CALL SELECT SUBROUTINE.
1085						#	;NUMBER OF UNIT TO BE SELECTED.
1086						XXX	;UNIT NOT AVAILABLE RETURN.
1087	003726	104006				NSI	;RETURN IF UNIT IS SUCCESSFULLY SELECTED.
1088	003730	012500				SELDRA: SAVOSS	
1089	003732	136067	003760	175130		MOV	(5)+,RO
1090	003740	001405				BITB	UNTAB(0),UNITS
1091	003742	010067	175120			BEQ	SELDRA
1092	003746	110067	175113			MOV	RO,UNITN
1093	003752	005725				MOV	RO,UNIT+1
1094	003754	104007				TST	(5)+
1095	003756	000002				SELDRA: RSTOSS	
1096	003760	001	002	004		RTI	;EXIT.
1097	003763	010	020	040		UNTAB: .BYTE	BIT0,BIT1,BIT2,BIT3,BIT4,BIT5,BIT6,BIT7
1098	003766	100	200			;EMT SUB TO GENERATE RANDOM TRANSFER COUNT (XFRONT)	


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1099 003770 104015 RNDXFF: RNDNUM ;GET RANDOM NUMBER.
1100 003772 000000 RNDXFA: OPEN ;NUMBER IS STORED HERE.
1101 003774 042767 000377 177770 BIC #377,RNDXFA
1102 004002 005767 177764 TST RNDXFA ;NUMBER MUST NOT BE 0.
1103 004006 001770 BEQ RNDXFF ;OR IF ZERO.
1104 004010 026767 177756 175066 CMP RNDXFA,BFSIZE ;COMPARE NUMBER AGAINST BUFFER SIZE.
1105 004016 101364 BHI RNDXFF ;IF LARGER, GET ANOTHER NUMBER.
1106 004020 016767 177746 175060 MOV RNDXFA,XFRCNT ;NUMBER TO XFRCNT.
1107 004026 104050 XFRSET ;PERFORM BUFFER AND BLOCK SETUP.
1108 004030 000002 RTI ;EXIT.
1109 ;EMT SUB TO SET UP BUFFER ADDRESSES AND FWD AND REV BLOCK NUMBERS
1110 ;BASED ON VALUE OF TRANSFER COUNT.
1111 004032 016767 175044 175050 XFRSTT: MOV WBFLIM,WADDR ;COMPUTE WRITE ADDRESS.
1112 004040 166767 175042 175042 SUB XFRCNT,WADDR
1113 004046 166767 175034 175034 SUB XFRCNT,WADDR
1114 004054 016767 175020 175030 MOV RBFLIM,RADDR ;COMPUTE READ ADDRESS.
1115 004062 166767 175020 175022 SUB XFRCNT,RADDR
1116 004070 166767 175012 175014 SUB XFRCNT,RADDR
1117 004076 016767 175004 175012 MOV XFRCNT,VRBLKN ;COMPUTE NUMBER OF BLOCKS REQUIRED,
1118 004104 105067 175006 CLRB VRBLKN ;AND FWD MAX AND REV MIN BLOCK NUMBERS
1119 004110 000367 175002 SWAB VRBLKN
1120 004114 012767 001102 174772 MOV #1102,VFBLKN
1121 004122 166767 174770 174764 SUB VRBLKN,VFBLKN ;MAX FWD BLOCK.
1122 004130 005367 174762 DEC VRBLKN ;MIN REV BLOCK.
1123 004134 000002 RTI ;EXIT.
1124 ;EMT SUB TO FILL WRITE BUFFER WITH NUMBER OF DRIVE UNDER TEST.
1125 004136 104006 DRVFL: SAVOSS
1126 004140 016700 174744 MOV WADDR,R0
1127 004144 016701 174716 MOV UNITN,R1
1128 004150 016703 174732 MOV XFRCNT,R3
1129 004154 010120 DRVFLA: MOV R1,(0)+
1130 004156 005303 DEC R3
1131 004160 001375 BNE DRVFLA
1132 004162 104007 RSTOSS
1133 004164 000002 RTI
1134 ;EMT SUB TO SELECT RANDOM FORWARD BLOCK NUMBER.
1135 004166 104015 RNDFBB: RNDNUM ;GET RANDOM NUMBER.
1136 004170 000000 RDFBBA: OPEN ;NUMBER IS STORED HERE.
1137 004172 026767 177772 174714 CMP RDFBBA,VFBLKN ;NUMBER MUST NOT BE LARGER THAN VFBLKN.
1138 004200 101372 BHI RNDFBB ;OR IF LARGER, GET ANOTHER NUMBER.
1139 004202 016767 177762 174650 MOV RDFBBA,BLKRG ;NEW BLOCK NUMBER TO BLKRG.
1140 004210 016767 174644 174644 MOV BLKRG,BLKRG
1141 004216 000002 RTI ;EXIT.
1142 ;EMT SUB TO SELECT RANDOM REVERSE BLOCK NUMBER.
1143 004220 104015 RNDRBB: RNDNUM ;GET RANDOM NUMBER.
1144 004222 000000 RDRBBA: OPEN ;NUMBER IS STORED HERE.
1145 004224 026767 174666 177770 CMP VRBLKN,RDRBBA ;NUMBER MUST NOT BE SMALLER THAN VRBLKN.
1146 004232 101372 BHI RNDRBB ;OR IF SMALLER, GET ANOTHER NUMBER.
1147 004234 026727 177762 001101 CMP RDRBBA,#1101 ;NUMBER MUST NOT EXCEED 1101.
1148 004242 101366 BHI RNDRBB ;OR IF LARGER.
1149 004244 016767 177752 174606 MOV RDRBBA,BLKRG ;NEW BLOCK NUMBER TO BLKRG.
1150 004252 016767 174602 174602 MOV BLKRG,BLKRG
1151 004260 000002 RTI ;EXIT.
1152 ;EMT SUB TO FILL WRITE BUFFER WITH RANDOM DATA.
1153 004262 104006 RNDFLL: SAVOSS
1154 004264 016700 174620 MOV WADDR,R0 ;GET STARTING ADDR.

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1155	004270	016701	174612		MOV	XFRcnt,R1	:GET COUNT.
1156	004274	104015			RNDFLA: RNDNUM		:GET RANDOM NUMBER.
1157	004276	000000			RNDFLB: OPEN		:NUMBER IS STORED HERE.
1158	004300	016720	177772		MOV	RNDFLB,(0)+	:STORE NUMBER HERE.
1159	004304	005301			DEC	R1	:DONE?
1160	004306	001372			BNE	RNDFLA	:BR IF NOT DONE.
1161	004310	104007			RSTOSS		
1162	004312	000002			RTI		:EXIT.
1163					:EMT SUB TO SAVE TCCM, TCST, TCDT	TCWC,TCBA.	:SAVE TCST.
1164	004314	017767	174464	174526	STATS: MOV	@TCST,TCSTT	:SAVE TCCM.
1165	004322	017767	174460	174516	MOV	@TCCM,TCCMT	:SAVE TCWC.
1166	004330	017767	174454	174516	MOV	@TCWC,TCWCT	:SAVE TCDT.
1167	004336	017767	174452	174506	MOV	@TCDT,TCDTT	:SAVE TCBA.
1168	004344	017767	174442	174504	MOV	@TCBA,TCBAT	:EXIT EMT SUB.
1169	004352	000002			RTI		
1170					:EMT SUB TO ISSUE DT COMMAND SPECIFIED AT CALL+2.		
1171	004354	005067	174512		STCOM: CLR	COMND	:CLEAR PREVIOUS COMMAND
1172	004360	016767	174500	174504	MOV	UNIT,COMND	:UNIT # TO COMND.
1173	004366	057667	000000	174476	BIS	@(6),COMND	:SET DESIRED COMMAND IN COMND.
1174	004374	016777	174472	174404	MOV	COMND,@TCCM	:ISSUE COMMAND.
1175	004402	032777	100200	174376	BIT	#BIT15!BIT7,@TCCM	:READY AND ERROR BIT CLEAR?
1176	004410	001414			BEQ	STCOMB	:BR IF YES.
1177	004412	032767	000001	174452	BIT	#BIT0,COMND	:WAS THE DO BIT SET IN COMND?
1178	004420	001410			BEQ	STCOMB	:BR IF NOT.
1179	004422	000003			SAVSS		:SAVE STATUS.
1180	004424	104024			STATUS		:ERROR. DO BIT FAILED TO CAUSE CLEARING
1181	004426	104012			ERRORN		
1182	004430	010003			FPCMSG		
1183	004432	007735			STCMMSG		:OF READY AND/OR ERROR BIT(S). OR ILO
1184	004434	007511			STAT		:BLOCK MISS, OR DATA MISS ERROR OCCURRED.
1185	004436	177777			-1		
1186	004440	104000			SCOPE		
1187	004442	062716	000002		STCOMB: ADD	#2,(6)	:SET UP RETURN.
1188	004446	000002			RTI		:EXIT STCOM SUB.
1189					:EMT SUB TO STOP ALL DECTAPES.		
1190	004450	042777	000116	174330	STPDT: BIC	#116,@TCCM	:ISSUE SAT COMMAND.
1191	004456	000002			RTI		:EXIT EMT SUB.
1192					:EMT SUB TO CHECK FOR DECTAPE ERROR OR END ZONE.		
1193	004460	000003			CKERZ: SAVSS		
1194	004462	005777	174320		TST	@TCCM	:ERROR BIT SET?
1195	004466	100404			BMI	CKERZC	:BR IF YES.
1196	004470	005725			TST	(5)+	:NO. SET UP OK EXIT.
1197	004472	005725			CKERZA: TST	(5)+	
1198	004474	000004			CKERZB: RSTSS		
1199	004476	000002			RTI		:EXIT EMT SUB.
1200	004500	005777	174300		CKERZC: TST	@TCST	:ENDZ BIT SET?
1201	004504	100772			BMI	CKERZA	:BR IF YES.
1202	004506	104024			CKERZD: STATUS		
1203	004510	104012			ERRORN		:DECTAPE ERROR.
1204	004512	010003			FPCMSG		
1205	004514	007561			DTERR		
1206	004516	007511			STAT		
1207	004520	177777			-1		
1208	004522	000764			BR	CKERZB	
1209					:EMT SUB TO HANDLE FAILURE TO INTERRUPT.		
1210	004524	000003			NOINTR: SAVSS		


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1211 004526 104024 STATUS
1212 004530 104012 ERRORN ;SAVE STATUS
1213 004532 010003 FPCMSG ;DECTAPE FAIL TO INTERRUPT.
1214 004534 007542 INTERAI
1215 004536 007511 STAT
1216 004540 177777 -1
1217 004542 000004 RSTSS
1218 004544 000002 RTI
1219 ; EMT SUB TO CHECK EXPECTED DATA AGAINST ACTUAL DATA AND REPORT ERRORS.
1220 004546 000000 DATIND: OPEN
1221 004550 000000 DATKNT: OPEN ;CURRENT WORD NUMBER.
1222 004552 000000 EXPDAT: OPEN
1223 004554 000000 ACTDAT: OPEN
1224 004556 012767 001066 174324 DTCKSS: MOV #UNITN,WADDR ;UNIT NUMBER ADDR TO WADDR.
1225 004564 012767 021021 000202 MOV #021021,DATCKE ;PREVENT INCREMENT OF S/B ADDR.
1226 004572 005067 177750 CLR DATIND
1227 004576 000414 BR DATCKK
1228 004600 012767 022041 000166 DTCKI: MOV #022041,DATCKE ;INDICATE DECREMENT OF ACT DATA.
1229 004606 012767 177777 177732 MOV #-1,DATIND
1230 004614 000405 BR DATCKK
1231 004616 012767 022021 000150 DATCK: MOV #022021,DATCKE ;INDICATE INCREMENT OF ACT DATA.
1232 004624 005067 177716 CLR DATIND
1233 004630 104006 DATCKK: SAVOSS
1234 004632 016700 174252 MOV WADDR,R0 ;GET EXP DATA ADDR.
1235 004636 016701 174250 MOV RADDR,R1 ;GET ACT DATA ADDR.
1236 004642 005767 177700 TST DATIND ;CHECK FOR ACT DATA DECREMENT.
1237 004646 001406 BEQ DATCKA ;BR IF NO DECREMENT REQUIRED.
1238 004650 066701 174232 ADD XFRcnt,R1 ;YES. COMPUTE UPPER LIMIT OF ACT DATA.
1239 004654 066701 174226 ADD XFRcnt,R1
1240 004660 162701 000002 SUB #2,R1
1241 004664 016702 174216 DATCKA: MOV XFRcnt,R2 ;GET # OF WORDS TO CHECK.
1242 004670 012767 000001 177652 MOV #1,DATKNT ;SET CURRENT WORD # TO 1.
1243 004676 016703 174216 MOV ERRLIM,R3 ;ERR LIMIT TO ERROR COUNTER.
1244 004702 011067 177644 DATCKB: MOV (0),EXPDAT ;GET EXP DATA WORD.
1245 004706 011167 177642 MOV (1),ACTDAT ;GET ACT DATA WORD.
1246 004712 026767 177634 DATCKC: CMP EXPDAT,ACTDAT ;COMPARE ACT DATA AND EXP DATA.
1247 004720 001423 BEQ DATCKD ;BR IF NOT SAME.
1248 004722 104014 BDCNV ;DATA NOT SAME. CONVERT WORD # TO DECIMAL ASCII.
1249 004724 004550 DATKNT
1250 004726 007677 AWDcnt
1251 004730 000004 4
1252 004732 104013 OACNV ;CONVERT EXP DATA TO ASCII.
1253 004734 004552 EXPDAT
1254 004736 007712 ADATSB
1255 004740 000006 6
1256 004742 104013 OACNV ;CONVERT ACT DATA TO ASCII.
1257 004744 004554 ACTDAT
1258 004746 007726 ADATWS
1259 004750 000006 6
1260 004752 104012 ERRORN ;TYPE DATA ERROR MESSAGE.
1261 004754 010003 FPCMSG
1262 004756 007572 BLKSB
1263 004760 007657 DATERR
1264 004762 177777 -1
1265 004764 005303 DEC R3
1266 004766 001405 BEQ DATCKH ;NTW ERROR?
;BR IF YES.

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1267	004770	005267	177554	DATEKD: INC	DATEKNT	; INCREMENT WORD #
1268	004774	000000		DATEKE: OPEN		
1269	004776	005302		DATEKG: DEC	R2	; DONE CHECKING?
1270	005000	001340			DATEKB	; BR IF NOT.
1271	005002	104007		DATEKH: RSTOSS		; DONE.
1272	005004	000002		RTI		; EXIT.
1273				; EMT SUB TO CLEAR SPECIFIED AREA TO 0'S.		
1274	005006	104006		CLEAR: SAVOSS		
1275	005010	012500		MOV	(5)+, R0	; GET STARTING ADDR.
1276	005012	012501		MOV	(5)+, R1	; GET COUNT.
1277	005014	005020		CLR	(0)+	; CLEAR WORD.
1278	005016	005301		DEC	R1	; DONE?
1279	005020	001375		BNE	-4	; BR IF NOT DONE.
1280	005022	104007		RSTOSS		; DONE.
1281	005024	000002		RTI		; EXIT.
1282				; EMT SUB TO FILL AREA WITH BINARY COUNT PATTERN.		
1283	005026	104006		BINFLL: SAVOSS		
1284	005030	016700	174054	MOV	WADDR, R0	; GET STARTING ADDR.
1285	005034	016701	174046	MOV	XFRcnt, R1	; GET COUNT.
1286	005040	104044		BINFLL: GETBN1		; GET BINARY WORD.
1287	005042	000000		BINFLL: OPEN		; BINARY WORD IS STORED HERE.
1288	005044	016720	177772	MOV	BINFLL, (0)+	; STORE WORD.
1289	005050	005301		DEC	R1	; DONE?
1290	005052	001372		BNE	BINFLL	; BR IF NOT DONE.
1291	005054	104007		RSTOSS		; DONE.
1292	005056	000002		RTI		; EXIT.
1293				; EMT SUB TO CHECK THAT WORD COUNT IS 0, AND THAT TCBA CONTENTS		
1294				; MATCH THE EXPECTED CONTENTS.		
1295	005060	000003		CWCBA: SAVOSS		
1296	005062	012567	174006	MOV	(5)+, TEMP	; GET EXPECTED TCBA CONTENTS.
1297	005066	104024		STATUS		; SAVE TCWC AND TCBA.
1298	005070	005777	173714	TST	@TCWC	; WORD COUNT 0?
1299	005074	001407		BEQ	CWCBB	; BR IF 0 (OK).
1300	005076	104012		ERRORN		; WORD COUNT NOT 0. TYPE
1301	005100	010003		FPCMSG		; CONTENTS OF TCWC AND TCBA.
1302	005102	007610		WCNOTO		
1303	005104	007457		CTCWC		
1304	005106	007474		TCBA		
1305	005110	177777		-1		
1306	005112	104000		SCOPE		
1307	005114	026777	173754 173670	CWCBB: CMP	TEMP, @TCBA	; TCBA AND EXPECTED TCBA SAME?
1308	005122	001414		BEQ	CWCBC	; BR IF YES (OK).
1309	005124	104013		OACNV		; NO. CONVERT EXPECTED TCBA TO ASCII.
1310	005126	001074		TEMP		
1311	005130	007646		ATCBAS		
1312	005132	000006		6		
1313	005134	104012		ERRORN		; TCBA DOES NOT MATCH EXPECTED
1314	005136	010003		FPCMSG		; TCBA CONTENTS. TYPE EXPECTED TCBA,
1315	005140	007624		INTCB		; ACTUAL TCBA, AND TCWC.
1316	005142	007640		TCBASB		
1317	005144	007474		CTCBA		
1318	005146	007457		CTCWC		
1319	005150	177777		-1		
1320	005152	104000		SCOPE		
1321	005154	000004		CWCBC: RSTSS		
1322	005156	000002		RTI		; EXIT.


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1323 : EMT SUBS TO SEARCH FOR DESIRED BLOCK NUMBER. SRCHFF GETS FORWARD
1324 : BLOCK NUMBERS. SRCHRR GETS REVERSE BLOCK NUMBERS.
1325 SRCHFF: CLAB DIRIND : SET FORWARD INDICATOR.
1326 SRCHRR: MOV 8-1 DIRIND : SET REVERSE INDICATOR.
1327 SRCHA: MOV 8SRCHC,ATCVTR : SET INTERRUPT VECTOR TO SRCHC.
1328 : MOV 85,REVCNT : SET MAX # OF REVERSALS ALLOWED.
1329 : BIS 8REV,SRCHM : SET REV BIT IN SRCHM.
1330 : BIT 8REV,ATCCM : REV BIT SET IN TCCM?
1331 : BNE SRCHAA : BR IF YES.
1332 : BIC 8REV,SRCHM : NO. CLEAR REV BIT FROM SRCHM.
1333 : SETCOM : START SEARCH.
1334 SRCHM: RNUM! IE! DO
1335 : BR SRCHB
1336 : SRCCON: INC ATCCM
1337 : SRCHB: DELAY : ISSUE DO TO ENABLE RNUM.
1338 : DELAY : TIME OUT INTERRUPT.
1339 : DELAY
1340 : NOINT
1341 : SCOPE
1342 : SRCHC: MOV 8SRCHD,(6) : HERE WHEN INTERRUPT OCCURS.
1343 : RTI : EXIT TO SRCHD.
1344 : POPSP2 : RESTORE STACK.
1345 : TST ATCCM : ERROR BIT SET?
1346 : BPL SRCHDA : BR IF NOT.
1347 : CKERRZ : CHECK FOR ERROR/ENDZ.
1348 : SCOPE : ERROR RETURN. SCOPE
1349 : BR SRCREV : ENDZ. GO REVERSE DIRECTION.
1350 : CMP ATCDT,BLKRO : COMPARE BLK# IN TCDT TO REQUIRED BLK.
1351 : BEQ SRCF : BR IF BLK FOUND.
1352 : BGT SRCHC : BR IF TCDT HIGH.
1353 : BIT 8BIT11,ATCCM : TCDT LOW. CHECK DIRECTION.
1354 : BEQ SRCCON : BR IF GOING FWD. CONTINUE SAME DIRECTION.
1355 : ADD 3,ATCDT : ADD 3 TO TCDT.
1356 : CMP ATCDT,BLKRO : LOWER BY 3 OR MORE?
1357 : BLOS SRCAVA : GO REVERSE IF LOWER BY 3 OR MORE.
1358 : BR SRCCON : NOT LOW ENOUGH. CONTINUE SAME DIRECTION.
1359 : BIT 8BIT11,ATCCM : TCDT HIGH. CHECK DIRECTION.
1360 : BNE SRCCON : BR IF IN REVERSE. CONTINUE DIRECTION.
1361 : SUB 3,ATCDT : SUBTRACT 3 FROM TCDT.
1362 : CMP BLKRO,ATCDT : HIGHER BY 3 OR MORE?
1363 : BLE SRCAVB : GO REVERSE IF HIGHER BY 3 OR MORE.
1364 : BR SRCCON : NOT HIGH ENOUGH. CONTINUE DIRECTION.
1365 : BIT 8BIT11,ATCCM : TCDT EQUAL. CHECK DIRECTION.
1366 : BNE SRCHG : BR IF IN REVERSE.
1367 : TSTB DIRIND : GOING FORWARD. FWD BLK# WANTED?
1368 : BNE SRCCON : BR IF FWD BLK# NOT WANTED.
1369 : RTI : EXIT EMT SUB.
1370 : TSTB DIRIND : GOING REV. REV BLK# WANTED?
1371 : BEQ SRCCON : BR IF REV BLK# NOT WANTED.
1372 : RTI : REV BLK# WANTED. EXIT.
1373 : BIT 8BIT11,ATCCM : REV BIT SET?
1374 : BEQ SRCAVB : BR IF NOT.
1375 : BIC 8BIT11,ATCCM : IN REVERSE. SET TO FORWARD.
1376 : BR SRCAVC : FORWARD. SET TO REVERSE.
1377 : BIS 8BIT11,ATCCM
1378

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1379	005454	105367	000024		SACRVC: DECB	REVCNT	:FIFTH REVERSAL ISSUED?
1380	005460	001270			ONE	SACCON	:BR IF NOT.
1381	005462	104024			STATUS		:YES. ERROR. SAVE STATUS.
1382	005464	000003			SAVSS		
1383	005466	104012			ERRORN		:BLK# NOT FOUND WITHIN 5 TAPE
1384	005470	010003			FPCMSG		:REVERSALS.
1385	005472	007572			BLKSB		
1386	005474	007764			SACRCH		
1387	005476	007511			STAT		
1388	005500	177777			-1		
1389	005502	104000			SCOPE		
1390	005504	000			REVCNT: .BYTE	OPEN	
1391	005505	000			DIRIND: .BYTE	OPEN	
1392					:EMT SUBS TO WDATA, RDATA, FORWARD OR REVERSE.		
1393	005506	016777	173374	173274	WRDFR: MOV	XFRCNT, JTCWC	:GET WORD COUNT AND SET IN TCWC
1394	005514	017767	173270	000100	MOV	JTCWC, WRDFRG	:2(WORD COUNT) TO WRDFRG.
1395	005522	006367	000074		ASL	WRDFRG	
1396	005526	005477	173256		NEG	JTCWC	:IN 2'S COMPLEMENT FORM.
1397	005532	067767	173254	000062	ADD	JTCBA, WRDFRG	:2(WORD COUNT)+TCBA=FINAL TCBA CONTENTS.
1398	005540	000000			WRDFRA: OPEN		:SACRCH OR SACRCH CALL GOES HERE.
1399	005542	012777	005600	173246	MOV	#WRDFRC, JTCVTR	:SET INTERRUPT VECTOR TO WRDFRC.
1400	005550	104023			SETCOM		:ISSUE WDATA OR RDATA.
1401	005552	000000			WRDFRB: OPEN		:COMMAND GOES HERE.
1402	005554	104400			DELAY		:WAIT FOR INTERRUPT.
1403	005556	104400			DELAY		
1404	005560	104400			DELAY		
1405	005562	104400			DELAY		
1406	005564	104400			DELAY		
1407	005566	104400			DELAY		
1408	005570	104400			DELAY		
1409	005572	104400			DELAY		
1410	005574	104027			NOINT		:FAILURE TO INTERRUPT.
1411	005576	104000			SCOPE		
1412	005600	022626			WRDFRC: POPSP2		:HERE WHEN INTERRUPT OCCURS.
1413	005602	022626			POPSP2		
1414	005604	005777	173176		TST	JTCCH, WRDFR	:ERROR BIT SET?
1415	005610	100003			BPL	WRDFR	:BR IF NOT.
1416	005612	104026			CKERRZ		:CHECK FOR ERRORS.
1417	005614	104000			SCOPE		:ERROR RETURN.
1418	005616	000240			NOP		:ENDZ RETURN.
1419	005620	104036			WRDFRF: CKWCBA		:CHECK WORD COUNT AND CURRENT ADDR.
1420	005622	000000			WRDFRG: OPEN		:TCBA SHOULD EQUAL THIS.
1421	005624	000240			WRDFRE: NOP		
1422	005626	000002			RTI		:EXIT.
1423	005630	012767	000115	177714	WDATF: MOV	#WDATA!FWD!IE!DO, WRDFRB	
1424	005636	016777	173246	173146	MOV	WADDR, JTCBA	
1425	005644	012767	104030	177666	MOV	#SACRCH, WRDFRA	
1426	005652	000715			BR	WRDFR	
1427	005654	012767	000105	177670	RDATAF: MOV	#RDATA!FWD!IE!DO, WRDFRB	
1428	005662	016777	173224	173122	MOV	RADDR, JTCBA	
1429	005670	012767	104030	177642	MOV	#SACRCH, WRDFRA	
1430	005676	000703			BR	WRDFR	
1431	005700	012767	004115	177644	WDATR: MOV	#WDATA!REV!IE!DO, WRDFRB	
1432	005706	016777	173176	173076	MOV	WADDR, JTCBA	
1433	005714	012767	104031	177616	MOV	#SACRCH, WRDFRA	
1434	005722	000671			BR	WRDFR	


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1435 005724 012767 004105 177620 RDATA: MOV #RDATA,REV,IE!DO,WRDFRB
1436 005732 016777 173154 173052 RADDR,ATCBA ;
1437 005740 012767 104031 177572 MOV #SRCHA,WRDFRA ;
1438 005746 000657 BR WRDFR
1439 :SUB TO REWIND AVAILABLE TRANSPORTS.
1440 005750 104002 MRWIND: SAVD3
1441 005752 005067 173102 CLR BLKRG
1442 005756 012700 000010 MOV #8,R0 ;SET UP TO REWIND 8 TRANSPORTS.
1443 005762 005267 000010 MRWINDA: INC MRWINDB
1444 005766 042767 177770 000002 BIC #177770,MRWINDB
1445 005774 104046 SELDRV ;SELECT TRANSPORT.
1446 005776 000000 MRWINDB: OPEN ;TRANSPORT NUMBER.
1447 006000 000402 BR MRWINDC ;TRANSPORT NOT AVAILABLE RETURN.
1448 006002 104031 SRCHR ;SEARCH FOR REVERSE BLOCK 0 ON
1449 006004 104025 STOPDT ;SELECTED DRIVE, AND STOP DECTAPE.
1450 006006 005300 MRWINDC: DEC R0 ;DONE 8 TRANSPORTS?
1451 006010 001364 BNE MRWINDA ;BR IF NOT.
1452 006012 104003 RST03
1453 006014 000207 RTS PC ;DONE. EXIT.
1454 :SUB TO GET AVAILABLE TRANSPORTS MOVING FORWARD.
1455 006016 104002 MFWD: SAVD3
1456 006020 012700 000010 MOV #8,R0 ;SET UP TO MOVE 8 TRANSPORTS.
1457 006024 005267 000010 MFWDA: INC MFWDB
1458 006030 042767 177770 000002 BIC #177770,MFWDB
1459 006036 104046 SELDRV ;SELECT TRANSPORT.
1460 006040 000000 MFWDB: OPEN ;TRANSPORT NUMBER.
1461 006042 000402 BR MFWDC ;TRANSPORT NOT AVAILABLE RETURN.
1462 006044 104023 SETCOM ;ISSUE RNUM!FWD COMMAND.
1463 006046 000002 RNUM!FWD
1464 006050 005300 MFWDC: DEC R0 ;DONE 8 TRANSPORTS?
1465 006052 001364 BNE MFWDA ;BR IF NOT.
1466 006054 104400 DELAY ;WAIT.
1467 006056 104003 RST03
1468 006060 000207 RTS PC ;EXIT.
1469 :*****
1470 006062 000000 TO: 0 ;ROUTINE NUMBER 0
1471 006064 006236 T1 ;ADDRESS OF NEXT ROUTINE
1472 006066 000012 IO. ;TEST ITERATION COUNT
1473 006070 006072 CA ;SCOPE ENTRY POINT
1474 :*****
1475 :SST COMMAND TEST. CHECK THAT ISSUING SST TO A SPECIFIC TRANSPORT DOES NOT
1476 :RESULT IN SOME OTHER TRANSPORT STOPPING ALSO.
1477 006072 012700 000010 CA: MOV #8,R0 ;SET UP TO TEST 8 TAPES.
1478 006076 004767 177646 CB: JSR PC,MRWIND ;REWIND ALL TAPES.
1479 006102 004767 177710 JSR PC,MFWO ;GET ALL TAPES MOVING FORWARD.
1480 006106 005267 000010 INC CC
1481 006112 042767 177770 000002 BIC #177770,CC
1482 006120 104046 SELDRV ;SELECT TRANSPORT.
1483 006122 000000 CC: OPEN ;TRANSPORT NUMBER.
1484 006124 000441 BR CF ;TRANSPORT NOT AVAILABLE RETURN.
1485 006126 104023 SETCOM ;STOP SELECTED TRANSPORT.
1486 006130 000010 SST
1487 006132 012701 000007 MOV #7,R1 ;SET UP TO CHECK OTHER 7 TRANSPORTS.
1488 006136 016767 177760 000014 MOV CC,CD ;MOVE # OF UNIT JUST STOPPEE AND INCREMENT IT.
1489 006144 005267 000010 CDA: INC CD
1490 006150 042767 177770 000002 BIC #177770,CD

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Line	Address	Hex	Dec	Label	Operation	Comments
1491	006156	104046			SELDRV	:SELECT TRANSPORT.
1492	006160	000000		CD:	OPEN	:TRANSPORT NUMBER.
1493	006162	000420			BR CE	:TRANSPORT NOT AVAILABLE RETURN.
1494	006164	104023			SETCOM	:SELECT TRANSPORT WITH DINH BIT SET.
1495	006166	010002			DINH:RNUM!FWD	
1496	006170	104400			DELAY	:WAIT
1497	006172	032777	000200 172604		BIT #BIT7,ATCST	:UPS BIT SET?
1498	006200	001011			BNE CE	:BR IF YES.
1499	006202	104024			STATUS	:SAVE STATUS.
1500	006204	104013			OACNV	:CONVERT # OF UNIT STOPPED TO ASCII.
1501	006206	006122			CC	
1502	006210	010123			ACEMSG	
1503	006212	000001			1	
1504	006214	104012			ERRORN	:SST TO SPECIFIC UNIT RESULTED IN ANOTHER
1505	006216	010064			CEMSG	:ALSO STOPPING.
1506	006220	007511			STAT	
1507	006222	177777			-1	
1508	006224	005301		CE:	DEC R1	:TESTED 7 UNITS?
1509	006226	001346			BNE CDA	:BR IF NOT.
1510	006230	005300		CF:	DEC R0	:STOP TESTED ALL UNITS?
1511	006232	001321			BNE CB	:BR IF NOT.
1512	006234	104000			SCOPE	:YES. SCOPE.
1513					*****	*****
1514	006236	000001		↑1:	1	:ROUTINE NUMBER 1 *
1515	006240	006376			T2	:ADDRESS OF NEXT ROUTINE *
1516	006242	000001			1	:TEST ITERATION COUNT *
1517	006244	006246			AA	:SCOPE ENTRY POINT *
1518					*****	*****
1519					:SELECTION TEST. WRITE EACH UNIT'S TAPE WITH THE UNIT'S NUMBER. THEN	
1520					:SEQUENTIALLY READ DATA FROM EACH UNIT. DATA READ SHOULD MATCH UNIT'S NUMBER.	
1521	006246	012767	000400 172632	AA:	MOV #256.,XFRcnt	:SET UP 256 WORD TRANSFER.
1522	006254	104050			XFRSET	
1523	006256	005067	000006		CLR AC	
1524	006262	012700	000010		MOV #8.,R0	
1525	006266	104046		AB:	SELDRV	:SELECT DRIVE.
1526	006270	000000		AC:	OPEN	:NUMBER OF DRIVE TO BE SELECTED.
1527	006272	000402			BR AD	:UNIT NOT AVAILABLE RETURN.
1528	006274	004767	000044		JSR PC,AK	:AVAILABLE. GO WRITE TAPE.
1529	006300	005267	177764	AD:	INC AC	
1530	006304	005300			DEC R0	:ALL UNITS AVAILABLE WRITTEN?
1531	006306	001367			BNE AB	:BR IF NOT
1532	006310	012700	000024		MOV #20.,R0	:SET UP TO READ 20 BLOCKS.
1533	006314	012767	177777 172536		MOV #-1,BLKRO	:STARTING WITH BLOCK 0.
1534	006322	005267	172532	AG:	INC BLKRO	
1535	006326	104056			SEQDRV	:SELECT SEQUENTIAL TRANSPORT
1536	006330	104034			RDATAF	:CALL RDATAF SUB TO READ FWD THE NUMBER OF WORDS
1537						:SET IN LOC XFRcnt, INTO ADDR SET IN LOC
1538						:RADDR AND ABOVE.
1539	006332	104025			STOPDT	:STOP DECTAPE.
1540	006334	104054			DATCKS	:CALL DATCKS SUB TO CHECK DATA SPECIFIED BY LOC RADDR
1541						:AGAINST THE DATA WORD IN LOC UNITN.
1542	006336	005300			DEC R0	:DONE 20 TIMES?
1543	006340	001370			BNE AG	:BR IF NOT.
1544	006342	104000			SCOPE	:DONE. SCOPE.
1545	006344	104053		AK:	DRVFIL	:FILL WRITE BUFFER WITH SELECTED UNIT'S NUMBER.
1546	006346	012701	000024		MOV #20.,R1	:SET UP TO WRITE 20 BLOCKS.


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1547 006352 012767 177777 172500 AL: MOV      #1, BLKRG ; STARTING WITH BLOCK 0.
1548 006360 005267 172474 INC      BLKRG ; CALL WDATAF SUB TO WRITE FWD THE # OF WORDS
1549 006364 104032 WDATAF ; SET IN LOC XFRONT, STARTING FROM ADDR SET
1550 ; IN LOC WADDR.
1551 ; 20 BLOCKS WRITTEN?
1552 006366 005301 DEC      R1 ; BR IF NOT.
1553 006370 001373 BNE     AL ; STOP DECTAPE.
1554 006372 104025 STOPDT ; EXIT.
1555 006374 000207 RTS      PC
1556 ; *****
1557 006376 000002 t2: 2 ; ROUTINE NUMBER 2
1558 006400 006450 t3 13 ; ADDRESS OF NEXT ROUTINE
1559 006402 000144 100. ; TEST ITERATION COUNT
1560 006404 006420 DA ; SCOPE ENTRY POINT
1561 ; *****
1562 ; SEQUENTIAL UNIT RANDOM BLOCK, 3 BLOCK TRANSFERS, FWD WRITE, REV READ.
1563 ; BINARY COUNT PATTERN
1564 006406 012767 001400 172472 MOV      #768., XFRONT ; SET UP 768 WORD TRANSFER.
1565 006414 104050 XFRSET ; RANDOM FWD BLOCK NUMBER.
1566 006416 104051 RND: BK ; RESTORE BLKRG CONTENTS.
1567 006420 016767 172436 172432 DA: MOV      BLKRG, BLKRG ; BINARY FILL WRITE BUFFER.
1568 006426 104040 BINFIL ; SELECT SEQUENTIAL TRANSPORT.
1569 006430 104056 SEQDRV ; CALL WDATAF SUB TO WRITE FWD THE # OF WORDS
1570 006432 104032 WDATAF ; SET IN LOC XFRONT, STARTING FROM ADDR SET
1571 ; IN LOC WADDR.
1572 006434 066767 172456 172416 ADD      VRBLKN, BLKRG ; CHANGE BLK NUM TO READ DATA IN REV
1573 006442 104035 RDATAF ; CALL RDATAF SUB TO READ REV THE # OF WORDS
1574 ; SET IN LOC XFRONT, INTO ADDR SET IN LOC
1575 ; RADDR AND ABOVE.
1576 006444 104042 DATCKI ; CALL DATCKI TO CHECK DATA SPECIFIED BY LOC
1577 ; WADDR AGAINST DATA SPECIFIED BY LOC RADDR +2(XFRONT)-2
1578 ; READ DATA IS CHECKED IN DESCENDING ORDER.
1579 ; SCOPE.
1580 006446 104000 SCOPE ; *****
1581 ; *****
1582 006450 000003 t3: 3 ; ROUTINE NUMBER 3
1583 006452 006522 t4 14 ; ADDRESS OF NEXT ROUTINE
1584 006454 000144 100. ; TEST ITERATION COUNT
1585 006456 006472 EA ; SCOPE ENTRY POINT
1586 ; *****
1587 ; SEQUENTIAL UNIT RANDOM BLOCK, 3 BLOCK TRANSFERS, REV WRITE, FWD READ.
1588 ; BINARY COUNT PATTERN.
1589 006460 012767 001400 172420 MOV      #768., XFRONT ; SET 768 WORD TRANSFER.
1590 006466 104050 XFRSET ; RANDOM REV BLOCK NUMBER.
1591 006470 104052 RND: BK ; RESTORE BLKRG CONTENTS.
1592 006472 016767 172364 172360 EA: MOV      BLKRG, BLKRG ; BINARY FILL WRITE BUFFER.
1593 006500 104040 BINFIL ; SELECT SEQUENTIAL TRANSPORT.
1594 006502 104056 SEQDRV ; CALL WDATAF SUB TO WRITE REV THE NUMBER OF WORDS
1595 006504 104033 WDATAF ; SET IN LOC XFRONT, FROM ADDR SET IN LOC
1596 ; WADDR AND ABOVE.
1597 006506 166767 172404 172344 SUB      VRBLKN, BLKRG ; CHANGE BLK NUM TO READ DATA FWD.
1598 006514 104034 RDATAF ; CALL RDATAF SUB TO READ FWD THE NUMBER OF WORDS
1599 ; SET IN LOC XFRONT, INTO ADDR SET IN LOC
1600 ; RADDR AND ABOVE.
1601 006516 104042 DATCKI ; CALL DATCKI TO CHECK DATA SPECIFIED BY LOC
1602

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1603                                     :WADDR AGAINST DATA SPECIFIED BY LOC RADDR +2(XFRCNT)-2
1604                                     :READ DATA IS CHECKED IN DESCENDING ORDER.
1605 006520 104000                                     :SCOPE.
1606                                     :*****
1607 006522 000004                                     :ROUTINE NUMBER 4
1608 006524 006574                                     :ADDRESS OF NEXT ROUTINE
1609 006526 000144                                     :TEST ITERATION COUNT
1610 006530 006544                                     :SCOPE ENTRY POINT
1611                                     :*****
1612                                     :SEQUENTIAL UNIT, RANDOM BLOCK, 3 BLOCK TRANSFERS, FWD WRITE, REV READ.
1613 : RANDOM DATA.
1614 006532 012767 001400 172346      MOV      #768.,XFRCNT      :SET UP 768 WORD TRANSFER.
1615 006540 104050      XFRSET
1616 006542 104051      RNDFBK      :RANDOM FWD BLOCK NUMBER.
1617 006544 016767 172312 172306 FA:  MOV      BLKRQS,BLKRG      :RESTORE BLKRQ CONTENTS.
1618 006552 104055      RNDFIL      :RANDOM FILL WRITE BUFFER
1619 006554 104056      SEQDRV      :SELECT SEQUENTIAL TRANSPORT.
1620 006556 104032      WDATAF      :CALL WDATAF SUB TO WRITE FWD THE # OF WORDS
1621                                     :SET IN LOC XFRCNT, STARTING FROM ADDR SET
1622                                     :IN LOC WADDR.
1623 006560 066767 172332 172272      ADD      VRBLKN,BLKRG      :CHANGE BLK NUM TO READ IN REV.
1624 006566 104035      RDATAF      :CALL RDATAF SUB TO READ REV THE # OF WORDS
1625                                     :SET IN LOC XFRCNT, INTO ADDR SET IN LOC
1626                                     :RADDR AND ABOVE.
1627 006570 104042      DATCKI      :CALL DATCKI TO CHECK DATA SPECIFIED BY LOC
1628                                     :WADDR AGAINST DATA SPECIFIED BY LOC RADDR +2(XFRCNT)-2
1629                                     :READ DATA IS CHECKED IN DESCENDING ORDER.
1630 006572 104000                                     :SCOPE
1631                                     :*****
1632 006574 000005                                     :ROUTINE NUMBER 5
1633 006576 006646                                     :ADDRESS OF NEXT ROUTINE
1634 006600 000144                                     :TEST ITERATION COUNT
1635 006602 006616                                     :SCOPE ENTRY POINT
1636                                     :*****
1637                                     :SEQUENTIAL UNIT, RANDOM BLOCK, 3 BLOCK TRANSFERS, REV WRITE, FWD READ.
1638 : RANDOM DATA.
1639 006604 012767 001400 172274      MOV      #768.,XFRCNT      :SET UP 768 WORD TRANSFER.
1640 006612 104050      XFRSET
1641 006614 104052      RNRDBK      :RANDOM REV BLOCK NUMBER.
1642 006616 016767 172240 172234 GA:  MOV      BLKRQS,BLKRG      :RESTORE BLKRQ CONTENTS.
1643 006624 104055      RNDFIL      :RANDOM FILL WRITE BUFFER.
1644 006626 104056      SEQDRV      :SELECT SEQUENTIAL TRANSPORT.
1645 006630 104033      WDATAF      :CALL WDATAF SUB TO WRITE REV THE NUMBER OF WORDS
1646                                     :SET IN LOC XFRCNT, FROM ADDR SET IN LOC
1647                                     :WADDR AND ABOVE.
1648 006632 166767 172260 172220      SUB      VRBLKN,BLKRG      :CHANGE BLK NUM TO READ FWD.
1649 006640 104034      RDATAF      :CALL RDATAF SUB TO READ FWD THE NUMBER OF WORDS
1650                                     :SET IN LOC XFRCNT, INTO ADDR SET IN LOC
1651                                     :RADDR AND ABOVE.
1652 006642 104042      DATCKI      :CALL DATCKI TO CHECK DATA SPECIFIED BY LOC
1653                                     :WADDR AGAINST DATA SPECIFIED BY LOC RADDR +2(XFRCNT)-2
1654                                     :READ DATA IS CHECKED IN DESCENDING ORDER.
1655 006644 104000                                     :SCOPE.
1656                                     :*****
1657 006646 000006                                     :ROUTINE NUMBER 6
1658 006650 006724      T7      :ADDRESS OF NEXT ROUTINE

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SEQ 0034

1715	007042	056	047125	052111	.ASCII	'UNIT'
1716	007043	040				
1717	007050	040				
1718	007051	040	040		AUNIT:	.ASCII
1719	007053	045	043130	041522	.ASCII	'%XFCNT'
1720	007060	052116	040			
1721	007063	040	020040	020040	AXFCNT:	.ASCII
1722	007070	020040	053440	042101		WADDR
1723	007076	051104	040			
1724	007101	040	020040	020040	AWADDR:	.ASCII
1725	007106	020040	051040	042101		RADDR
1726	007114	051104	040			
1727	007117	040	020040	020040	ARADDR:	.ASCIZ
1728	007124	000040				
1729	007126	022445	047111	040526	AINCRT:	.ASCIZ
1730	007134	044514	020104	042524		'%INVALID TEST'
1731	007142	052123	000			
1732	007145	045	052045	032503	PGTIT:	.ASCIZ
1733	007152	026440	052040	030503		'%TC5 - TC11 TEST 5%'
1734	007160	020061	042524	052123		
1735	007166	032440	022445	000		
1736	007173	045	052123	047101	INST1:	.ASCII
1737	007200	040504	042122	052040		'%STANDARD TAPES ON UNITS'
1738	007206	050101	051505	047440		
1739	007214	020116	047125	052111		
1740	007222	123				
1741	007223	045	042522	047515	.ASCII	'%REMOTE, WRITE ENABLE'
1742	007230	042524	020054	051127		
1743	007236	052111	020105	047105		
1744	007244	041101	042514			
1745	007250	053445	046101	051514	.ASCII	'%WALLSW: OFF, WRTMSW: OFF'
1746	007256	035127	047440	043106		
1747	007264	020054	051127	046524		
1748	007272	053523	020072	043117		
1749	007300	106				
1750	007301	045	042523	042514	.ASCII	'%SELECT UNITS WITH SR7 - SR0.'
1751	007306	052103	052440	044516		
1752	007314	051524	053440	052111		
1753	007322	020110	051123	020067		
1754	007330	020055	051123	027060		
1755	007336	040				
1756	007337	120	042522	051523	.ASCIZ	'PRESS CONT%'
1757	007344	041440	047117	022524		
1758	007352	000				
1759	007353	045	042523	020124	ASETSR:	.ASCIZ
1760	007360	051123	047440	052120		'%SET SR OPTIONS. NORMAL SR=0'
1761	007366	047511	051516	020056		
1762	007374	047516	046522	046101		
1763	007402	051440	036522	000060		
1764	007410	044045	043511	042510	HADRM:	.ASCII
1765	007416	052123	046040	041517		'%HIGHEST LOC FOR TRANSFERS:'
1766	007424	043040	051117	052040		
1767	007432	040522	051516	042506		
1768	007440	051522	020072			
1769	007444	020040	020040	020040	ACRLIM:	.ASCIZ
1770	007452	000				

1771	007453	007			APGEND: .BYTE	007	
1772	007454	025045	000		.ASCIZ	%*	
1773	007457	040	041524	041527	CTCWC: .ASCII	' TCWC '	
1774	007464	040					
1775	007465	040	020040	020040	ATCWC: .ASCIZ	' '	
1776	007472	000040					
1777	007474	052040	041103	020101	CTCBA: .ASCII	' TCBA '	
1778	007502	020040	020040	020040	ATCBA: .ASCIZ	' '	
1779	007510	000					
1780	007511	040	041524	046503	STAT: .ASCII	' TCCM '	
1781	007516	040					
1782	007517	040	020040	020040	ATCCM: .ASCII	' TCST '	
1783	007524	020040	041524	052123			
1784	007532	040					
1785	007533	040	020040	020040	ATCST: .ASCIZ	' '	
1786	007540	000040					
1787	007542	047040	020117	052104	INTFAI: .ASCIZ	' NO DT INTRPT '	
1788	007550	044440	052116	050122			
1789	007556	020124	000				
1790							
1791	007561	040	052104	042440	DTERR: .ASCIZ	' DT ERR '	
1792	007566	051122	000040				
1793	007572	041040	045514	050522	BLKSB: .ASCII	' BLKRQ '	
1794	007600	040					
1795	007601	040	020040	020040	ABLKRO: .ASCIZ	' '	
1796	007606	000040					
1797	007610	041524	041527	047040	WCNOTO: .ASCIZ	' TCWC NOT 0 '	
1798	007616	052117	030040	000040			
1799	007624	041524	040502	053440	INCTCB: .ASCIZ	' TCBA WRONG '	
1800	007632	047522	043516	000040			
1801	007640	052040	041103	020101	TCBASB: .ASCII	' TCBA '	
1802	007646	020040	020040	020040	ATCBAS: .ASCIZ	' '	
1803	007654	020040	000				
1804	007657	040	040504	040524	DATERR: .ASCII	' DATA ERR WORD '	
1805	007664	042440	051122	020040			
1806	007672	047527	042122	040			
1807	007677	040	020040	027040	AWDCNT: .ASCII	' S/B '	
1808	007704	020040	027523	020102			
1809	007712	020040	020040	020040	ADATSB: .ASCII	' WAS '	
1810	007720	020040	040527	020123			
1811	007726	020040	020040	020040	ADATWS: .ASCIZ	' '	
1812	007734	000					
1813	007735	122	054504	042457	STCMMSG: .ASCIZ	' RDY/ERR NOT 0 AFTER DO '	
1814	007742	051122	047040	052117			
1815	007750	030040	040440	052106			
1816	007756	051105	042040	000117			
1817	007764	041040	045514	047040	SRCHER: .ASCIZ	' BLK NOT FOUND '	
1818	007772	052117	043040	052517			
1819	010000	042116	000				
1820	010003	040	043040	041520	FPCMSG: .ASCII	' FPC '	
1821	010010	040					
1822	010011	040	020040	020040	AFPC: .ASCIZ	' % '	
1823	010016	020040	000045				
1824	010022	052445	051520	041040	BEMSG: .ASCIZ	' %UPS BIT NOT SET WITHIN 20 MSECS. '	
1825	010030	052111	047040	052117			
1826	010036	051440	052105	053440			

K03

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SEQ 0036

1827	010044	052111	044510	020116	
1828	010052	053006	046440	042523	
1829	010060	051503	000056		
1830	010064	052445	044516	020124	CEMSG: .ASCII '%UNIT STOPPED WITH SST TO UNIT '
1831	010072	052123	050117	042520	
1832	010100	020104	044527	044124	
1833	010106	051440	052123	052040	
1834	010114	020117	047125	052111	
1835	010122	040			
1836	010123	040	000		ACMSG: .ASCIZ ' '
1837	010125	045	047516	052440	NOUNIT: .ASCIZ '%NO UNITS AVAILABLE.'
1838	010132	044516	051524	040440	
1839	010140	040526	046111	041101	
1840	010146	042514	000056		
1841	010152	053445	046111	020114	GOOD: .ASCIZ '%WILL TEST UNITS: '
1842	010160	042524	052123	052440	
1843	010166	044516	051524	020072	
1844	010174	000			
1845	010175	040	000054		GTAPES: .ASCIZ ' ' '1' '2' '3' '4' '5' '6' '7'
1846	010200	060	061	062	GTAB: .BYTE
1847	010203	063	064	065	
1848	010206	066	067		
1849					
1850	010210	000000			CODEND: .EVEN
1851		000001			.OPEN
					.END

[illegible]

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CROSS REFERENCE TABLE -- USER SYMBOLS

[illegible]

RP2	003634	1047	1051	1054*	1059#	1062*										
RST03 =	104003	551#	1452	1467												
RST05 =	104005	552#														
RST0SS =	104007	555#	802	816	898	968	978	1003	1056	1093	1132	1161	1271	1280		
RSTSS =	000004	1291#														
RS03	002262	497#	889	918	950	1198	1217	1321								
RS05	002312	550#	760#													
RS0SS	002306	553#	771#													
RSSS	002372	554#	769#													
RTMNO	001036	401#	790#													
SAT =	000000	550#	681	703	720*	726	837									
SAV03 =	104002	550#	1440	1455												
SAV05 =	104004	552#														
SAV0SS =	104006	554#	798	813	892	953	971	981	1043	1086	1125	1153	1233	1274		
SAVSS =	000003	1283#														
SCOPE =	104000	496#	829	914	948	1179	1193	1210	1295	1382						
		548#	1186	1306	1320	1342	1349	1389	1411	1417	1512	1544	1580	1605		
		1630#	1655	1681	1707											
SCOPTR	001034	519#	696	723*												
SELDRA	003754	1089#	1093#													
SELDRA	003726	585#	1086#													
SELDRA	104046	586#														
SELE =	004000	494#	610	646	1067	1077	1445	1459	1482	1491	1525					
SEQDRV =	104056	594#	1535	1569	1594	1619	1644									
SETCOM =	104023	567#	613	622	1334	1400	1462	1485	1494							
SPBOT =	001000	413#	596	668	690											
SQDRV	003654	593#	1065#	1069												
SQDRVA	003670	1065#	1066#	1068#												
SQDRVI	001342	608#	609#	611#	639											
SR =	177570	411#	660	676	679	694	697	701	705	726*	819	881				
SRCCON	005242	1337#	1355	1359	1361	1365	1369	1372	1380							
SRCF	005376	1352#	1366#													
SRCHA	005174	1326#	1328#													
SRCHAA	005234	1332#	1334#													
SRCHB	005246	1336#	1338#													
SRCHC	005260	1328#	1343#													
SRCHD	005266	1343#	1345#													
SRCHDA	005304	1347#	1351#													
SRCHE	005346	1353#	1360#													
SRCHER	007764	1386#	1817#													
SRCHF =	104030	572#	1425	1429												
SRCHFF	005160	571#	1325#													
SRCHG	005416	1367#	1371#													
SRCHM	005236	1330#	1333#	1335#												
SRCHR =	104031	573#	1433	1437	1448											
SRCHRA	005166	572#	1327#													
SRCREV	005426	1350#	1374#													
SRCRVA	005436	1358#	1376#													
SRCRVB	005446	1364#	1375	1378#												
SRCRVC	005454	1377#	1379#													
SRESET =	104001	549#	669													
SRSETT	002436	548#	805#	808*												
SST =	000010	487#	1486													
START	001260	504	596#													
STAT	007511	1184	1206	1215	1387	1506	1780#									

[illegible]

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[illegible]

G04

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SEQ 0045

CKDT	3928														
CKDTI	3928	1577	1602	1627	1652	1678	1704								
CKDTS	3928	1540													
EMTDEF	3928	547	548	549	550	551	552	553	554	555	556	557	558	559	560
	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575
	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590
	591	592	593												
RDTF	3928	1536	1599	1649	1701										
RDTR	3928	1574	1624	1675											
TSTA	3928	1469	1513	1556	1581	1606	1631	1656							
TSTAA	3928	1469	1513	1556	1581	1606	1631	1656	1682						
WDTF	3928	1549	1570	1620	1671										
WDTR	3928	1595	1645	1697											

. ABS. 010212 000

ERRORS DETECTED: 0

DZTCED, DZTCED/CRF/SOL/DOC=DZTCED.P11

RUN-TIME: 24.8 SECONDS

RUN-TIME RATIO: 71/7=9.9

CORE USED: 9K (17 PAGES)

DOCUMENT PAGES: 45