

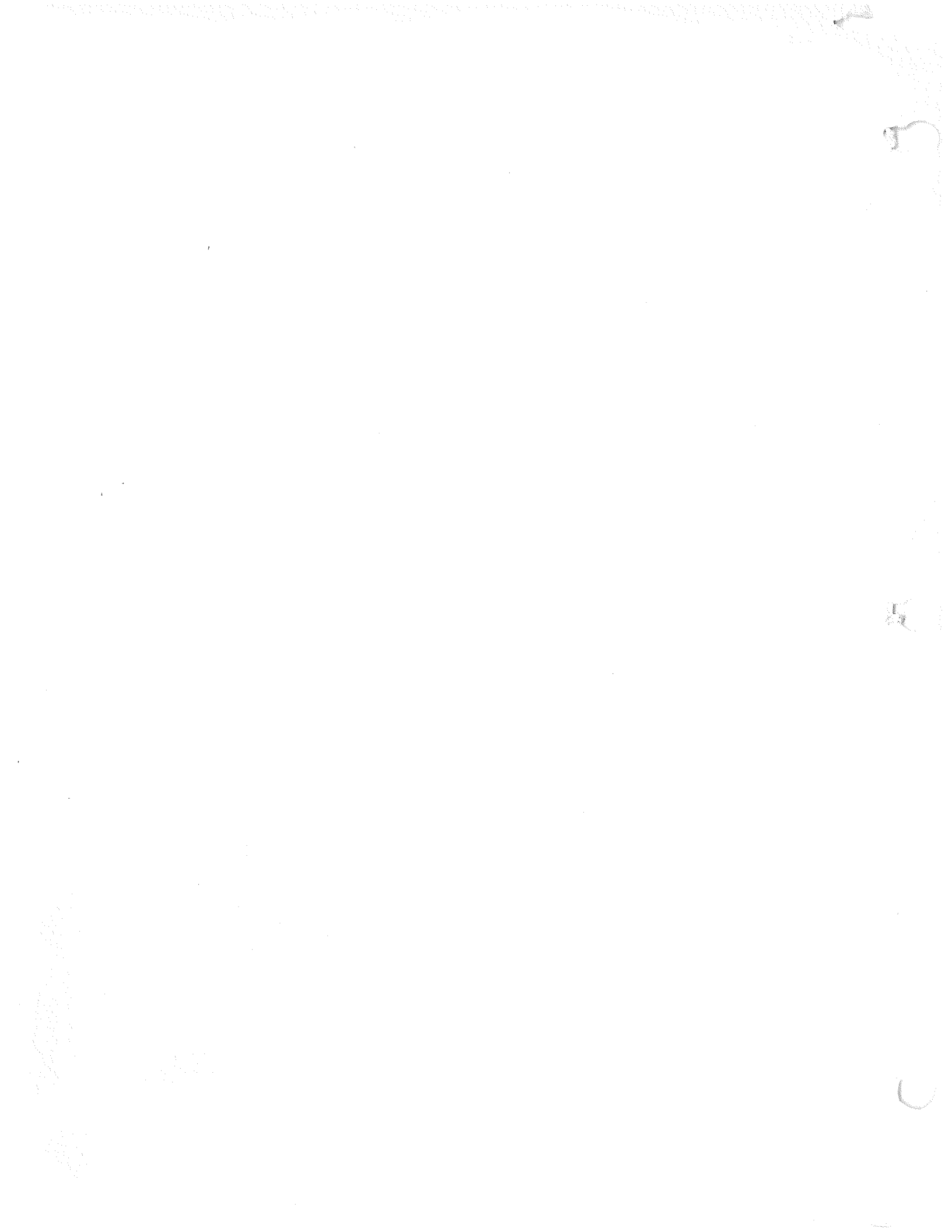
IDENTIFICATION

PRODUCT CODE: MAINDEC-12-07CD
PRODUCT NAME: PDP-12 SYSTEM EXERCISER
DATE: FEBRUARY 1, 1972
MAINTAINER: DIAGNOSTIC GROUP
AUTHOR: RAYMOND SHOOP *ext 4069*

SYEX12

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MAY BE REQUIRED FOR
PROGRAM TO OPERATE





MAINDEC CHANGE NOTICE

12-D7CD-2
CHANGE NO.

Sheet 1 of 1

AUTHOR Ray Shoop	PROGRAM DATE 2/1/72	PRODUCT LINE PDP-12	MAINDEC NUMBER MAINDEC-12-D7CD
DATE 6/12/72	EXT. 3958		

PROGRAM NAME PDP-12 System Exerciser **DEVICE** PDP-12 System

ITEM

1a. Problem: TU10/TC58 Magtape running and EOT is encountered; the program does not wait for TUR.

Correction: To be toggled in only if running TC58.

Field Ø:	LOCATION	VALUE
	2761	5367
	2767	6721
	2770	5367
	2771	3057
	2772	1365
	2773	5362

1b. Problem: ONLY if KW12 is inoperative and the TC58 Magtape is running; a TC58 error will occur approximately every 10 min.

Correction: A. Repair inoperative KW12!!!
B. Wait for M-12-D7CE when available.

2.
6/22/2

Problem and Correction: The following locations should be changed only if the program is running with the API (KF12B) enabled (changes are in memory field Ø).

ROUTINE	LOCATION	OLD VALUE	NEW VALUE
RFØ8/JF32	1Ø23	6772	72ØØ
IFP-12	1737	6772	72ØØ
RKØ8	2427	6772	72ØØ
AIP-12	2614	6772	72ØØ
TC58	71Ø5	6772	72ØØ



1. ABSTRACT

PDP-12 SYSTEM EXERCISER IS A COMBINED TEST OF THE PDP-12 AND ITS COMMON OPTIONS. ITS PURPOSE IS TO TEST THAT THE PDP-12 CAN ACCURATELY AND CONSISTENTLY PASS DATA BETWEEN THESE DEVICES. BOTH DATA BREAKS AND PROGRAM INTERRUPTS ARE USED EXTENSIVELY THROUGHOUT THIS PROGRAM, TWO BACK-GROUND PROGRAMS ARE RUN TO ENSURE THAT THE C.P.U. OVERHEAD REMAINS HIGH, THE LINCTAPE IS HANDLED IN SUCH A MANNER THAT A DRIVE MAYBE DE-SELECTED OR WRITE-LOCKED WITHOUT CAUSING AN ERROR. THIS WILL CAUSE THE TAPE PROCESSOR TO HANG IN NO-PAUSE WAITING FOR AN INTERRUPT THAT WILL NEVER APPEAR, IT WAS NECESSARY DUE TO PROLONG RUNNING OF A TAPE WILL WEAR OUT THE TAPE.

2. REQUIREMENTS

2.1. EQUIPMENT

STANDARD PDP-12 COMPUTER

8K OF MEMORY WORDS

KW12A REAL TIME CLOCK

KF12B A.P.I.*

FPP-12 FLOATING POINT PROCESSOR*

AIP-12 LABORATORY DATA PROCESSOR*

RK08 DISK CARTRIDGE*

RF08/DF32 DISK MEMORY*

TC58 MAGTAPE MEMORY*

LP08/LP12 LINE PRINTER*

PR12 HIGH SPEED READER*

DC02-F TELETYPE CONTROL*

*OPTIONAL

2,2

STORAGE

THIS PROGRAM OCCUPIES MEMORY LOCATIONS 0 0000 ITHRU 1 7777.

2,3

PRELIMINARY PROGRAMS

ALL PDP-12 AND OPTION DIAGNOSTIC TEST MUST HAVE BEEN RUN SUCCESSFULLY.

3,

LOADING PROCEDURE

PROCEED WITH THE LOADING OF A STANDARD BINARY PROGRAM; IT MAY ALSO BE LOADED BY DIAL V2 OR DIAL MS.

4,

STARTING PROCEDURE

THE PROCEDURE TO SETUP THE PDP-12 SYSTEM IS CRITICAL, ANY ERROR IN THE STARTING PROCEDURE WILL RESULT IN AN ERROR.

A. TAPE TRANSPORT

1. MOUNT A CERTIFIED PDP-12 TAPE (MARK 1600 BLOCKS) ON ALL DRIVES TO BE TESTED.
2. SET THE UNIT SELECTOR ON EACH TRANSPORT TO AN INCREMENTING NUMBER STARTING WITH UNIT 0.
3. SET THE LOCAL/REMOTE SWITCH TO REMOTE ON EACH DRIVE.
4. SET THE WRITE ENABLE SWITCH ON EACH DRIVE.

B. RK08 DISK CARTRIDGE

MAKE SURE THAT THE READY LIGHT IS ON AND ALL WRITE LOCK SWITCHES ARE RESET.

C. RF08/DF32 DISK MEMORY

UNIT 0 IS SELECTED AND THE WRITE LOCK SWITCHES ARE RESET; ANY ADDITIONAL UNITS SET TO AN INCREMENTING UNIT NUMBER STARTING WITH UNIT 1.

D. TC58 MAGTAPE MEMORY

UNIT 0 SELECTED AND THE WRITE-ENABLE RING IS INSTALLED; THE UNIT MUST BE ON LINE, ADDITIONAL UNITS SET TO AN INCREMENTING UNIT NUMBER STARTING WITH UNIT 1.

E. DC02F TELETYPE CONTROL

PLACE ALL TERMINALS ON-LINE. IF A KEYBOARD FLAG IS SENSED IT IS IN ERROR.

F. LP08/LP12 LINE PRINTER

MAKE SURE THAT IT IS ON-LINE AND READY,

G. PR12 HIGH SPEED READER

INSERT BINARY COUNT PATTERN TEST TAPE (MAINDEC-00-D2G3-PT)
INTO THE READER AND PLACE READER ON-LINE,

H. SCOPE (VR14)

PLACE CHANNEL SELECTOR TO 1 & 2,
IF A VR20, PLACE THE COLOR SWITCH TO THE REMOTE POSITION,

I. A.I.P.

INSERT KM12A CLOCK OUTPUT CABLE INTO SLOT G15 OF THE A.I.P.;
THIS CABLE MUST BE INSTALLED TO OPERATE THE A.I.P.,

J. COMPUTER

1. SET THE SWITCHES, (REFER TO SECTION 4.1)
IF THE DEVICE IS NOT ON THE SYSTEM, IT IS NOT NECESSARY
TO SET THAT INHIBIT SWITCH, (REFER TO SECTION 6)
2. SET THE MODE SWITCH TO 8-MODE,
3. DEPRESS I/O PRESET;
4. DEPRESS START 20,

AT THIS POINT NO DEVICES HAVE BEEN STARTED, THE WORD "REALLY"
WILL APPEAR ON THE VR14 DISPLAY (IN RED IF A VR20).
THIS IS TO GIVE THE OPERATOR A SECOND CHANCE, IF THE DISK
AND/OR TAPES CONTAIN IMPORTANT DATA, SAVE IT NOW OR KISS IT GOODBYE,

5. TYPE " Y " ON THE CONSOLE TTY TO CONTINUE,
6. AFTER THE PROGRAM IS STARTED, CHECK THE DISPLAYED MESSAGE
TO INSURE THE DEVICES ARE RUNNING,

0120

7711

w/b KFILE A.P.I.

00

0120

3711

w/ KF 108 A.P.I

00

4.1

CONTROL SWITCH SETTINGS

A. RIGHT SWITCHES

- RSW 0 = 1 INHIBIT STARTING KF128
- RSW 1 = 1 INHIBIT STARTING A.I.P. (REFER TO 6.D)
- RSW 2 = 1 INHIBIT STARTING OF THE TC58 MAGTAPE.
- RSW 3 = 1 INHIBIT STARTING OF THE FPP-12.
- RSW 4 = 1 INHIBIT STARTING OF RF08-DF32.
- RSW 5 = 1 INHIBIT STARTING OF THE RK08
- RSW 6 = 8 NUMBER OF EXTRA LINC-TAPE TRANSPORTS GREATER THAN UNIT 0.
- RSW 9 = 11 NUMBER OF EXTRA MEMORY BANKS GREATER THAN 4K.

B. LEFT SWITCHES

- LSW 0 NOT USED.
- LSW 1 = 2 NUMBER OF EXTRA TU10 DRIVES (TC58 CONTROLLER).
- LSW 3 = 4 DC02F GROUP (8 LINES PER GROUP).
- LSW 5 = 1 INHIBIT STARTING OF THE DC02F.
- LSW 6 = 0 80 COLUMN LP08 OR AN LP12.
- LSW 6 = 1 132 COLUMN LP08.
- LSW 7 = 1 INHIBIT STARTING LP08-LP12.
- LSW 8 = 0 KW12A CLOCK CABLE CONNECTED TO CHANNEL 44-47 OF THE A.I.P.
- LSW 8 = 1 KW12A CLOCK CABLE CONNECTED TO CHANNEL 40-43 OF THE A.I.P.
- LSW 9 NOT USED
- LSW 10-11 NUMBER OF EXTRA RK08 DRIVES.

C. SENSE SWITCHES

- SNS 0 = 1 DELETE RECOVERABLE ERROR LOOP, RESTART CURRENT PASS
- SNS 1 = 1 DELETE ERROR MESSAGE
- SNS 2 = 1 BYPASS CP BACKGROUND (MAINTENANCE ONLY)
- SNS 3 = 1 BYPASS DISPLAY BACKGROUND (MAINTENANCE ONLY)

DUE TO THE FLEXIBILITY OF THE INTERRUPT LEVELS OF THE KF128 (A.P.I.) IT BECOMES NECESSARY (IF THE KF128 IS INSTALLED AND ENARLED) TO TOGGLE SEVERAL CHANGES INTO THE PROGRAM, FIRST DETERMINE WHAT DEVICES ARE ON THE SYSTEM AND WHAT INTERRUPT LEVELS IN OCTAL THEY ARE ASSIGNED TO; SECONDLY PLACE THE DEVICE NUMBER IN THAT LEVEL; AFTER THE DEVICE NUMBER IS DEPOSITED, THE PROGRAM WILL NOT HALT IN LOCATIONS 3000-3037; FAILURE TO EXECUTE THIS CORRECTLY WILL CAUSE A PROGRAM HALT, INTERRUPT VECTORS ARE DOCUMENTED AND LOCATED AT LOC. 3000-3037 OF FIELD 0 IN THE LISTING; THERE ARE TWO LOCATIONS FOR EACH INTERRUPT VECTOR, ONLY THE FIRST LOCATION IS CHANGED.

DEVICE	DEVICE NUMBER
RF08/DF32	4570
RK08	4571
AIP-12	4572
FPP-12	4573
LP08/LP12	4574
PR-12	4575
DC02-F	4576
TC58	4577

EXAMPLE1 RF08 AT LEVEL 12,LP08 AT LEVEL 13,DC02-F AT LEVEL 14

LOCATION	VALUE	COMMENT
3024	4570(RF08)	/LEVEL 12
3025	7402	/
3026	4574(LP08)	/LEVEL 13
3027	7402	/
3030	4576(DC02-F)	/LEVEL 14
3031	7402	/

4.2 STARTING ADDRESSES

PDR-8 MODE, START 20 IS THE ONLY VALID STARTING ADDRESS OF THIS PROGRAM, NO SWITCHES SHOULD BE CHANGED AFTER STARTING THE PROGRAM; WHEN AN ERROR IS DETECTED, IF DESIRED, THE PROGRAM WILL RESTART ITSELF AND USE THE SWITCHES AGAIN.

5.

ERRORS

ALL PROGRAM HALTS OR TYPE-OUTS ARE ERRORS, THE ERROR TYPE-OUT MESSAGE CONSISTS OF:

- A. THE CURRENT PROGRAM RUN TIME.
- B. THE ADDRESS OF THE ERROR IN FIELD 0.
- C. THE GOOD DATA OR STATUS VALUE EXPECTED.
- D. THE BAD DATA OR STATUS VALUE OBTAINED.
- E. THE MEMORY FIELD IN WHICH THE DEVICE DETECTED AN ERROR IN.

IF THE GOOD VALUE WAS 0000, THERE WAS A STATUS ERROR. IF NON-ZERO A DATA ERROR OCCURRED. THE LISTING MUST BE CONSULTED TO FIND THE TYPE OF ERROR. ALL ERROR HALTS AND TYPE-OUTS REFER TO MEMORY FIELD 0.

6.

RESTRICTIONS

- A. STANDARD POP-12 COMPUTER.
- B. THE TAPE TRANSPORTS MUST BE SELECTED SEQUENTIALLY, STARTING WITH UNIT 0 AND WRITE ENABLED.
- C. THE SWITCHES SET TO ONLY THE EXISTING TRANSPORTS AND MEMORY FIELDS AVAILABLE.
- D. THERE IS AN IOT CONFLICT BETWEEN THE A.I.P. AND THE CCM1 INTERFACE, THEREFORE IF A CCM1 INTERFACE IS INSTALLED, INHIBIT A.I.P. MUST BE SET.
- E. DATA ON TAPE BLOCKS 70 TO 1027 WILL BE DESTROYED ON ALL TAPE DRIVES USED.
- F. ALL DATA ON RK08, RF08 OR DF32, TU10 MAGTAPE WILL BE DESTROYED.

7.

EXECUTION TIME

COMPLETION OF ONE PASS OF THIS PROGRAM WILL TAKE APPROXIMATELY 1 HOUR AND 20 MIN. THIS IS THE MINIMUM AMOUNT OF RUN TIME EXPECTED. AT COMPLETION OF A PASS THE PROGRAM WILL TYPE THE PASS NUMBER FOLLOWED BY A TOTAL NUMBER OF ERRORS SINCE THE START OF THE PROGRAM. DURING THE FIRST PASS OF THE PROGRAM, THE DISK ADDRESSING WILL BE AN INCREMENTING PATTERN, DURING THE SECOND PASS IT WILL BE RANDOM. IF THE PASS NUMBER IS ODD, THE ADDRESSING IS INCREMENTING. IF THE PASS NUMBER IS EVEN, THE ADDRESSING IS RANDOM.

8. PROGRAM DESCRIPTION

PDP-12 SYSTEM EXERCISER IS A COMPREHENSIVE PROGRAM TO EXERCISE THE PDP-12 DATA BREAK SYSTEM. ALL COMMON DATA BREAK DEVICES ARE USED TO TEST THE ABILITY TO EXCHANGE DATA BETWEEN THE DEVICES AND THE PDP-12. WHILE THE PROGRAM IS RUNNING, THE VR14 WILL DISPLAY THE CURRENT DEVICES AND THE MEMORY FIELDS RUNNING. THE NUMBER 0 AFTER A DEVICE INDICATES THAT THE DEVICE IS NOT RUNNING. A NON-ZERO NUMBER AFTER A DEVICE, INDICATES THE MEMORY FIELD THE DEVICE IS EXERCISING DATA IN. IF A DATA BREAK DEVICE ONCE STARTED, STOPS, THE PROGRAM WILL DETECT THAT AND REPORT IT AS AN ERROR.

8.1 ROUTINE DESCRIPTION

DISPLAYED MESSAGES (IN GREEN IF VR20)

CPI A CENTRAL PROCESSOR BACKGROUND PROGRAM TO TEST SOME OF THE BASIC PDP-12 INSTRUCTIONS. AT THE START OF THE PROGRAM, IF THE MACHINE HAS GREATER THAN 8K OF CORE, THIS PROGRAM WILL BE RELOCATED TO ALL EXISTING MEMORY FIELDS. DURING THE EXECUTION OF THE EXERCISER A RANDOM MEMORY FIELD IS SELECTED AND IF IT EXISTS THE BACKGROUND PROGRAM IS RUN IN THAT FIELD.

RK081 THIS IS A TEST OF THE DATA HANDLE CAPABILITY OF THE RK08 DISK CARTRIDGE. THIS PROGRAM EXECUTES A WRITE - READ OPERATION OF 400 OCTAL WORDS LONG ON AN INCREMENTING DISK SECTOR, SURFACE AND DISK ADDRESS. BOTH THE DATA PATTERN AND MEMORY FIELDS ARE OF RANDOM NATURE.

RF08/DF321 THIS IS A TEST OF THE DATA HANDLE CAPABILITY OF THE RF26/DF32 DISK MEMORY. THIS PROGRAM EXECUTES A WRITE - READ OPERATION OF 1000 OCTAL WORDS LONG ON AN INCREMENTING DISK EXTENDED ADDRESS. THE DISK ADDRESS, DATA PATTERN AND MEMORY FIELDS ARE RANDOM.

FPP-121 THIS ROUTINE EXECUTES A SERIES OF FPP-12 INSTRUCTIONS. UPON COMPLETION THE ANSWER IS COMPARED TO KNOWN RESULTS. IF NO ERROR HAS BEEN MADE, THE INSTRUCTIONS ARE REPEATED. THE ALGORITHM USED WILL TAKE ABOUT FIVE SECONDS TO EXECUTE BEFORE COMPLETION. THE MEMORY FIELD THE ANSWER WILL BE STORED INTO IS RANDOM. THE CORRECT FPP-12 ANSWER IS:

EXPONENT	0015
M,S,W	2000
L,S,W	0000

A.I.P.: THIS ROUTINE WILL PERFORM AN EXTERNAL SYNC SAMPLE FROM THE A, TO D, CHANNELS OF THE A.I.P., THE MEMORY FIELD THE RESULT WILL BE STORED INTO IS RANDOM, THE KW12A CLOCK CABLE MUST BE INSTALLED TO OPERATE THE A.I.P.

TC98: THIS IS A TEST OF THE TC58/TU10 MAGTAPE MEMORY, A 200 WORD WRITE RECORD IS WRITTEN FIVE TIMES, THIS IS THEN FOLLOWED BY A SPACE REVERSE AND A READ/COMPARE OVER THE FIVE RECORDS, ANOTHER SPACE REVERSE IS EXECUTED AND THE FIVE RECORDS ARE THEN READ AND THE DATA IS COMPARED TO THE EXPECTED VALUE, IF EOT (END OF TAPE) IS DETECTED THE DRIVE IS RESET TO BOT (BEGINNING OF TAPE) AND THE PROCESS IS REPEATED.

KF12B: IF THE MESSAGE SAYS "ON" THIS INFORMS THE OPERATOR THAT THE KF12B (A.P.I.) IS HANDLING THE INTERRUPT SERVICE, IF THE MESSAGE SAYS "OFF" THIS INFORMS THE OPERATOR THAT THE KF12B IS NOT HANDLING THE INTERRUPT SERVICE.

DISPLAYED MESSAGES (IN RED IF VR20)

TIME: THIS IS A 4 DIGIT OCTAL NUMBER OF THE RUN-TIME OF THE PROGRAM, THE SECOND 4 DIGIT OCTAL NUMBER INDICATES THE TOTAL NUMBER OF ERRORS, NON-DISPLAYED ROUTINES

LP08/LP12: THIS ROUTINE WILL OUTPUT A "SLIDING" PATTERN ON THE LINE PRINTER,

IC12: THIS ROUTINE WILL WRITE - READ FROM ALL EXISTING TAPE DRIVES, A BUFFER OF 400 OCTAL WORDS IN MEMORY FIELD 0 IS USED, THE TAPE INSTRUCTIONS ARE EXECUTED IN NO-PAUSE, EXTENDED ADDRESS MODE, THE LINTAPE IS HANDLED IN SUCH A MANNER THAT A DRIVE MAYBE DE-SELECTED OR WRITE-LOCKED WITHOUT CAUSING AN ERROR, THIS WILL CAUSE THE TAPE PROCESSOR TO HANG IN NO-PAUSE WAITING FOR AN INTERRUPT THAT WILL NEVER APPEAR, IT WAS NECESSARY DUE TO PROLONG RUNNING OF A TAPE WILL WEAR THE TAPE OUT.

PR12: THIS ROUTINE WILL READ A BINARY COUNT PATTERN TAPE (MAINDEC-00-D2G3-PT) THROUGH THE HIGH SPEED PAPER TAPE READER, THE ROUTINE WILL POSITION THE PAPER TAPE IN THE CORRECT POSITION.

KW12A: THIS ROUTINE WILL HANDLE THE CLOCK FLAGS AND UPDATE THE RUN-TIME INDICATOR ON THE VR14 DISPLAY.

DC02F: THIS ROUTINE WILL HANDLE A GROUP (UP TO 8) OF ITTY TERMINALS CONNECTED TO A DC02-F TELETYPE CONTROL, IF A KEYBOARD FLAG IS DETECTED, IT IS CONSIDERED AN ERROR,

8.2

VR14 (VR20) DISPLAY MESSAGE

```
-----  
-      CP      N      -  
-      RK08     N      -  
-      RF08     N      -  
-      FPP12    N      -  
-      AIP      N      -  
-      TC58     N      -  
-      KF12B    OFF/ON -  
-      TIME     XXXX   YYYY -  
-----
```

8.3

LIGHT INDICATORS

N#0 DEVICE NOT BEING TESTED
N#X DEVICE MEMORY FIELD
XXXX PROGRAM RUN TIME
YYYY TOTAL NUMBER OF ERRORS

RF08: DISK ADDRESS SHOULD BE INCREMENTING STARTING WITH 0 UNTIL AN "NX0" ERROR OCCURS, THE DISK "FIELD" BITS WILL BE THE FIELD BEING WORKED ON, THE DISK ADDRESS AND DISK MEMORY BUFFER WILL BE RANDOM, THE BOTTOM ROW OF LIGHTS WILL HAVE "CIE" EIE" SET, ADDITIONAL LIGHTS IN THIS ROW WILL ALSO BE OFF/ON DEPENDING UPON THE DISK OPERATION,

RK08: DISK ADDRESS SHOULD BE INCREMENTING STARTING WITH 0 UP TO ADDRESS 6177, DATA LIGHTS WILL BE RANDOM, COMMAND LIGHTS SHOULD READ 30XY (X=MEMORY FIELD, Y=DRIVE SELECTED),

/PDP-12 SYSTEM EXERCISER

/

/

/

/

/

/

/ RF00,DF32,RK00,LP00,TC12,KW12,PR12,LP12,FPP=12

/ AIP=12,TC58,KF12B,VR20 EXERCISER FOR THE PDP-12A SYSTEM

/ 8 MODE 0020 IS THE ONLY STARTING ADDRESS

/

/

/

/

/

/

***** 8K OF MEMORY IS REQUIRED *****

/ CORE LOCATIONS OF FIELD 0

/ 0000-2777
 / 3000-3377
 / 3400-3777
 / 4000-6777
 / 7000-7177
 / 7200-7377
 / 7400-7577
 / 7600-7777

MAIN PROGRAM
 KF128 (API) VECTORS AND STACK
 TAPE BLOCK PATTERN TABLE
 TAPE INPUT-OUTPUT BUFFER
 TC58 PROGRAM
 DC02-F TELETYPE PROGRAM
 MESSAGE OUTPUT BUFFER
 ***** LOADER *****

/ CORE LOCATIONS OF FIELD 1

/ 0000-2777
 / 3000-3177
 / 3200-3377
 / 3400-3777
 / 4000-4777
 / 5000-5777
 / 6000-6777
 / 7000-7377
 / 7400-7777

CP BACKGROUND PROGRAM
 TC58 BUFFER
 MISC. ROUTINES
 A.I.P. AND FPP BUFFER
 RF08,DF32 DATA WRITTEN
 RF08,DF32 DATA READ
 DISPLAY ROUTINE
 RK08 DATA WRITTEN
 RK08 DATA READ

LP08,LP12

/AUTO INDEX REGISTER IN FIELD 0 THAT ARE USED

/ 10 RF08
 / 11 TC58
 / 12
 / 13 FPP-12
 / 14 RK08
 / 15 TC12
 / 16 TC12
 / 17 TC12


```

0001          *1
0001          JMP          TSTMOR+1
0002          XXXAC, 0000
0020          *20
0020          CIF CDF 10
0021          JMP I LREAL
                    /TYPE OUT POINTER
                    /THE ONLY STARTING ADDRESS OF THE PROGRAM
                    /WHEN "Y" IS TYPED, RETURN TO LOCATION "WORLD"

```

```

0022          /STORAGE AREA FOR SOME COMMONLY USED VARIABLES
0023          MASTER, 0
0024          W01, 0
0025          TCTIME, 0
0026          W03, 0
0027          W04, 0
0028          UNIT, 0
0029          X0BWD, 0
0030          CLOCK, 0000
0031          ONBN, 0
0032          PASS, 0
0033          K0017, 0017
0034          KILLIT, 0
0035          K0100, 100
0036          K0200, 200
0037
                    /MASTER WORD
                    /WORD1
                    /WORD3
                    /WORD4
                    /UNIT BITS (IN 6,7,8)
                    /EXTENDED OPERATIONS BUFFER WORD
                    /QUARTER NUMBER, BLOCK NUMBER SAVE
                    /PASS COUNT

```

/LINC INTERRUPT HANDLER

```

0040          *40
0040          TSTMOR, PDP
0041          CLA CLL CMA
0042          DCA INTRPT
0043          TAD K0100
0044          6151
0045          JMP I LPATC0
0046          CLA
0047          TAD K0200
0050          6151
0051          6151
0052          CLA
0053          DCA INTRPT
0054          LINC
0055          MACTAP, LUMP
                    .
0056          LPATC0, PATCH0
0057          INTRPT, 0
                    /CHANGE TO PDP=8 MODE
                    /SET INTERRUPT FLAG
                    /SKIP IF TAPE DONE SET
                    /NOT THE TAPE TRY OTHERS
                    /CLEAR TAPE DONE
                    /CLEAR INTERRUPT FLAG
                    /CHANGE BACK TO LINC MODE
                    /GO ON TO CHECK TRANSFER

```

/CONSTANTS AND ADDRESS LINKS

0060	3777	K3777,	3777
0061	4777	K4777,	4777
0062	2467	K206,	WKRITE
0063	1025	K205,	START
0064	0500	SFTAT,	0500
0065	0532	DRANG,	RANGET
0066	0000	WKD1,	0000
0067	0000	AKDD,	0000
0070	0000	CKNT,	0000
0071	7000	STAT,	7000
0072	0000	DDFELD,	0000
0073	0000	FXELD,	0000
0074	0007	K007,	0007
0075	6201	CDFX,	6201
0076	1400	PATC5,	KW12
0077	1201	PATC6,	CPRUN
0101	0000	AFA,	0000
0102	0000	NRDK,	0000
0103	1012	RKDAV,	0000
0104	2417	WLD2,	WAIT
0105	0000	WLD3,	RKEX
0106	6203	CPFLD,	0000
0107	3700	KCIDF,	6203
0110	0000	K3700,	3700
0111	2056	FFFELD,	0
0112	0000	LCETR,	GETRAN
0113	0000	API,	0
0114	0000	APFLD,	0
0115	0000	DKFELD,	0000
0116	0000	TCFDL,	0
0117	0000	BADFLD,	0
0120	0000	ERCNT,	0
0121	7770	TICKS,	0
0122	0000	M10,	-10
0123	0000	RFTIME,	0
0124	0000	RKTIME,	0
0125	0000	APTIME,	0
0126	7766	FPTIME,	0
0127	0000	M12,	-12
0130	2157	TIC10,	0
0131	0726	FIXNP,	FINOP
0132	4571	LPIC2,	PTCH2
0133	0733	KPY2,	JMS I
0134	4576	LPIC6,	PTCH6
0135	4577	KPYC9,	JMS I
		KUMPTC,	JMS I
		PATC9,	PATC9
		PATC10,	PATC10

/TRAP LOCATION

```

*140
0140 0000
0141 0000
0142 4152
0143 4151
0144 4116
0145 6537
0146 0747
0147 4100
0148 4100
0149 1512
0150 0000
0151 0000
0152 0000
0153 0000
0154 3211
0155 0400
0156 1007
0157 3527
0158 3534
0159 3547
0160 6420
0161 7543
0162 0727

```

```

0000
STC
GOOD
BAD
XXX
LUMP
AERROR
KW12RT, 4100
DF32S, DFST
FAILED, 0
GOOD, 0000
BAD, 0000
DF, 0
LTP, 3211
K0400, 0400
V1007, 1007
FSAPP, APT-1
FSAPPL, APT+4
LIRB, BASE-1
LREAL, REAL
HSRST, HSRST
LPTCH7, PTCH7

```

```

/SAVE THE AC
/SET LOC, GOOD TO 0000
/RESET ERROR FIELD
/TRAP OCCURRED, ERROR

```

*0170 /A.P.I.: LINKING ADDRESSES

```

0170 1000
0171 2400
0172 2600
0173 1656
0174 2206
0175 1462
0176 7200
0177 7113

```

```

PATC1, RF8SA
PATC2, RK8
PATC8, AIP
PATC7, INTFP
PATC3, SETTP
PATC4, HSR
PATC9, DC02F
PATC10, TC58

```

```

/RF08/DF32
/RK08
/AIP-12
/PPP-12
/LP08-LP12
/HIGH SPEED READER
/DC02F
/TC58 MAGTAPE

```

```

0200 *200
0200 0011 DATUM, CLR
0201 4022 STC
0202 0641 RESTAR, LDF 1
0203 0066 SET+20 6
0204 3377 BLKTBLE=1
0205 0067 SET+20 7
0206 7577 7577
0207 1066 STA+20 6
0210 0227 XSK+20 7
0211 6207 LJMPL
0212 4023 DATLUP, STC
0213 6512 LJMPL
0214 4025 STC
0215 6512 LJMPL
0216 4026 STC
0217 1066 STA+20 6
0220 0227 XSK+20 7
0221 6207 LJMPL
0222 4023 DATLUP, STC
0223 6512 LJMPL
0224 4025 STC
0225 6512 LJMPL
0226 4026 STC
0227 1066 STA+20 6
0230 0227 XSK+20 7
0231 6207 LJMPL
0232 4023 DATLUP, STC
0233 6512 LJMPL
0234 4025 STC
0235 6512 LJMPL
0236 4026 STC
0237 1066 STA+20 6
0240 0227 XSK+20 7
0241 6207 LJMPL
0242 4023 DATLUP, STC
0243 6512 LJMPL
0244 4025 STC
0245 6512 LJMPL
0246 4026 STC
    
```

/INITIALIZE MASTER WORD TO 0
/CLEAR OUT BLOCK PATTERN TABLE

/SET UP WORD 1
/WORD 3
/AND WORD 4

/THIS SECTION OF CODING TAKES CARE OF THE EXTENDED UNITS (MORE THAN 1)

```

0217 6512 EXTEND, LJMPL
0220 1560 BCL+20
0221 4777 4777
0222 0305 ROR
0223 4027 STC
0224 2023 ADD
0225 1560 BCL+20
0226 7767 7767
0227 2027 ADD
0230 4027 STC
0231 0516 RSH
0232 1560 BCL+20
0233 7707 7707
0234 0017 COM
0235 2027 ADD
0236 0471 APO+20
0237 6314 LJMPL
0240 1000 LDA
0241 0027 UNIT
0242 0304 ROR
0243 1560 BCL+20
0244 7774 7774
0245 2511 ADD
0246 4030 STC
    
```

/ADD WD1
/MASK TO EXTENDED UNIT
/POSITION TO NEXT TO "U" BIT
/GET WD1
/MASK TO BIT 7
/ADD TO CURRENT UNIT
/RESTORE NEW UNIT
/READ THE RIGHT SWITCHES
/CLEAR ALL BUT UNITS BITS
/COMPLEMENT
/ADD CURRENT UNIT NUMBER
/AC MINUS
/NO, BAD UNIT NUMBER, GO TO INCREMENT WD1
/GET UNIT
/ROTATE 4 RIGHT
/CLEAR ALL BUT 2 LSB/S
/STORE IN XOB WORD

```

0247 0226 EXT1,
0250 2550 ADD WD4
0251 0471 ADD K4000 /GET WORD 4
0252 6256 APO+20 /AC POSITIVE?
0253 6512 LUMP RANDOM /YES, OK SO FAR
0254 4026 STC WD4 /NO, ADDRESS IS 3777 OR BELOW
0255 6247 LUMP EXT1
0256 1000 LDA EXT2, /GET WORD 4 AGAIN
0257 0026 WD4 /ADD =7000
0260 1120 ADA+20
0261 1377 1377
0262 0471 APO+20 /AC MINUS?
0263 6253 LUMP EXT2=3 /NO, ADDRESS IS ABOVE 7000
0264 1000 LDA EXT4,
0265 0025 WD3 /MASK TO BITS 8 TO 11
0266 1560 BCL+20
0267 7740 7740
0270 2510 ADD K0770 /STORE IN QNBN SAVE
0271 4032 STC QNBN

```

/THIS SECTION OF CODING DISPATCHES THE PROGRAM
 /TO THE APPROPRIATE SECTION OF CODING TO HANDLE
 /THE PARTICULARS RELATING TO EACH MAG TAPE INSTRUCTION

```

0272 0011 DISPATCH, CLR /GET WORD 1
0273 2023 ADD WD1 /MASK TO FUNCTION BITS
0274 1560 BCL+20 /ADD IN "MASTER JUMP"
0275 7770 7770 /STORE
0276 1120 ADA+20 /EXECUTE
0277 6302 LUMP TABLE1 /READ AND CHECK (0)
0300 4301 STC ,+1 /READ (2)
0301 6301 LUMP RDSUB /WRITE AND CHECK (4)
0302 6312 LUMP INCR /WRITE (6)
0303 6314 LUMP RDSUB
0304 6312 LUMP INCR
0305 6314 LUMP INCR
0306 6372 LUMP WRITE
0307 6314 LUMP INCR
0310 6372 LUMP WRITE
0311 6314 LUMP INCR
0312 6324 LUMP READ
0313 6314 LUMP INCR
0314 1020 INCR, LDA+20 /INCREMENT MASTER WORD
0315 0001 1
0316 2022 ADD MASTER
0317 0451 APO
0320 0011 CLR
0321 1040 STA
0322 0022 MASTER
0323 6212 LUMP DATLUP

```

/THIS SECTION OF CODING HANDLES THE INSTRUCTIONS "READ"
/AND "READ AND CHECK BLOCK"

0324	2000	READ,	ADD	0	
0325	4371		STC	REXIT	/SAVE RETURN ADDRESS
0326	1020		LDA+20		/SET UP FOR RETURN
0327	6342		LJMP	RCHK	
0330	6452		LJMP	MTSET	/FROM FLAG HANDLING
0331	1000		LDA	/YES	
0332	0032		GNBN	/GET GN=BN	
0333	0601		LIF	1	
0334	6020		LJMP	WRITEN	/HAS BLOCK BEEN WRITTEN?
0335	6371		LJMP	REXIT	/NO, EXIT
0336	4363		STC	TGOOD	/YES, OK, SAVE PATTERN WORD
0337	2026		ADD	WD4	/GET EXTENDED ADDRESS
0340	0023		TMA		/LOAD TMA SETUP REGISTER
0341	6472		LJMP	MTINST	/EXECUTE "RDE OR RDC BN"

/RETURN HERE IF FLAGS OK UPON INSTRUCTION COMPLETION

0342	1000	RCHK,	LDA		
0343	0026		WD4		
0344	6601		LJMP	SUBT1	/SUBTRACT 1
0345	4015		STC	15	/SAVE THE STARTING ADDR. OF DATA TO BE WRITTEN
0346	0077		SET+20	17	/SET UP A 400 WORD COUNTER
0347	7400		-400		
0350	0002		PDP		
0351	6201		DCF	0	/DATA FIELD 0
0352	3365		DCA	TFLO	/
0353	1415	TSTDAT,	TAD I	15	/GET A WORD READ FROM TAPE
0354	3364		DCA	TBAD	/SAVE IT
0355	1364		TAD	TBAD	/GET IT BACK
0356	7041		CIA		/NEGATE IT
0357	1363		TAD	TGOOD	/ADD EXPECTED VALUE
0360	7650		SNA CLA		/ARE THEY EQUAL ?
0361	5366		JMP	+5	/YES
0362	4545		JMS I	ERROR	/NO, LINC=TAPE DATA ERROR
0363	0000	TGOOD,	0		
0364	0000	TBAD,	0		
0365	0000	TFLO,	0		
0366	2017		ISZ	17	/FINISHED ALL WORDS ?
0367	5353		JMP	TSTDAT	/NO, MORE TO TEST
0370	6141		LINC		/YES
0371	6371	REXIT,	LJMP	.	/EXIT

/THIS SECTION OF CODING HANDLES THE INSTRUCTIONS "WRITE"
/AND "WRITE AND CHECK BLOCK"

0372	1020	WRITE,	LDA+20	/SETUP FOR RETURN
0373	6440	LJMP	WCHK	/FROM FLAG HANDLING
0374	6452	LJMP	MTSET	/GET A RANDOM NUMBER
0375	6512	LJMP	RANDOM	/MAKE SURE IT IS NON-ZERO
0376	0470	AZE+20		/IT WAS ZERO
0377	6375	LJMP	I=2	/SAVE IT
0400	4444	STC	WPAT	
0401	0002	PDP	WD4	/GET STARTING ADDRESS
0402	1026	TAD		/SUBTRACT 1
0403	7041	CIA		
0404	7040	CMA		
0405	3015	DCA	15	/SAVE IT
0406	1251	TAD	ML400	/SET UP A COUNTER
0407	3016	DCA	16	/LOCATION
0410	1244	TAD	WPAT	/GET DATA WORD
0411	3415	DCA I	15	/SAVE IT IN THE BUFFER
0412	2016	ISZ	16	/DONE 400 WORDS ?
0413	5210	JMP	I=3	/NO, MORE TO DO
0414	6141	LINC		
0415	2473	ADD	MTINST+1	/GET ON=BN
0416	1120	ADA+20		/SUBTRACT 770
0417	7007	7007		
0420	4424	STC		
0421	2027	ADD	C4TEMA	/SAVE BLOCK NUMBER
0422	0242	ROL	UNIT	/GET UNIT
0423	1120	ADA+20	2	/MOVE LEFT 2
0424	0000			/ADD BLOCK NUMBER
0425	1120			/ADD TAPE PATTERN POINTER
0426	3400	BLKTBL		
0427	0641	LDF	1	
0430	1040	STA		/SAVE THE DATA WRITTEN ON UNIT X, BLOCK Y
0431	0447	UNBNSV		/STORE FOR EXECUTION
0432	4434	STC	I+2	/CLEAR STAT
0433	1040	STA		/SAVE THE WORDS WORD
0434	0000			
0435	2026	ADD	WD4	/GET EXTENDED ADDRESS
0436	0023	TMA		/LOAD TMA SETUP REGISTER
0437	6472	LJMP	MTINST	/EXECUTE
/RETURN HERE IF FLAGS OK UPON INSTRUCTION COMPLETION				
0440	1000	WCHK,	LDA	/GET ON=BN
0441	0473		MTINST+1	
0442	4032	STC	ONBN	
0443	1020	WCONT2,	LDA+20	/GET PATTERN WRITTEN IN BLOCK
0444	0000	WPAT,		
0445	0641		LOF	
0446	1040		STA	
0447	0000	UNBNSV,		/STORE IN BLOCK PATTERN INDICATOR
0450	6314	WEXIT,	LJMP	/EXIT
0451	7400	ML400,	-400	

/SUBROUTINE TO SET UP MAGTAPE INSTRUCTIONS
 /SUBROUTINE IS ENTERED WITH "WHERE TO GO IF INTERRUPT OCCURS AS EXPECTED" IN AC
 /SUBROUTINE EXITS WITH CONTENTS OF XOB WORD IN AC AND IN XOB

0452	0455	MISSET, STC	MAGTAP	/SAVE INSTRUCTION WHERE WE HOPE IT WILL STAY
0453	2000	ADD	0	
0454	4470	STC	MTEXTIT	/SAVE RETURN ADDRESS
0455	2023	ADD	WD1	
0456	1560	BCL+20		/MASK IO INSTRUCTION BITS
0457	7760	7760		
0460	2471	ADD	RDCCON	/STORE
0461	4472	STC	MTINST	
0462	2032	ADD	GNBN	
0463	4473	STC	MTINST+1	/MOVE GN-BN INDICATOR
0464	2030	ADD	XOBWD	/GET XOB WORD
0465	1560	BCL+20		
0466	0004	0004		
0467	0001	AXO		/LOAD XOB
0470	6470	MTEXTIT, LJM		/EXIT
0471	0700	RDCCON, 0700		

/EXECUTE THE FOLLOWING MAGTAPE INSTRUCTIONS BY JUMPING HERE

0472	0000	MTINST, 0		/MAGTAPE INSTRUCTION
0473	0000	0		/GN-BN
2474	0011	CLR		
0475	2112	ADD	API	
0476	0470	AZE+20		
0477	6503	LJMP	TDFLAG	
0500	0500	IOB		
0501	6771	RESTOR		
0502	0000	0000		
0503	0416	STD		/KF12 DID NOT EXECUTE THE RESTORE COMMAND
0504	6745	LJMP	PATCHC	/TAPE DONE CLEAR ?
0505	4152	STC	BAD	/YES, GO TO DISPLAY BACKGROUND
0506	4151	STC	GOOD	/NO, SAVE AC
0507	6537	LJMP	XXX	/SET GOOD TO 0000
				/NO-PAUSE FAILED
0510	0770	K0770, 0770		
0511	0130	KX08WD, 0130		

/RANDOM NUMBER GENERATOR = EXIT WITH RANDOM NUMBER IN AC

```

0512 1000  RANDOM, LDA
0513 0000
0514 4531  STC RANXIT
0515 2527  ADD HALFX
0516 2530  ADD HALFY
0517 0263  ROL+20 3
0520 4530  STC HALFY
0521 2530  ADD HALFY
0522 2527  ADD HALFX
0523 0262  ROL+20 2
0524 4527  STC HALFX
0525 2530  ADD HALFY
0526 6531  LJMPL ,+3
0527 0001  HALFX, 0001
0530 0001  HALFY, 0001
0531 5331  RANXIT, JMP , /EXIT

```

/GET A RANDOM NUMBER ENTER IN PDP MODE

```

0532 0000  RANGET, 0
0533 6141  LINC
0534 6512  LJMPL RANDOM
0535 0002  PDP
0536 5732  JMP I RANGET

```

```

0537 0500 /COMMON ERROR HALT SUBROUTINE
0540 6002 IOB
0541 1000 IOF
0542 0000 LDA
0543 1560 BCL+20
0544 6000 6000
0545 4600 STC
0546 2461 SNS+20
0547 6553 LJMPC
0550 4000 STC
0551 2600 ADD
0552 6607 LJMPC
0553 0460 SNS+20
0554 6570 LJMPC
0555 0066 SET+20
0556 7500 7500
0557 0607 LIF
0560 0020 DDISP
0561 0226 XSK+20
0562 6557 LJMPC
0563 0607 LIF
0564 6365 LJMPC
0565 0226 XSK+20
0566 6563 LJMPC
0567 6553 LJMPC
0570 1020 LDA+20
0571 0020 0020
0572 0004 ESF
0573 0226 XSK+20
0574 6573 LJMPC
0575 0002 PDP
0576 5777 JMP I
0577 1241 WORLD
0600 6600 LJMPC

0601 4605 /COMMON ROUTINE TO SUBTRACT
0602 0011 / 1 FROM THE NUMBER IN THE AC
0603 0017 SUBT1, STC
0604 1220 CLR
0605 2000 COM
0606 6000 LAM+20
0607 0000 0
0608 6000 LJMPC 0

```

/DISABLE INTERRUPTS

/DELETE TYPE OUT
/NO, TYPE OUT THE MESSAGE/INHIBIT HALT ** RESTART**
/ERROR, DISPLAY THE INFORMATION
/SET UP A TIMER
/CHANGE TO FIELD 7 (LINC)
/DISPLAY THE CURRENT TIME AND FIELD NUM.
/DONE 100 TIMES ?
/NO DISPLAY IT AGAIN
/YES, NOW DISPLAY "ERROR"/COMPLETED 2000 TIMES ?
/NO DO IT AGAIN
/TEST SNS 0 AGAIN
/RESTART THE PROGRAM
/I/O CLEAR

/DELAY

/COMMON ROUTINE TO SUBTRACT
/ 1 FROM THE NUMBER IN THE ACSUBT1, STC
CLR
COM
LAM+20
0
LJMPC 0

/PDP-12 LINK MODE ERROR
/HANDLER

```

0607 6601    XX,      LUMP      SUBT1    /SUBTRACT 1
0610 4002    STC        XXXAC     /SAVE THE AC
0611 6634    LUMP      SPACE     /INSERT SPACES
0612 2031    ADD        CLOCK     /GET THE TIME
0613 6647    LUMP      OCT       /TYPE OUT OCT, AC
0614 6634    LUMP      SPACE     /INSERT SPACES
0615 2002    ADD        XXXAC     /GET THE PC VALUE
0616 6647    LUMP      OCT       /TYPE OUT OCT, VALUE
0617 6634    LUMP      SPACE     /INSERT SPACES
0620 2151    ADD        GOOD      /GET THE GOOD VALUE
0621 6647    LUMP      OCT       /TYPE OUT OCT, VALUE
0622 6634    LUMP      SPACE     /INSERT SPACES
0623 2152    ADD        BAD       /GET THE BAD VALUE
0624 6647    LUMP      OCT       /TYPE OUT OCT, VALUE
0625 6634    LUMP      SPACE     /INSERT SPACES
0626 2116    ADD        BADFLD   /GET ERROR FIELD
0627 0303    ROR          3              /MOVE RIGHT
0630 2663    ADD        K0260     /ADD 0260
0631 6705    LUMP      PRINTR    /PRINT IT
0632 6671    LUMP      CRLF      /DO "CR"-"LF"
0633 6553    LUMP      XXR       /RETURN TO ERROR HANDLER

```

/THIS ROUTINE WILL SPACE 8 PLACES

```

0634 1000    SPACE,    LDA        /GET RETURN ADDRESS
0635 0000    0          STC        /SAVE IT
0636 4646    STC        SET+20   /SET UP COUNT
0637 0067    7          SPEX     /GET A SPACE
0640 7767    -11      ADD        /PRINT IT
0641 2704    K240    LUMP      /DONE ?
0642 6705    PRINTR   XSK+20  /NO, DO MORE
0643 0227    7          LUMP      /EXIT
0644 6641    1=3     CLR        /
0645 0011    SPEX,    LUMP      /
0646 6646    LUMP      /

```

/THIS ROUTINE IS ENTERED WITH THE NUMBER TO BE TYPED IN THE
/ A C ; TYPE THE OCTAL NUMBER IN THE AC

```

0647 4657 OCT, STC TEMP /SAVE AC
0650 2000 ADD 2
0651 4670 STC OCTE /SAVE RETURN
0652 0067 SET+20 7
0653 7773 7773 TEMP
0654 2657 ADD 3
0655 7243 ROL
0656 1050 STA+20
0657 0000 RCL+20
0660 1560 7770
0661 7770 ADA+20
0662 1120 K0260, PRINTR
0663 0260 LJMP 7
0664 6705 XSK+20 TEMP=3
0665 0227 LJMP CLR
0666 6654 CLR LJMP
0667 0011 OCTE,
0670 6670
    
```

/THIS ROUTINE TYPES A "CR-LF" ON THE TELETYPE

```

0671 1000 CRLF, LDA
0672 0000 0
0673 4703 STC CRLF
0674 1020 LDA+20
0675 0215 0215 PRINTR
0676 6705 LJMP
0677 1020 LDA+20
0700 0212 0212 PRINTR
0701 6705 LJMP CLR
0702 0011 CLR LJMP
0703 6703 CRLF, LJMP
0704 0240 K240, 0240
    
```

/THIS IS THE ACTUAL TYPE OUT ROUTINE, ENTER WITH THE CHARACTER TO
/ BE TYPED IN THE A C, EXITS WITH A CLEARED AC.

```

0705 0002 PRINTR, PDP
0706 6046 6046
0707 7220 CLA CML
0710 6041 6041
0711 5310 JMP 1-1
0712 6042 6042
0713 6141 LINC
0714 6000 LJMP 0
    
```

/THIS IS THE DISPATCH ROUTINE FOR THE SYSTEM BACKGROUND PROGRAMS
 / THE PROGRAM WILL LOOP IN AND OUT OF THIS ROUTINE

0715	0002	PATCH,	PDP		
0716	7300		CLA CLL		
0717	1112	TAD	API		
0720	7650		SNA CLA		
0721	5335	JMP	PATCHA		
0722	6006		APION		
0723	5477		JMP I	PATC6	/API IS ON NOW
0724	4476	PATCH0,	JMS I	PATC5	/EXIT TO THE CP ROUTINE
0725	4570	PTCH1,	JMS I	PATC1	/KW12 ?
0726	4571	PTCH2,	JMS I	PATC2	/RF08, DF32 ?
0727	4577	PTCH7,	JMS I	PATC10	/RK08 ?
0730	4573	PTCH3,	JMS I	PATC7	/TCSR MAGTAPE ?
0731	4572	PTCH4,	JMS I	PATC8	/FPP-12 ?
0732	4574	PTCH5,	JMS I	PATC3	/A.I.P. ?
0733	4576	PTCH6,	JMS I	PATC9	/LP08, LP12 ?
0734	4575		JMS I	PATC4	/DC02F
0735	2057	PATCHA,	ISZ	INTRPT	/HSR ?
0736	5343		JMP	PATCHB	/INTERRUPT CLEARED ?
0737	4545		JMS I	ERROR	/YES
0740	0000		2		/UNEXPECTED INTERRUPT
0741	7777				
0742	0000				
0743	6001	PATCHB,	ION	PATC6	
0744	5477		JMP I		
0745	0002	PATCHC,	PDP		
0746	5335		JMP	PATCHA	

/EXIT TO THE DISPLAY AND CP ROUTINES

/ERROR PRE-HANDLER

0747	0000	AERROR,	0		
0750	6002		IOF		
0751	2117		ISZ	ERCNT	
0752	7000		NOP		
0753	7300		CLA CLL		
0754	6201		0		
0755	1347	TAD	AERROR		
0756	3150	DCA	FAILED		
0757	1747	TAD I	AERROR		
0760	3151	DCA	GOOD		
0761	2347	ISZ	AERROR		
0762	1747	TAD I	AERROR		
0763	3152	DCA	BAD		
0764	2347	ISZ	AERROR		
0765	1747	TAD I	AERROR		
0766	3116	DCA	BADFLD		
0767	1150	TAD	FAILED		
0770	6141	LJNC			
0771	6545	LJMP	XRRX		

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PAGE

/RF08 SYSTEM PROGRAM
 /THIS ROUTINE IS A READ/WRITE ROUTINE FOR THE RF08,DF32 DISK
 /THE DATA USED IS RANDOM
 /THE DISK ADDRESSING IS ALSO RANDOM
 /THE FIELD THAT THE TRANSFER USES IS ALSO RANDOM

1000	RF8SA,	0000	/ENTERED BY A JMS TO HERE
1001		CLA	
1002		SETLEV	/RAISE MACHINE LEVEL
1003		6614	/READ STATUS
1004		AND	/MASK
1005		V1007	/ERRORS ?
1006		RF8EX	/YES, FIND OUT WHAT KIND
1007		6622	/SKIP ON DONE ?
1008		JMS I	/NOT DONE, EXIT
1009		JMP I	/YES, JMP I NEXT LOC.
1010		JMP I	/SET TO A WRITE INITI,
1011	WAIT,	.+1	
1012		START	
1013		ISZ	
1014	M1007,	RFTIME	
1015		NOP	
1016		CLA	
1017		DCA	/CLEAR INTERRUPT FLAG
1018		TAD	/
1019		API	
1020		SNA CLA	/API ?
1021		JMP I	/NO, EXIT
1022		TAD	/GET 0017
1023		SETLEV	/LOWER MACHINE LEVEL
1024		RESTOR	/YES
1025	START,	JMS I	/GET THE FIELD
1026		DCA	/SAVE IT
1027		JMS I	/GET A RANDOM NUMBER
1028		DCA	/SAVE DATA WORD
1029		JMS I	/GET A RANDOM NUMBER
1030		DCA	/SAVE DISK ADDRESS
1031		JMS I	/RANDOM DISK ACCESS
1032		DCA	/?
1033		TAD	/YES, RANDOM DISK EXTENDED ADDRESSING
1034		SZA CLA	/NO, INCREMENTING ADDRESSING
1035		JMP	/
1036		ISZ	/GET A RANDOM NUMBR
1037		NOP	/SAVE THE RANDOM EXTENDED ADDRESS
1038		JMP	/YES WE DO, GET CA POINTER
1039		5243	/SAVE IN LOC, 10
1040		5243	/SET UP A COUNT LOC,
1041		4465	/
1042		3100	/GET THE DISK FIELD
1043		1062	/ADD A CHANGE DATA FIELD
1044		3010	/SAVE IN THE NEXT LOC.
1045		1214	/CHANGE DATA FIELD
1046		3322	
1047		1072	
1048		1075	
1049		1075	
1050		TAD	
1051		DCA	
1052		.+1	
1053		6211	

```

1053 1362 STAR, TAD DFATA /GET THE DATA TO BE WRITTEN
1054 3410 DCA I 10 /STORE IT IN THE NEW FIELD
1055 2322 152 SETUP /DONE ?
1056 5253 JMP STAR /NO, MORE TO DO
1057 1060 TAD K3777 /GET THE CA VALUE
1060 4322 JMS SETUP /SETUP MC CA
1061 6605 JMS /WRITE ON THE DISK
1062 4212 JMS WAIT /THEN EXIT

/THIS IS THE READ ROUTINE FOR THE DISK SERVICE
1063 1061 RFEAD, TAD K4777 /SETUP FOR THE BREAK
1064 4322 JMS SETUP /ROUTINE
1065 6603 6603 /READ THE DISK
1066 4212 JMS WAIT /EXIT TO THE WAIT LOOP

/THIS IS WHERE TO RETURN TO WHEN THE READ IS COMPLETED
1067 1214 TAD M1000 /SET UP A COUNTER
1070 3322 DCA SETUP /LOCATION
1071 1061 TAD K4777 /SET UP CHECK LOCATION
1072 3010 DCA 10 /
1073 1072 TAD DDFELD /GET THE FIELD BITS
1074 3315 DCA RFFLD /SAVE IT
1075 1072 TAD DDFELD /GET THE FIELD BITS AGAIN
1076 1075 TAD DDFELD /ADD CHANGE DATA FIELD
1077 3300 DCA I+1 /SAVE IN THE NEXT LOCATION
1100 6211 6211
1101 1362 TAD DFATA /GET THE EXPECTED DATA
1102 3313 DCA RFGOOD /SAVE IN GOOD LOC,
1103 1410 TAD I 10 /GET THE DATA READ BACK
1104 3314 DCA RFBAD /SAVE IT IN BAD
1105 1314 TAD RFBAD /GET THE DATA READ
1106 7041 CIA /NEGATE IT
1107 1313 TAD /ADD THE DATA EXPECTED
1110 7650 SNA CLA /ARE THEY EQUAL ?
1111 5316 JMP I+5 /YES
1112 4545 JMS I ERROR /NO, RE08=DF32 DATA ERROR
1113 0000 0
1114 0000 RFGOOD, 0
1115 0000 RFBAD, 0
1116 2322 RFFLD, 0
1117 5353 JMS SETUP /FINISHED ?
1120 4212 JMS CFHECK /NO, MORE TO TEST
1121 5225 JMP WAIT START

```

```

1122 0000
1123 6201
1124 3761
1125 1214
1126 3760
1127 1100
1130 5337
1131 1064
1132 1072
1133 6615
1134 7300
1135 1363
1136 5722
1137 0107
1140 5332

/THIS ROUTINE LOADS THE WC CA LOCATION
SETUP, 0000
    DCA I      DCAA
    TAD        M1000
    DCA I      DWCA
    TAD        AFEA
    JMP        SETUPB
    TAD        SFTAT
    TAD        DDFELD
    DIML      CLA CLL
    TAD        AFDD
    JMP I      SETUP
    AND      K3700
    JMP      SETUPA

    /CHANGE TO FIELD 0
    /SAVE CA
    /SETUP WC

    /GET DISK EXTENDED ADDRESS
    /DXAL IF RF08
    /GET STATUS SETUP
    /ADD FIELD
    /LOAD EXTENDED ADDRESS

    /GET DISK ADDRESS
    /EXIT
    /MASK IO BITS 1-5
    /

```

```

/THIS ROUTINE TESTS THE ERROR ON RF08-DF32
/NXD ERRORS ARE OK
/DRL ARE NOT ACCEPTIABLE

```

```

1141 0000
1142 7012
1143 7630
1144 5353
1145 6614
1146 3351
1147 4545
1150 0000
1151 0000
1152 0000

1153 3100
1154 6601
1155 6611
1156 6601
1157 5225

1160 7750
1161 7751
1162 0000
1163 0000

RF8EX, 0
    RTR
    SZL CLA
    JMP      RF8EXA
    6614
    DCA
    JMS I
    2
    2
    0

DFBAD, 2
    2
    0

RF8EXA, DCA
    6601
    6611
    6601
    JMP
    7750
    DCAA, 7751
    DFATA, 0000
    AFDD, 0

    /MOVE 2 RIGHT
    /NXD ERROR ?
    /YES, NXD ARE OK
    /NO, REAL ERROR, READ RF08 STATUS
    /SAVE BAD STATUS
    /RF08-DF32 STATUS ERROR

    /NXD ERROR, CLEAR EXT, DISK ADDRESSING
    /CLEAR FLAGS
    /CLEAR EXTENDED ADDRESS
    /CLEAR FLAGS AGAIN
    /TRY AGAIN

    START

```


1200

PAGE

/CP RUNNING PROGRAM

/THIS ROUTINE GETS A RANDOM NUMBER, AND IF THAT MEMORY FIELD
/ IS AVAILABLE IT WILL THEN RUN THE CP PROGRAM IN THAT FIELD

```

1200 0002 PDP /CHANGE TO PDP MODE
1201 7300 CPRUN, CLA CLL
1202 6772 SETLEV /RESET LEVEL
1203 4511 JMS I LGETR /GET THE FIELD
1204 3105 DCA CPFLD /SAVE THE FIELD
1205 1034 TAD K0017 /GET 0017
1206 6772 SETLEV /LOWER MACHINE LEVEL
1207 7300 CLA CLL
1210 1105 CPFLD /YES, GET THE NUMBER
1211 1176 TAD KCIDF /ADD CHANGE INSTRUCTION AND DATA FIELD
1212 3213 DCA I+1 /SAVE IN THE NEXT LOCATION
1213 0000 CPFRN, 0000 /CHANGE FIELDS
1214 4177 JMS CPEXIT /GO TO THAT FIELD AND RUN
1215 7450 SNA /IT WILL RETURN HERE, CLEAR AC IF NO ERROR
1216 5226 JMP CPDSP /NO CP ERROR
1217 3224 DCA CPBAD /SAVE THE AC IN LOC.
1220 1105 TAD CPFLD /GET FIELD
1221 3225 DCA CPBFLD /SAVE IT
1222 4545 JMS I ERROR /CP BACKGROUND ERROR, BAD IS THE P.I.C. AT ERROR
1223 0000 CPGOOD, 0
1224 0000 CPBAD, 0
1225 0000 CPBFLD, 0
1226 6141 CPDSP, LINC
1227 0463 SNS+20
1230 7200 LJMP /BYPASS DISPLAY ?
1231 2105 ADD CPRUN=1 /YES
1232 0301 ROR CPFLD /GET CP FIELD
1233 1120 ADA+20 /MOVE RIGHT 1
1234 7603 2603 /ADD LIF 3
1235 5236 STC I+1 /SAVE IT
1236 0607 LIF 7 /CHANGE TO LINC FIELD X
1237 6020 LJMP DDISP /AND DISPLAY THE MESSAGE
1240 7200 LJMP CPRUN=1

```

/START UP AND INITILIZE ROUTINE
 /THIS ROUTINE CLEARS SOME LOCATIONS
 /AND STARTS THE MOST COMMON OPTIONS
 /

1241	7604	WORLD, LAS			
1242	0074	AND		/MASK TO BITS 9-11	
1243	7440	SAZ	K0007	/IS IT ZERO ?	
1244	5247	JMP	I+3	/NO, IT WAS OK	
1245	7402	HLT	WORLD	/OPERATOR ERROR, 8K OF CORE REQUIRED	
1246	5241	JMP		/DO NOT LET HIM CONTINUE	
1247	7100	RTL CLL		/ROTATE LEFT INTO BITS 6-8	
1250	7104	RAL CLL		/	
1251	0073	DCA	FXELD	/SAVE IN THE NUMBER OF FIELDS AVAILABLE	
1252	1121	TAD	M10	/SET UP A COUNT	
1253	3120	DCA	TICKS	/LOCATION	
1254	1126	TAD	M12	/SET UP A COUNTER	
1255	3127	DCA	TIC10	/LOCATION	
1256	4771	JMS I	LSTKW	/GO START THE CLOCK	
1257	6213	CIF CDF	I0	/	
1260	4770	JMS I	LTCP	/SETUP THE EXTENDED MEMORY FIELDS	
1261	4563	JMS I	HSRIS	/START HSR I	
1262	3102	DCA	RK0AV	/SAVE THE NUMBER OF RK08 DRIVES AVAILABLE	
1263	3101	DCA	NRDK	/	
1264	3072	DCA	DDFELD	/CLEAR SOME LOCATIONS	
1265	3100	DCA	AFA	/	
1266	3114	DCA	DKFELD	/	
1267	3066	DCA	WKD1	/	
1270	3067	DCA	AKDD	/	
1271	3070	DCA	CKNT	/	
1272	3112	DCA	API	/	
1273	3113	DCA	AIPFLD	/	
1274	3105	DCA	CPFLD	/	
1275	3123	DCA	RKTIME	/	
1276	3122	DCA	RFTIME	/	
1277	3124	DCA	APTIME	/	
1300	3125	DCA	FPTIME	/	
1301	3024	DCA	TCIME	/	
1302	3057	DCA	INTRPT	/	
1303	4530	DCA	FIXNP	/	
1304	6212	JMS I	I0	/	
1305	4554	CIF	I0	/	
1306	7604	JMS I	LTLF	/ START LP08-LP12	
1307	0036	LAS		/	
1310	7640	AND	K0100	/MASK TO BIT 05	
1311	5321	SAZ CLA		/IS IT SET ?	
1312	1132	JMP	WORLD1	/YES	
1313	3531	TAD	KPT2	/START THE RK08	
1314	1071	DCA I	LPTC2	/	
1315	6742	TAD	STAT	/	
1316	6732	DCLS		/	
1317	6742	DLDC		/	
1320	6735	DCLS		/	
1321	7604	DLDW		/	
1322	0037	WORLD1, LAS		/READ RIGHT SWITCHES	
		AND	K0200	/MASK TO BIT 04	

1323 7450
 1324 4547
 1325 4765
 1326 4766
 1327 4767
 1328 1063
 1329 3503
 1330 3110
 1331 1062
 1332 3504
 1333 3115
 1334 4764
 1335 4765
 1336 6141
 1337 1020
 1338 0130
 1339 0201
 1340 0706
 1341 0770
 1342 1020
 1343 6200
 1344 4055
 1345 2517
 1346 2241
 1347 1560
 1348 7774
 1349 4102
 1350 1020
 1351 1254
 1352 0204
 1353 0640
 1354 6715
 1355 1543
 1356 2657
 1357 1752
 1358 2332
 1359 2722
 1360 0042
 1361 2364
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SNA
 JMS I
 JMS I
 JMS I
 JMS I
 TAD
 DCA I
 DCA
 TAD
 DCA I
 DCA
 JMS I
 JMS I
 LINC
 LDA+20
 0130
 AXO
 WRI
 0770
 LDA+20
 LJMP
 STC
 LSW
 ROL
 BCL+20
 7774
 STC
 LDA+20
 1254
 ESF
 LDF
 LJMP
 APIST
 APIST
 LSTAIIP, APIST
 LSTAIIP, ASTFPP
 LDCST, DCST
 LDCST, ST58
 LTCP, CPST
 LSTKW, KWST

DF32S
 LSTFPP
 LDCST
 LST58
 K205
 WLD2
 FFPELD
 K206
 WLD3
 TCFDL
 LSTAIIP
 LAPI
 DATUM
 MAGTAP
 1
 RKDAV
 0
 PATCH

/IS IT SET ?
 /NO, START RE08-DF32
 / START THE FPP-12
 /START DC02-F
 /START TC58 MAGTAPE
 /PRESET SOME LOCATIONS
 /
 /
 /
 /
 /STARTUP A.P.I.I.
 /CHANGE TO LINC MODE
 /LOAD AC WITH 1254
 /LOAD SPECIAL FUNCTION REG.
 /
 /GO AND WAIT

FORG,

```

1400 PAGE
1401 /KW12 SERVICE
1402 /UPDATE THE CLOCK LOCATION IF THE CLOCK FLAG IS SET
1403
1404 KW12, 0
1405 6131 /KW12 FLAG ?
1406 JMP I KW12 /NO, EXIT
1407 6135 /CLEAR CLOCK FLAG
1408 ISZ /SECONDS OVERFLOW ?
1409 JMP TICKS /NO
1410 2031 ISZ /YES, UPDATE THE CLOCK, PASS COMPLETE ?
1411 5231 JMP CLOCK /NO
1412 2033 ISZ KW12A /YES, INCREMENT THE PASS
1413 NOP KNOP,
1414
1415 CLA CLL
1416 TAD KILLIT
1417 CMA /TIME TO CHANGE ADDRESSING SCHEME
1418 DCA /CHANGE LOCATION
1419 TAD /"KILLIT"
1420 LINC /GET PASS NUMBER
1421 LJMP OCT /PRINT IT
1422 LDA+20 /GET "H"
1423 0255 /PRINT IT
1424 LJMP PRINTR
1425 CLR /GET ERROR COUNT
1426 ADD ERCNT /PRINT IT
1427 6647 LJMP OCT /"CR-LF"
1428 6671 LJMP CRLF
1429 0002 PDP
1430
1431 KW12A,
1432 CLA CLL
1433 LINC
1434 RTA
1435 ADA+20
1436 0001 ATR
1437 0014 PDP
1438 0002 PDP
1439 2127 ISZ
1440 5244 JMP I
1441 5643 JMP I
1442 2075 CHECKFL
1443 7300 CLA CLL
1444 1121 TAD
1445 3120 DCA
1446 7300 CLA CLL
1447 3057 DCA
1448 1112 TAD
1449 7650 SNA CLA
1450 5600 JMP I KW12
1451 6771 RESTOR
1452 7402 HLT
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```

/HIGH SPEED READER ROUTINE

```

1456 4545 HSR, JMS I ERROR /HIGH SPEED READER ERROR
1457 0000 HGOOD, 0
1460 0000 HBAD, 0
1461 0000 HFLO, 0
1462 0000 HSR, 0
1463 6011
1464 5662 JMP I HSR
1465 7300 CLA CLL INTRPT
1466 3057 DCA 6016
1467 6016 SNA
1470 7450 JMP I#0
1471 5307 DCA HBAD
1472 3260 TAD HBAD
1473 1260 CIA
1474 7041 TAD HGOOD
1475 1257 SZA CLA
1476 7640 JMP HSR
1477 5256 ISZ HGOOD
1500 2257 NOP
1501 7000 HAREA, TAD API
1502 1112 SNA CLA
1503 7650 JMP I HSR
1504 5662 RESTOR
1505 6771 HLT
1506 7402

```

/IF THE CHARACTER WAS 0000

```

1507 7301 I#0, CLA CLL IAC
1510 3257 DCA HGOOD
1511 5302 JMP HSREA

```

/DF32=RF08 SELECTION ROUTINE

```

1512 0000 DFST, 0
1513 6201 CDF 0
1514 7360 CLA CLL CMA CML
1515 6643 /SET AC TO 7777
1516 6605 /LOAD DISK EXT; ADDRESS (RF08)
1517 7200 /WRITE
1520 1340 TAD KJMPDF
1521 3742 DCA I LPTC1
1522 6645 /SET UP THE RETURN JUMP
1523 7650 SNA CLA /LOCATION
1524 5332 JMP DFST1 /READ DISK EXT; ADDRESS
1525 1064 TAD SFTAT /NON-ZERO ?
1526 6615 DIML /NO IT WAS ZERO
1527 1341 TAD KDXAL /YES, WE HAVE AN RF08 ON LINE
1530 3737 DCA I FUDGE1 /LOAD STATUS
1531 5335 JMP DFST2
1532 1074 TAD K0007
1533 3156 DCA V1007
1534 7096 RTL
1535 3153 DCA DF
1536 5712 JMP I DFST
1537 1130 FUDGE1, FUDGE1
1540 4570 KJMPDF, JMS I PATC1
1541 6643 KDXAL, DXAL
1542 0725 LPTC1, PTC1
/A,P,I: START UP ROUTINE

1543 0000 APIST, 0
1544 7624 LAS
1545 7710 SPA CLA
1546 5743 JMP I APIST
1547 1365 TAD K3000
1550 6777 SETVEC
1551 7300 CLA CLL
1552 1366 TAD K3040
1553 6776 SETSTK
1554 7300 CLA CLL
1555 1364 TAD K0037
1556 6772 SETLEV
1557 7200 CLA
1560 6774 RSTACK
1561 7440 SZA
1562 3112 DCA API
1563 5743 JMP I APIST
1564 0037 K0037,
1565 3000 K3000,
1566 3040 K3040,

```

1600

PAGE

/FPP-12 ROUTINES
 /INTERRUPT SERVICE AND ANSWER TEST
 /START-UP AND REINITIALIZE ROUTINE

1600	0000	STFPP, 0			
1601	6552	JMS I	FPICL		
1602	4511	DCA	LGETR		/GET THE FIELD
1603	3351	TAD	FPELD		/SAVE IT
1604	1351	DCA	FPELD		/YES, MAKE SCOPE NUMBER EQUAL
1605	3110	DCA	FPELD		
1606	1351	TAD	FPELD		/GET THE NUMBER AGAIN
1607	1075	TAD	CDFX		/ADD A CDF
1610	3211	DCA	IR1		/SAVE IT
1611	6211	6211			/CHANGE FIELDS
1612	7300	CLA CLL			
1613	1157	TAD	FSAPP		/GET THE APT ADDRESS
1614	3013	DCA	13		/SAVE IT
1615	1350	TAD	K1111		/GET THE NUMBER
1616	3413	DCA I	13		/FPP-12 P
1617	1341	TAD	KFP1		/STARTING ADDRESS OF FPP CODE
1620	3413	DCA I	13		IR1
1621	1342	TAD	KFP2		/GET THE IR POINTER
1622	3413	DCA I	13		IR2
1623	1343	TAD	KFP3		/GET THE BASE POINTER
1624	3413	DCA I	13		IR3
1625	3413	DCA I	13		IR4
1626	3413	DCA I	13		IR5
1627	3413	DCA I	13		IR6
1630	3413	DCA I	13		IR7
1631	3561	DCA I	LIRB		
1632	7000	NOF			
1633	6201	CDF			/CHANGE TO DATA FIELD 0
1634	1351	TAD	FPELD		/GET THE FIELD NUMBER AGAIN
1635	7012	RTR			/MOVE IT TO BITS 9=11
1636	7010	RAR			
1637	1155	TAD	K0400		/ADD INTERRUPT ENABLE
1640	6553	FPCOM			/
1641	7200	CLA			
1642	1254	TAD	KJMPFP		
1643	3655	DCA I	LPTC3		/GET THE STARTING ADDRESS OF APT TABLE
1644	1344	TAD	KFP5		/START FPP=12
1645	6555	FPST			
1646	7000	NOF			
1647	5600	JMP I	STFPP		/EXIT
1650	4545	JMS I	ERROR		/FPP-12 ERROR
1651	0000	FPGOOD, 0			
1652	0000	FPBAD, 0			
1653	0000	FPBFLD, 0			
1654	4573	KJMPFP, JMS I	PATC7		
1655	0730	LPTC3, PTCH3			

/FPP-12 INTERRUPT SERVICE ROUTINE

```

1656 0000 INTFP, 0
1657 6557 FPIST
1658 5656 JMP I INTFP
1661 7300 CLA CLL
1662 3057 DCA
1663 6772 SETLEV
1664 1351 TAD
1665 3253 DCA
1666 1351 TAD
1667 1075 TAD
1670 3271 DCA
1671 6211 6211
1672 1150 TAD
1673 3013 DCA
1674 1413 TAD I
1675 3252 DCA
1676 1345 TAD
1677 3251 DCA
1700 1251 TAD
1701 7041 CIA
1702 1252 TAD
1703 7440 SZA
1704 5250 JMP
1705 1413 TAD I
1706 3252 DCA
1707 1346 TAD
1710 3251 DCA
1711 1251 TAD
1712 7041 CIA
1713 1252 TAD
1714 7440 SZA
1715 5250 JMP
1716 1413 TAD I
1717 3252 DCA
1720 1347 TAD
1721 3251 DCA
1722 1251 TAD
1723 7041 CIA
1724 1252 TAD
1725 7440 SZA
1726 5250 JMP
1727 4200 JMS
1730 2125 ISZ
1731 7000 NOP
1732 7200 CLA
1733 1112 TAD
1734 7650 SNA CLA
1735 5656 JMP I INTFP
1736 1034 TAD
1737 6772 SETLEV
1740 6771 RESTOR

/FPP-12 INTERRUPT ?
/NO, EXIT

/CLEAR INTERRUPT FLAG

/GET THE FPP-12 FIELD NUMBER
/SAVE IT
/GET IT AGAIN
/ADD THE FIELD
/SAVE IT
/CHANGE FIELDS
/GET THE APT EXPONENT ADDRESS
/SAVE IT
/GET THE EXPONENT VALUE
/SAVE THE EXPONENT
/GET THE CORRECT ANSWER
/SAVE IT IN GOOD
/GET THE GOOD ANS.
/NEGATE IT
/ADD THE DATA READ
/ARE THEY EQUAL ?
/NO, FPP12 EXPONENT ERROR
/GET THE MSW
/SAVE IT IN BAD
/GET THE EXPECTED ANS.
/SAVE IT IN GOOD
/GET THE DATA EXPECTED
/NEGATE IT
/ADD THE DATA READ
/ARE THEY EQUAL ?
/NO, FPP12 MSW ERROR
/GET THE LSW
/SAVE IT IN BAD
/GET THE EXPECTED DATA
/SAVE IT
/GET IT BACK
/NEGATE IT
/ADD DATA READ
/ARE THEY EQUAL ?
/NO, FPP12 LSW ERROR
/START FPP-12

/API ?
/NO, EXIT

```



```

1741 3614 KFPI, FPRG
1742 3540 KFP2, IR
1743 3550 KFP3, RASE
1744 3530 KFP5, APT
1745 0015 KFP6, 0015
1746 2000 KFP8, 2000
1747 0000 KFP9, 0000
1750 1111 K1111, 1111
1751 0000 FPELD, 0

```

/FPP-12 STARTUP ROUTINE

```

1752 0000 ASTFPP, 0
1753 7604 LAS
1754 0155 AND K0400
1755 7450 SNA
1756 4200 JMS STFPP
1757 5752 JMP I ASTFPP

```

```

/FPP PROGRAM STARTING ADDRESS
/IR ADDRESS
/BASE ADDRESS
/APT ADDRESS
/CORRECT EXPONENT
/CORRECT MSW
/CORRECT LSW

```

```

/GET RIGHT SWITCHES
/MASK IO BIT 3
/IS IT SET ?
/NO, START THE FPP-12
/EXIT

```

2020 *2020

/SUBROUTINE TO CHECK TO SEE IF BLOCK "N" HAS BEEN WRITTEN INTO
 /"N" IS IN AC; TAPE DRIVE NUMBER IS IN LOCATION "UNIT";
 /ROUTINE EXITS TO LUMP+1 IF UNWRITTEN, LUMP+2 IF WRITTEN

2020	4054	WRITEN, STC	WSAVE=2000	/SAVE AC
2021	2000	ADD	0	/GET CONTENTS OF 0
2022	4053	STC	WNEXIT=2000	/AND SAVE
2023	0640	LDF	0	
2024	2054	ADD	WSAVE	/GET BLOCK NUMBER
2025	1120	ADA+20		/SUBTRACT 770
2026	7007	7007		
2027	4054	STC	WSAVE=2000	/SAVE
2030	1000	LDA		/GET UNIT NUMBER
2031	2027	UNIT+2000		
2032	0242	ROL	2	/ROTATE 2 LEFT
2033	2054	ADD	WSAVE	/ADD IN "TRIMMED" BLOCK NUMBER
2034	1120	ADA+20		/ADD IN TABLE ENTRY ADDRESS
2035	3400	ADD	BLKTL	
2036	4037	STC	GET-2000	/STORE AWAY
2037	2037	ADD		/GET CONTENTS OF BLOCK STATUS WORD
2040	4054	STC	WSAVE=2000	
2041	2054	ADD	WSAVE	
2042	0470	AZE+20		
2043	6051	LJMP	WNEXIT-2	/NON-ZERO?
2044	1020	LDA+20		/NO, ZERO, EXIT
2045	0001	1		/YES, INCREMENT EXIT POINT
2046	2053	ADD	WNEXIT	/THEN
2047	4053	STC	WNEXIT=2000	
2050	2054	ADD	WSAVE	/GET STATUS WORD
2051	0641	LDF	1	
2052	0600	LIF	0	
2053	5053	LJMP	:	/EXIT
2054	0000	WSAVE,	0	
2055	6000	LJMP	0	

/GET A RANDOM FIELD, EXIT ONLY WITH A EXISTING
 / FIELD NUMBER IN AC 6=8

2056	0000	GETRAN, 0		
2057	4465	JMS I	ORANG	
2060	0274	AND	K0070	
2061	7450	SNA		
2062	5257	JMP	03	
2063	3273	DCA	GETSAV	
2064	1073	TAD	FXELD	
2065	7041	CIA		
2066	1273	TAD	GETSAV	
2067	7740	SMA SZA	CLA	
2070	5257	JMP	011	
2071	1273	TAD	GETSAV	
2072	5656	JMP I	GETRAN	
2073	0000	GETSAV, 0		
2074	0070	K0070, 0070		

/A DEVICE HAS STOPPED REPORT IT

```

2145 0000 CHEXIT, 0
2146 7300 CLA CLL
2147 1345 TAD CHEXIT
2150 7041 CIA
2151 7040 CMA
2152 3355 DCA TIMOUT
2153 4545 JMS I ERROR
2154 0000 0
2155 0000 TIMOUT, 0
2156 0000 0

```

/TIMEOUT ERROR, AC IS THE BAD P.C.

```

2157 0000 FINOP, 0
2160 7300 CLA CLL
2161 1056 TAD LPATC0
2162 3010 DCA 10
2163 1372 TAD M5
2164 3011 DCA 11
2165 1346 TAD CHEXIT+1
2166 3410 DCA I 10
2167 2011 ISZ 11
2170 5365 JMP I -3
2171 5757 JMP I FINOP
2172 7771 M5, -7

```

2200 PAGE

/LP08=LP12 PRINTER ROUTINE
/LP08=LP12 EXECUTION ROUTINE

2200	0000								
2201	7300	LPEX,	0	CLA CLL					
2202	1112	TAD		API		/GET API SWITCH			
2203	7440	SEA				/API ?			
2204	6771	RESTOR				/YES, EXIT VIA A.P.I.I.			
2205	5606	JMP I		:+1		/NO, EXIT			
2206	7000	0							
2207	6663	SETTP,	0			/LP08=LP12 ERROR ?			
2210	5215	JMP		SETTPA		/NO			
2211	4545	JMS I		ERROR		/LP08=LP12 STATUS ERROR			
2212	0000	0							
2213	7777	7777							
2214	0000	0							
2215	6661	SETTPA,	6661	JMP I	SETTP	/LP08=LP12 DONE FLAG ?			
2216	5606	JMP I				/NO, EXIT			
2217	7330	CLA CLL				/YES			
2220	3057	DCA		INTRPT		/CLEAR INTERRUPT FLAG			
2221	5600	JMP I		LPEX					
2222	2223	LPOUT,	LP08P						
2223	0000	0				/PRINT A CHARACTER ON THE LP08			
2224	6666	6666				/PRINT			
2225	6665	6665				/			
2226	4200	JMS		LPEX		/WAIT FOR FLAG			
2227	7300	CLA CLL		LP08P		/RETURN TO PRINTER ROUTINE			
2230	5623	JMP I				/LOAD A CHARACTER INTO THE LP-12 PRINTER BUFFER			
2231	0000	0							
2232	6654	6654							
2233	7000	NOP							
2234	4200	JMS		LPEX		/WAIT FOR A FLAG			
2235	7300	CLA CLL		LP12P		/RETURN TO THE PRINTER ROUTINE			
2236	5631	JMP I				/DO A "PRINT" ON THE LP12			
2237	0000	0							
2240	7300	CLA CLL		K0010		/GET 0010			
2241	1321	TAD				/LOAD FORMAT AND PRINT			
2242	6652	6652							
2243	6664	6664				/WAIT FOR A FLAG			
2244	4200	JMS		LPEX					
2245	7300	CLA CLL		ACRLF		/RETURN TO THE PRINTER ROUTINE			
2246	5637	JMP I							
2247	4237	KACR,	JMS	ACRLF					

/LP08-LP12 PRINTER ROUTINE
/SLIDING PATTERN

2250	7300	LST0,	CLA CLL		/GET 0240
2251	1322	TAD	K0240		/SAVE THE STARTING CHARACTER
2252	3325	DCA	LPSTCH		/GET 0240
2253	1322	TAD	K0240		/SAVE THE FIRST CHARACTER
2254	3326	DCA	LPCH		/GET A FULL LINE WIDTH
2255	1327	TAD	FULINE		/SAVE IT IN THE COUNTER
2256	3324	DCA	WIDTH		/FINISHED A LINE ?
2262	7410	SKP			/NO,
2261	5271	JMP	LST4		/YES, DO A "CR-LF" OR "PRINT"
2262	1326	TAD	LPCH		/GET A CHARACTER
2263	4304	JMS	TESTIT		/TEST IT'S VALUE
2264	5301	JMP	LST5		/INCORRECT, RESET CHARACTER
2265	1326	TAD	LPCH		/CHARACTER WAS OK, GET IT AGAIN
2266	4622	JMS	LPCH		/OUTPUT IT
2267	2326	ISZ	LPCH		/INCREMENT CHARACTER
2270	5257	JMP	LST3		/DO ANOTHER CHARACTER
2271	4312	JMS	BCRLF		/END OF A LINE CJ
2272	2325	ISZ	LPSTCH		/INCREMENT THE STARTING CHARACTER
2273	1325	TAD	LPSTCH		/GET THAT CHARACTER
2274	4304	JMS	TESTIT		/TEST IT'S VALUE
2275	5250	JMP	LST0		/INCORRECT, RESET CHARACTER
2276	1325	TAD	LPSTCH		/GET CHARACTER AGAIN
2277	3326	DCA	LPCH		/SAVE THE NEW FIRST CHARACTER
2300	5255	JMP	LST2		/DO A NEW LINE
2301	1322	TAD	K0240		/GET 0240
2302	3326	DCA	LPCH		/RESET FIRST CHARACTER
2303	5262	JMP	LST3+3		/
2304	0000				
2305	7041	CIA			/NEGATE IT
2306	1323	TAD	K0340		/ADD EXPECTED
2307	7640	SZA			/ARE THEY EQUAL ?
2310	2304	ISZ	TESTIT		/NO,
2311	5704	JMP	TESTIT		/YES,
2312	0000				
2313	7300	BCRLF,			
2314	1331	TAD	CLA CLL		
2315	4223	JMS	K0215		
2316	1330	TAD	LP08P		
2317	4223	JMS	K0212		
2320	5712	JMP	LP08P		
2321	0010	JMP	BCRLF		
2322	0240				
2323	0340				
2324	0000				
2325	0000				
2326	0000				
2327	7657	LPCH,			
2330	0212	FULINE,			
2331	0212	K0212,			
2331	0215	K0215,			

```

2332 0000 DCST,
2333 6141 LINC
2334 0517 LSW
2335 0266 ROL+20 6
2336 1560 BCL+20
2337 7774 7774
2340 0002 PDP
2341 7430 SZL
2342 5732 JMP I DCST
2343 7040 CMA
2344 3364 DCA
2345 1361 TAD
2346 7010 RAR
2347 2364 ISZ
2350 5346 JMP
2351 3762 DCA I
2352 1134 TAD
2353 3533 DCA I
2354 4763 JMS I
2355 7301 CLA CLL
2356 6115 MINT
2357 6126 MILS
2360 5732 JMP I DCST

2361 0020 K0020,
2362 7276 LGROUP, GROUP
2363 7263 LGDC, GDC

/KW12A STARTUP ROUTINE FIRST TIME ONLY

2364 0000 KWST,
2365 6132
2366 7600
2367 1366 TAD
2370 6133
2371 7300 CLA CLL
2372 1146 TAD
2373 6132
2374 7300 CLA CLL
2375 1036 TAD
2376 6134
2377 5764

/GET LEFT SWITCHES
/MOVE LEFT
/MASK IO BITS 10-11
/INHIBIT DC02=F ?
/YES
/
/SAVE IT
/GET 0020
/MOVE RIGHT
/DONE ?
/NO
/SAVE GROUP NUMBER
/GET POINTER
/SAVE IT
/ENABLE THE DC02-F STATIONS
/SET AC TO 0001
/ENABLE INTERRUPTS
/PRINT AND START A WORLD OF INTERRUPTS
/EXIT

/CLEAR CONTROL
/CLEAR AC
/GET 7600
/LOAD BUFFER PRESET
/CLEAR AC
/GET CLOCK RATE
/LOAD CLOCK CONTROL

/LOAD KW12A INTERRUPT ENABLE
/EXIT
    
```

```

2430 PAGE
2400 /RK08 SYSTEM PROGRAM
2401 /RK8, DSKD /RK08 STATUS ERROR ?
2402 /RK8, JMP /NO,
2403 /RK8, DRDS /YES, HEAD STATUS
2404 /RK8, DCA /SAVE IN LOC. BAD
2405 /RK8, JMS I /RK08 STATUS ERROR REPORT IT
2406 /RK8, 0
2407 /RK8, ARKBAD, 0
2410 /RK8, 0
2411 /RK8, DSKD
2412 /RK8, JMP I /RK8
2413 /RK8, CLA CLL
2414 /RK8, DCA INTRPT
2415 /RK8, SETLEV
2416 /RK8, JMP I ,+1
2417 /RK8, WKRITE
2420 /RK8, ISZ
2421 /RK8, 7400
2422 /RK8, CLA
2423 /RK8, TAD API
2424 /RK8, SNA CLA
2425 /RK8, JMP I /RK8
2426 /RK8, TAD K0017
2427 /RK8, SETLEV
2430 /RK8, RESTOR
2431 /RK8, TAD K7377
2432 /RK8, JMS SET1
2433 /RK8, DLDR
2434 /RK8, JMS
2435 /RETURN HERE AFTER A READ COMMAND
2436 /RK8, TAD M400 /SET A COUNT;
2437 /RK8, DCA CKNT / LOCATION
2440 /RK8, TAD K7377 /SET 14 TO THE STARTING ADDRESS OF THE READ BUFFER
2441 /RK8, DCA 14
2442 /RK8, TAD DKFELD
2443 /RK8, DCA RKBFELD
2444 /RK8, TAD DKFELD
2445 /RK8, TAD CDFX
2446 /RK8, DCA ,+1
2447 /RK8, 6211
2450 /RK8, DCA /GET RK08 FIELD BITS
2451 /RK8, TAD I /SAVE FIELD
2452 /RK8, TAD /GET I1 RACK
2453 /RK8, TAD /ADD A CHANGE DATA FIELD COMMAND
2454 /RK8, CIA /SAVE IN THE NEXT LOCATION
2455 /RK8, TAD /CHANGE TO THE MEMORY FIELD THE RK08 READ INTO
2456 /RK8, TAD /GET THE EXPECTED DATA
2457 /RK8, JMS I /SAVE IT IN LOC GOOD
2460 /RK8, 0 /GET THE DATA READ
2461 /RK8, 0 /SAVE IT IN LOC BAD
2462 /RK8, 0 /GET IT BACK
0 /NEGATE IT
0 /ADD THE EXPECTED DATA
0 /ARE THEY EQUAL ?
0 /YES
0 /NO, RK08 DATA ERROR

```


/THIS ROUTINE LOADS W.C. AND C.A. AND COMMAND REGISTER

```

2543 0000
2544 3365
2545 1101
2546 1114
2547 1071
2550 6742
2551 6732
2552 6742
2553 1365
2554 6755
2555 1221
2556 6753
2557 1067
2560 5743

2561 6777
2562 7377
2563 1600
2564 0000
2565 0000
2566 2006

0
DCA
TAD
TAD
TAD
DCLS
DLOC
DCLS
TAD
DLCA
TAD
DLWC
TAD
JMP I

RKSVA
NRDK
DKFELD
STAT

RKSVA
M400
AKOD
SET1

/SAVE CURRENT ADDRESS
/GET RK08 DRIVE NUMBER
/ADD RK08 FIELD
/ADD RK08 STATUS
/CLEAR RK08 STATUS
/LOAD RK08 COMMAND REGISTER
/CLEAR RK08 STATUS REGISTER AGAIN
/GET CURRENT ADDRESS
/LOAD RK08 CURRENT ADDRESS
/GET -400
/LOAD RK08 WORD COUNT
/GET DISK ADDRESS
/EXIT

```

SET1:

```

K6777: 6777
K7377: 7377
K1600: 1600
DATA: 0
RKSVA: 0
K0006: 0006

```

2600

PAGE

/AIP-12 ROUTINE
/TWO WORD FORMAT, RANDOM MEMORY FIELDS
/ A TO D CHANNELS

```

2600 0000 AIP, 0
2601 6307 JMP I AIP /A,I,P, DONE ?
2602 5600 JMS AIP1 /NO, EXIT
2603 4217 ISZ APTIME /YES, RESTART THE AIP
2604 2124 NOP /INCREMENT A,I,P, TIMER
2605 7000 CLA CLL
2606 7300 DCA INTRPT /CLEAR INTERRUPT FLAG
2607 3057 TAD API /GET API SWITCH
2610 1112 SNA CLA /IS IT SET ?
2611 7650 JMP I AIP /NO, EXIT
2612 5600 TAD K0017 /YES, GET 0017
2613 1034 SETLEV /LOWER MACHINE LEVEL
2614 6772 RESTOR /EXIT VIA API
2615 6771 HLT
2616 7402

```

AIP1,

```

2617 0000 0
2620 7300 CLA CLL /RESET MACHINE LEVEL
2621 6772 SETLEV /GET 0014
2622 1314 TAD A0014 /SELECT CHANNEL 14
2623 6301 SCH /LOAD CHANNEL 14
2624 6302 LCH /GET FIRST CHANNEL
2625 1310 DCA ASTCH /SAVE IT
2626 3311 TAD M3 /SAVE IT
2627 1306 TAD ACHTOT /GET 0010
2630 3307 DCA A0010 /SELECT C.I.A.
2631 1312 TAD BUFF /GET BUFFER POINTER
2632 6301 SCH /LOAD C.I.A.
2633 1317 TAD A0011 /GET 0011
2634 6302 LCH K0100 /SELECT W.C.
2635 1313 TAD A0014 /LOAD W.C.
2636 6301 SCH /GET 0014
2637 1036 TAD A0014 /SELECT CHANNEL 14
2640 6302 LCH LGETR /SAVE THE FIELD
2641 1314 TAD AIPFLD /GET IT BACK
2642 6301 SCH /ADD "GO" AND INTERRUPT
2643 4511 JMS I A1001 /LOAD CONTROL WORD
2644 3113 DCA AIPFLD /GET A TO D CHANNEL
2645 1113 TAD A1001 /ADD "EN" BIT
2646 1316 LCH ASTCH /SELECT CHANNEL
2647 6302 TAD A1000 /INCREMENT CHANNEL
2650 1311 TAD ISZ /FINISHED ?
2651 1315 TAD ISZ /NO,
2652 6301 SCH JMP I AIP1 /EXIT
2653 2311 ISZ
2654 2307
2655 5250
2656 5617

```

```

2657 0000 AIPST, 0
2660 7604 LAS
2661 7004 RAL
2662 7710 SPA CLA
2663 5657 JMP I AIPST
2664 6141 LINC
2665 0517 LSW
2666 0304 ROR 4
2667 0451 APO 1+4
2670 6674 LJMP 1+3
2671 1020 LDA+20
2672 0044 44
2673 6676 LJMP 1+3
2674 1020 LDA+20
2675 0040 40
2676 4710 STC STCH=2000
2677 0002 PDP
2700 4217 JMS AIP1
2701 7300 CLA CLL
2702 1320 TAD KJMPAP
2703 3721 DCA I LPTC4
2704 3113 DCA AIPFLD
2705 5657 JMP I AIPST

2706 7774 M3, -4
2707 0000 ACHTOT, 0
2710 0000 STCH, 0
2711 0000 ASTCH, 0
2712 0010 A0010, 0010
2713 0011 A0011, 0011
2714 0014 A0014, 0014
2715 1000 A1000, 1000
2716 1001 A1001, 1001
2717 3400 BUFF, BUFFER
2720 4572 KJMPAP, JMS I PATC8
2721 0731 LPTC4, PTCH4

```

/READ RIGHT SWITCHES

/MOVE LEFT

/RSW 1 CLEARED ?

/NO, SET

/READ LEFT SWITCHES

/MOVE BIT 8 TO BIT 0

/IS IT SET ?

/YES

/NO, KW12A IS CONNECTED TO A.I.P. CHANNEL 44-47

/YES, KW12A IS CONNECTED TO A.I.P. CHANNEL 40-43

/SAVE CLOCK CHANNEL

/START THE A.I.P.

/SET UP THE RETURN JUMP

/EXIT

/TC58 MAGTAPE START UP ROUTINE

```

2722 0000 SI58, 0
2723 7604 LAS
2724 7106 RTL CLL
2725 7710 SPA CLA
2726 5722 JMP I ST58
2727 6141 LINC
2730 0517 LSW
2731 1560 BCL+20
2732 4777 4777
2733 0002 PDP
2734 3744 DCA I LTCAV
2735 1343 TAD KR58
2736 3577 DCA I PATC10
2737 1135 TAD KJMPTC
2740 3564 DCA I LPTCH7
2741 5766 JMP I LL58
2742 5722 JMP I ST58

2743 2742 KR58, 01
2744 7156 LTCAV, TCAVIL
    
```

/TC58 REWIND ROUTINE

```

2745 0000 TCCIT, 0
2746 7006 RTL
2747 7510 SPA
2750 5745 JMP I TCCIT
2751 7006 RTL
2752 7006 RTL
2753 7710 SPA CLA
2754 5360 JMP TCRWIND
2755 2345 ISZ TCCIT
2756 6706 MTRS
2757 5745 JMP I TCCIT
2760 3115 TCRWIND, DCA TCFDL
2761 1365 TAD TC10
2762 4764 JMS I LTCEXE
2763 5766 JMP I LL58

2764 7074 LTCEXE, TCXEXE
2765 0010 TC10, 10
2766 7000 LL58, TC58A
    
```

```

/START TC58 ?
/NO, EXIT
/
/GET SW,
/MASK TO BIT 1=2
/SAVE THE NUMBER OF EXTRA TU10
/GET RETURN
/SAVE IT
/GET POINTER
/SAVE IT
/EXIT
    
```

```

/ROT ?
/YES
/NO, AN ERROR
/READ TC58 STATUS
/EXIT
/GET 0010
/EXECUTE IT
/RESTART TC58 ROUTINE
    
```



```

7000 *7000 /TC58 ROUTINE
6701 MTSF=6701 /SKIP ON TC58
6706 MTRS=6706 /READ STATUS
6716 MTL=6716 /LOAD COMMAND REGISTER
6721 MTR=6721 /SKIP ON TUR
6722 MTGO=6722 / "GO"

7000 4465 JMS I DRANG /SAVE GOOD DATA
7001 DCA TCGOOD /MASK TO BITS 1-2
7002 JMS I DRANG /SAVE DRIVE NUMBER
7003 AND TK3000 /GET AVAIL. DRIVES
7004 DCA TCDR /ADD CURRENT DRIVE
7005 1356 TAD TCAVIL
7006 7041 CIA TADR
7007 1355 TAD TADR
7010 7740 SMA SZA CLA
7011 5202 JMP I=7
7012 4511 JMS I LGETR /GET MEMORY FIELD
7013 3340 DCA TCFLO /SAVE FILED
7014 1336 TAD TCGOOD
7015 6212 CIF I0
7016 4771 JMS I LFLIT
7017 1357 TAD TMS
7020 3360 DCA TCSAV
7021 4341 JMS TCSET
7022 1361 TAD K0040
7023 4274 JMS TCXEXE
7024 2360 ISZ TCSAV
7025 5221 JMP I=4
7026 4347 JMS TSPACE
7027 1357 TAD TMS
7030 3360 DCA TCSAV
7031 4341 JMS TCSET
7032 1362 TAD K0030
7033 4274 JMS TCXEXE
7034 2360 ISZ TCSAV
7035 5231 JMP I=4
7036 4347 JMS TSPACE
7037 1357 TAD TMS
7040 3360 DCA TCSAV

7000 4465 JMS I DRANG /EXECUTE A READ/COMPARE
7001 DCA TCGOOD /DONE ?
7002 JMS I DRANG /NO
7003 AND TK3000 /YES, SPACE REVERSE 5 RECORDS
7004 DCA TCDR /SET UP A COUNT
7005 1356 TAD TCAVIL /LOCATION
7006 7041 CIA TADR /SET W.C. AND C.A.
7007 1355 TAD TADR /EXECUTE A WRITE
7010 7740 SMA SZA CLA /DONE ?
7011 5202 JMP I=7 /NO
7012 4511 JMS I LGETR /YES, SPACE REVERSE 5 RECORDS
7013 3340 DCA TCFLO /SET UP A COUNT
7014 1336 TAD TCGOOD /LOCATION
7015 6212 CIF I0 /SET W.C. AND C.A.
7016 4771 JMS I LFLIT /EXECUTE A WRITE
7017 1357 TAD TMS /DONE ?
7020 3360 DCA TCSAV /NO
7021 4341 JMS TCSET /YES, SPACE REVERSE 5 RECORDS
7022 1361 TAD K0040 /SET UP A COUNT
7023 4274 JMS TCXEXE /LOCATION
7024 2360 ISZ TCSAV /SET W.C. AND C.A.
7025 5221 JMP I=4 /EXECUTE A READ/COMPARE
7026 4347 JMS TSPACE /DONE ?
7027 1357 TAD TMS /NO
7030 3360 DCA TCSAV /YES, SPACE REVERSE
7031 4341 JMS TCSET /SET UP A COUNT
7032 1362 TAD K0030 /LOCATION
7033 4274 JMS TCXEXE /SET W.C. AND C.A.
7034 2360 ISZ TCSAV /EXECUTE A READ/COMPARE
7035 5231 JMP I=4 /DONE ?
7036 4347 JMS TSPACE /NO
7037 1357 TAD TMS /YES, SPACE REVERSE
7040 3360 DCA TCSAV /SET UP A COUNT
/ LOCATION

```

/TC58 READ ROUTINE

```

7041 6212 TC58C, CIF 10 /CLEAR THE TC58
7042 4771 JMS I LFILIT /BUFFER AERA
7043 4341 JMS TCSET /SET W.C. AND C.A.
7044 1364 TAD TK0020 /EXECUTE A READ
7045 4274 JMS TCXE /GET *200
7046 1324 TAD KT7600 /SAVE IT
7047 3341 DCA TCSET /GET TC58 BUFFER POINTER
7048 1366 TAD KTCBF /SAVE IT
7049 3011 DCA 11 /GET TC58 FIELD
7050 1340 TAD TCFLD /UPDATE THE DISPLAY MESSAGE
7051 3115 DCA TCFDL /GET FIELD AGAIN
7052 1340 TAD TCFLD /ADD CDF (6201)
7053 1075 TAD CDFX /SAVE IN THE NEXT LOC.
7054 3257 DCA ,+1 /CHANGE FO FIELD X
7055 6211 CDF 10 /GET A WORD READ FROM TAPE
7056 1411 TAD I 11 /SAVE IT
7057 3337 DCA TCBAD /GET IT BACK
7058 1337 TAD TCBAD /NEGATE IT
7059 7041 CIA /ADD EXPECTED VALUE
7060 1336 TAD TCG000 /ARE THEY EQUAL ?
7061 5335 JMP /NO, TC58 DATA ERROR
7062 2341 ISZ /YES, FINISHED 200 WORDS ?
7063 5260 JMP /NO, MORE TO TEST
7064 2360 ISZ /FINISHED 5 RECORDS ?
7065 5241 JMP /NO, MORE RECORDS
7066 5330 JMP /YES, DO IT AGAIN

```

/TC58 EXECUTE AN INSTRUCTION ROUTINE
/ THE INSTRUCTION IS IN THE AC BITS 6-8

```

7074 0000 TCEXE, 0 /ADD TC58 DRIVE NUMBER
7075 1355 TAD TCDR /ADD "MAGIC" NUMBER
7076 1365 TAD K0607 /LOAD TC58 COMMAND REGISTER
7077 6716 MTL C /CLEAR THE AC
7100 3000 TK3000, TAD /GET TC58 FIELD
7101 1340 TAD TCFLD /!! GO MAGTAPE GO !!
7102 6722 MTGO /GET 0017
7103 7300 CLA CLL /LOWER MACHINE LEVEL
7104 1034 TAD K0017 /GET API SWITCH
7105 6772 SETLEV /API ?
7106 7300 CLA CLL /YES, EXIT VIA API
7107 1112 TAD API /NO, EXIT
7110 7640 SZA CLA /MAGTAPE FLAG ?
7111 6771 RESTOR /NO,
7112 5713 JMP I ,+1 /YES,
7113 0000 C /READ TC58 STATUS
7114 6701 MTSF /ERROR ?
7115 5713 JMP I TC58 /YES,
7116 6201 CDF 0 /MAGTAPE FLAG ?
7117 6706 MTRS /READ TC58 STATUS
7120 7510 SPA /ERROR ?
7121 5331 JMP TCEXA /YES,

```



```

7122 6721 MTRR
7123 5322 JMP
7124 7600 KT7600, DCA
7125 3057 DCA INTRPT
7126 6772 SETLEV
7127 2024 ISZ
7130 5674 JMP I
7131 4772 TCEXE, JMS I
7132 5324 JMP
7133 3337 DCA
7134 3336 DCA
7135 4545 JMS I
7136 0000 TCGOOD, 0
7137 0000 TCBAD, 0
7140 0000 TCFLD, 0
    
```

/ROUTINE TO LOAD TC58 CA AND WC

```

7141 0000 TCSET, 0
7142 1366 TAD
7143 3767 DCA I
7144 1324 TAD
7145 3770 DCA I
7146 5741 JMP I
    
```

/ROUTINE TO SPACE REVERSE 5 RECORDS

```

7147 0000 TSPACE, 0
7150 1357 TAD
7151 3770 DCA I
7152 1363 TAD
7153 4274 JMS
7154 5747 JMP I
    
```

```

7155 0000 TCDR, 0
7156 0000 TCAVIL, 0
7157 7773 TMS, -5
7160 0000 TCSAV, 0
7161 0040 K0040, 40
7162 0030 K0030, 30
7163 0070 TK0070, 70
7164 0020 TK0020, 20
7165 0607 K0607, 0607
7166 2777 KICBF, TC8UFF-1
7167 7753 MICA, 7753
7170 7752 MTWC, 7752
7171 2740 LFILIT, FILIT
7172 2745 TCCHIT, TCIT
    
```

```

/NO, WAIT FOR TRANSPORT READY
/CLEAR AC
/CLEAR INTERRUPT FLAG
/RAISE THE MACHINE LEVEL
/INCREMENT TC58 TIMER
/GO DO SOMETHING USEFULL
/AN ERROR WAS DETECTED FIND OUT WHAT KIND
/ACCEPTABLE ERROR
/UN-ACCEPTABLE ERROR, SAVE STATUS
/RESET GOOD
/TC58 ERROR
    
```

```

/GET TC58 BUFFER ADDRESS
/LOAD TC58 CURRENT ADDRESS
/GET TC58 WORD COUNT (*200)
/LOAD TC58 WORD COUNT
/EXIT
    
```

```

/GET A MINUS 5
/LOAD TC58 WORD COUNT
/GET 0070
/EXECUTE IT
/EXIT
    
```

7200 *7200

/DC02=F ROUTINE

6125
6123
6121
6113
6117
6126
6115

MINS=6125
MTKF=6123
MTSF=6121
MTPF=6113
MTON=6117
MTLS=6126
MINT=6115

7200 0000
7201 7300
7202 3277
7203 1276
7204 6125
7205 5600
7206 6201
7207 6121
7210 7410
7211 5220
7212 6123
7213 3216
7214 4545
7215 0000
7216 0000
7217 0000
7220 5113
7221 7104
7222 7430
7223 5230
7224 7450
7225 5255
7226 2277
7227 5221
7230 7330
7231 3057
7232 1277
7233 1306
7234 3302
7235 1702
7236 3301
7237 1277
7240 7160
7241 3303
7242 7010
7243 2303
7244 5242
7245 1276
7246 6117
7247 7300
7250 1701
7251 7450
7252 5271

DC02F,

Ø CLA CLL DCSTAT
DCA GROUP
TAD
MINS
JMP I DC02F
CDF Ø
MTSF
SKP
JMP DC02FC=1
MTKF
DCA DCBAD
JMS I ERROR
ØØØØ

DCBAD:

DC02FC,

ØØØØ
MTPF
RAL CLL
SCL
SNA
JMP
ISE
JMP
CLA CLL
DCA
TAD
TAD
TAD
DCA
TAD I
DCA
TAD
CMA CLL
DCA
RAR
ISE
JMP
TAD
MTON
CLA CLL
TAD I
SNA
JMP

DC02FA,

ØØØØ
DCA
TAD
TAD
TAD
DCA
TAD I
DCA
TAD
CMA CLL
DCA
RAR
ISE
JMP
TAD
MTON
CLA CLL
TAD I
SNA
JMP

/SKIP ON DC02F INTERRUPT
/NO DC02F

/PRINTER FLAG ?

/
/READ KEYBOARD FLAGS
/SAVE RESULTS
/DC02=F KEYBOARD FLAG

/DC02F KEYBOARD FLAG ON THIS CHANNEL

/READ PRINTER FLAGS
/FIND THE LINE ACTIVE

/
/CLEAR INTERRUPT
/GET STATION POINTER
/ADD TABLE POINTER

/SAVE IT

/NO, GET THE GROUP NUMBER
/SELECT ACTIVE LINE

/END OF MESSAGE ?
/YES

7253	2702	ISZ I	DCSAV3	/INCREMENT POINTER
7254	6126	MTLS		/PRINT THE DATA
7255	4263	DC02FD,	GODC	/RE INITIATE THE LINES
7256	7300	CLA CLL	API	
7257	1112	TAD	SNA CLA	/API ?
7260	7650	JMP	DC02F+1	/NO
7261	5201	RESTOR		/YES
7262	6771			
7263	0000	GODC,		
7264	7300	CLA CLL	GROUP	/ADD 7760
7265	1276	TAD	K7760	/RESELECT ALL LINES
7266	1304	TAD		/EXIT
7267	6117	MTON		
7270	5663	JMP I	GODC	
7271	1305	DC02FB,	KTYBUF	
7272	3702	TAD	DCSAV3	/RESET POINTER
7273	1277	DCA I	DCSTAT	/GET LINE
7274	1300	TAD	K260	/ADD 0260
7275	5254	TAD	DC02FD=1	/PRINT IT
7276	0010	JMP		
7276	0010	GROUP,	0010	/DC02F GROUP NUMBER
7277	0000	DCSTAT,	0	/DC02F STATION
7300	0260	K260,	0260	
7301	0000	DCSAV2,	0	
7302	0000	DCSAV3,	0	
7303	0000	DCSAV4,	0	
7304	7760	K7760,	7760	
7305	7317	KTYBUF,	TTYBUF	
7306	7307	TABPT,	+1	
7307	7317	TTY0,	TTYBUF	
7310	7317	TTY1,	TTYBUF	
7311	7317	TTY2,	TTYBUF	
7312	7317	TTY3,	TTYBUF	
7313	7317	TTY4,	TTYBUF	
7314	7317	TTY5,	TTYBUF	
7315	7317	TTY6,	TTYBUF	
7316	7317	TTY7,	TTYBUF	

TIYBUF, 0215
0212

7317 0215
7320 0212
7321 0320
7322 0304
7323 0320
7324 0255
7325 0261
7326 0262
7327 0240
7330 0323
7331 0331
7332 0323
7333 0324
7334 0305
7335 0315
7336 0240
7337 0305
7340 0330
7341 0305
7342 0322
7343 0303
7344 0311
7345 0323
7346 0305
7347 0322
7350 0211
7351 0240
7352 0304
7353 0267
7354 0303
7355 0304
7356 0211
7357 0240
7360 0324
7361 0324
7362 0331
7363 0240
7364 0314
7365 0311
7366 0316
7367 0305
7370 0240
7371 0000

"P;"D;"P;"-" ;"1;"2;" ;"S;"Y;"S;" ;"T;"E;"M

" ;"E;"X;"E;"R;"C;" ;"I;"S;"E;"R

" ;" ;"D;" ;"7;" ;"C;" ;"D

" ;" ;"T;" ;"T;" ;"Y;" ;" ;"L;" ;"I;" ;"N;" ;"E;" ;"J"

0000

7400 *7400

/THIS ROUTINE RESETS THE CLOCK COUNTER
/ AND TYPES OUT THE HEADER MESSAGE AT THE START OF THE PROGRAM

7400	7300	MESSG,	CLA CLL	KILLIT	/RESET RANDOM DISK ADDRESS
7401	3035	DCA	DCA	PASS	/RESET PASS COUNT
7402	3033	DCA	CLOCK	ERCNT	/RESET CLOCK COUNT
7403	3031	DCA	TAD	TX1L	/RESET ERROR COUNT
7404	3117	DCA	TAD I	17	/SET UP TYPE OUT POINTER
7405	1224	DCA	SNA	17	/LOCATION
7406	3017	TAD I	JMP I	17	/GET A CHARACTER
7407	1417	SNA	JMP I	LWLD	/IS IS ZERO ?
7410	7450	JMP I	JMS	PRT	/YES, EXIT TO START THE PROGRAM
7411	5614	JMS	JMP	I-4	/NO, PRINT IT
7412	4215	JMP	WORLD		/DO SOME MORE
7413	5207				
7414	1241	LWLD,			

7415	0000	PRT,	0		/PRINT THE CHARACTER
7416	6046	CLA CML	6041	-1	/DONE ?
7417	7220	JMP	6042		/NO, WAIT
7420	6041	JMP I	PRT		/EXIT
7421	5220				
7422	6042				
7423	5615				

7424 TX1L, TX1-1

/TYPE OUT MESSAGE
/ "PASS TIME PC GOOD BAD FIELD
TX1,

7425	0215	0215				
7426	0212	0315				
7427	0315	0255				
7430	0255	0261				
7431	0261	0262				
7432	0262	0255				
7433	0255	0304				
7434	0304	0267				
7435	0267	0303				
7436	0303	0304				
7437	0304	0215				
7440	0215	0212				
7441	0212	0212				
7442	0212	0320				
7443	0320	0301				
7444	0301	0323				
7445	0323	0323				
7446	0323	0240				
7447	0240	0240				
7450	0240	0240				
7451	0240	0240				
7452	0240	0324				
7453	0324					

7454	0311	0311
7455	0315	0315
7456	0305	0305
7457	0240	0240
7460	0240	0240
7461	0240	0240
7462	0240	0240
7463	0240	0240
7464	0240	0240
7465	0240	0240
7466	0240	0240
7467	0320	0320
7470	0303	0303
7471	0240	0240
7472	0240	0240
7473	0240	0240
7474	0240	0240
7475	0240	0240
7476	0240	0240
7477	0240	0240
7500	0240	0240
7501	0240	0240
7522	0240	0240
7503	0307	0307
7504	0317	0317
7505	0317	0317
7506	0304	0304
7507	0240	0240
7510	0240	0240
7511	0240	0240
7512	0240	0240
7513	0240	0240
7514	0240	0240
7515	0240	0240
7516	0240	0240
7517	0302	0302
7520	0301	0301
7521	0304	0304
7522	0240	0240
7523	0240	0240
7524	0240	0240
7525	0240	0240
7526	0240	0240
7527	0240	0240
7530	0240	0240
7531	0240	0240
7532	0240	0240
7533	0306	0306
7534	0311	0311
7535	0305	0305
7536	0314	0314
7537	0304	0304
7540	0215	0215
7541	0212	0212
7542	0000	0000

/THIS ROUTINE IS ONLY TO POSITION THE HSR1 ON THE CORRECT STARTING / CHARACTER.

7543	0000	HSRST, 0	
7544	6016	DCA	HSRSV
7545	3365	ISZ	HSRSV
7546	2365	JMP	1=1
7547	5346	ISZ	HSRSV
7550	2365	JMP	1=1
7551	5350	6011	
7552	6011	JMP I	HSRST
7553	5743	6016	
7554	6016	6011	
7555	6011	JMP	1=1
7556	5355	SZA	CLA
7557	7640	JMP	1=4
7560	5354	JAC	
7561	7001	IAC	LLAST
7562	3764	DCA I	HSRST
7563	5743	JMP I	
7564	1457	HGOOD	
7565	0000	LLAST, HSRSV, 0	

4000
4100
4200
4300
4400
4500
4600
4700

5000
5100
5200
5300
5400
5500
5600
5700

6000
6100
6200
6300
6400
6500
6600
6700

7000 1111111 1111111 1111111 1111111 1111111 1111111 1111111 1111111
7100 1111111 1111111 1111111 1111111 1111111 1111111 1111111 1110000
7200 1111111 1111111 1111111 1111111 1111111 1111111 1111111 1111111
7300 1111111 1111111 1111111 1111111 1111111 1111111 1111111 1100000
7400 1111111 1111111 1111111 1111111 1111111 1111111 1111111 1111111
7500 1111111 1111111 1111111 1111111 1111111 1111111 1111111 0000000
7600
7700

0001 FIELD 1

/PDP-12 CP TEST PART 3- BACKGROUND - 1 PASS THRU
 /ENTER BY A JMS TO LOC, 177, WILL EXIT WITH 0 A.C.; IF NO ERROR DETECTED
 /XXX A.C. IF ERROR IS DETECTED A.C.=THE P.C. IN ERROR
 /WILL EXIT BY A CPJMP I 177 TO BANK 0
 /SA 0200 8-MODE ANY MEMORY BANK

6167	CPHLT=6167	/HALT
0016	CPNOP=0016	/NO OPERATION
6000	CPJMP=6000	
0020	*20	
0021	K7777, 7777	
0022	K5252, 5252	
0023	TEMP, 0000	
0024	KP0007, 0007	
0025	K0601, 0601	
0026	7007, 7007	
0027	7707, 7707	
0030	0770, 0770	
0031	2552, 2552	
0032	7752, 7752	
0033	7725, 7725	
0034	7700, 7700	
0035	0000, 0000	
0036	K2525, 2525	
0037	TEMP, 0000	

/CP START UP ROUTINE ONE TIME ONLY
 /THIS ROUTINE IS ENTERED ONLY AT THE START OF THE PROGRAM
 / TO LOAD THE CP PROGRAM INTO MEMORY FIELDS HIGHER THAN FIELD 1

0040	6203	CPF CIF 0	/RESET DF
0041	5442	JMP I .+1	/EXIT
0042	0000	CPST, 0000	
0043	7604	LAS	/READ RSW
0044	0103	AND AK0007	/MASK IO BITS 9-11
0045	7041	CIA	/NEGATE IT
0046	3104	DCA	/SAVE IT IN A TEMPORARY LOC,
0047	7301	CLA CLL IAC	/SET AC TO 0001
0050	3105	DCA ACPFLD	/SAVE STARTING FIELD VALUE
0051	2104	ISZ ACNT	/INCREMENT COUNT
0052	7410	SKP	/WE HAVE MORE THAN 8K OF CORE
0053	5040	JMP CPST-2	/NO ONLY 8K SO EXIT
0054	2105	ISZ ACPFLD	/INCREMENT CP FIELD POINTER
0055	1105	TAD ACPFLD	/GET THE NEW POINTER VALUE
0056	7106	RTL CLL	/ROTATE LEFT
0057	7114	RAL CLL	/INTO BITS 6-8
0060	1106	TAD ACPFX	/ADD A 6201
0061	3067	DCA CDFXX	/SAVE IT IN CDFXX
0062	7300	CLA CLL	
0063	3107	DCA ACKNT	/ LOCATION
0064	3110	DCA AAFDD	/CLEAR A POINTER LOCATION
0065	6211	6211	/CHANGE TO THE OLD FIELD
0066	1510	TAD I AAFDD	/GET THE NEXT WORD
0067	6221	6221	/CHANGE TO THE NEW FIELD
0070	3510	DCA I AAFDD	/SAVE IN THE NEW MEMORY FIELD
0071	1510	TAD I AAFDD	
0072	6211	6211	
0073	7041	CIA	/ERROR IN DUPLICATING FIELD 0
0074	1510	TAD I AAFDD	/ INTO THE EXTENDED MEMORY
0075	7640	SZA CLA	/INCREMENT POINTER LOCATION
0076	7402	HLT	/INCREMENT THE COUNTER, DONE ?
			/NO MORE TO DO
			/YES COMPLETED WITH THIS MEMORY FIELD
0077	2110	ISZ AAFDD	
0100	2107	ISZ ACKNT	
0101	5065	JMP CPST2	
0102	5051	JMP CPST1	
0103	0007	AK0007, 0007	
0104	0000	ACNT, 0	
0105	0000	ACPFLD, 0	
0106	6201	ACDFX, 6201	
0107	0000	ACKNT, 0	
0110	0000	AAFDD, 0	
0111	0212	AK212, 0212	

0167 *0167

```

0167 0011 CLR
0170 2000 ADD
0171 1560 BCL+20
0172 6000 PDP
0173 0002 CPOUTA,
0174 7000 PDP
0175 6203 CPOUT, CIF CDF 0
0176 5577 JMP I ,+1
0177 0000 CPEXIT, 2

```

*0200

```

0200 6141 LINC
0201 6202 LJMP ,+1
0202 7462 SNS+20 2 /BYPASS CP TEST ?
0203 6173 LJMP CPOUTA /YES

```

/SAE TEST I=0 B=0 ADDRESS OF OPERAND IS IN SECOND WORD

```

0204 1020 LDA+20
0205 7777 7777
0206 1440 SAE
0207 0020 K7777
0210 6167 CPHLT /SAE FAILED TO SKIP AC=7777 MEM=7777

```

```

0211 1020 LDA+20
0212 7777 7777
0213 1440 SAE
0214 0035 K0000
0215 0456 LSKP
0216 6167 CPHLT /SAE SKIPPED IN ERROR AC=7777 MEM=0000

```

```

0217 0011 CLR
0220 1440 SAE
0221 0020 K7777
0222 0456 LSKP
0223 6167 CPHLT /SAE SKIPPED IN ERROR AC=0000 MEM=7777

```

```

0224 0011 CLR
0225 1440 SAE
0226 0035 K0000
0227 6167 CPHLT /SAE FAILED TO SKIP AC=0000 MEM=0000

```

```

0230 1020 LDA+20
0231 5252 5252
0232 1440 SAE
0233 0021 K5252
0234 6167 CPHLT /SAE FAILED TO SKIP AC=5252 MEM=5252

```

```

0235 1020 LDA+20
0236 2525 2525
0237 1440 SAE
0240 0021 K5252
0241 0456 LSKP
0242 6167 CPHLT /SAE SKIPPED IN ERROR AC=2525 MEM=5252

```

0243 1020
 0244 5252
 0245 1440
 0246 0036
 0247 2456
 0250 6167
 0251 1020
 0252 5252
 0253 1440
 0254 0036
 0255 6167

LDA+20
 5252
 SAE
 K2525
 LSKP
 CPHLT
 LDA+20
 2525
 SAE
 K2525
 CPHLT

/SAE SKIPPED IN ERROR AC=5252 MEM=2525

/SAE FAILED TO SKIP AC=2525 MEM=2525

0256 0077
 0257 0035
 0260 0011
 0261 1457
 0262 6167
 0263 0075
 0264 0035
 0265 1020
 0266 7777
 0267 1455
 0270 0456
 0271 6167
 0272 0076
 0273 0021
 0274 1020
 0275 5252
 0276 1456
 0277 6167

SET+20+17
 K0000
 CLR
 SAE 17
 CPHLT
 SET+20+15
 K0000
 LDA+20
 7777
 SAE 15
 LSKP
 CPHLT

/SAE TEST I=0 B=X ADDRESS OF OPERAND IS IN BETA REGISTER

/SAE FAILED TO SKIP AC=0000 MEM=0000 B=17

SET+20+16
 K5252
 LDA+20
 5252
 SAE 16
 CPHLT

/SAE SKIPPED IN ERROR AC=7777 MEM=0000 B=14

SET+20+13
 K7777
 CLR
 SAE 13
 LSKP
 CPHLT

/SAE FAILED TO SKIP AC=5252 MEM=5252 B=16

SET+20+15
 K7777
 LDA+20
 7777
 SAE 15
 CPHLT

/SAE SKIPPED IN ERROR AC=0000 MEM=7777 B=13

SET+20+12
 K5252

/SAE FAILED TO SKIP AC=7777 MEM=7777 B=15

0316 1020 LDA+20
 0317 2525 SAE 12
 0320 1452 LSKP
 0321 0456 CPHLT
 0322 6167 /SAE SKIPPED IN ERROR AC=2525 MEM=5252 B=12
 0323 0071 SET+20+11
 0324 0036 K2525
 0325 1020 LDA+20
 0326 5252 SAE 11
 0327 1451 LSKP
 0330 0456 CPHLT
 0331 6167 /SAE SKIPPED IN ERROR AC=5252 MEM=2525 B=11
 0332 0067 SET+20+7
 0333 0036 K2525
 0334 1020 LDA+20
 0335 2525 SAE 7
 0336 1447 LSKP
 0337 6167 CPHLT
 /SAE FAILED TO SKIP AC=2525 MEM=2525 B=7

/SAE TEST AUTO INDEXING TEST
 /ADDRESS OF OPERAND -1 IS IN BETA REGISTER
 /SAE I=1 B=X

0340 2070 SET+20+10
 0341 0034 K0000=1
 0342 0011 CLR
 0343 1470 SAE+20+10
 0344 6167 CPHLT
 /SAE FAILED TO SKIP AC=0000 MEM=0000 B=10
 0345 0066 SET+20+6
 0346 0034 K0000=1
 0347 1020 LDA+20
 0350 7777 7777
 0351 1466 SAE+20+6
 0352 0456 LSKP
 0353 6167 CPHLT
 /SAE SKIPPED IN ERROR AC=7777 MEM=0000 B=6

0354 0067 SET+20+7
 0355 0017 K7777=1
 0356 1020 LDA+20
 0357 7777 7777
 0360 1467 SAE+20+7
 0361 6167 CPHLT
 /SAE FAILED TO SKIP AC=7777 MEM=7777 B=7
 0362 0072 SET+20+12
 0363 0017 K7777=1
 0364 0011 CLR
 0365 1472 SAE+20+12
 0366 0456 LSKP
 0367 6167 CPHLT
 /SAE SKIPPED IN ERROR AC=0000 MEM=7777 B=12

/PDP-12 SYSTEM EXERCISER

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0370 0066 SET+20+6
 0371 0020 K5252+1
 0372 1020 LDA+20
 0373 5252 5252
 0374 1466 SAE+20+6
 0375 6167 CPHLT

/SAE FAILED TO SKIP AC=5252 MEM=5252 B=6

0376 0073 SET+20+13
 0377 0020 K5252+1
 0400 1020 LDA+20
 0401 2525 2525
 0402 1473 SAE+20+13
 0403 0456 LSKP
 0404 6167 CPHLT

/SAE SKIPPED IN ERROR AC=2525 MEM=5252 B=13

0405 0065 SET+20+5
 0406 0035 K2525+1
 0407 1020 LDA+20
 0410 2525 2525
 0411 1465 SAE+20+5
 0412 6167 CPHLT

/SAE FAILED TO SKIP AC=2525 MEM=2525 B=5

0413 2071 SET+20+11
 0414 0035 K2525+1
 0415 1020 LDA+20
 0416 5252 5252
 0417 1471 SAE+20+11
 0420 0456 LSKP
 0421 6167 CPHLT

/SAE SKIPPED IN ERROR AC=5252 MEM=2525 B=11

/SET TEST I=0 B=X

0422 0057 SET+17
 0423 0020 K7777
 0424 1020 LDA+20
 0425 7777 7777
 0426 1440 SAE
 0427 0017 0017
 0430 6167 CPHLT

/SET+1 FAILED TO SET B17 AC=7777

0431 0052 SET+12
 0432 0021 K5252
 0433 1020 LDA+20
 0434 5252 5252
 0435 1440 SAE
 0436 0012 0012
 0437 6167 CPHLT

/SET+2 FAILED TO SET B12 AC=5252

0440 0053 SET+13
 0441 0036 K2525
 0442 1020 LDA+20
 0443 2525 2525

```

0444 1440
0445 0013
0446 6167
/SET+3 FAILED IO SET B13 AC=2525

0447 0054
0450 0035
0451 1020
0452 0000
0453 1440
0454 0014
0455 6167
/SET 4 FAILED IO SET B14 AC=0000

0456 0054
0457 0020
0460 1020
0461 7777
0462 1440
0463 0014
0464 6167
/SET+14 FAILED TO SET B14 AC=7777

0465 0055
0466 0021
0467 1020
0470 5252
0471 1440
0472 0015
0473 6167
/SET+15 FAILED TO SET B15 AC=5252

0474 0056
0475 0036
0476 1020
0477 2525
0500 1440
0501 0016
0502 6167
/SET+16 FAILED TO SET B16 AC=2525

0503 0057
0504 0035
0505 1020
0506 0000
0507 1440
0510 0017
0511 6167
/SET+17 FAILED TO SET B17 AC=0000

```

```

/LDA ALL MODE TEST
/1=0 B=0 ADDRESS OF OPERAND IS IN SECOND WORD
/

```

```

0512 1000
0513 0035
0514 1460
0515 0000
0516 6167
/LDA FAILED AC=0000

LDA
K0000
SAE+20
0000
CPHLT

```


0517 1000
 0520 0020
 0521 1460
 0522 7777
 0523 6167
 /LDA FAILED AC=7777
 LDA
 K7777
 SAE+20
 7777
 CPHLT

0524 1000
 0525 0021
 0526 1460
 0527 5252
 0530 6167
 /LDA FAILED AC=5252
 LDA
 K5252
 SAE+20
 5252
 CPHLT

0531 1000
 0532 0036
 0533 1460
 0534 2525
 0535 6167
 /LDA FAILED AC=2525
 LDA
 K2525
 SAE+20
 2525
 CPHLT

/I=0 B=X ADDRESS OF OPERAND IS IN B REGISTER
 /

0536 0071
 0537 0035
 0540 1011
 0541 1460
 0542 0000
 0543 6167
 /LDA + B FAILED AC=0000
 SET+20+11
 K0000
 LDA 11
 SAE+20
 0000
 CPHLT

0544 0072
 0545 0020
 0546 1012
 0547 1460
 0550 7777
 0551 6167
 /LDA + B FAILED AC=7777
 SET+20+12
 K7777
 LDA 12
 SAE+20
 7777
 CPHLT

0552 0073
 0553 0021
 0554 1013
 0555 1460
 0556 5252
 0557 6167
 /LDA + B FAILED AC=5252
 SET+20+13
 K5252
 LDA 13
 SAE+20
 5252
 CPHLT

0560 0074
 0561 0036
 0562 1014
 0563 1460
 0564 2525
 0565 6167
 /LDA + B FAILED AC=2525
 SET+20+14
 K2525
 LDA 14
 SAE+20
 2525
 CPHLT

/LDA I B TEST
 / I=1 B=X ADDRESS OF OPERAND -1 IS IN B REGISTER
 /

0566 0075
 SET+20+15

0567 0034
 0570 1035
 0571 1460
 0572 0000
 0573 6167

 0574 0076
 0575 0017
 0576 1036
 0577 1460
 0600 7777
 0601 6167

 0602 0077
 0603 0020
 0604 1037
 0605 1460
 0606 5252
 0607 6167

 0610 0071
 0611 0035
 0612 1031
 0613 1460
 0614 5252
 0615 6167

/LDA I B FAILED AC=0000

/LDA I B FAILED AC=7777

/LDA I B FAILED AC=5252

/LDA I B FAILED AC=2525

/STA I=1 B=0 TESTED IN PART 1
 /STA ALL MODE TEST
 /I=0 B=0 ADDRESS OF OPERAND IS IN SECOND WORD

0616 0011
 0617 1040
 0620 0022
 0621 1440
 0622 0022
 0623 6167

 0624 1020
 0625 7777
 0626 1040
 0627 0037
 0630 1440
 0631 0037
 0632 6167

 0633 1020
 0634 5252
 0635 1040
 0636 0022
 0637 1440
 0640 0022
 0641 6167

/STA FAILED AC=0000 TEMPL=0000

/STA FAILED AC=7777 TEMPH=7777

/STA FAILED AC=5252 TEMPL=5252

/PDP-12 SYSTEM EXERCISER

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0642 1020 LDA+20
 0643 2525 STA
 0644 1040 TEMPH
 0645 0037 SAE
 0646 1440 TEMPH
 0647 0037 CPHLT
 0650 6167 /STA FAILED AC=2525 TEMPH=2525

0651 0011 CLR
 0652 1040 STA
 0653 0037 TEMPH
 0654 1440 SAE
 0655 0037 TEMPH
 0656 6167 CPHLT
 /STA FAILED AC=0000 TEMPH=0000

0657 1020 LDA+20
 0660 7777 7777
 0661 1040 STA
 0662 0022 TEMPL
 0663 1440 SAE
 0664 0022 TEMPL
 0665 6167 CPHLT
 /STA FAILED AC=7777 TEMPL=7777

0666 1020 LDA+20
 0667 5252 5252
 0670 1040 STA
 0671 0037 TEMPH
 0672 1440 SAE
 0673 0037 TEMPH
 0674 6167 CPHLT
 /STA FAILED AC=5252 TEMPH=5252

0675 1020 LDA+20
 0676 2525 2525
 0677 1040 STA
 0700 0022 TEMPL
 0701 1440 SAE
 0702 0022 TEMPL
 0703 6167 CPHLT
 /STA FAILED AC=2525 TEMPL=2525

/STA TEST A
 /STA I=0 B=X ADDRESS OF OPERAND IS IN B REGISTER

0704 0067 SET+20+7
 0705 0037 TEMPH
 0706 1020 LDA+20
 0707 0000 0000
 0710 1047 STA 7
 0711 1440 SAE
 0712 0037 TEMPH
 0713 6167 CPHLT
 /STA A FAILED AC=0000 TEMPH=0000 B=7

0714 0066 SET+20+6
 0715 0037 TEMPH
 0716 1020 LDA+20
 0717 7777 7777

/PDP-12 SYSTEM EXERCISER

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0720 1046
0721 1440
0722 0037
0723 6167

/STA A FAILED AC=7777 TEMPH=7777

0724 0077
0725 0037
0726 1020
0727 5252
0730 1057
0731 1440
0732 0037
0733 6167

SET+20+17
TEMPL
LDA+20
5252
STA+17
SAE
TEMPL
CPHLT

/STA A FAILED AC=5252 TEMPH=5252 B=17

0734 0076
0735 0037
0736 1020
0737 2525
0740 1056
0741 1440
0742 0037
0743 6167

SET+20+16
TEMPL
LDA+20
2525
STA+16
SAE
TEMPL
CPHLT

/STA A FAILED AC=2525 TEMPH=2525 B=16

0744 0067
0745 0022
0746 1020
0747 0000
0750 1047
0751 1440
0752 0022
0753 6167

SET+20+7
TEMPL
LDA+20
0000
STA+7
SAE
TEMPL
CPHLT

/STA A FAILED AC=0000 TEMPL=0000 B=7

0754 0071
0755 0022
0756 1020
0757 7777
0760 1051
0761 1440
0762 0022
0763 6167

SET+20+11
TEMPL
LDA+20
7777
STA+11
SAE
TEMPL
CPHLT

/STA A FAILED AC=7777 TEMPL=7777 B=11

0764 0075
0765 0022
0766 1020
0767 5252
0770 1055
0771 1440
0772 0022
0773 6167

SET+20+15
TEMPL
LDA+20
5252
STA+15
SAE
TEMPL
CPHLT

/STA A FAILED AC=5252 TEMPL=5252 B=15

0774 0074
0775 0022
0776 1020

SET+20+14
TEMPL
LDA+20

/PDP-12 SYSTEM EXERCISER

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0777 2525
1000 1054
1001 1440
1002 0022
1003 6167

/STA A FAILED AC=2525 TEMPL=2525 B=14

/STA TEST AUTO INDEX
/STA I=1 B=X ADDRESS OF OPERAND-1 IS IN B REGISTER

1004 0070
1005 0021
1006 1020
1007 5252
1010 1070
1011 1440
1012 0022
1013 6167

/STA I A FAILED AC=5252 TEMPL=5252 B=10

SET+20+10
TEMPL=1
LDA+20
5252
STA 20+10
SAE
TEMPL
CPHLT

1014 0067
1015 0021
1016 1020
1017 2525
1020 1067
1021 1440
1022 0022
1023 6167

/STA I A FAILED AC=2525 TEMPL=2525 B=7

SET+20+11
TEMPH=1
LDA+20
5252
STA+20+11
SAE
TEMPH
CPHLT

1024 0071
1025 0036
1026 1020
1027 5252
1030 1071
1031 1440
1032 0037
1033 6167

/STA I A FAILED AC=5252 TEMPH=5252 B=11

SET+20+6
TEMPH=1
LDA+20
2525
STA+20+6
SAE
TEMPH
CPHLT

/STA I A FAILED AC=2525 TEMPH=2525 B=6

1044 2011
1045 1100
1046 0035
1047 1100

/ADA ALL MODE ADDRESSING TEST
/ADA I=1 B=0 TEST IN PART 1
/ADA I=0 B=0 ADDRESS OF OPERAND IN SECOND WORD
CLR
ADA
K0000
ADA

1050	0020	K7777		
1051	1460	SAE+20		
1052	7777	7777		
1053	6167	CPHLT	/ADA FAILED A=0000 B=7777 AC=7777	
1054	0474	FLO+20	/FLO FAILED FLO=0	
1055	6167	CPHLT		
1056	0011	CLR		
1057	1100	ADA		
1060	0021	K5252		
1061	1100	ADA		
1062	0021	K5252		
1063	1460	SAE+20		
1064	2525	2525	/ADA FAILED A=5252 B=5252 AC=2525	
1065	6167	CPHLT	/FLO FAILED F=1	
1066	0454	FLO		
1067	6167	CPHLT		
1070	0011	CLR		
1071	1100	ADA		
1072	0020	K7777		
1073	1100	ADA		
1074	0035	K0000		
1075	1460	SAE+20		
1076	7777	7777	/ADA FAILED A=7777 B=0000 AC=7777	
1077	6167	CPHLT	/FLOW FAILED FLO=0	
1100	0474	FLO+20		
1101	6167	CPHLT		
1102	0011	CLR		
1103	1100	ADA		
1104	0036	K2525		
1105	1100	ADA		
1106	0036	K2525		
1107	1460	SAE+20		
1110	5252	5252	/ADA FAILED A=2525 B=2525 AC=5252	
1111	6167	CPHLT	/FLO FAILED	
1112	0454	FLO		
1113	6167	CPHLT		
1114	0011	CLR		
1115	1100	ADA		
1116	0021	K5252		
1117	1100	ADA		
1120	0036	K2525		
1121	1460	SAE+20		
1122	7777	7777	/ADA FAILED A=5252 B=2525 AC=7777	
1123	6167	CPHLT	/FLO FAILED	
1124	0474	FLO+20		
1125	6167	CPHLT		
1126	0011	CLR		
1127	1100	ADA		
1130	0036	K2525		

1131 1100
 1132 0021
 1133 1460
 1134 7777
 1135 6167

/ADA FAILED A=2525 B=5252 AC=7777

/ADA A TEST
 /I=0 B=X

1136 0071 SET+20+11
 1137 0035 K0000
 1140 0011 CLR
 1141 1111 ADA 11
 1142 1111 ADA 11
 1143 1460 SAE+20
 1144 0000 0000
 1145 6167 CPHLT

/ADA B FAILED A=0000 B=0000 AC=0000 B=11

1146 0077 SET+20+17
 1147 0021 K5252
 1150 0011 CLR
 1151 1117 ADA 17
 1152 1117 ADA 17
 1153 1460 SAE+20
 1154 2525 2525
 1155 6167 CPHLT

/ADA B FAILED A=5252 B=5252 AC=2525 B=17

1156 0067 SET+20+7
 1157 0021 K5252
 1160 0070 SET+20+10
 1161 0036 K2525
 1162 0011 CLR
 1163 1107 ADA+7
 1164 1110 ADA+10
 1165 1460 SAE+20
 1166 7777 7777
 1167 6167 CPHLT

/ADA B FAILED A=5252 B=2525 AC=7777 B=7,10

1170 0073 SET+20+13
 1171 0036 K2525
 1172 0077 SET+20+17
 1173 0021 K5252
 1174 0011 CLR
 1175 1113 ADA+13
 1176 1117 ADA+17
 1177 1460 SAE+20
 1200 7777 7777
 1201 6167 CPHLT

/ADA B FAILED A=2525 B=5252 AC=7777 B=13,17

/ADA I A TEST

1202 0067 SET+20+7
 1203 0034 K0000-1
 1204 0077 SET+20+17

/PDP-12 SYSTEM EXERCISER

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1205 2017
 1206 2011
 1207 1127
 1210 1137
 1211 1460
 1212 7777
 1213 6167
 /ADA I A FAILED A=0000 B=7777 AC=7777 B=7,17

1214 2067
 1215 2020
 1216 0070
 1217 0035
 1220 2011
 1221 1127
 1222 1130
 1223 1460
 1224 7777
 1225 6167
 /ADA I A FAILED A=0000 B=0000 AC=0000 B=7,10

1226 2072
 1227 0034
 1230 2065
 1231 0034
 1232 2011
 1233 1132
 1234 1125
 1235 1460
 1236 2000
 1237 6167
 /ADA I A FAILED A=0000 B=0000 AC=0000 B=12,5

1240 2072
 1241 2035
 1242 0076
 1243 0020
 1244 2011
 1245 1132
 1246 1136
 1247 1460
 1250 7777
 1251 6167
 /ADA I A FAILED A=2525 B=5252 AC=7777 B=12,16

/BCO ALL MODE ADDRESSING TEST
 /BCO I=0 B=0 ADDRESS OF OPERAND IS IN SECOND WORD
 /BCO I=1 B=0 TESTED IN PART 1

1252 1020
 1253 7777
 1254 1640
 1255 0021
 1256 1460
 1257 2525
 1260 6167
 /BCO FAILED A=7777 B=5252 AC=2525

1261 1020
 1262 5252
 1263 1640
 1264 0036
 1265 1460
 1266 7777
 1267 6167

/BC0 FAILED A=5252 B=2525 AC=7777

LDA+20
 5252
 BCO
 K2525
 SAE+20
 7777
 CPHLT

1270 1020
 1271 2525
 1272 1640
 1273 0020
 1274 1460
 1275 5252
 1276 6167

/BC0 FAILED A=2525 B=7777 AC=5252

CLR
 RCO
 K0000
 SAE+20
 0000
 CPHLT

1277 0011
 1300 1640
 1301 0035
 1302 1460
 1303 0000
 1304 6167

/BC0 FAILED A=0000 B=0000 AC=0000

/BC0 A TEST

1305 0071
 1306 0020
 1307 1020
 1310 5252
 1311 1651
 1312 1460
 1313 2525
 1314 6167

/BC0 FAILED A=5252 B=7777 AC=2525

SET+20+11
 K7777
 LDA+20
 5252
 BCO+11
 SAE+20
 2525
 CPHLT

1315 0077
 1316 0035
 1317 1020
 1320 2525
 1321 1657
 1322 1460
 1323 2525
 1324 6167

/BC0 FAILED A=2525 B=0000 AC=2525

SET+20+17
 K0000
 LDA+20
 2525
 BCO+17
 SAE+20
 2525
 CPHLT

1325 0075
 1326 0036
 1327 1020
 1330 0000
 1331 1655
 1332 1460
 1333 2525
 1334 6167

/BC0 FAILED A=0000 B=2525 AC=2525

SET+20+15
 K2525
 LDA+20
 0000
 BCO+15
 SAE+20
 2525
 CPHLT

1335 0072
 1336 0021

SET+20+12
 K5252

1337 1020
 1340 2525
 1341 1652
 1342 1460
 1343 7777
 1344 6167

/BCO FAILED A=2525 B=5252 AC=7777

/BCO I+A TEST

1345 7066 SET+20*6
 1346 7017 K7777*1
 1347 1020 LDA+20
 1350 0000 0000
 1351 1666 BCO+20*6
 1352 1460 SAE+20
 1353 7777 7777
 1354 6167 CPHLT

/BCO FAILED A=0000 B=7777 AC=7777 B=6

1355 0071 SET+20*11
 1356 7020 K5252*1
 1357 1020 LDA+20
 1360 2525 2525
 1361 1671 BCO+20*11
 1362 1460 SAE+20
 1363 7777 7777
 1364 6167 CPHLT

/BCO FAILED A=2525 B=5252 AC=7777 B=11

1365 0073 SET+20*13
 1366 0034 K0000*1
 1367 1020 LDA+20
 1370 5252 5252
 1371 1673 BCO+20*13
 1372 1460 SAE+20
 1373 5252 5252
 1374 6167 CPHLT

/BCO FAILED A=5252 B=0000 AC=5252 B=13

1375 0074 SET+20*14
 1376 0035 K2525*1
 1377 1020 LDA+20
 1400 2525 2525
 1401 1674 BCO+20*14
 1402 1460 SAE+20
 1403 0000 0000
 1404 6167 CPHLT

/BCO FAILED A=2525 B=2525 AC=0000 B=14

1405 0011 CLR
 1406 1600 BSE
 1407 0036 K2525
 1410 1460 SAE+20
 1411 2525 2525

/BSE I=0 B=0 ADDRESS OF OPERAND IN NEXT LOCATION
 /BSE ALL ADDRESSING MODE TEST
 /BSE I=1 B=0 TESTED IN PART 1

/PDP-12 SYSTEM EXERCISER

1412 6167 PAL10 V141 17-FEB-72 11152 PAGE 47-15
 /BSE FAILED A=2525 AC=2525

1413 0011 CLR
 1414 1600 BSE
 1415 0021 K5252
 1416 1460 SAE+20
 1417 5252 5252
 1420 6167 CPHLT

/BSE FAILED A=5252 AC=5252

1421 1020 LDA+20
 1422 2525 2525
 1423 1600 BSE
 1424 0021 K5252
 1425 1460 SAE+20
 1426 7777 7777
 1427 6167 CPHLT

/BSE FAILED A=2525 B=5252 AC=7777

1430 1020 LDA+20
 1431 5252 5252
 1432 1600 BSE
 1433 0036 K2525
 1434 1460 SAE+20
 1435 7777 7777
 1436 6167 CPHLT

/BSE FAILED A=5252 B=2525 AC=7777

/BSE TEST

/BSE I=0 B=X ADDRESS OF OPERAND IN B REGISTER

1437 0071 SET+20+11
 1440 0036 K2525
 1441 0011 CLR
 1442 1611 BSE 11
 1443 1460 SAE+20
 1444 2525 2525
 1445 6167 CPHLT

/BSE FAILED A=2525 AC=2525 B=11

1446 0077 SET+20+17
 1447 0021 K5252
 1450 0011 CLR
 1451 1617 BSE+17
 1452 1460 SAE+20
 1453 5252 5252
 1454 6167 CPHLT

/BSE FAILED A=5252 AC=5252 B=17

1455 0067 SET+20+7
 1456 0021 K5252
 1457 1020 LDA+20
 1460 2525 2525
 1461 1607 BSE 7
 1462 1460 SAE+20
 1463 7777 7777
 1464 6167 CPHLT

/BSE FAILED A=2525 B=5252 AC=7777 B=7

```

1465 0070
1466 0020
1467 1020
1470 5777
1471 1610
1472 1460
1473 7777
1474 6167

SET+20+10
K7777
LDA+20
5777
BSE 10
SAE+20
7777
CPHLT

/BSE FAILED A=5777 B=7777 AC=7777 B=10

/BSE AUTOINDEX TEST
/BSE I=1 B=X ADDRESS OF OPERAND-1 IN THE B REGISTER

1475 0072
1476 0035
1477 1020
1500 5252
1501 1632
1502 1460
1503 7777
1504 6167

SET+20+12
K2525=1
LDA+20
5252
BSE+20+12
SAE+20
7777
CPHLT

/BSE FAILED A=5252 B=2525 AC=7777 B=12

1505 0076
1506 0020
1507 1020
1510 2525
1511 1636
1512 1460
1513 7777
1514 6167

SET+20+16
K5252=1
LDA+20
2525
BSE+20+16
SAE+20
7777
CPHLT

/BSE FAILED A=5252 B=2525 AC=7777 B=16

1515 0074
1516 0034
1517 0011
1520 1634
1521 1460
1522 0000
1523 6167

SET+20+14
K0000=1
CLR
BSE+20+14
SAE+20
0000
CPHLT

/BSE FAILED A=0000 AC=0000 B=14

1524 0073
1525 0017
1526 1020
1527 2525
1530 1633
1531 1460
1532 7777
1533 6167

SET+20+13
K7777=1
LDA+20
2525
BSE+20+13
SAE+20
7777
CPHLT

/BSE FAILED A=2525 B=7777 AC=7777 B=13

1534 1020
1535 7777
1536 1540
1537 0036

/BCL I=1 B=0 TESTED IN PART 1
/BCL ALL MODE ADDRESSING TEST
/BCL I=0 B=0 ADDRESS OF OPERAND IN NEXT LOCATION
LDA+20
7777
BCL
K2525

```

1540 1460 SAE+20
 1541 5252
 1542 6167 /BCL FAILED A=7777 B=2525 AC=5252
 1543 1020 LDA+20
 1544 2525
 1545 1540 BCL
 1546 0036 K2525
 1547 1460 SAE+20
 1550 0000
 1551 6167 /BCL FAILED A=2525 B=2525 AC=0000
 1552 1020 LDA+20
 1553 5252
 1554 1540 BCL
 1555 0036 K2525
 1556 1460 SAE+20
 1557 5252
 1560 6167 /BCL FAILED A=5252 B=2525 AC=5252
 1561 1020 LDA+20
 1562 0000
 1563 1540 BCL
 1564 0020 K7777
 1565 1460 SAE+20
 1566 0000
 1567 6167 /BCL FAILED A=0000 B=7777 AC=0000

/BCL B TEST

1570 0075 SET+20+15
 1571 0036 K2525
 1572 1020 LDA+20
 1573 7777
 1574 1555 BCL+15
 1575 1460 SAE+20
 1576 5252
 1577 6167 /BCL B FAILED A=7777 B=2525 AC=5252 B=15
 1600 0072 SET+20+12
 1601 0021 K5252
 1602 1020 LDA+20
 1603 2525
 1604 1552 BCL+12
 1605 1460 SAE+20
 1606 2525
 1607 6167 /BCL B FAILED A=2525 B=5252 AC=2525
 1610 0074 SET+20+14
 1611 0036 K2525
 1612 1020 LDA+20
 1613 5252
 1614 1554 BCL+14
 1615 1460 SAE+20

1616 5252
 1617 6167
 1620 0076
 1621 0020
 1622 0011
 1623 1556
 1624 1460
 1625 0000
 1626 6167

/BCL B FAILED A=5252 B=2525 AC=5252

SET+20+16
 K7777
 CLR
 BCL+16
 SAE+20
 0000
 CPHLT

/BCL B FAILED A=0000 B=7777 AC=0000

/BCL I A TEST AUTO INDEX

1627 0077
 1630 0020
 1631 1020
 1632 2525
 1633 1577
 1634 1460
 1635 2525
 1636 6167

SET+20+17
 K5252=1
 LDA+20
 2525
 BCL+20+17
 SAE+20
 2525
 CPHLT

/BCL I B FAILED A=2525 B=5252 AC=2525 B=17

1637 0073
 1640 0034
 1641 1020
 1642 7777
 1643 1573
 1644 1460
 1645 7777
 1646 6167

SET+20+13
 K0000=1
 LDA+20
 7777
 BCL+20+13
 SAE+20
 7777
 CPHLT

/BCL I B FAILED A=7777 B=0000 AC=7777 B=13

1647 0075
 1650 0017
 1651 1020
 1652 0000
 1653 1575
 1654 1460
 1655 0000
 1656 6167

SET+20+15
 K7777=1
 LDA+20
 0000
 BCL+20+15
 SAE+20
 0000
 CPHLT

/BCL I B FAILED A=0000 B=7777 AC=0000 B=15

1657 0073
 1660 0035
 1661 1020
 1662 5252
 1663 1573
 1664 1460
 1665 5252
 1666 6167

SET+20+13
 K2525=1
 LDA+20
 5252
 BCL+20+13
 SAE+20
 5252
 CPHLT

/BCL I B FAILED A=5252 B=2525 AC=5252 B=13

/SRO I=0 B=0 ADDRESS OF OPERAND IN NEXT LOCATION
 /SRO ALL MODE ADDRESSING TEST
 /SRO I=1 B=0 TESTED IN PART 1

1667 1020 LDA+20
 1670 5252 STA
 1671 1040 STA
 1672 0022 TEMPL
 1673 1500 SRO
 1674 0022 TEMPL
 1675 6167 CPHLT
 1676 1020 LDA+20
 1677 2525 SAE
 1700 1440 SAE
 1701 0022 TEMPL
 1702 6167 CPHLT

/DID NOT EXECUTE SKIP

/SRO FAILED TO ROTATE PROPERLY

1703 1020 LDA+20
 1704 7775 SAE
 1705 1040 STA
 1706 0022 TEMPL
 1707 1500 SRO
 1710 0022 TEMPL
 1711 0016 CPNOP
 1712 1020 LDA+20
 1713 7776 SAE
 1714 1440 SAE
 1715 0022 TEMPL
 1716 6167 CPHLT

/SRO FAILED TO ROTATE PROPERLY

1717 1020 LDA+20
 1720 0002 SAE
 1721 1040 STA
 1722 0037 TEMPH
 1723 1500 SRO
 1724 0037 TEMPH
 1725 6167 CPHLT
 1726 1020 LDA+20
 1727 0001 SAE
 1730 1440 SAE
 1731 0037 TEMPH
 1732 6167 CPHLT
 1733 1020 LDA+20
 1734 2525 SAE
 1735 1040 STA
 1736 0037 TEMPH
 1737 1500 SRO
 1740 0037 TEMPH
 1741 0016 CPNOP
 1742 1020 LDA+20
 1743 5252 SAE
 1744 1440 SAE
 1745 0037 TEMPH
 1746 6167 CPHLT

/DID NOT EXECUTE SKIP

/SRO FAILED TO ROTATE PROPERLY

/CHANGE FIELDS
 PDP
 JMP I
 TAPE6

/SRO FAILED TO ROTATE PROPERLY

1747 0022
 1750 5751
 1751 2051

2020 *2020

2020	7777	7777
2021	5252	5252
2022	0000	0000
2023	0007	0007
2024	0601	0601
2025	7007	7007
2026	7707	7707
2027	7770	7770
2030	0770	0770
2031	2552	2552
2032	7752	7752
2033	7725	7725
2034	7700	7700
2035	0000	0000
2036	2525	2525
2037	0000	0000

CPHLT=6040

6040

*2040

2040	0011	CLR
2041	2030	ADD
2042	1560	BCL+20
2043	6000	6000
2044	1620	BSE+20
2045	2000	2000
2046	0002	PDP
2047	7300	CLA CLL
2050	5175	JMP CPOUT

TAPE6,

LINC

LJMP

,+1

/STH I=0 B=X

/STH I=0 B=X OPERAND ADDRESS IS IN THE B REGISTER

2053	0011	CLR
2054	0067	SET+20+7
2055	4006	4006
2056	0011	CLR
2057	0066	SET+20+6
2060	7777	7777
2061	1300	LDH
2062	4025	4025
2063	1347	STH+7
2064	0011	CLR
2065	1300	LDH
2066	4006	4006
2067	1100	ADA
2070	0027	0027
2071	1460	SAE+20
2072	7777	7777
2073	6040	CPHLT

2074 0011 CLR
 2075 1300 LDH
 2076 0006 0006
 2077 1100 ADA
 2100 0034 0034
 2101 1460 SAE+20
 2102 7777 7777
 2103 6040 CPHLT

2104 0011 CLR
 2105 0067 SET+20+7
 2106 2006 0006
 2107 0011 CLR
 2110 0066 SET+20+6
 2111 7777 7777
 2112 1300 LDH
 2113 4025 4025
 2114 1347 STH+7
 2115 0011 CLR
 2116 1300 LDH
 2117 0006 0006
 2120 1120 ADA
 2121 0027 0027
 2122 1460 SAE+20
 2123 7777 7777
 2124 6040 CPHLT

/STH MODIFIED WRONG HALF

/STH FAILED A=7777 B=0007 C=0777 D=L E=6,7

2125 0011 CLR
 2126 1300 LDH
 2127 4006 4006
 2130 1100 ADA
 2131 0034 0034
 2132 1460 SAE+20
 2133 7777 7777
 2134 6040 CPHLT

2135 0011 CLR
 2136 0067 SET+20+7
 2137 4006 4006
 2140 0011 CLR
 2141 0066 SET+20+6
 2142 7777 7777
 2143 1300 LDH
 2144 4031 4031
 2145 1347 STH+7
 2146 0011 CLR
 2147 1300 LDH
 2150 4006 4006
 2151 1100 ADA
 2152 0033 0033
 2153 1460 SAE+20
 2154 7777 7777
 2155 6040 CPHLT

/STH MODIFIED WRONG HALF

/STH FAILED A=7777 B=0052 C=7752 D=R E=6,7

2156 0011
 2157 1300
 2160 0006
 2161 1100
 2162 0034
 2163 1460
 2164 7777
 2165 6040
 2166 0011
 2167 0067
 2170 0006
 2171 0011
 2172 0066
 2173 7777
 2174 1300
 2175 4031
 2176 1347
 2177 0011
 2200 1300
 2201 0006
 2202 1100
 2203 0033
 2204 1460
 2205 7777
 2206 6040

CLR
 LDH
 0006
 ADA
 0034
 SAE+20
 7777
 CPHLT
 CLR
 SET+20+7
 0006
 CLR
 SET+20+6
 7777
 LDH
 4031
 STH+7
 CLR
 LDH
 0006
 ADA
 0033
 SAE+20
 7777
 CPHLT

/STH MODIFIED WRONG HALF

/STH FAILED A=7777 B=0052 C=5277 D=L E=6,7

2207 0011
 2210 1300
 2211 4006
 2212 1100
 2213 0034
 2214 1460
 2215 7777
 2216 6040

CLR
 LDH
 4006
 ADA
 0034
 SAE+20
 7777
 CPHLT

/STH MODIFIED WRONG HALF

/ADM I=0 B=0
 /ADM I=0 B=0 OPERAND ADDRESS IS IN THE NEXT LOCATION

2217 0011
 2220 1040
 2221 0007
 2222 1140
 2223 0007
 2224 1460
 2225 0000
 2226 6040
 2227 0474
 2230 6040
 2231 0011
 2232 0017
 2233 1040
 2234 0007

CLR
 STA
 0007
 ADM
 0007
 SAE+20
 0000
 CPHLT
 FLO+20
 CPHLT
 CLR
 COM
 STA
 0007

/ADM FAILED A=0000 B=0000 E=7

/FLO FAILED FLO=0

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2235 1140
 2236 0007
 2237 1460
 2240 7777
 2241 6040
 2242 0011
 2243 0067
 2244 2525
 2245 1020
 2246 5252
 2247 1140
 2250 0007
 2251 1460
 2252 7777
 2253 6040

ADM
 0007
 SAE+20
 7777
 CPHLT

SET+20+7
 2525
 LDA+20
 5252
 ADM
 0007
 SAE+20
 7777
 CPHLT

/ADM FAILED A=7777 B=0000 C=7777 E=7

/ADM FAILED A=2525 B=5252 C=7777 E=7

2254 0011
 2255 0067
 2256 7777
 2257 1020
 2260 0001
 2261 1140
 2262 0007
 2263 0452
 2264 6040
 2265 1460
 2266 0001
 2267 6040

CLR
 SET+20+7
 7777
 LDA+20
 0001
 ADM
 0007
 LZE
 CPHLT
 SAE+20
 0001
 CPHLT

/ADM CHANGED LINK

/ADM FAILED AC SHOULD = 0001

2270 0011
 2271 0067
 2272 2525
 2273 1020
 2274 5253
 2275 1140
 2276 0007
 2277 0452
 2300 6040
 2301 1460
 2302 0001
 2303 6040

CLR
 SET+20+7
 2525
 LDA+20
 5253
 ADM
 0007
 LZE
 CPHLT
 SAE+20
 0001
 CPHLT

/ADM CHANGED LINK

/ADM FAILED A=2525 B=5253 C=0001 E=7

2304 0011
 2305 1020
 2306 4000
 2307 0261
 2310 0452
 2311 0456
 2312 6040
 2313 0067
 2314 7777
 2315 1020
 2316 0001

CLR
 LDA+20
 4000
 ROL+20+1
 LZE
 LSKP
 CPHLT
 SET+20+7
 7777
 LDA+20
 0001

/ROL FAILED LINK = 0

2317 1140
 2320 0007
 2321 0452
 2322 0456
 2323 6040
 2324 1460
 2325 0001
 2326 6040

ADM
 0007
 LZE
 LSKP
 CPHLT
 SAE+20
 0001
 CPHLT

/ADM CHANGED LINK
 /ADM FAILED A=7777 B=0001 C=0001 E=7

2327 0011
 2330 1020
 2331 0001
 2332 0321
 2333 0452
 2334 0456
 2335 6040
 2336 0067
 2337 5252
 2340 1020
 2341 5252
 2342 1140
 2343 0007
 2344 0452
 2345 0456
 2346 6040
 2347 1460
 2350 2525
 2351 6040

CLR
 LDA+20
 0001
 ROR+20+1
 LZE
 LSKP
 CPHLT
 SET+20+7
 5252
 LDA+20
 5252
 ADM
 0007
 LZE
 LSKP
 CPHLT
 SAE+20
 2525
 CPHLT

/ROR FAILED L=0
 /ADM CHANGED LINK L=1
 /ADM FAILED A=5252 B=5252 C= E=7
 /FLO FAILED FLO=1

2352 0454
 2353 6040

FLO
 CPHLT

/ADM I=0 B=X
 /ADM I=0 B=X OPERAND ADDRESS IS IN THE B REGISTER

2354 0011
 2355 0066
 2356 7777
 2357 0067
 2360 0006
 2361 1020
 2362 0001
 2363 1147
 2364 1460
 2365 0001
 2366 6040
 2370 0006
 2371 1460
 2372 0001
 2373 6040

CLR
 SET+20+6
 7777
 SET+20+7
 0006
 LDA+20
 0001
 ADM+7
 SAE+20
 0001
 CPHLT
 LDA
 0006
 SAE+20
 0001
 CPHLT

/ADM FAILED
 /ADM FAILED A=7777 B=0001 C=0001 E=6,7

2374 0011
 2375 0066

CLR
 SET+20+6

2376	2525	2525	
2377	0067	SET+20+7	
2400	0006	0006	
2401	1020	LDA+20	
2402	5253	5253	
2403	1147	ADM+7	
2404	1460	SAE+20	
2405	0001	0001	
2406	6040	CPHLT	
/ADM FAILED A=2525 B=5253 C=0001 E=6,7			
2407	0011	CLR	
2410	1020	LDA+20	
2411	4000	4000	
2412	0261	ROL+20+1	
2413	0452	LZE	
2414	0456	LSKP	
2415	6040	CPHLT	
2416	0066	SET+20+6	
2417	7777	7777	
2420	0067	SET+20+7	
2421	0006	0006	
2422	1020	LDA+20	
2423	0001	0001	
2424	1147	ADM+7	
2425	0452	LZE	
2426	0456	LSKP	
2427	6040	CPHLT	
2430	1460	SAE+20	
2431	0001	0001	
2432	6040	CPHLT	
2433	1020	LDA	
2434	0006	0006	
2435	1460	SAE+20	
2436	0001	0001	
2437	6040	CPHLT	
/ADM I=1 B=0			
/ADM I=1 B=0 OPERAND IS IN THE NEXT LOCATION			
2440	0011	CLR	
2441	1020	LDA+20	
2442	0001	0001	
2443	1040	STA	
2444	0450		+4=2000
2445	1020	LDA+20	
2446	7776	7776	
2447	1160	ADM+20	
2450	0001	0001	
2451	1460	SAE+20	
2452	7777	7777	
2453	6040	CPHLT	
/ADM FAILED A=7776 B=0001 C=0001 E=6,7			
2454	1000	LDA	
2455	0450	I=2005	
2456	1460	SAE+20	

/ADM FAILED A=7776 B=0001 C=7777

2457 7777
2460 6040
2461 0011
2462 1020
2463 0001
2464 1040
2465 0471

/ADM FAILED TO CHANGE DATA

,+4-2000

2466 1020
2467 7777
2470 1160
2471 0001
2472 1460
2473 0001
2474 6040

/ADM FAILED A=7777 B=0001 C=0001

2475 1000
2476 0471
2477 1460
2500 0001
2501 6040

/ADM FAILED

,+4-2000

2502 0011
2503 1020
2504 5253
2505 1040
2506 0512
2507 1020
2510 2525
2511 1160
2512 5253
2513 1460
2514 0001
2515 6040

/ADM FAILED A=2525 B=5253 C=0001

2516 1000
2517 0512
2520 1460
2521 0001
2522 6040

/ADM FAILED

2523 0011
2524 1020
2525 2525
2526 1040
2527 0533
2530 1020
2531 5252
2532 1160
2533 2525
2534 1460
2535 7777

,+4-2000

CLR
LDA+20
2525
STA
LDA+20
5252
ADM+20
2525
SAE+20
7777

LDA
2005
SAE+20
0001
CPHLT

CLR
LDA+20
5253
STA
LDA+20
2525
ADM+20
5253
SAE+20
0001
CPHLT

LDA+20
7777
ADM+20
0001
SAE+20
0001
CPHLT

CLR
LDA+20
0001
STA

/POP-12 SYSTEM EXERCISER

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/ADM FAILED A=5252 B=2525 C=7777

2536 6040

CPHLT

LDA
L=2005
SAE+20
7777
CPHLT

2537 1000
2540 0533
2541 1460
2542 7777
2543 6040

/ADM FAILED

CLR
LDA+20
2526
STA

2544 2011
2545 1020
2546 2526
2547 1040
2550 0554

,+4=2000

LDA+20
5252
ADM+20
2526
SAE+20
0001
CPHLT

2551 1020
2552 5252
2553 1160
2554 2526
2555 1460
2556 0001
2557 6040

/ADM FAILED A=5252 B=2526 C=0001

LDA
L=2005
SAE+20
0001
CPHLT

2560 1000
2561 0554
2562 1460
2563 0001
2564 6040

/ADM FAILED

/ADM I=1 B=X
/ADM I=1 B=X OPERAND ADDRESS =1 IS IN THE B REGISTER

CLR
SET+20+7
0005
SET+20+6
7776
LDA+20
0001
ADM+20+7
SAE+20
7777
CPHLT

2565 0011
2566 0067
2567 0005
2570 0066
2571 7776
2572 1020
2573 0001
2574 1167
2575 1460
2576 7777
2577 6040

/ADM FAILED A=7776 B=0001 C=7777 E=6,7

LDA
0006
SAE+20
7777
CPHLT

2600 1000
2601 0006
2602 1460
2603 7777
2604 6040

/ADM FAILED

CLR
SET+20+7
0016
SET+20+17
7776
LDA+20

2605 0011
2606 0057
2607 0016
2610 0077
2611 7776
2612 1020

2613 2001
 2614 1167
 2615 1460
 2616 7777
 2617 6040
 2620 1000
 2621 0017
 2622 1460
 2623 7777
 2624 6040
 2625 0011
 2626 0067
 2627 0016
 2630 0077
 2631 2525
 2632 1020
 2633 5252
 2634 1167
 2635 1460
 2636 7777
 2637 6040

/ADM FAILED A=7776 B=0001 C=7777 E=7,17

/ADM FAILED

/ADM FAILED A=2525 B=5252 C=7777 E=7,17

/ADM FAILED

/ADM FAILED A=5252 B=2526 C=0001 E=7,17

/ADM FAILED

/LAM I=0 B=0
 /LAM I=0 B=0 OPERAND ADDRESS IS IN THE NEXT LOCATION

2665 0011
 2666 1020

CLR
 LDA+20

0001
 ADM+20+7
 SAE+20
 7777
 CPHLT
 LDA
 0017
 SAE+20
 7777
 CPHLT
 CLR
 SET+20+7
 0016
 SET+20+17
 2525
 LDA+20
 5252
 ADM+20+7
 SAE+20
 7777
 CPHLT
 LDA
 0017
 SAE+20
 7777
 CPHLT

CLR
 SET+20+7
 0016
 SET+20+17
 5252
 LDA+20
 2526
 ADM+20+7
 SAE+20
 0001
 CPHLT
 LDA
 0017
 SAE+20
 0001
 CPHLT

2645 0011
 2646 0067
 2647 0016
 2650 0077
 2651 5252
 2652 1020
 2653 2526
 2654 1167
 2655 1460
 2656 0001
 2657 6040
 2660 1000
 2661 0017
 2662 1460
 2663 0001
 2664 6040

2667 4000
 2670 0261
 2671 0067
 2672 6517
 2673 1020
 2674 3743
 2675 1200
 2676 0007
 2677 1460
 2700 2463
 2701 6040
 2702 0474
 2703 6040

4000
 ROL+20+1
 SET+20+7
 6517
 LDA+20
 3743
 LAM
 0007
 SAE+20
 2463
 CPHLT
 FLO+20
 CPHLT

/LAM FAILED AC SHOULD = 2463
 /FLO FAILED FLO=0

2704 2452
 2705 2456
 2706 6040

LZE
 LSKP
 CPHLT

/LINK SHOULD = 1

2707 1000
 2710 0007
 2711 1460
 2712 2463
 2713 6040

LDA
 0007
 SAE+20
 2463
 CPHLT

/LAM FAILED TO MODIFY LOCATION 7

2714 0011
 2715 0067
 2716 5253
 2717 1020
 2720 2525
 2721 1200
 2722 0007
 2723 1460
 2724 0000
 2725 6040
 2726 0452
 2727 0456
 2730 6040
 2731 1000
 2732 0007
 2733 1460
 2734 0000
 2735 6040

CLR
 SET+20+7
 5253
 LDA+20
 2525
 LAM
 1200
 SAE+20
 0000
 CPHLT
 LZE
 LSKP
 CPHLT
 LDA
 0007
 SAE+20
 0000
 CPHLT
 /CHANGE FIELDS

/LAM FAILED AC SHOULD BE 0000

/LINK SHOULD BE SET

/LAM FAILED TO MODIFY CORRECT ADDRESS

2736 0002
 2737 5175

PDP
 JMP
 CPOUT

/TC58 FILIT ROUTINE FILLS THE IC58 BUFFER WITH THE NUMRER ENTERED IN
/THE AC, EXIT WITH A CLEAR AC

```

2740 0000 FILIT, 0
2741 3363 DCA FILSV1 /SAVE AC
2742 6201 CDF 0 /GET FIELD
2743 1762 TAD I LTCFLD /ADD 6201
2744 1770 TAD I LCDFX /SAVE IT
2745 3346 DCA +1 /CHANGE TO THAT FIELD
2746 6211 CDF 10 /GET #200
2747 1366 TAD FT7600 /SET UP A COUNT
2750 3364 DCA FILSV2 /GET CURRENT ADDRESS POINTER
2751 1367 TAD FTCBF /SAVE IT
2752 3365 DCA FILSV3 /GET GOOD DATA
2753 1363 TAD FILSV1 /SAVE IT IN THE NEW FIELD
2754 3765 DCA I FILSV3 /INCREMENT ADDRESS
2755 2365 ISZ FILSV3 /FINISHED 200 WORDS ?
2756 2364 ISZ FILSV2 /NO, MORE TO DO
2757 5353 JMP CDF 0 /YES, RETURN TO FIELD 0
2760 6203 C/JF CDF 0
2761 5740 JMP I FILIT

2762 7140 LTCFLD, TCFLD
2763 0000 FILSV1, 0
2764 0000 FILSV2, 0
2765 0000 FILSV3, 0
2766 7600 FT7600, 7600
2767 0000 FTCBF, TCBUFF
2770 0075 LCDFX, CDFX

3000 3000 *3000
/TC58 BUFFER +200 WORDS LONG

3000 0000 TCBUFF, 0

```

3200 *3200

/SELECT BETWEEN LP08 AND LP12, DETERMINE TO START OR INHIBIT,
/LP08-LP12 STARTUP ROUTINE

```

3200 7300          CLA CLL
3201 1260          TAD          KLPJMP
3202 3661          DCA I       LPTC5
3203 1111          TAD          AK212
3204 6666          6666
3205 6665          NOP
3206 7000          CIF CDF 0
3207 6203          JMP I      ,+1
3210 5611          0
3211 0000          ST1,
3212 7300          CLA CLL
3213 6201          CDF 0
3214 1250          TAD          KSETTP
3215 3652          DCA I       ASETTP
3216 3013          DCA I       13
3217 6141          LINC
3220 0517          LSW
3221 0267          ROL+20 7
3222 0002          PDP
3223 7510          SPA
3224 5207          JMP
3225 7430          SZL
3226 5243          JMP
3227 6662          6662
3230 2013          ISZ
3231 5230          JMP
3232 6661          6661
3233 5200          JMP
3234 7300          CLA CLL
3235 1654          TAD I
3236 3655          DCA I       AKACR
3237 1246          TAD          AST3X
3240 3656          DCA I       KLPOT
3241 1251          TAD          ALPOUT
3242 3653          DCA I       K6651
3243 1247          TAD          LSETTP
3244 3657          DCA I       M206
3245 5200          JMP          AULINE
3246 2231          KLPOT,   LP12P
3247 7572          M206,   -206
3250 2250          KSETTP,  LST0
3251 6651          K6651,  6651
3252 2200          ASETTP,  LPEX
3253 2207          LSETTP,  SETTP+1
3254 2247          AKACP,   KACR
3255 2271          AST3X,  LST4
3256 2222          ALPOUT,  LPOUT
3257 2327          AULINE,  FULINE
3260 4574          KLPJMP,  JMS I
3261 0730          LPTC5,  PTC5

```

```

/SET UP RETURN JUMP
/LOCATION
/GET A 0212
/PRINT IT
/ENABLE LP08 INTERRUPTS
/EXIT TO FIELD 0
/ENTER HERE

/RESET A COUNT LOCATION
/GET LEFT SWITCHES
/MOVE LEFT 7
/BIT 0 SET ?
/YES, EXIT
/132 COLUMN LP08 ONLY ?
/CLEAR LP12 BUFFER [FUN AND GAMES ]
/DELAY
/FLAG ? IF NO FLAG LP08 OR NO PRINTER
/LP08 OR NO PRINTER
/LP12 CHANGE SOME LOCATIONS
/132 COLUMN LP08 OR LP12

```

PATC3

*3400 /A,I,P; BUFFER +100 LOCATIONS

3400 0000 BUFFER, 0
 3530 *3530

3530 0000 APT, 0
 3531 0000 0
 3532 0000 0
 3533 0000 0
 3534 0000 0
 3535 0000 0
 3536 0000 0
 3537 0000 0

3540 0000 IR, 0
 3541 0000 0
 3542 0000 0
 3543 0000 0
 3544 0000 0
 3545 0000 0
 3546 0000 0
 3547 0000 0

3550 0000 BASE, 0
 3551 0000 0
 3552 0000 0000
 3553 0001 0001
 3554 0000 2000
 3555 0000 0000
 3556 7776 7776
 3557 0002 0002
 3560 0000 0000
 3561 0001 0001
 3562 5777 5777
 3563 7777 7777
 3564 0000 0000
 3565 0000 0000
 3566 0000 0000
 3567 0000 0000
 3570 0000 0000
 3571 0000 0000
 3572 0000 0000
 3573 0000 0000
 3574 0000 0000
 3575 0007 0007
 3576 0002 0002
 3577 0000 0000
 3600 3000 3000
 3601 2000 2000
 3602 2000 2000
 3603 0000 0000
 3604 0000 0000

BASA,

3605 0000
 3606 0000
 3607 0001
 3610 3626
 3611 0030
 3612 3777
 3613 7777

/FPP-12 INSTRUCTION CODE

3614 0002	FPPRG1	FCLR
3615 0005		STARTF
3616 1011		JGE 1
3617 3621		+2
3620 0000		FEXIT
3621 1021		JLE 1
3622 3624		+2
3623 0000		FEXIT
3624 7212		FLDA 212
3625 0007		JAC
3626 0002	TJAC,	FCLR
3627 0006		STARTD
3630 0005		STARTF
3631 0201		FLDA 201
3632 1061		JGT 1
3633 3635		+2
3634 0000		FEXIT
3635 4201		FMUL 201
3636 3201		FDIV 201
3637 2041		FNOP
3640 2201		FSUB 201
3641 6204		FSTR 204
3642 0002		FCLR
3643 0100		LDX 0
3644 0001		1
3645 1101		SETX 1
3646 3540		IR
3647 0030		XTA 0
3650 1041		JNE 1
3651 3653		+2
3652 0000		FEXIT
3653 0110		ADDX 0
3654 7777		7777
3655 0030		XTA 0
3656 1001		JEQ 1
3657 3661		+2
3660 0000		FEXIT
3661 0002		FCLR
3662 0003		FNEG
3663 0020		ATX 0
3664 0002		FCLR
3665 0030		XTA 0
3666 1001		JEQ 1
3667 3671		+2
3670 0000		FEXIT

PAL10

3671 0004
 3672 1121
 3673 3677
 3674 1001
 3675 3703
 3676 0000
 3677 0041
 3700 0041
 3701 1031
 3702 3674
 3703 0213
 3704 1071
 3705 3707
 3706 0000
 3707 0203
 3710 0003
 3711 3201
 3712 6211
 3713 0204
 3714 5211
 3715 2211
 3716 4201
 3717 1207
 3720 2201
 3721 4202
 3722 6204
 3723 3002
 3724 1111
 3725 3550
 3726 1131
 3727 3733
 3730 1031
 3731 3736
 3732 2000
 3733 1031
 3734 3551
 3735 0000
 3736 2203
 3737 1051
 3740 3742
 3741 0000
 3742 0210
 3743 0101
 3744 0027
 3745 0011
 3746 0003
 3747 1001
 3750 3752
 3751 2000
 3752 0207
 3753 6211
 3754 0202
 3755 7211
 3756 3211
 3757 6205

TJSA,

TJSB,

FNORM
 JSA 1
 TJSA
 JEQ 1
 TJSB
 FEXIT
 FNOP
 FNOP
 JA 1
 *6
 FLDA 213
 JAL 1
 +2
 FEXIT
 FLDA 203
 FNEG
 FDIV 201
 FSTR 211
 FLDA 204
 FADD 211
 FLDA 211
 FMUL 201
 FADD 207
 FSUB 201
 FMUL 202
 FSTR 204
 FCLR
 SETB 1
 RASE
 JSR 1
 +4
 JA 1
 +5
 FEXIT
 JA 1
 BASE+1
 FEXIT
 FLDA 203
 JLT 1
 +2
 FEXIT
 FLDA 210
 LOX 1
 0027
 ALN 1
 FNEG
 JEQ 1
 +2
 FEXIT
 FLDA 207
 FSTR 211
 FLDA 202
 FMUL 211
 FLDA 211
 FSTR 205

/PDP-12 SYSTEM EXERCISER

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17-FEB-72

11152

PAGE 51-3

3760 0002
3761 0204
3762 3205
3763 1206
3764 6206
3765 2171
3766 3614
3767 6205
3770 0002
3771 6206
3772 3205
3773 0000

FCLR
FLDA 204
FDIV 205
FADD 206
FSTR 206
JXN 171
PPRPG
FSTR 205
FCLR
FSTR 206
FLDA 205
FEXIT

/

/ 4000-5777 IS THE RF08/DF32 IO BUFFER

/

6020

*6020

/CLOCK SERVICE UPDATE ROUTINE
/CONVERT THE CLOCK TICKS TO DIGITAL NUMBERS
/AND DISPLAY THEM

6020	DDISP,	LDA		/SAVE RETURN ADDRESS
6021	0	STC	DDEX-2000	
6022	LDF	0		/RESET LINC DATA FIELDS
6023	LJMP	,+1		/RESET INTERRUPT ENABLE
6024	LDA+20			
6025	1254	FSF		/RED
6026	446	LSKP		
6027	2456	LJMP	,+2	
6028	6230	CLR		
6029	6011	STC	1	
6030	6034	SET+20	15	
6031	6035	-17		
6032	7761	SET+20	10	
6033	6070	T3-2001		
6034	4477	LDA+20		
6035	1020	400		
6036	2470	STA		
6037	1040	XAXIS=2000		
6038	4114	LJMP	DISPIT	
6039	6131	SET+20	1	
6040	6061	300		
6041	1000	LDA		/GET THE CLOCK VALUE
6042	2031	CLOCK+2000		/ LOCATION
6043	6062	LJMP	SHUFF	
6044	6410	LJMP	X1	
6045	6410	LJMP	X1	
6046	6410	LJMP	X1	
6047	6055	LDA		
6048	2117	ERCNT+2000		
6049	6062	LJMP	SHUFF	
6050	6147	LJMP	DEROR	
6051	1040	STA		
6052	4415	DCKS-2000		
6053	0241	ROL	1	
6054	1540	RCL		
6055	4416	X1-2000		
6056	2417	ADD	G1-4000	
6057	4013	STC	13	
6058	2000	ADD	0	
6059	4130	STC	SHUFEX-2000	

6073	2415	ADD	DCKS=4000
6074	0302	ROR	2
6075	1040	STA	
6076	4415	DCKS=2000	
6077	1540	BCL	
6100	4416	M1=2000	
6101	2417	ADD	G1=4000
6102	4012	STC	12
6103	2415	ADD	DCKS=4000
6104	0301	ROR	1
6105	6142	LJMP	SHFD
6106	4011	STC	11
6107	2415	ADD	DCKS=4000
6110	0304	ROR	4
6111	6142	LJMP	SHFD
6112	4014	STC	14
6113	1020	LDA+20	
6114	0000		
6115	1754	DSC	14
6116	1774	DSC+20	14
6117	6410	LJMP	X1
6120	1751	DSC	11
6121	1771	DSC+20	11
6122	6410	LJMP	X1
6123	1752	DSC	12
6124	1772	DSC+20	12
6125	6410	LJMP	X1
6126	1753	DSC	13
6127	1773	DSC+20	13
6130	6130	LJMP	,
6131	4135	DISPIT, STC	DISAV=2000
6132	2000	ADD	0
6133	4141	STC	DISEX=2000
6134	1020	LDA+20	
6135	0000		
6136	1770	DSC+20	10
6137	0235	XSK+20	15
6140	6134	LJMP	1=4
6141	6141	LJMP	,
6142	0302	ROR	2
6143	1540	BCL	
6144	4416	M1=2000	
6145	2417	ADD	G1=4000
6146	6000	LJMP	0

XAXIS,

SHUFEX,

DISAV,

DISEX,

SHFD,

```

6147 1020 DEROR, LDA+20 /GREEN
6150 1250 ESF
6151 0004 446
6152 0446 LSKP
6153 0456 LJMP
6154 6152 CLR
6155 0011 ADA
6156 1100 CPFLD+2000 /GET AND CONVERT THE DIGITS FOR:
6157 2105 LJMP SHFD /CP
6160 6142 STC 14
6161 4014 ADA
6162 1100 DKFELD+2000 /RK08
6163 2114 LJMP SHFD
6164 6142 STC 13
6165 4013 ADA
6166 1100 DDFELD+2000 /DF32 OR RF08 DISK
6167 2072 LJMP SHFD
6170 6142 STC 12
6171 4012 ADA
6172 1100 FPFELD+2000 /FPP-12
6173 2110 LJMP SHFD
6174 6142 STC 11
6175 4011 STC 1
6176 4001 SET+20 15
6177 0075 -7
6201 0070 SET+20 10 /CP
6202 4515 T4-2001
6203 1020 LDA+20
6204 0300 300
6205 6131 LJMP DISPIT
6206 0061 SET+20 1
6207 0300 300
6210 1754 DSC 14
6211 1774 DSC+20 14 /CP FIELD DIGITS
6212 0011 CLR
6213 4001 STC 1
6214 0075 SET+20 15
6215 7761 -17
6216 0070 SET+20 10
6217 4523 T5-2001 /RK08
6220 1020 LDA+20
6221 0200 200
6222 6131 LJMP DISPIT
6223 0061 SET+20 1
6224 0300 300
6225 1753 DSC 13
6226 1773 DSC+20 13

```

```

6227 2011 CLR
6230 4001 STC
6231 0075 SET+20 15
6232 7761 -17
6233 1000 LDA
6234 2153 DF+2000
6235 0470 AZE+20
6236 6242 LUMP +4
6237 2070 SET+20 10
6240 4557 T7-2001
6241 6244 LUMP +3
6242 2070 SET+20 10
6243 4541 T6-2001
6244 1020 LDA+20
6245 0100 100
6246 6131 LUMP DISPII
6247 0061 SET+20 1
6250 0300 0300
6251 1752 DSC 12
6252 1772 DSC+20 12
6253 0011 CLR
6254 4001 STC
6255 0075 SET+20 15
6256 7755 -23
6257 0070 SET+20 10
6260 4617 T9-2001
6261 6131 LUMP DISPII
6262 0061 SET+20 1
6263 0300 0300
6264 1751 DSC 11
6265 1771 DSC+20 11
6266 0011 CLR
6267 1100 ADA
6270 2113 AIPFLD+2000
6271 6142 LUMP SHFD
6272 4011 STC
6273 4001 STC
6274 0075 SET+20 15
6275 7765 -13
6276 0070 SET+20 10
6277 4703 T11-2001
6300 1020 LDA+20
6301 0700 700
6302 6131 LUMP DISPII
6303 0061 SET+20 1
6304 0300 0300
6305 1751 DSC 11
6306 1771 DSC+20 11
6307 0011 CLR
6310 4001 STC
6311 0075 SET+20 15
6312 7755 -23
6313 0070 SET+20 10
6314 4641 T10-2001
6315 1020 LDA+20

```

/DETERMINE IF RFA8 OR DF32

/FPP-12

/A.I.P.

/KF-12

```

6316 0500
6317 6131
6320 0061
6321 0300
6322 1000
6323 2112
6324 0470
6325 6333
6326 0075
6327 7771
6330 0070
6331 4663
6332 6337
6333 0075
6334 7765
6335 0070
6336 4671
6337 1020
6340 0500
6341 6131
6342 0011
6343 1100
6344 2115
6345 6142
6346 4011
6347 4001
6350 0075
6351 7761
6352 0070
6353 4751
6354 1020
6355 0600
6356 6131
6357 0061
6360 0300
6361 1751
6362 1771
6363 0600
6364 6364

6365 1000
6366 0000
6367 4007
6370 1020
6371 1254
6372 0004
6373 0446
6374 0456
6375 6373
6376 0061
6377 0550
6400 0075
6401 7755
6402 0070

500
LJMP DISPIT
SET+20 1
300
LDA
API+2000
AZE+20
LJMP ADEXA
SET+20 15
-7
SET+20 10
T13-2001
LJMP DAEX
SET+20 15
-13
SET+20 10
T14-2001
LDA+20
500
LJMP DISPIT
CLR
ADA
TCFDL+2000
LJMP SHFD
STC 11
STC 1
SET+20 15
-17
SET+20 10
T15-2001
LDA+20
600
LJMP DISPIT
SET+20 1
300
DSC 11
DSC+20 11
LIF 0
LJMP
DDEX,

DAXER,
LDA
STC
LDA+20
1254
ESF
446
LSKP
LJMP
SET+20 1
550
SET+20 15
-23
SET+20 10

DDEX,
DDEX+2000
/RED

```

6403	4575	T8-2001	
6404	0011	CLR	
6405	6131	LJMP	DISPIT
6406	0000	LIF	0
6407	6407	LJMP	,
		DXEX,	
6410	1760	DSC+20	
6411	0000	0000	
6412	1760	DSC+20	
6413	0000	0000	
6414	6000	LJMP	0
6415	0000	0000	
6416	7761	7761	
6417	4456	T2-2000	
6420	6141	LINC	
6421	1020	LDA+20	
6422	0214	214	
6423	0004	ESF	
6424	0446	446	
6425	0456	LSKP	
6426	6424	LJMP	,=2
6427	0011	CLR	
6430	0061	SET+20	1
6431	0240	0240	
6432	0075	SET+20	15
6433	7743	-35	
6434	0070	SET+20	10
6435	4715	T12-2001	
6436	6131	LJMP	DISPIT
6437	0415	KST	
6440	6427	LJMP	REAL1
6441	0500	IOB	
6442	0036	KRB	
6443	0500	IOB	
6444	6046	TLS	
6445	1460	SAE+20	
6446	0331	0331	
6447	6427	LJMP	REAL1
6450	0002	PDP	
6451	6041	TSF	
6452	5251	JMP	,=1
6453	6203	CIF	0
6454	5655	JMP	I ,+1
6455	7400	MESSG	

T2,

6456 4136
 6457 3641
 6460 2101
 6461 0177
 6462 4523
 6463 2151
 6464 4122
 6465 2651
 6466 2414
 6467 0477
 6470 5172
 6471 0651
 6472 1506
 6473 4225
 6474 4443
 6475 6050
 6476 0000
 6477 0000

4136
 3641
 2101
 0177
 4523
 2151
 4122
 2651
 2414
 0477
 5172
 0651
 1506
 4225
 4443
 6050
 0000
 0000

T3,

6500 4040
 6501 4077
 6502 0000
 6503 0000
 6504 7741
 6505 0041
 6506 0000
 6507 0000
 6510 3077
 6511 7730
 6512 0000
 6513 0000
 6514 4577
 6515 4145

4040
 4077
 0000
 0000
 7741
 0041
 0000
 0000
 3077
 7730
 0000
 0000
 4577
 4145

T4,

6516 4136
 6517 2241
 6520 0000
 6521 0000
 6522 4477
 6523 3044

4136
 2241
 0000
 0000
 4477
 3044

T5:
 6524 4477
 6525 3146
 6526 0000
 6527 0000
 6530 1077
 6531 4324
 6532 0000
 6533 0000
 6534 4136
 6535 3641
 6536 0000
 6537 0000
 6540 5126
 6541 2651

PAL10
 4477
 3146
 0000
 0000
 1077
 4324
 0000
 0000
 4136
 3641
 0000
 0000
 5126
 2651

/RF08

T6:
 6542 4477
 6543 3146
 6544 0000
 6545 0000
 6546 4477
 6547 4044
 6550 0000
 6551 0000
 6552 4136
 6553 3641
 6554 0000
 6555 0000
 6556 5126
 6557 2651

4477
 3146
 0000
 0000
 4477
 4044
 0000
 0000
 4136
 3641
 0000
 0000
 5126
 2651

T7:
 6560 4177
 6561 3641
 6562 0000
 6563 0000
 6564 4477
 6565 4044
 6566 0000
 6567 0000
 6570 4122
 6571 2651
 6572 0000
 6573 0000
 6574 4523
 6575 2151

4177
 3641
 0
 0
 4477
 4044
 0000
 0
 4122
 2651
 0
 0
 4523
 2151

/DF32

/ERROR

T8,

T9,

/FPP-12

ADDRESS	EXERCISER	PAL10	V141	17-FEB-72	11:52	PAGE 5A
6576	4577	4577				
6577	4145	4145				
6600	0000	0				
6601	0000	0				
6602	4477	4477				
6603	3146	3146				
6604	0000	0				
6605	0000	0				
6606	4477	4477				
6607	3146	3146				
6610	0000	0				
6611	0000	0				
6612	4136	4136				
6613	3641	3641				
6614	0000	0				
6615	0000	0				
6616	4477	4477				
6617	3146	3146				
6620	4477	4477				
6621	4044	4044				
6622	0000	0000				
6623	0000	0				
6624	4477	4477				
6625	3044	3044				
6626	0000	0				
6627	0000	0				
6630	4477	4477				
6631	3044	3044				
6632	0000	00				
6633	0000	0				
6634	2101	2101				
6635	0177	0177				
6636	0000	0				
6637	0000	0				
6640	4523	4523				
6641	2151	2151				

/KF12

T10,

6642 1077
 6643 4324
 6644 0000
 6645 0000
 6646 4477
 6647 4044
 6650 0000
 6651 0000
 6652 2101
 6653 0177
 6654 0000
 6655 0000
 6656 4523
 6657 2151
 6660 0000
 6661 0000
 6662 5177
 6663 2651
 6664 4177
 6665 7741
 6666 0000
 6667 0000
 6670 3077
 6671 7706

PAL10 1077
 4324
 0
 4477
 4044
 0
 2101
 0177
 0
 4523
 2151
 0
 5177
 2651
 4177
 7741
 0
 3077
 7706

T13,

6672 4177
 6673 7741
 6674 0000
 6675 0000
 6676 4477
 6677 4044
 6700 0000
 6701 0000
 6702 4477
 6703 4044

4177
 7741
 0
 0
 4477
 4044
 0
 0
 4477
 4044

/OFF

T11,

6704 4477
 6705 7744
 6706 0000
 6707 0000
 6710 7741
 6711 0041
 6712 0000
 6713 0000
 6714 4477
 6715 3044

4477
 7744
 0
 0
 7741
 0041
 0
 0
 4477
 3044

/A,I,P,

T12,

6716 4477
 6717 3146
 6720 0000
 6721 0000
 6722 4577
 6723 4145
 6724 0000
 6725 0000

4477
 3146
 0
 0
 4577
 4145
 0
 0

/REALLY ?

6726	4477	4477
6727	7744	7744
6730	0000	0
6731	0000	0
6732	0177	0177
6733	0301	0301
6734	0000	0
6735	0000	0
6736	0177	0177
6737	0301	0301
6740	0000	0
6741	0000	0
6742	0770	0770
6743	7007	7007
6744	0000	0
6745	0000	0
6746	0000	0
6747	0000	0
6750	4020	4020
6751	2055	2055

6752	4040	4040
6753	4077	4077
6754	0000	0
6755	0000	0
6756	4136	4136
6757	2241	2241
6760	0000	0
6761	0000	0
6762	5172	5172
6763	0651	0651
6764	0000	0
6765	0000	0
6766	5126	5126
6767	2651	2651

/TC58

/LINC INSTRUCTION DEFINITIONS

2000	ADD=2000
1100	ADA=1100
1140	ADM=1140
1200	LAM=1200
1000	LDA=1000
4000	STC=4000
1040	STA=1040
0240	ROL=0240
0300	ROR=0300
0011	CLR=0011
0040	SET=0040
6000	LJMP=6000
0006	DJR=0006
0004	ESF=0004
1540	RCL=1540
1600	BSE=1600
0017	COM=0017
1440	SAE=1440
0440	SNS=0440
0456	LSKP=0456
0450	AZE=0450
0451	APO=0451
0452	LZE=0452
0200	XSK=0200
0014	ATR=0014
0015	RTA=0015
0100	SAM=0100
1740	DSC=1740
0516	RSW=0516
0517	LSW=0517
0500	IOB=0500
0600	LIF=0600
0640	LDF=0640
0706	WRI=0706
0704	WRC=0704
0707	CHK=0707
0001	AXO=0001
0023	TMA=0023
0416	STD=0416
0002	PDP=0002
0454	FLO=0454
1640	BCO=1640
1500	SRO=1500
1300	LDM=1300
1340	STH=1340
6141	LINC=6141
0415	KST=0415
0003	TAC=0003
6557	FPIST=6557
6552	FPICL=6552
6553	FPCOM=6553
6555	FPST=6555
6000	FSTR=6000

0002	FCLR=0002
0000	FLDA=0000
4000	FMUL=4000
3000	FDIV=3000
2000	FSUB=2000
0003	FNEG=0003
1000	FADD=1000
0000	JXN=2000
0000	FEXIT=0000
6733	DLDR=6733
6735	DLDW=6735
6732	DLDC=6732
6753	DLWC=6753
6755	DLCA=6755
6741	DRDS=6741
6742	DCLS=6742
6745	DSKD=6745
6747	DSKE=6747
6751	DCLA=6751
6743	DMNT=6743
6734	DRDA=6734
6002	IOF=6002
6001	ION=6001
6301	SCH=6301
6302	LCH=6302
6307	SBF=6307
6006	APION=6006
6771	RESTOR=6771
6772	SETLEV=6772
6774	RSTACK=6774
6776	SETSTK=6776
6777	SETVEC=6777
0041	FNOP=0041
5000	FADDM=5000
7000	FMULM=7000
1070	JAL=1070
1110	SETB=1110
1130	JSR=1130
1030	JA=1030
1050	JLT=1050
0010	ALN=0010
1000	JEQ=1000
0100	LDX=0100
1100	SETX=1100
0030	XTA=0030
1040	JNE=1040
0110	ADDX=0110
0020	ATX=0020
0004	FNORM=0004
1120	JSA=1120
0005	STARTF=0005
0006	STARTD=0006
0007	JAC=0007
1020	JLE=1020
1010	JGE=1010

/PDP-12 SYSTEM EXERCISER

PAL10

V141

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1060
6643
6615

JGT=1060
DXAL=6643
DML=6615

ADDRESS	OPERATION	STATUS	ADDRESS	OPERATION	STATUS	ADDRESS	OPERATION	STATUS
A0010	ADD	0010	DCBAD	DCBAD	7216	FAILED	0150	
A0011	ADD	2713	DCKS	DCKS	6415	FCLR	0002	
A0014	ADD	2714	DCLA	DCLA	6751	FDIR	3000	
A1000	ADD	2715	DCLS	DCLS	6742	FEXIT	0000	
A1001	ADD	2716	DCSAV2	DCSAV2	7301	FPPELD	0110	
A7000	ADD	2605	DCSAV3	DCSAV3	7302	FILIT	2740	
AAFDD	ADD	0110	DCSAV4	DCSAV4	7303	FILSV1	2763	
ACDFX	ADD	0106	DCST	DCST	2332	FILSV2	2764	
ACHTOT	ADD	2707	DCSTAT	DCSTAT	7277	FILSV3	2765	
ACKNT	ADD	0107	DDEX	DDEX	6364	FINOP	2157	
ACNT	ADD	0104	DDFELD	DDFELD	0072	FINXP	0130	
ACPFDD	ADD	0105	DDISP	DDISP	6020	FLO	0000	
ACRLF	ADD	2237	DEROR	DEROR	6147	FLO	0454	
ADA	ADD	1100	DF	DF	0153	FMUL	4000	
ADD	ADD	2000	DF325	DF325	0147	FMULM	7000	
ADXX	ADD	0110	DFATA	DFATA	1162	FNEG	0003	
ADEXA	ADD	6333	DFBAD	DFBAD	1151	FNOP	0041	
ADM	ADD	1140	DFST1	DFST1	1512	FNORM	0004	
AERROR	ADD	0747	DFST2	DFST2	1532	FORG	1340	
AFDD	ADD	1163	DIML	DIML	1535	FPBAD	1652	
AFEA	ADD	0100	DISAV	DISAV	6615	FPBFLD	1653	
AIP	ADD	2600	DISEX	DISEX	6135	FPCOM	6553	
AIP1	ADD	2617	DISPCH	DISPCH	6141	FPELD	1751	
AIPFLD	ADD	0113	DISPIT	DISPIT	6131	FPGOOD	1651	
AIPST	ADD	2657	DJR	DJR	0006	FPICL	6552	
AK007	ADD	0103	DKFELD	DKFELD	0114	FPPRG	3614	
AK212	ADD	0111	DLCA	DLCA	6755	FPST	6555	
AKACR	ADD	3254	DLDC	DLDC	6732	FPTIME	0125	
AKDD	ADD	0067	DLDR	DLDR	6733	FSAPP	0157	
ALN	ADD	0010	DLDM	DLDM	6735	FSAPPL	0160	
ALPOUT	ADD	3256	DLWC	DLWC	6753	FSTR	6000	
API	ADD	0112	DMNT	DMNT	6743	FSUB	2000	
APION	ADD	6006	DRANG	DRANG	0065	F77600	2766	
APISI	ADD	1543	DRDS	DRDS	6734	FTCBF	2767	
APD	ADD	0451	DSC	DSC	6741	FUDG1	1130	
APT	ADD	3530	DSKE	DSKE	6747	FUDGE1	1537	
APTIME	ADD	0124	DWCA	DWCA	1160	FULINE	2327	
ARKBAD	ADD	2407	DXAL	DXAL	6643	G1	0073	
ASETTP	ADD	3252	DXER	DXER	6365	GET	6417	
ASIX	ADD	3255	DXEX	DXEX	6407	GETRAN	2037	
ASICH	ADD	2711	ERCNT	ERCNT	0117	GETSAV	2073	
ASIFPP	ADD	1752	ERROR	ERROR	0145	GODC	7263	
ATR	ADD	0014	ESF	ESF	0004	GOOD	0151	
ATX	ADD	0020	EXT1	EXT1	0247	GROUP	7276	
AULINE	ADD	3257	EXT2	EXT2	0256	HALFX	0527	
AXO	ADD	0001	EXT4	EXT4	0264	HALFY	0530	
AZE	ADD	0450	EXTJND	EXTJND	0217	HBAD	1460	
BAD	ADD	0152	FADD	FADD	1000	HFLD	1461	
BADFLD	ADD	0116	FADDM	FADDM	5000	HGOOD	1457	
BASA	ADD	3573						
BASE	ADD	3550						
BCL	ADD	1540						

HSR	1456	PAL10	V141	17-FEB-72	1152	M1	6416
HSR	1462	K240	0704	LCH	6302	M10	0121
HSREA	1502	K2525	0036	LDA	1000	M1000	0121
HSRST	7543	K260	7300	LDCST	1366	M12	0126
HSRSV	7565	K3000	1565	LDF	0640	M206	3247
HSRTS	0163	K3040	1566	LDH	1300	M3	2706
INCR	0314	K3700	0107	LDX	0100	M400	2421
INCR	0321	K3777	0060	LFLIT	7171	M5	2172
INTRP	1656	K4000	0550	LGETR	0111	MAGTAP	0055
INTRPT	0057	K4777	0061	LGDDC	2363	MASSER	0022
IOB	0500	K5252	0021	LGROUP	2362	MESSG	7400
IOF	6002	K6651	3251	LIF	0600	MINS	6125
ION	6001	K6777	2561	LINC	6141	MINT	6115
IR	3540	K7377	2562	LIRB	0161	ML400	0451
IW	1507	K7760	7304	LJ58	6000	MTC	7167
JA	1030	K7777	0020	LL58	2766	MTE	0470
JAC	0007	KACR	2247	LLAST	7564	MTGO	6722
JAL	1070	KCIDF	0106	LP08P	2233	MTINST	0472
JEG	1000	KDXAL	1541	LP12P	2231	MTKF	6123
JEG	1010	KFP1	1741	LPATC0	0056	MTLC	6716
JGT	1060	KFP2	1742	LPEX	2326	MPLS	6126
JGT	1060	KFP3	1743	LPNOP	2200	MTON	6117
JLE	1020	KFP5	1744	LPOUT	2232	MTPF	6113
JLT	1050	KFP6	1745	LPSTCH	2325	MTRS	6706
JNE	1040	KFP8	1746	LPTC1	1542	MSET	0452
JSA	1120	KFP9	1747	LPTC2	0131	MSET	6121
JSR	1130	KILLIT	0035	LPTC3	1655	MTR	6721
JXN	2000	KJMPAP	2720	LPTC4	2721	MWC	7170
K000	0035	KJMPDF	1540	LPTC5	3261	NRDK	0101
K0006	2566	KJMPFF	1654	LPTC6	0133	OCT	0647
K0007	0074	KJMPTC	0135	LPTC7	0164	OCTE	0670
K0010	2321	KLPJMP	3260	LREAL	0162	PASS	0033
K0017	0034	KLPOT	3246	LSETTP	3253	PATC1	0170
K0020	2361	KNOP	1411	LSKP	0456	PATC10	0177
K0030	7162	KP0007	0023	LST0	2250	PATC2	0171
K0037	1564	KPT2	0132	LST1	2253	PATC3	0174
K0040	7161	KPTC9	0134	LST2	2255	PATC4	0175
K0070	2074	KR58	2743	LST3	2257	PATC5	0076
K0100	0036	KSETTP	3250	LST4	2271	PATC6	0077
K0200	0037	KST	0415	LST5	2301	PATC7	0173
K0212	2330	KT7600	7124	LST58	1367	PATC8	0172
K0215	2331	KTCBF	7166	LSTAIIP	1364	PATC9	0176
K0240	2322	KTYBUF	7305	LSTFPP	1365	PATCH	0715
K0260	0663	KW12	1400	LSTKW	1371	PATCH0	0724
K0340	2323	KW12A	1431	LSW	0517	PATCHA	0735
K0400	0155	KW12B	1444	LTC	2744	PATCHB	0743
K0601	0024	KW12C	1447	LTC	2744	PATCHC	0745
K0607	7165	KW12RT	0146	LYCEXE	2762	PDP	0002
K0770	0510	KWST	2364	LTCFLD	2762	PRINTR	0705
K1111	1750	KX0BWD	0511	LYCP	1370	PRT	7415
K1500	2563	LAM	1203	LWLD	0154	PYCH1	0725
K205	0063	LAPI	1363	LZE	0452	PYCH2	0726
K206	0062	LCDFX	2770				

OP-12 SYSTEM EXERCISER

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ERRORS DETECTED: 0

LINKS GENERATED: 0

RUN-TIME: 43 SECONDS

3K CORE USED

