SYSEX startup procedure

RSW 1 set to inhibit A/P test

RSW 3 set to inhibit FPP-12 test

RSW 6-7 highest fixtape unit number to use
Fixtape units must be set 0, 1, 2, ---

RSW 9-11 highest 4K memory field to use

RSW 4 set to inhibit RF/8 test

LSW 7 [illegible]

[illegible]

get 1600 bpi fixtapes on fixtape unit

type: 8 MODE
I/O PRESET
START 20

[illegible]

get good tape with [illegible]

Type "Y"

Use Dial scratch tapes marked w/ 1600_8 blocks (896_{10}). Use MARKOS "B" option to create them. Most of our Dial scratch tapes are 512_{10} blocks (std length) "L" option.

IDENTIFICATION

PRODUCT CODE: MAINDEC-12-D7CD

PRODUCT NAME: PDP-12 SYSTEM EXERCISER

DATE: FEBRUARY 1, 1972

MAINTAINER: DIAGNOSTIC GROUP

AUTHOR: RAYMOND SHOOP

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 EXTENSIVILY 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*

TC58 MAGTAPE MEMORY*

LP08/LP12 LINE PRINTER*

PR12 HIGH SPEED READER*

DC02-F TELETYPE CONTROL*

*OPTIONAL

THIS PROGRAM OCCUPIES MEMORY LOCATIONS 0 0000 TH[illegible]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, [illegible]

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-08-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 KW12A CLOCK OUTPUT CABLE INTO SLOT C15 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 "C" ON THE CONSOLE TO CONTINUE

6, AFTER THE PROGRAM IS STARTED, CHECK THE DISPLAYED MESSAGE
TO INSURE THE DEVICES ARE RUNNING.

CONTROL SWITCH SETTINGS

A, RIGHT SWITCHES

RSW 2 = 1 INHIBIT STARTING KF12B

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 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 KF12B (A,P,I,) IT
BECOMES NECESSARY (IF THE KF12B IS INSTALLED AND ENABLED) 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
AJP-12	4572
FPP-12	4573
LP08/LP12	4574
PR-12	4575
DC02-F	4576
TC58	4577

EXAMPLE: 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	/

1.2 STARTING ADDRESSES

PDP-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,

ALL PROGRAM HALTS OR TYPE-OUTS ARE ERRORS. THE ERR 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 PDP-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 CC01 INTERFACE. THEREFORE IF A CC01 INTERFACE IS INSTALLED, INHIBIT A,I,P, MUST BE SET.

E. DATA ON TAPE BLOCKS 770 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.

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 Ø 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 VR2Ø)

CP! 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,

RK08! THIS IS A TEST OF THE DATA HANDLINE CAPABILITY OF THE RKØ8 DISK CARTRIDGE, THIS PROGRAM EXECUTES A WRITE - READ OPERATION OF 4ØØ OCTAL WORDS LONG ON AN INCREMENTING DISK SECTOR, SURFACE AND DISK ADDRESS, BOTH THE DATA PATTERN AND MEMORY FIELDS ARE OF RANDOM NATURE,

RF08/DF32! THIS IS A TEST OF THE DATA HANDLINE CAPABILITY OF THE RF08/ DF32 DISK MEMORY, THIS PROGRAM EXECUTES A WRITE - READ OPERATION OF 1ØØØ OCTAL WORDS LONG ON AN INCREMENTING DISK EXTENDED ADDRESS, THE DISK ADDRESS, DATA PATTERN AND MEMORY FIELDS ARE RANDOM,

FPP12! [illegible] PLETION 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	ØØ15
M,S,W,	2ØØØ
L,S,W,	ØØØØ

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 A,I,P,

TC58: 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 (BEGINING 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,

TC12: 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 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
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,

[illegible]: THIS ROUTINE WILL HANDLE THE CLOCK FLAGS AND UPDATE THE RUN-TIME
[illegible] ON THE VR20 DISPLAY,

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

8 VR14 (VR20) DISPLAY MESSAGE

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

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

8,3 LIGHT INDICATORS

RF08: DISK ADDRESS SHOULD BE INCREMENTING STARTING WITH 0 UNTIL AN "NXD" ERROR OCCURS. THE DISK "FIELD" BITS WILL BE THE SAME AS THE MEMORY FIELD BEING TESTED. THE BOTTOM ROW OF LIGHTS WILL HAVE "DATA/PARITY" 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 32XY [X=MEMORY FIELD, Y=DRIVE SELECTED].

```
/ CORE LOCATIONS OF FIELD 0
/ 0000-2777                     MAIN PROGRAM
/ 3000-3377                     KF12B (API) VECTORS AND STACK
/ 3400-3777                     TAPE BLOCK PATTERN TABLE
/ 4000-6777                     TAPE INPUT-OUTPUT BUFFER
/ 7000-7177                     TC58 PROGRAM
/ 7200-7377                     DC02-F TELETYPE PROGRAM
/ 7400-7577                     MESSAGE OUTPUT BUFFER
/ 7600-7777                     ****** LOADER *******
/ CORE LOCATIONS OF FIELD 1
/ 0000-2777                     CP BACKROUND PROGRAM
/ 3000-3177                     TC58 BUFFER
/ 3200-3377                     MISC, ROUTINES
/ 3400-3777                     A,I,P, AND FPP BUFFER
/ 4000-4777                     RF08,DF32 DATA WRITTEN
/ 5000-5777                     RF08,DF32 DATA READ
/ 6000-6777                     DISPLAY ROUTINE
/ 7000-7377                     RK08 DATA WRITTEN
/ 7400-7777                     RK08 DATA READ
/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
```

IDENTIFICATION

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PRODUCT NAME: PDP-12 SYSTEM EXERCISER

DATE: FEBRUARY 1, 1972

MAINTAINER: DIAGNOSTIC GROUP

AUTHOR: RAYMOND SHOOP

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 EXTENSIVILY 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 THRU 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 KW12A CLOCK OUTPUT CABLE INTO SLOT C15 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.

4,1 CONTROL SWITCH SETTINGS

A, RIGHT SWITCHES

RSW 0 = 1 INHIBIT STARTING KF12B

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 KF12B (A',P,I',) IT
BECOMES NECESSARY (IF THE KF12B IS INSTALLED AND ENABLED) 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

EXAMPLE: 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

PDP-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 PDP-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 CC01 INTERFACE. THEREFORE IF A CC01 INTERFACE IS INSTALLED, INHIBIT A,I,P, MUST BE SET.

E, DATA ON TAPE BLOCKS 770 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)

CP! 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',

RK08! THIS IS A TEST OF THE DATA HANDLINE 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/DF32! THIS IS A TEST OF THE DATA HANDLINE CAPABILITY OF THE RF08/ 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-12! 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 A 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,

TC58: 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 (BEGINING 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,

TC12: 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 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
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 ITY 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              |
|                                         |
|                                         |
+-----------------------------------------+
```

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

8,3 LIGHT INDICATORS

RF08: DISK ADDRESS SHOULD BE INCREMENTING STARTING WITH 0 UNTIL AN "NXD" 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

                        /
                        /
                        /
                        /
                        /
                        /
                        / RF08,DF32,RK08,LP08,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                     MAIN PROGRAM
                / 3000-3377                     KF12B (API) VECTORS AND STACK
                / 3400-3777                     TAPE BLOCK PATTERN TABLE
                / 4000-6777                     TAPE INPUT-OUTPUT BUFFER
                / 7000-7177                     TC58 PROGRAM
                / 7200-7377                     DC02-F TELETYPE PROGRAM
                / 7400-7577                     MESSAGE OUTPUT BUFFER
                / 7600-7777                     ****** LOADER *******
                / CORE LOCATIONS OF FIELD 1
                / 0000-2777                     CP BACKROUND PROGRAM
                / 3000-3177                     TC58 BUFFER
                / 3200-3377                     MISC. ROUTINES
                / 3400-3777                     A,I,P, AND FPP BUFFER
                / 4000-4777                     RF08,DF32 DATA WRITTEN
                / 5000-5777                     RF08,DF32 DATA READ
                / 6000-6777                     DISPLAY ROUTINE
                / 7000-7377                     RK08 DATA WRITTEN
                / 7400-7777                     RK08 DATA READ
                /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  5042              JMP     TSTMOR+1
0002  0000    XXXAC,    0000                    /TYPE OUT POINTER
                0020    *20
0020  6213              CIF CDF 10              /THE ONLY STARTING ADDRESS OF THE PROGRAM
0021  5562              JMP I   LREAL           /WHEN "Y" IS TYPED, RETURN TO LOCATION "WORLD"


                        /STORAGE AREA FOR SOME COMMONLY USED VARIABLES
0022  0000    MASTER,   0                       /MASTER WORD
0023  0000    WD1,      0                       /WORD1
0024  0000    TCTIME,   0
0025  0000    WD3,      0                       /WORD3
0026  0000    WD4,      0                       /WORD4
0027  0000    UNIT,     0                       /UNIT BITS (IN 6,7,8)
0030  0000    XQBWD,    0                       /EXTENDED OPERATIONS BUFFER WORD
0031  0000    CLOCK,    0000
0032  0000    QNBN,     0                       /QUARTER NUMBER, BLOCK NUMBER SAVE
0033  0000    PASS,     0                       /PASS COUNT
0034  0017    K0017,    0017
0035  0000    KILLIT,   0
0036  0100    K0100,    100
0037  0200    K0200,    200


                        /LINC INTERRUPT HANDLER

                0040    *40
0040  0000              0
0041  0002    TSTMOR,   PDP                     /CHANGE TO PDP-8 MODE
0042  7340              CLA CLL CMA
0043  3057              DCA     INTRPT          /SET INTERRUPT FLAG
0044  1036              TAD     K0100
0045  6151              6151                    /SKIP IF TAPE DONE SET
0046  5456              JMP I   LPATC0          /NOT THE TAPE TRY OTHERS
0047  7200              CLA
0050  1037              TAD     K0200
0051  6151              6151                    /CLEAR TAPE DONE
0052  7200              CLA
0053  3057              DCA     INTRPT          /CLEAR INTERRUPT FLAG
0054  6141              LINC                    /CHANGE BACK TO LINC MODE
0055  6055    MAGTAP,   LJMP    .               /GO ON TO CHECK TRANSFER

0056  0724    LPATC0,   PATCH0
0057  0000    INTRPT,   0
```

```
                    /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    K0007,  0007
0075  6201    CDFX,   6201
0076  1400    PATC5,  KW12
0077  1201    PATC6,  CPRUN
0100  0000    AFEA,   0000
0101  0000    NRDK,   0000
0102  0000    RKDAV,  0000
0103  1012    WLD2,   WAIT
0104  2417    WLD3,   RKEX
0105  0000    CPFLD,  0000
0106  6203    KCIDF,  6203
0107  3700    K3700,  3700
0110  0000    FFPELD, 0
0111  2056    LGETR,  GETRAN
0112  0000    API,    0
0113  0000    AIPFLD, 0
0114  0000    DKFELD, 0000
0115  0000    TCFDL,  0
0116  0000    BADFLD, 0
0117  0000    ERCNT,  0
0120  0000    TICKS,  0
0121  7770    M10,    -10
0122  0000    RFTIME, 0
0123  0000    RKTIME, 0
0124  0000    APTIME, 0
0125  0000    FPTIME, 0
0126  7766    M12,    -12
0127  0000    TIC10,  0
0130  2157    FIXNP,  FINOP
0131  0726    LPTC2,  PTCH2
0132  4571    KPT2,   JMS I   PATC2
0133  0733    LPTC6,  PTCH6
0134  4576    KPTC9,  JMS I   PATC9
0135  4577    KJMPTC, JMS I   PATC10
```

```
                    /TRAP LOCATION
          0140      *140

0140      0000      .         0000
0141      4152                STC       BAD             /SAVE THE AC
0142      4151                STC       GOOD            /SET LOC, GOOD TO 0000
0143      4116                STC       BADFLD          /RESET ERROR FIELD
0144      6537                LJMP      XXX             /TRAP OCCURRED, ERROR
0145      0747      ERROR,    AERROR
0146      4100      KW12RT,   4100
0147      1512      DF32S,    DFST
0150      0000      FAILED,   0
0151      0000      GOOD,     0000
0152      0000      BAD,      0000
0153      0000      DF,       0
0154      3211      LTLP,     ST-1
0155      0400      K0400,    0400
0156      1007      V1007,    1007
0157      3527      FSAPP,    APT-1
0160      3534      FSAPPL,   APT+4
0161      3547      LIRB,     BASE-1
0162      6420      LREAL,    REAL
0163      7543      HSRTS,    HSRST
0164      0727      LPTCH7,   PTCH7

          0170      *0170
                    /A,P,I, LINKING ADDRESSES

0170      1000      PATC1,    RF8SA                     /RF08/DF32
0171      2400      PATC2,    RK8                       /RK08
0172      2600      PATC8,    AIP                       /AIP-12
0173      1656      PATC7,    INTFP                     /FPP-12
0174      2206      PATC3,    SETTP                     /LP08-LP12
0175      1462      PATC4,    HSR                       /HIGH SPEED READER
0176      7200      PATC9,    DC02F                     /DC02-F
0177      7113      PATC10,   TC58                      /TC58 MAGTAPE
```

```
                0200    *200

0200    0011    DATUM,  CLR
0201    4022            STC     MASTER          /INITIALIZE MASTER WORD TO 0
0202    0641    RESTAR, LDF 1
0203    0066            SET+20  6               /CLEAR OUT BLOCK PATTERN TABLE
0204    3377            BLKTBL-1
0205    0067            SET+20  7
0206    7577            7577
0207    1066            STA+20  6
0210    0227            XSK+20  7
0211    6207            LJMP    .-2
0212    4023    DATLUP, STC     WD1             /SET UP WORD 1
0213    6512            LJMP    RANDOM
0214    4025            STC     WD3             /WORD 3
0215    6512            LJMP    RANDOM
0216    4026            STC     WD4             /AND WORD 4

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

0217    6512    EXTUND, LJMP    RANDOM          /ADD WD1
0220    1560            BCL+20                  /MASK TO EXTENDED UNIT
0221    4777            4777
0222    0305            RQR     5               /POSITION TO NEXT TO "U" BIT
0223    4027            STC     UNIT
0224    2023            ADD     WD1             /GET WD1
0225    1560            BCL+20                  /MASK TO BIT 7
0226    7767            7767
0227    2027            ADD     UNIT            /ADD TO CURRENT UNIT
0230    4027            STC     UNIT            /RESTORE NEW UNIT
0231    0516            RSW                     /READ THE RIGHT SWITCHES
0232    1560            BCL+20                  /CLEAR ALL BUT UNITS BITS
0233    7707            7707
0234    0017            COM                     /COMPLEMENT
0235    2027            ADD     UNIT            /ADD CURRENT UNIT NUMBER
0236    0471            APO+20                  /AC MINUS
0237    6314            LJMP    INCR            /NO, BAD UNIT NUMBER, GO TO INCREMENT WD1
0240    1000            LDA
0241    0027            UNIT                    /GET UNIT
0242    0304            RQR     4               /ROTATE 4 RIGHT
0243    1560            BCL+20                  /CLEAR ALL BUT 2 LSB'S
0244    7774            7774
0245    2511            ADD     KXOBWD
0246    4030            STC     XOBWD           /STORE IN XOB WORD
```

```
0247  2026  EXT1,  ADD     WD4             /GET WORD 4
0250  2550         ADD     K4000
0251  0471         APO+20                  /AC POSITIVE?
0252  6256         LJMP    EXT2            /YES, OK SO FAR
0253  6512         LJMP    RANDOM          /NO, ADDRESS IS 3777 OR BELOW
0254  4026         STC     WD4
0255  6247         LJMP    EXT1
0256  1000  EXT2,  LDA                     /GET WORD 4 AGAIN
0257  0026         WD4
0260  1120         ADA+20                  /ADD =7000
0261  1377         1377
0262  0471         APO+20                  /AC MINUS?
0263  6253         LJMP    EXT2-3          /NO, ADDRESS IS ABOVE 7000
0264  1000  EXT4,  LDA
0265  0025         WD3
0266  1560         BCL+20                  /MASK TO BITS 8 TO 11
0267  7740         7740
0270  2510         ADD     K0770
0271  4032         STC     QNBN            /STORE IN QNBN SAVE

                   /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  DISPCH, CLR                     /GET WORD 1
0273  2023         ADD     WD1
0274  1560         BCL+20                  /MASK TO FUNCTION BITS
0275  7770         7770
0276  1120         ADA+20                  /ADD IN "MASTER JUMP"
0277  6302         LJMP    TABLE1
0300  4301         STC     .+1             /STORE
0301  6301         LJMP    .               /EXECUTE
0302  6312  TABLE1, LJMP    RDSUB           /READ AND CHECK          (0)
0303  6314         LJMP    INCR
0304  6312         LJMP    RDSUB           /READ                    (2)
0305  6314         LJMP    INCR
0306  6372         LJMP    WRITE           /WRITE AND CHECK         (4)
0307  6314         LJMP    INCR
0310  6372         LJMP    WRITE           /WRITE                   (6)
0311  6314         LJMP    INCR
0312  6324  RDSUB,  LJMP    READ
0313  6314         LJMP    INCR

0314  1020  INCR,   LDA+20                  /INCREMENT MASTER WORD
0315  0001         1
0316  2022         ADD     MASTER
0317  0451         APO
0320  0011         CLR
0321  1040  INCRA,  STA
0322  0022         MASTER
0323  6212         LJMP    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           QNBN                    /GET QN-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 ADD', OF DATA TO BE WRITTED
0346  0077           SET+20   17             /SET UP A 400 WORD COUNTER
0347  7400           -400
0350  0002           PDP
0351  6201           CDF      0              /DATA FIELD 0
0352  3365           DCA      TFLD           /
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  TFLD,    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
0374  6452            LJMP    MTSET           /FROM FLAG HANDLING
0375  6512            LJMP    RANDOM          /GET A RANDOM NUMBER
0376  0470            AZE+20                  /MAKE SURE IT IS NON-ZERO
0377  6375            LJMP    .-2             /IT WAS ZERO
0400  4444            STC     WPAT            /SAVE IT
0401  0002            PDP
0402  1026            TAD     WD4             /GET STARTING ADDRESS
0403  7041            CIA                     /SUBTRACT 1
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     .-3             /NO, MORE TO DO
0414  6141            LINC
0415  2473            ADD     MTINST+1        /GET QN-BN
0416  1120            ADA+20                  /SUBTRACT 770
0417  7007            7007
0420  4424            STC     C4TEMA          /SAVE BLOCK NUMBER
0421  2027            ADD     UNIT            /GET UNIT
0422  0242            ROL     2               /MOVE LEFT 2
0423  1120            ADA+20                  /ADD BLOCK NUMBER
0424  0000    C4TEMA, 0
0425  1120            ADA+20                  /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
0432  4434            STC     .+2             /STORE FOR EXECUTION
0433  1040            STA                     /CLEAR STAT             /SAVE THE WORDUS WORD
0434  0000            0
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 QN-BN
0441  0473            MTINST+1
0442  4032            STC     QNBN
0443  1020    WCONT2, LDA+20                  /GET PATTERN WRITTEN IN BLOCK
0444  0000    WPAT,   0
0445  0641            LDF     1
0446  1040            STA
0447  0000    UNBNSV, 0                       /STORE IN BLOCK PATTERN INDICATOR
0450  6314    WEXIT,  LJMP    INCR            /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  4055    MTSET,  STC     MAGTAP          /SAVE INSTRUCTION WHERE WE HOPE IT WILL STAY
0453  2000            ADD     0
0454  4470            STC     MTEXIT          /SAVE RETURN ADDRESS
0455  2023            ADD     WD1
0456  1560            BCL+20                  /MASK TO INSTRUCTION BITS
0457  7760            7760
0460  2471            ADD     RDCCON
0461  4472            STC     MTINST          /STORE
0462  2032            ADD     QNBN
0463  4473            STC     MTINST+1        /MOVE QN-BN INDICATOR
0464  2030            ADD     XOBWD           /GET XOB WORD
0465  1560            BCL+20
0466  0004            0004
0467  0001            AXO                     /LOAD XOB
0470  6470    MTEXIT, LJMP    .               /EXIT
0471  0700    RDCCON, 0700

                /EXECUTE THE FOLLOWING MAGTAPE INSTRUCTIONS BY JUMPING HERE

0472  0000    MTINST, 0                       /MAGTAPE INSTRUCTION
0473  0000            0                       /QN-BN
0474  0011            CLR
0475  2112            ADD     API
0476  0470            AZE+20
0477  6503            LJMP    TDFLAG
0500  0500            IOB
0501  6771            RESTOR
0502  0000            0000            /KF12 DID NOT EXECUTE THE RESTORE COMMAND
0503  0416    TDFLAG, STD                     /TAPE DONE CLEAR ?
0504  6745            LJMP    PATCHC          /YES, GO TO DISPLAY BACKROUND
0505  4152            STC     BAD             /NO, SAVE AC
0506  4151            STC     GOOD            /SET GOOD TO 0000
0507  6537            LJMP    XXX             /NO-PAUSE FAILED

0510  0770    K0770,  0770
0511  0130    KXOBWD, 0130
```

```
                    /RANDOM NUMBER GENERATOR - EXIT WITH RANDOM NUMBER IN AC

0512  1000    RANDOM, LOA
0513  0000            0
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            LJMP    .+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            LJMP    RANDOM
0535  0002            PDP
0536  5732            JMP I   RANGET
```

```
                    /COMMON ERROR HALT SUBROUTINE

0537  2500    XXX,    IOB
0540  6072            IOF                     /DISABLE INTERRUPTS
0541  1000            LDA
0542  0000            0
0543  1560            BCL+20
0544  6000            6000
0545  4600    XXRX,   STC     XXXPC
0546  0461            SNS+20  1
0547  6553            LJMP    XXR             /DELETE TYPE OUT
0550  4000    K4000,  STC                     /NO, TYPE OUT THE MESSAGE
0551  2600            ADD     XXXPC
0552  6607            LJMP    XX
0553  0460    XXR,    SNS+20  0
0554  6570            LJMP    XXRE            /INHIBIT HALT  ** RESTART***
0555  0066            SET+20  6               / ERROR, DISPLAY THE INFORMATION
0556  7500            7500                    /SET UP A TIMER
0557  0607            LIF     7               /CHANGE TO FIELD 7 (LINC)
0560  6020            LJMP    DDISP           /DISPLAY THE CURRENT TIME AND FIELD NUM.
0561  0226            XSK+20  6               /DONE 100 TIMES ?
0562  6557            LJMP    .-3             /NO DISPLAY IT AGAIN
0563  0607            LIF     7               /YES, NOW DISPLAY "ERROR"
0564  6365            LJMP    DXER
0565  0226            XSK+20  6               /COMPLETED 2000 TIMES ?
0566  6563            LJMP    .-3             /NO DO IT AGAIN
0567  6553            LJMP    XXR             /TEST SNS 0 AGAIN
0570  1020    XXRE,   LDA+20                  /RESTART THE PROGRAM
0571  0020            0020                    /I/O CLEAR
0572  0004            ESF
0573  0226            XSK+20  6
0574  6573            LJMP    .-1             /DELAY
0575  0002            PDP
0576  5777            JMP I   .+1
0577  1241            WORLD
0600  6600    XXXPC,  LJMP    .

                    /COMMON ROUTINE TO SUBTRACT
                    / 1 FROM THE NUMBER IN THE AC
0601  4605    SUBT1,  STC     .+4
0602  0011            CLR
0603  0017            COM
0604  1220            LAM+20
0605  0000            0
0606  6000            LJMP    0
```

```
                /PDP-12 LINK MODE ERROR
                /HANDLER

0607  6671  XX,   LJMP   SUBT1          /SUBTRACT 1
0610  4072        STC    XXXAC          /SAVE THE AC
0611  6634        LJMP   SPACE          /INSERT SPACES
0612  2031        ADD    CLOCK          /GET THE TIME
0613  6647        LJMP   OCT            /TYPE OUT OCT, AC
0614  6634        LJMP   SPACE          /INSERT SPACES
0615  2002        ADD    XXXAC          /GET THE PC VALUE
0616  6647        LJMP   OCT            /TYPE OUT OCT, VALUE
0617  6634        LJMP   SPACE          /INSERT SPACES
0620  2151        ADD    GOOD           /GET THE GOOD VALUE
0621  6647        LJMP   OCT            /TYPE OUT OCT, VALUE
0622  6634        LJMP   SPACE          /INSERT SPACES
0623  2152        ADD    BAD            /GET THE BAD VALUE
0624  6647        LJMP   OCT            /TYPE OUT OCT, VALUE
0625  6634        LJMP   SPACE          /INSERT SPACES
0626  2116        ADD    BADFLD         /GET ERROR FIELD
0627  0303        ROR    3              /MOVE RIGHT
0630  2663        ADD    K0260          /ADD 0260
0631  6705        LJMP   PRINTR         /PRINT IT
0632  6671        LJMP   CRLF           /DO "CR"-"LF"
0633  6553        LJMP   XXR            /RETURN TO ERROR HANDLER

                /THIS ROUTINE WILL SPACE 8 PLACES

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

```
                    /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     0
0651  4670            STC     OCTE            /SAVE RETURN
0652  0067            SET+20  7
0653  7773            7773
0654  2657            ADD     TEMP
0655  0243            ROL     3
0656  1060            STA+20
0657  0000    TEMP,   0000
0660  1560            BCL+20
0661  7770            7770
0662  1120            ADA+20
0663  0260    K0260,  0260
0664  6705            LJMP    PRINTR
0665  0227            XSK+20  7
0666  6654            LJMP    TEMP-3
0667  0011            CLR
0670  6670    OCTE,   LJMP    .

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

0671  1000    CRLF,   LDA
0672  0000            0
0673  4703            STC     CRLFE
0674  1020            LDA+20
0675  0215            0215
0676  6705            LJMP    PRINTR
0677  1020            LDA+20
0700  0212            0212
0701  6705            LJMP    PRINTR
0702  0011            CLR
0703  6703    CRLFE,  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
0712  6042            6042
0713  6141            LINC
0714  6000            LJMP    0
```

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

 0715  0002   PATCH,  POP
 0716  7300           CLA CLL
 0717  1112           TAD     API
 0720  7650           SNA CLA
 0721  5335           JMP     PATCHA
 0722  6006           APION                   /API IS ON NOW
 0723  5477           JMP I   PATC6           /EXIT TO THE CP ROUTINE
 0724  4476   PATCH0, JMS I   PATC5           /KW12 ?
 0725  4570   PTCH1,  JMS I   PATC1           /RF08, DF32 ?
 0726  4571   PTCH2,  JMS I   PATC2           /RK08 ?
 0727  4577   PTCH7,  JMS I   PATC10          /TC58 MAGTAPE ?
 0730  4573   PTCH3,  JMS I   PATC7           /FPP-12 ?
 0731  4572   PTCH4,  JMS I   PATC8           /A,I,P, ?
 0732  4574   PTCH5,  JMS I   PATC3           /LP08, LP12 ?
 0733  4576   PTCH6,  JMS I   PATC9           /DC02F
 0734  4575           JMS I   PATC4           /HSR ?
 0735  2057   PATCHA, ISZ     INTRPT          /INTERRUPT CLEARED ?
 0736  5343           JMP     PATCHB          /YES
 0737  4545           JMS I   ERROR           /UNEXPECTED INTERRUPT
 0740  0000           0
 0741  7777           7777
 0742  0000           0
 0743  6001   PATCHB, ION
 0744  5477           JMP I   PATC6           /EXIT TO THE DISPLAY AND CP ROUTINES
 0745  0002   PATCHC, POP
 0746  5335           JMP     PATCHA


                    /ERROR PRE-HANDLER

 0747  0000   AERROR, 0
 0750  6002           IOF
 0751  2117           ISZ     ERCNT
 0752  7000           NOP
 0753  7300           CLA CLL
 0754  6201           CDF     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           LINC
 0771  6545           LJMP    XXRX
```

```
                1000    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  7000      RF8SA,  2000                    /ENTERED BY A JMS TO HERE
1001  7200              CLA
1002  6772              SETLEV                  /RAISE MACHINE LEVEL
1003  6614              6614                    /READ STATUS
1004  0156              AND     V1007           /MASK
1005  7440              SZA                     /ERRORS ?
1006  4341              JMS     RF8EX           /YES, FIND OUT WHAT KIND
1007  6622              6622                    /SKIP ON DONE ?
1010  5600              JMP I   RF8SA           /NOT DONE, EXIT
1011  5612              JMP I   .+1             /YES, JMP I NEXT LOC,
1012  1025      WAIT,   START                   /SET TO A WRITE INITI,
1013  2122              ISZ     RFTIME
1014  7000      M1000,  NOP
1015  7200              CLA
1016  3057              DCA     INTRPT          /CLEAR INTERRUPT FLAG
1017  1112              TAD     API             /
1020  7650              SNA CLA                 /API ?
1021  5600              JMP I   RF8SA           /NO, EXIT
1022  1034              TAD     K0017           /GET 0017
1023  6772              SETLEV                  /LOWER MACHINE LEVEL
1024  6771              RESTOR                  /YES
1025  4511      START,  JMS I   LGETR           /GET THE FIELD
1026  3072              DCA     DDFELD          /SAVE IT
1027  4465              JMS I   DRANG           /GET A RANDOM NUMBER
1030  3362              DCA     DFATA           /SAVE DATA WORD
1031  4465              JMS I   DRANG           /GET A RANDOM NUMBER
1032  3363              DCA     AFDD            /SAVE DISK ADDRESS
1033  1035              TAD     KILLIT          /RANDOM DISK ACCESS
1034  7640              SZA CLA                 / ?
1035  5241              JMP     .+4             /YES, RANDOM DISK EXTENDED ADDRESSING
1036  2100              ISZ     AFEA            /NO, INCREMENTING ADDRESSING
1037  7000              NOP
1040  5243              JMP     .+3             /
1041  4465              JMS I   DRANG           /GET A RANDOM NUMBER
1042  3100              DCA     AFEA            /SAVE THE RANDOM EXTENDED ADDRESS
1043  1060              TAD     K3777           /YES WE DO, GET CA POINTER
1044  3010              DCA     10              /SAVE IN LOC, 10
1045  1214              TAD     M1000           /SET UP A COUNT LOC,
1046  3322              DCA     SETUP
1047  1072              TAD     DDFELD          /GET THE DISK FIELD
1050  1075              TAD     CDFX            /ADD A CHANGE DATA FIELD
1051  3252              DCA     .+1             /SAVE IN THE NEXT LOC,
1052  6211              6211                    /CHANGE DATA FIELD
```

```
1053  1362    STAR,   TAD     DFATA           /GET THE DATA TO BE WRITTEN
1054  3410            DCA I   10              /STORE IT IN THE NEW FIELD
1055  2322            ISZ     SETUP           /DONE ?
1056  5253            JMP     STAR            /NO, MORE TO DO
1057  1060            TAD     K3777           /GET THE CA VALUE
1060  4322            JMS     SETUP           /SETUP WC CA
1061  6605            6605                    /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     CDFX            /ADD CHANGE DATA FIELD
1077  3300            DCA     .+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    CFHECK, 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     RFGOOD          /ADD THE DATA EXPECTED
1110  7650            SNA CLA                 /ARE THEY EQUAL ?
1111  5316            JMP     .+5             /YES
1112  4545            JMS I   ERROR           /NO, RF08-DF32 DATA ERROR
1113  0000    RFGOOD, 0
1114  0000    RFBAD,  0000
1115  0000    RFFLD,  0
1116  2322            ISZ     SETUP           /FINISHED ?
1117  5303            JMP     CFHECK          /NO, MORE TO TEST
1120  4212            JMS     WAIT
1121  5225            JMP     START
```

```
                        /THIS ROUTINE LOADS THE WC CA LOCATION
1122  0000    SETUP,    0000
1123  6201              6201                    /CHANGE TO FIELD 0
1124  3761              DCA I   DCAA            /SAVE CA
1125  1214              TAD     M1000           /SETUP WC
1126  3760              DCA I   DWCA
1127  1100              TAD     AFEA            /GET DISK EXTENDED ADDRESS
1130  5337    FUDG1,    JMP     SETUPB          /DXAL IF RF08
1131  1064              TAD     SFTAT           /GET STATUS SETUP
1132  1072    SETUPA,   TAD     DDFELD          /ADD FIELD
1133  6615              DIML                    /LOAD EXTENDED ADDRESS
1134  7300              CLA CLL
1135  1363              TAD     AFDD            /GET DISK ADDRESS
1136  5722              JMP I   SETUP           /EXIT
1137  0107    SETUPB,   AND     K3700           /MASK TO BITS 1-5
1140  5332              JMP     SETUPA          /

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

1141  0000    RF8EX,    0
1142  7012              RTR                     /MOVE 2 RIGHT
1143  7630              SZL CLA                 /NXD ERROR ?
1144  5353              JMP     RF8EXA          /YES, NXD ARE OK
1145  6614              6614                    /NO, REAL ERROR, READ RF08 STATUS
1146  3351              DCA     DFBAD           /SAVE BAD STATUS
1147  4545              JMS I   ERROR           /RF08-DF32 STATUS ERROR
1150  0000              0
1151  0000    DFBAD,    0
1152  0000              0

1153  3100    RF8EXA,   DCA     AFEA            /NXD ERROR, CLEAR EXT, DISK ADDRESSING
1154  6601              6601                    /CLEAR FLAGS
1155  6611              6611                    /CLEAR EXTENDED ADDRESS
1156  6601              6601                    /CLEAR FLAGS AGAIN
1157  5225              JMP     START           /TRY AGAIN

1160  7750    DWCA,     7750
1161  7751    DCAA,     7751
1162  0000    DFATA,    0000
1163  0000    AFDD,     0
```

```
                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            TAD     CPFLD           /YES, GET THE NUMBER
        1211    1106            TAD     KCIDF           /ADD CHANGE INSTRUCTION AND DATA FIELD
        1212    3213            DCA     .+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 BACKROUND ERROR, BAD IS THE P.C. AT ERROR
        1223    0000    CPGOOD, 0
        1224    0000    CPBAD,  0
        1225    0000    CPBFLD, 0
        1226    6141    CPDSP,  LINC
        1227    0463            SNS+20  3               /BYPASS DISPLAY ?
        1230    7200            LJMP    CPRUN+1         /YES
        1231    2105            ADD     CPFLD           /GET CP FIELD
        1232    0301            ROR     1               /MOVE RIGHT 1
        1233    1120            ADA+20                  /ADD LIF 3
        1234    0603            0603
        1235    5236            STC     .+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     K0007           /MASK TO BITS 9-11
1243  7440          SZA                     /IS IT ZERO ?
1244  5247          JMP     .+3             /NO, IT WAS OK
1245  7402          HLT                     / OPERATOR ERROR, 8K OF CORE REQUIRED
1246  5241          JMP     WORLD           /DO NOT LET HIM CONTINUE
1247  7106          RTL CLL                 /ROTATE LEFT INTO BITS 6-8
1250  7104          RAL CLL                 /
1251  3073          DCA     FXELD           /SAVE IN THE NUMBER OF FIELDS AVAILIABLE
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 10
1260  4770          JMS I   LTCP            /SETUP THE EXTENDED MEMORY FIELDS
1261  4563          JMS I   HSRTS           /START HSR1
1262  3102          DCA     RKDAV           /SAVE THE NUMBER OF RK08 DRIVES AVAILABLE
1263  3101          DCA     NRDK
1264  3072          DCA     DDFELD          /CLEAR SOME LOCATIONS
1265  3100          DCA     AFEA            /
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     TCTIME          /
1302  3057          DCA     INTRPT          /
1303  4530          JMS I   FIXNP
1304  6212          CIF     10
1305  4554          JMS I   LTLP            / START LP08-LP12
1306  7604          LAS
1307  0036          AND     K0100           /MASK TO BIT 05
1310  7640          SZA CLA                 /IS IT SET ?
1311  5321          JMP     WORLD1          /YES
1312  1132          TAD     KPT2            /START THE RK08
1313  3531          DCA I   LPTC2           /
1314  1071          TAD     STAT            /
1315  6742          DCLS                    /
1316  6732          DLDC                    /
1317  6742          DCLS                    /
1320  6735          DLOW                    /
1321  7604  WORLD1, LAS                     /READ RIGHT SWITCHES
1322  0037          AND     K0200           /MASK TO BIT 04
```

```
                    /HIGH SPEED READER ROUTINE

1456  4545    HSER,   JMS I   ERROR           /HIGH SPEED READER ERROR
1457  0000    HGOOD,  0
1460  0000    HBAD,   0
1461  0000    HFLD,   0
1462  0000    HSR,    0
1463  6011            6011                    /HSR! ?
1464  5662            JMP I   HSR             /NO EXIT
1465  7300            CLA CLL
1466  3057            DCA     INTRPT          /CLEAR INT' FLAG
1467  6016            6016                    /READ BUFFER
1470  7450            SNA                     /IS IT NON-ZERO
1471  5307            JMP     IW0             /NO, IT IS ZERO
1472  3260            DCA     HBAD            /SAVE DATA READ
1473  1260            TAD     HBAD            /GET IT BACK
1474  7041            CIA                     /NEGATE IT
1475  1257            TAD     HGOOD           /ADD EXPECTED
1476  7640            SZA CLA                 /ARE THEY EQUAL ?
1477  5256            JMP     HSER            /NO, REPORT IT
1500  2257            ISZ     HGOOD           /INCREMENT EXPECTED
1501  7000            NOP
1502  1112    HSREA,  TAD     API             /GET API SWITCH
1503  7650            SNA CLA                 /API ?
1504  5662            JMP I   HSR             /NO, EXIT
1505  6771            RESTOR                  /YES, EXIT VIA API
1506  7402            HLT

                    /IF THE CHARACTER WAS 0000

1507  7301    IW0,    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         /SET AC TO 7777
1515  6643        6643                    /LOAD DISK EXT, ADDRESS (RF08)
1516  6605        6605                    /WRITE
1517  7200        CLA
1520  1340        TAD     KJMPDF          /SET UP THE RETURN JUMP
1521  3742        DCA I   LPTC1           / LOCATION
1522  6645        6645                    /READ DISK EXT, ADDRESS
1523  7650        SNA CLA                 /NON-ZERO ?
1524  5332        JMP     DFST1           /NO IT WAS ZERO
1525  1064        TAD     SFTAT           /YES, WE HAVE AN RF08 ON LINE
1526  6615        DIML                    /LOAD STATUS
1527  1341        TAD     KDXAL
1530  3737        DCA I   FUDGE1
1531  5335        JMP     DFST2
1532  1074  DFST1,TAD     K0007           /
1533  3156        DCA     V1007           /
1534  7006        RTL                     /MOVE LINK TO THE AC
1535  3153  DFST2,DCA     DF              /CHANGE THE DISPLAY MESSAGE TO DF32
1536  5712        JMP I   DFST            /EXIT
1537  1130  FUDGE1, FUDG1
1540  4570  KJMPDF, JMS I   PATC1
1541  6643  KDXAL,  DXAL
1542  0725  LPTC1,  PTCH1
                /A,P,I, START UP ROUTINE

1543  0000  APIST,  0
1544  7604        LAS                     /GET THE RIGHT SWITCHES
1545  7710        SPA CLA                 /BIT 0 SET ?
1546  5743        JMP I   APIST           /YES, EXIT
1547  1365        TAD     K3000           /NO, GET 3000
1550  6777        SETVEC                  /LOAD VECTOR TABLE POINTER
1551  7300        CLA CLL
1552  1366        TAD     K3040           /GET STACK POINTER
1553  6776        SETSTK                  /LOAD STACK POINTER
1554  7300        CLA CLL
1555  1364        TAD     K0037           /GET 37
1556  6772        SETLEV                  /LOWER MACHINE LEVEL
1557  7200        CLA
1560  6774        RSTACK                  /READ STACK POINTER
1561  7440        SZA                     /DO WE HAVE API INSTALLED ?
1562  3112        DCA     API             /YES,SET API SWITCH
1563  5743        JMP I   APIST           /NO, EXIT
1564  0037  K0037,  0037
1565  3000  K3000,  3000
1566  3040  K3040,  3040
```

```
                1600    PAGE
                        /FPP-12 ROUTINES
                        /INTERRUPT SERVICE AND ANSWER TEST
                        /START-UP AND REINITILIZE ROUTINE

        1600    0000    STFPP,  0
        1601    6552            FPICL
        1602    4511            JMS I   LGETR           /GET THE FIELD
        1603    3351            DCA     FPELD           /SAVE IT
        1604    1351            TAD     FPELD           /YES, MAKE SCOPE NUMBER EQUAL
        1605    3110            DCA     FFPELD
        1606    1351            TAD     FPELD           /GET THE NUMBER AGAIN
        1607    1075            TAD     CDFX            /ADD A CDF
        1610    3211            DCA     .+1             /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              /       P+1
        1621    1342            TAD     KFP2            / GET THE IR POINTER
        1622    3413            DCA I   13              /       P+2
        1623    1343            TAD     KFP3            /GET THE BASE POINTER
        1624    3413            DCA I   13              /       P+3
        1625    3413            DCA I   13              /       P+4
        1626    3413            DCA I   13              /       P+5
        1627    3413            DCA I   13              /       P+6
        1630    3413            DCA I   13              /       P+7
        1631    3561            DCA I   LIRB            /       IR+7
        1632    7000            NOP
        1633    6201            CDF     0               /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
        1644    1344            TAD     KFP5            /GET THE STARTING ADDRESS OF APT TABLE
        1645    6555            FPST                    /START FPP-12
        1646    7000            NOP
        1647    5600            JMP I   STFPP          /EXIT

        1650    4545    FPER,   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  7000    INTFP,  0
1657  6557            FPIST                   /FPP-12 INTERRUPT ?
1660  5656            JMP I   INTFP           /NO, EXIT
1661  7300            CLA CLL
1662  3057            DCA     INTRPT          /CLEAR INTERRUPT FLAG
1663  6772            SETLEV
1664  1351            TAD     FPELD           /GET THE FPP-12 FIELD NUMBER
1665  3253            DCA     FPBFLD          /SAVE IT
1666  1351            TAD     FPELD           /GET IT AGAIN
1667  1075            TAD     CDFX            /ADD THE FIELD
1670  3271            DCA     .+1             /SAVE IT
1671  6211            6211                    /CHANGE FIELDS
1672  1160            TAD     FSAPPL          /GET THE APT EXPONENT ADDRESS
1673  3013            DCA     13              /SAVE IT
1674  1413            TAD I   13              /GET THE EXPONENT VALUE
1675  3252            DCA     FPBAD           /SAVE THE EXPONENT
1676  1345            TAD     KFP6            /GET THE CORRECT ANSWER
1677  3251            DCA     FPGOOD          /SAVE IT IN GOOD
1700  1251            TAD     FPGOOD          /GET THE GOOD ANS,
1701  7041            CIA                     /NEGATE IT
1702  1252            TAD     FPBAD           /ADD THE DATA READ
1703  7440            SZA                     /ARE THEY EQUAL ?
1704  5250            JMP     FPER            / NO, FPP12 EXPONENT ERROR
1705  1413            TAD I   13              /GET THE MSW
1706  3252            DCA     FPBAD           /SAVE IT IN BAD
1707  1346            TAD     KFP8            /GET THE EXPECTED ANS,
1710  3251            DCA     FPGOOD          /SAVE IT IN GOOD
1711  1251            TAD     FPGOOD          /GET THE DATA EXPECTED
1712  7041            CIA                     /NEGATE IT
1713  1252            TAD     FPBAD           /ADD THE DATA READ
1714  7440            SZA                     /ARE THEY EQUAL ?
1715  5250            JMP     FPER            / NO, FPP12 MSW ERROR
1716  1413            TAD I   13              /GET THE LSW
1717  3252            DCA     FPBAD           /SAVE IT IN BAD
1720  1347            TAD     KFP9            /GET THE EXPECTED DATA
1721  3251            DCA     FPGOOD          /SAVE IT
1722  1251            TAD     FPGOOD          /GET IT BACK
1723  7041            CIA                     /NEGATE IT
1724  1252            TAD     FPBAD           /ADD DATA READ
1725  7440            SZA                     /ARE THEY EQUAL ?
1726  5250            JMP     FPER            / NO, FPP12 LSW ERROR
1727  4200            JMS     STFPP           /START FPP-12
1730  2125            ISZ     FPTIME
1731  7000            NOP
1732  7200            CLA
1733  1112            TAD     API
1734  7650            SNA CLA                 /API ?
1735  5656            JMP I   INTFP           / NO, EXIT
1736  1034            TAD     K0017
1737  6772            SETLEV
1740  6771            RESTOR
```

```
1741  3614    KFP1,   FPPRG                   /FPP PROGRAM STARTING ADDRESS
1742  3540    KFP2,   IR                      /IR ADDRESS
1743  3550    KFP3,   BASE                    /BASE ADDRESS
1744  3530    KFP5,   APT                     /APT ADDRESS
1745  0015    KFP6,   0015                    /CORRECT EXPONENT
1746  2000    KFP8,   2000                    /CORRECT MSW
1747  0000    KFP9,   0000                    /CORRECT LSW
1750  1111    K1111,  1111
1751  0000    FPELD,  0

                /FPP-12 STARTUP ROUTINE

1752  0000    ASTFPP, 0
1753  7604            LAS                     /GET RIGHT SWITCHES
1754  0155            AND     K0400           /MASK TO BIT 3
1755  7450            SNA                     /IS IT SET ?
1756  4200            JMS     STFPP           /NO, START THE FPP-12
1757  5752            JMP I   ASTFPP          /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 LJMP+1 IF UNWRITTEN, LJMP+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     BLKTBL
2036  4037              STC     GET-2000        /STORE AWAY
2037  2037      GET,    ADD     .               /GET CONTENTS OF BLOCK STATUS WORD
2040  4054              STC     WSAVE-2000
2041  2054              ADD     WSAVE
2042  0470              AZE+20                  /NON-ZERO?
2043  6051              LJMP    WNEXIT-2        /NO, ZERO, EXIT
2044  1020              LDA+20                  /YES, INCREMENT EXIT POINT
2045  0001              1
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  6053      WNEXIT, LJMP    .               /EXIT
2054  0000      WSAVE,  0
2055  6000              LJMP    0


2056  0000      GETRAN, 0                       /GET A RANDOM FIELD, EXIT ONLY WITH A EXISTING
2057  4465              JMS I   DRANG           / FIELD NUMBER IN AC 6-8
2060  0274              AND     K0070
2061  7450              SNA
2062  5257              JMP     .-3
2063  3273              DCA     GETSAV
2064  1073              TAD     FXELD
2065  7041              CIA
2066  1273              TAD     GETSAV
2067  7740              SMA SZA CLA
2070  5257              JMP     .-11
2071  1273              TAD     GETSAV
2072  5656              JMP I   GETRAN

2073  0000      GETSAV, 0
2074  0070      K0070,  0070
```

```
                    /EVERY 10 SECONDS ENTER THIS ROUTINE TO TEST THAT THE DEVICES
                    / ARE STILL RUNNING

2075  7300  CHEKFL, CLA CLL
2076  1072        TAD     DDFELD
2077  7650        SNA CLA
2100  5305        JMP     CHECKA
2101  1122        TAD     RFTIME
2102  7650        SNA CLA
2103  4345        JMS     CHEXIT          /RF08-DF32 TIMEOUT ERROR
2104  3122        DCA     RFTIME
2105  1114  CHECKA, TAD   DKFELD
2106  7650        SNA CLA
2107  5314        JMP     CHECKB
2110  1123        TAD     RKTIME
2111  7650        SNA CLA
2112  4345        JMS     CHEXIT          /RK08 TIMEOUT ERROR
2113  3123        DCA     RKTIME
2114  1113  CHECKB, TAD   AIPFLD
2115  7650        SNA CLA
2116  5323        JMP     CHECKC
2117  1124        TAD     APTIME
2120  7650        SNA CLA
2121  4345        JMS     CHEXIT          /A,I,P,-12 TIMEOUT ERROR
2122  3124        DCA     APTIME
2123  1110  CHECKC, TAD   FFPELD
2124  7650        SNA CLA
2125  5332        JMP     CHECKD
2126  1125        TAD     FPTIME
2127  7650        SNA CLA
2130  4345        JMS     CHEXIT          /FPP-12 TIMEOUT ERROR
2131  3125        DCA     FPTIME
2132  1115  CHECKD, TAD   TCFDL
2133  7650        SNA CLA
2134  5341        JMP     CHECKE
2135  1024        TAD     TCTIME
2136  7650        SNA CLA
2137  4345        JMS     CHEXIT          /TC58 TIME OUT ERROR
2140  3024        DCA     TCTIME
2141  1126  CHECKE, TAD   M12
2142  3127        DCA     TIC10
2143  5744        JMP I   .+1
2144  1444        KW12B
```

```
                    /A DEVICE HAS STOPPED REPORT IT

2145  0000    CHEXIT, 0
2146  7330            CLA CLL
2147  1345            TAD     CHEXIT
2150  7041            CIA
2151  7040            CMA
2152  3355            DCA     TIMOUT
2153  4545            JMS I   ERROR           /TIMEOUT ERROR, AC IS THE BAD P.C.
2154  0000            0
2155  0000    TIMOUT, 0
2156  0000            0


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     .-3
2171  5757            JMP I   FINOP

2172  7771    M5,     -7
```

```
2200    PAGE

        /LP08-LP12 PRINTER ROUTINE
        /LP08-LP12 EXECUTION ROUTINE

2200 0000  LPEX,   0
2201 7300          CLA CLL
2202 1112          TAD     API          /GET API SWITCH
2203 7440          SZA                  /API ?
2204 6771          RESTOR               /YES, EXIT VIA API
2205 5606          JMP I   .+1          /NO, EXIT
2206 0000  SETTP,  0
2207 6663          6663                 /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                 /LP08/LP12 DONE FLAG ?
2216 5606          JMP I   SETTP        /NO, EXIT
2217 7300          CLA CLL              /YES
2220 3057          DCA     INTRPT       /CLEAR INTERRUPT FLAG
2221 5600          JMP I   LPEX

2222 2223  LPOUT,  LP08P

2223 0000  LP08P,  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
2230 5623          JMP I   LP08P        /RETURN TO PRINTER ROUTINE

2231 0000  LP12P,  0                    /LOAD A CHARACTER INTO THE LP-12 PRINTER BUFFER
2232 6654          6654
2233 7000  LPNOP,  NOP
2234 4200          JMS     LPEX         /WAIT FOR A FLAG
2235 7300          CLA CLL
2236 5631          JMP I   LP12P        /RETURN TO THE PRINTER ROUTINE

2237 0000  ACRLF,  0                    /DO A "PRINT" ON THE LP12
2240 7300          CLA CLL
2241 1321          TAD     K0010        /GET 0010
2242 6652          6652                 /LOAD FORMAT AND PRINT
2243 6664          6664
2244 4200          JMS     LPEX         /WAIT FOR A FLAG
2245 7300          CLA CLL
2246 5637          JMP I   ACRLF        /RETURN TO THE PRINTER ROUTINE

2247 4237  KACR,   JMS     ACRLF
```

```
                /LP08-LP12 PRINTER ROUTINE
                /SLIDING PATTERN

2250  7300  LST0,  CLA CLL
2251  1322        TAD     K0240       /GET 0240
2252  3325        DCA     LPSTCH      /SAVE THE STARTING CHARACTER
2253  1322  LST1, TAD     K0240       /GET 0240
2254  3326        DCA     LPCH        /SAVE THE FIRST CHARACTER
2255  1327  LST2, TAD     FULINE      /GET A FULL LINE WIDTH
2256  3324        DCA     WIDTH       /SAVE IT IN THE COUNTER
2257  2324  LST3, ISZ     WIDTH       /FINISHED A LINE ?
2260  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 I   LPOUT       /OUTPUT IT
2267  2326        ISZ     LPCH        /INCREMENT CHARACTER
2270  5257        JMP     LST3        /DO ANOTHER CHARACTER
2271  4312  LST4, JMS     BCRLF       /END OF A LINE []
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  LST5, TAD     K0240       /GET 0240
2302  3326        DCA     LPCH        /RESET FIRST CHARACTER
2303  5262        JMP     LST3+3      /
2304  0000  TESTIT, 0
2305  7041        CIA                 /NEGATE IT
2306  1323        TAD     K0340       /ADD EXPECTED
2307  7640        SZA CLA             /ARE THEY EQUAL ?
2310  2304        ISZ     TESTIT      /NO,
2311  5704        JMP I   TESTIT      /YES,
2312  0000  BCRLF, 0
2313  7300        CLA CLL
2314  1331        TAD     K0215
2315  4223        JMS     LP08P
2316  1330        TAD     K0212
2317  4223        JMS     LP08P
2320  5712        JMP I   BCRLF
2321  0010  K0010, 0010
2322  0240  K0240, 0240
2323  0340  K0340, 0340
2324  0000  WIDTH, 0
2325  0000  LPSTCH, 0
2326  0000  LPCH,  0
2327  7657  FULINE, -121
2330  0212  K0212, 0212
2331  0215  K0215, 0215
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2332  0000    DCST,   0
2333  6141            LINC
2334  6517            LSW                     /GET LEFT SWITCHES
2335  7266            BCL+20  6               /MOVE LEFT
2336  1560            BCL+20
2337  7774            7774                    /MASK TO BITS 10-11
2340  7072            PDP
2341  7430            SZL                     /INHIBIT DC02-F ?
2342  5732            JMP I   DCST            /YES
2343  7040            CMA                     /
2344  3364            DCA     KWST            /SAVE IT
2345  1361            TAD     K0020           /GET 0020
2346  7010            RAR                     /MOVE RIGHT
2347  2364            ISZ     KWST            /DONE ?
2350  5346            JMP     .-2             /NO
2351  3762            DCA I   LGROUP          /SAVE GROUP NUMBER
2352  1134            TAD     KPTC9           /GET POINTER
2353  3533            DCA I   LPTC6           /SAVE IT
2354  4763            JMS I   LGODC           /ENABLE THE DC02-F STATIONS
2355  7301            CLA CLL IAC             /SET AC TO 0001
2356  6115            MINT                    /ENABLE INTERRUPTS
2357  6126            MTLS                    /PRINT AND START A WORLD OF INTERRUPTS
2360  5732            JMP I   DCST            /EXIT

2361  0020    K0020,  0020
2362  7276    LGROUP, GROUP
2363  7263    LGODC,  GODC

                /KW12A STARTUP ROUTINE FIRST TIME ONLY

2364  0000    KWST,   0
2365  6132            6132                    /CLEAR CONTROL
2366  7600            7600                    /CLEAR AC
2367  1366            TAD     .-1             /GET 7600
2370  6133            6133                    /LOAD BUFFER PRESET
2371  7300            CLA CLL                 /CLEAR AC
2372  1146            TAD     KW12RT          /GET CLOCK RATE
2373  6132            6132                    /LOAD CLOCK CONTROL
2374  7300            CLA CLL
2375  1036            TAD     K0100
2376  6134            6134                    /LOAD KW12A INTERRUPT ENABLE
2377  5764            JMP I   KWST            /EXIT
```

```
                2400    PAGE
                        /RK08 SYSTEM PROGRAM
2400  7000      RK8,    0
2401  6747              DSKE                    /RK08 STATUS ERROR ?
2402  5211              JMP     RK8A            /NO,
2403  6741              DRDS                    /YES, READ STATUS
2404  3207              DCA     ARKBAD          /SAVE IN LOC, BAD
2405  4545              JMS I   ERROR           / RK08 STATUS ERROR REPORT IT
2406  0000              0
2407  0000      ARKBAD, 0
2410  0000              0
2411  6745      RK8A,   DSKD                    /RK08 DONE ?
2412  5600              JMP I   RK8
2413  7300              CLA CLL
2414  3057              DCA     INTRPT          /CLEAR INTERRUPT FLAG
2415  6772              SETLEV
2416  5617              JMP I   .+1             /YES, GO SERVICE IT
2417  2467      RKEX,   WKRITE                  /WKRITE,RKEAD OR CKHECK
2420  2123              ISZ     RKTIME
2421  7400      M400,   7400
2422  7200              CLA
2423  1112              TAD     API
2424  7650              SNA CLA                 /API ?
2425  5600              JMP I   RK8             / NO, RETURN TO BACKROUND PROG,
2426  1034              TAD     K0017
2427  6772              SETLEV
2430  6771              RESTOR                  /YES
2431  1362      RKEAD,  TAD     K7377           /GET CA ADDRESS
2432  4343              JMS     SET1            /SET UP FOR EXE,
2433  6733              DLDR                    /READ
2434  4217              JMS     RKEX
                        /RETURN HERE AFTER A READ COMMAND
2435  1221      CKHECK, TAD     M400            /SET A COUNT,
2436  3070              DCA     CKNT            / LOCATION
2437  1362              TAD     K7377           /SET 14 TO THE STARTING ADDRESS OF THE READ BUFFER
2440  3014              DCA     14
2441  1114              TAD     DKFELD          /GET RK08 FIELD BITS
2442  3263              DCA     RKBFLD          /SAVE FIELD
2443  1114              TAD     DKFELD          /GET IT BACK
2444  1075              TAD     CDFX            /ADD A CHANGE DATA FIELD COMMAND
2445  3246              DCA     .+1             /SAVE IN THE NEXT LOCATION
2446  6211              6211                    /CHANGE TO THE MEMORY FIELD THE RK08 READ INTO
2447  1364              TAD     DATA            /GET THE EXPECTED DATA
2450  3261              DCA     RKGOOD          /SAVE IT IN LOC GOOD
2451  1414      CKHEC,  TAD I   14              /GET THE DATA READ
2452  3262              DCA     RKBAD           /SAVE IT IN LOC BAD
2453  1262              TAD     RKBAD           /GET IT BACK
2454  7041              CIA                     /NEGATE IT
2455  1261              TAD     RKGOOD          /ADD THE EXPECTED DATA
2456  7650              SNA CLA                 /ARE THEY EQUAL ?
2457  5264              JMP     .+5             /YES
2460  4545              JMS I   ERROR           /NO, RK08 DATA ERROR
2461  0000      RKGOOD, 0
2462  0000      RKBAD,  0
```

```
2463  7000  RKBFLD, 0
2464  2070        ISZ     CKNT            /YES, INCREMENT COUNT= FINISHED ?
2465  5251        JMP     CKHEC           /NO, MORE TO DO
2466  4217        JMS     RKEX            /YES, NOW EXIT THE RK08 ROUTINE

                  /THIS IS THE ACTUAL SETUP FOR THE RK08 WRITE ROUTINE

2467  4465  WKRITE, JMS I  DRANG           /GET A RANDOM NUMBER
2470  3364        DCA     DATA            /SAVE IT THIS IS THE DATA TO BE WRITTEN
2471  1035  RKAKD,  TAD     KILLIT
2472  7640        SZA CLA
2473  5276        JMP     RKADK
2474  2067        ISZ     AKDD            /YES, INCREMENTING RK08 ADDRESSING
2475  5300        JMP     RKADK+2         /
2476  4465  RKADK,  JMS I  DRANG           /RANDOM ADDRESSING, GET A RANDOM NUMBER
2477  3067        DCA     AKDD            /SAVE IT THIS IS THE DISK ADDRESS
2500  1067        TAD     AKDD            /GET IT BACK
2501  7500        SMA                     /IS IT NEGATIVE ?
2502  5310        JMP     RKDOK           /NO, POSITIVE NUMBERS ARE OK
2503  1363        TAD     K1600           /ADD A CONSTANT
2504  7710        SPA CLA                 /IS THE ADDRESS WITHIN THE LIMITS ?
2505  5310        JMP     RKDOK           /YES
2506  3067        DCA     AKDD            /NO, LIMIT EXCEEDED CLEAR THE DISK ADDRESS
2507  5271        JMP     RKAKD
2510  4511  RKDOK,  JMS I  LGETR           /GET THE FILED
2511  3114        DCA     DKFELD          /SAVE IT
2512  4465        JMS I   DRANG           /YES,GET A RANDOM NUMBER
2513  0366        AND     K0006           /MASK TO BITS 10-11
2514  3101        DCA     NRDK            /SAVE IT THIS IS THE DRIVE NUMBER
2515  1102        TAD     RKDAV           /GET THE NUMBER OF DRIVES AVAILABLE
2516  7041        CIA                     /NEGATE IT
2517  1101        TAD     NRDK            /ADD THE NEW NUMBER
2520  7740        SMA SZA CLA             /DO WE HAVE THAT RK08 DRIVE ?
2521  5312        JMP     .-7             /NO, TRY AGAIN
2522  1221        TAD     M400            /YES WE DO, SET UP A COUNT
2523  3070        DCA     CKNT            /LOCATION
2524  1361        TAD     K6777           /GET STARTING ADDRESS POINTER
2525  3014        DCA     14              /SAVE IT
2526  1114        TAD     DKFELD          /GET RK08 FIELD
2527  1075        TAD     CDFX            /ADD CHANGE DATA FIELD
2530  3331        DCA     .+1             /SAVE IN NEXT LOCATION
2531  6211        6211                    /CHANGE TO FIELD X
2532  1364        TAD     DATA            /GET DATA TO BE WRITTEN
2533  3414        DCA I   14              /STORE IT
2534  2070        ISZ     CKNT            /DONE ?
2535  5332        JMP     .-3             /NO, MORE TO DO
2536  1361        TAD     K6777           /GET CA
2537  4343        JMS     SET1            /SET UP CA AND WC
2540  6735        DLDW                    /WRITE ON THE DISK
2541  4217        JMS     RKEX            /THEN WAIT FOR DONE
2542  5231        JMP     RKEAD           /WHEN DONE, GO TO READ
```

```
                    /THIS ROUTINE LOADS W.C, AND C.A, AND COMMAND REGISTER
                    /
2543  0000  SET1,    0
2544  3365          DCA     RKSVA           /SAVE CURRENT ADDRESS
2545  1101          TAD     NRDK            /GET RK08 DRIVE NUMBER
2546  1114          TAD     DKFELD          /ADD RK08 FIELD
2547  1071          TAD     STAT            /ADD RK08 STATUS
2550  6742          DCLS                    /CLEAR RK08 STATUS
2551  6732          DLDC                    /LOAD RK08 COMMAND REGISTER
2552  6742          DCLS                    /CLEAR RK08 STATUS REGISTER AGAIN
2553  1365          TAD     RKSVA           /GET CURRENT ADDRESS
2554  6755          DLCA                    /LOAD RK08 CURRENT ADDRESS
2555  1221          TAD     M400            /GET -400
2556  6753          DLWC                    /LOAD RK08 WORD COUNT
2557  1067          TAD     AKDD            /GET DISK ADDRESS
2560  5743          JMP I   SET1            /EXIT

2561  6777  K6777,  6777
2562  7377  K7377,  7377
2563  1600  K1600,  1600
2564  0000  DATA,    0
2565  0000  RKSVA,   0
2566  0006  K0006,  0006
```

```
                2600    PAGE
                        /AIP-12 ROUTINE
                        /TWO WORD FORMAT, RANDOM MEMORY FIELDS
                        / A TO D CHANNELS

2600  0000      AIP,    0
2601  6337              SBF                     /A,I,P, DONE ?
2602  5600              JMP I   AIP             /NO, EXIT
2603  4217              JMS     AIP1            /YES, RESTART THE AIP
2604  2124              ISZ     APTIME          /INCREMENT A,I,P, TIMER
2605  7000      A7000,  NOP
2606  7300              CLA CLL
2607  3057              DCA     INTRPT          /CLEAR INTERRUPT FLAG
2610  1112              TAD     API             /GET API SWITCH
2611  7650              SNA CLA                 /IS IT SET ?
2612  5600              JMP I   AIP             /NO, EXIT
2613  1034              TAD     K0017           /YES, GET 0017
2614  6772              SETLEV                  /LOWER MACHINE LEVEL
2615  6771              RESTOR                  /EXIT VIA API
2616  7402              HLT

2617  0000      AIP1,   0
2620  7300              CLA CLL
2621  6772              SETLEV                  /RESET MACHINE LEVEL
2622  1314              TAD     A0014           /GET 0014
2623  6301              SCH                     /SELECT CHANNEL 14
2624  6302              LCH                     /LOAD CHANNEL 14
2625  1310              TAD     STCH            /GET FIRST CHANNEL
2626  3311              DCA     ASTCH           /SAVE IT
2627  1306              TAD     M3
2630  3307              DCA     ACHTOT          /SAVE IT
2631  1312              TAD     A0010           /GET 0010
2632  6301              SCH                     /SELECT C,A,
2633  1317              TAD     BUFF            /GET BUFFER POINTER
2634  6302              LCH                     /LOAD C,A,
2635  1313              TAD     A0011           /GET 0011
2636  6301              SCH                     /SELECT W,C,
2637  1036              TAD     K0100
2640  6302              LCH                     /LOAD W,C,
2641  1314              TAD     A0014           /GET 0014
2642  6301              SCH                     /SELECT CHANNEL 14
2643  4511              JMS I   LGETR
2644  3113              DCA     AIPFLD          /SAVE THE FIELD
2645  1113              TAD     AIPFLD          /GET IT BACK
2646  1316              TAD     A1001           /ADD "GO" AND INTERRUPT
2647  6302              LCH                     /LOAD CONTROL WORD
2650  1311              TAD     ASTCH           /GET A TO D CHANNEL
2651  1315              TAD     A1000           /ADD "E" BIT
2652  6301              SCH                     /SELECT CHANNEL
2653  2311              ISZ     ASTCH           /INCREMENT CHANNEL
2654  2307              ISZ     ACHTOT          /FINISHED ?
2655  5250              JMP     .-5             /NO,
2656  5617              JMP I   AIP1            /EXIT
```

```
                    /AIP STARTUP ROUTINE

2657  0000  AIPST,  0
2660  7604         LAS                    /READ RIGHT SWITCHES
2661  7004         RAL                    /MOVE LEFT
2662  7710         SPA CLA                /RSW 1 CLEARED ?
2663  5657         JMP I   AIPST          /NO, SET
2664  6141         LINC
2665  0517         LSW                    /READ LEFT SWITCHES
2666  0304         ROR     4              /MOVE BIT 8 TO BIT 0
2667  0451         APO                    /IS IT SET ?
2670  6674         LJMP    .+4            /YES
2671  1020         LDA+20                 /NO, KW12A IS CONNECTED TO A,I,P, CHANNEL 44-47
2672  0044         44
2673  6676         LJMP    .+3
2674  1020         LDA+20                 /YES, KW12A IS CONNECTED TO A,I,P, CHANNEL 40-43
2675  0040         40
2676  4710         STC     STCH-2000      /SAVE CLOCK CHANNEL
2677  0002         PDP
2700  4217         JMS     AIP1           /START THE A,I,P,
2701  7300         CLA CLL
2702  1320         TAD     KJMPAP         /SET UP THE RETURN JUMP
2703  3721         DCA I   LPTC4
2704  3113         DCA     AIPFLD
2705  5657         JMP I   AIPST          /EXIT

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
```

```
                    /TC58 MAGTAPE START UP ROUTINE

2722  0000    ST58,   0
2723  7604            LAS
2724  7106            RTL CLL
2725  7710            SPA CLA                         /START TC58 ?
2726  5722            JMP I   ST58                    /NO, EXIT
2727  6141            LINC                            /
2730  0517            LSW                             /GET SW,
2731  1560            BCL+20
2732  4777            4777                            /MASK TO BIT 1-2
2733  0002            PDP
2734  3744            DCA I   LTCAV                   /SAVE THE NUMBER OF EXTRA TU10
2735  1343            TAD     KR58                    /GET RETURN
2736  3577            DCA I   PATC10                  /SAVE IT
2737  1135            TAD     KJMPTC                  /GET POINTER
2740  3564            DCA I   LPTCH7                  /SAVE IT
2741  5766            JMP I   LL58
2742  5722            JMP I   ST58                    /EXIT

2743  2742    KR58,   .-1
2744  7156    LTCAV,  TCAVIL

                    /TC58 REWIND ROUTINE

2745  0000    TCCIT,  0
2746  7006            RTL
2747  7510            SPA                     /BOT ?
2750  5745            JMP I   TCCIT           /YES
2751  7006            RTL
2752  7006            RTL
2753  7710            SPA CLA                 /EOT ?
2754  5360            JMP     TCRWND          /YES, REWIND THE DRIVE
2755  2345            ISZ     TCCIT           /NO, AN ERROR
2756  6706            MTRS                    /READ TC58 STATUS
2757  5745            JMP I   TCCIT           /EXIT
2760  3115    TCRWND, DCA     TCFDL
2761  1365            TAD     TC10            /GET 0010
2762  4764            JMS I   LTCEXE          /EXECUTE IT
2763  5766            JMP I   LL58            /RESTART TC58 ROUTINE

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

```
                    /A,P,I, VECTOR ADDRESSES

          3000      *3000

3000  7432          HLT                                 /LEVEL 0
3001  7432          HLT                                 /ILLEGAL
3002  5042          JMP     TSTMOR+1                    /LEVEL 1
3003  7402          HLT                                 /TC12
3004  4476          JMS I   PATC5                       /LEVEL 2 KW12A CLOCK
3005  7402          HLT
3006  7402          HLT                                 /LEVEL 3
3007  7402          HLT
3010  7402          HLT                                 /LEVEL 4
3011  7402          HLT
3012  7402          HLT                                 /LEVEL 5
3013  7402          HLT
3014  7402          HLT                                 /LEVEL 6
3015  7402          HLT
3016  7402          HLT                                 /LEVEL 7
3017  7402          HLT
3020  7402          HLT                                 /LEVEL 10
3021  7402          HLT
3022  7402          HLT                                 /LEVEL 11
3023  7402          HLT
3024  7402          HLT                                 /LEVEL 12
3025  7402          HLT
3026  7402          HLT                                 /LEVEL 13
3027  7402          HLT
3030  7402          HLT                                 /LEVEL 14
3031  7402          HLT
3032  7402          HLT                                 /LEVEL 15
3033  7402          HLT
3034  7402          HLT                                 /LEVEL 16
3035  7402          HLT
3036  7402          HLT                                 /LEVEL 17
3037  7402          HLT

          3040      *3040
                    /STACK ADDRESS
                    /STACK FORMAT
                    /       P               AC 0-11
                    /       P+1             PC 0-11
                    /       P+2             MODE 0, FLO 1, LINK 2, MACHINE LEVEL 8-11
                    /       P+3             MQ 0-11
                    /       P+4             UF 1, IF 2-6, DF 7-11

          3400      *3400
                    /BLOCK PATTERN TABLE = 400 LOCATIONS
3400  0000    BLKTBL, 0
```

```
                7000    *7300
                        /TC58 ROUTINE

                6701            MTSF=6701               /SKIP ON TC58
                6706            MTRS=6706               /READ STATUS
                6716            MTLC=6716               /LOAD COMMAND REGISTER
                6721            MTTR=6721               /SKIP ON TUR
                6722            MTGO=6722               / "GO"

7000    4465    TC58A,  JMS I   DRANG
7001    3336            DCA     TCGOOD                  /SAVE GOOD DATA
7002    4465            JMS I   DRANG
7003    0300            AND     TK3000                  /MASK TO BITS 1-2
7004    3355            DCA     TCDR                    /SAVE DRIVE NUMBER
7005    1356            TAD     TCAVIL                  /GET AVAIL. DRIVES
7006    7041            CIA
7007    1355            TAD     TCDR                    /ADD CURRENT DRIVE
7010    7740            SMA SZA CLA
7011    5202            JMP     .+7
7012    4511            JMS I   LGETR                  /GET MEMORY FIELD
7013    3340            DCA     TCFLD                   /SAVE FILED
7014    1336            TAD     TCGOOD
7015    6212            CIF     10
7016    4771            JMS I   LFILIT                  /FILL THE TC58 BUFFER WITH TCGOOD
7017    1357            TAD     TM5                     /SET UP A COUNT
7020    3360            DCA     TCSAV                   / LOCATION
7021    4341            JMS     TCSET                   /SET W.C. AND C.A.
7022    1361            TAD     K0040
7023    4274            JMS     TCEXE                   /EXECUTE A WRITE
7024    2360            ISZ     TCSAV                   /DONE ?
7025    5221            JMP     .-4                     /NO
7026    4347            JMS     TSPACE                  /YES, SPACE REVERSE 5 RECORDS
7027    1357            TAD     TM5                     /SET UP A COUNT
7030    3360            DCA     TCSAV                   / LOCATION
7031    4341            JMS     TCSET                   /SET W.C. AND C.A.
7032    1362            TAD     K0030                   /
7033    4274            JMS     TCEXE                   /EXECUTE A READ/COMPARE
7034    2360            ISZ     TCSAV                   /DONE ?
7035    5231            JMP     .-4                     /NO
7036    4347            JMS     TSPACE                  /YES, SPACE REVERSE
7037    1357            TAD     TM5                     /SET UP A COUNT
7040    3360            DCA     TCSAV                   / 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      TCEXE
7046  1324          TAD      KT7600          /GET -200
7047  3341          DCA      TCSET           /SAVE IT
7050  1366          TAD      KTCBF           /GET TC58 BUFFER POINTER
7051  3011          DCA      11              /SAVE IT
7052  1340          TAD      TCFLD           /GET TC58 FIELD
7053  3115          DCA      TCFDL           /UPDATE THE DISPLAY MESSAGE
7054  1340          TAD      TCFLD           /GET FIELD AGAIN
7055  1075          TAD      CDFX            /ADD CDF  (6201)
7056  3257          DCA      .+1             /SAVE IN THE NEXT LOC.
7057  6211          CDF      10              /CHANGE FO FIELD X
7060  1411  TC58B,  TAD I    11              /GET A WORD READ FROM TAPE
7061  3337          DCA      TCBAD           /SAVE IT
7062  1337          TAD      TCBAD           /GET IT BACK
7063  7041          CIA                      /NEGATE IT
7064  1336          TAD      TCGOOD          /ADD EXPECTED VALUE
7065  7640          SZA CLA                  /ARE THEY EQUAL ?
7066  5335          JMP      TCERR           /NO, TC58 DATA ERROR
7067  2341          ISZ      TCSET           /YES, FINISHED 200 WORDS ?
7070  5260          JMP      TC58B           /NO, MORE TO TEST
7071  2360          ISZ      TCSAV           /FINISHED 5 RECORDS ?
7072  5241          JMP      TC58C           /NO, MORE RECORDS
7073  5200          JMP      TC58A           /YES, DO IT AGAIN

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

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

```
7122  6721            MTTR                    /NO, WAIT FOR TRANSPORT READY
7123  5322            JMP     .-1
7124  7600  KT7600,    7600                    /CLEAR AC
7125  3057            DCA     INTRPT          /CLEAR INTERRUPT FLAG
7126  6772            SETLEV                  /RAISE THE MACHINE LEVEL
7127  2024            ISZ     TCTIME          /INCREMENT TC58 TIMER
7130  5674            JMP I   TCEXE           /GO DO SOMETHING USEFULL
7131  4772  TCEXEA,   JMS I   TCCHIT          /AN ERROR WAS DETECTED FIND OUT WHAT KIND
7132  5324            JMP     KT7600          /ACCEPTIABLE ERROR
7133  3337            DCA     TCBAD           /UN-ACCEPTIABLE ERROR, SAVE STATUS
7134  3336            DCA     TCGOOD          /RESET GOOD
7135  4545  TCERR,    JMS I   ERROR           /TC58 ERROR
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     KTCBF           /GET TC58 BUFFER ADDRESS
7143  3767            DCA I   MTCA            /LOAD TC58 CURRENT ADDRESS
7144  1324            TAD     KT7600          /GET TC58 WORD COUNT (-200)
7145  3770            DCA I   MTWC            /LOAD TC58 WORD COUNT
7146  5741            JMP I   TCSET           /EXIT

                /ROUTINE TO SPACE REVERSE 5 RECORDS

7147  0000  TSPACE,   0
7150  1357            TAD     TM5             /GET A MINUS 5
7151  3770            DCA I   MTWC            /LOAD TC58 WORD COUNT
7152  1363            TAD     TK0070          /GET 0070
7153  4274            JMS     TCEXE           /EXECUTE IT
7154  5747            JMP I   TSPACE          /EXIT

7155  0000  TCDR,     0
7156  0000  TCAVIL,   0
7157  7773  TM5,      -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  KTCBF,    TCBUFF-1
7167  7753  MTCA,     7753
7170  7752  MTWC,     7752
7171  2740  LFILIT,   FILIT
7172  2745  TCCHIT,   TCCIT
```

```
                    7200    *7200
                            /DC02-F ROUTINE

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


          7200  0000    DC02F,  0
          7201  7300            CLA CLL
          7202  3277            DCA     DCSTAT
          7203  1276            TAD     GROUP
          7204  6125            MINS                    /SKIP ON DC02F INTERRUPT
          7205  5600            JMP I   DC02F           /NO DC02F
          7206  6201            CDF     0
          7207  6121            MTSF                    /PRINTER FLAG ?
          7210  7410            SKP
          7211  5220            JMP     DC02FC-1        /
          7212  6123            MTKF                    /READ KEYBOARD FLAGS
          7213  3216            DCA     DCBAD           /SAVE RESULTS
          7214  4545            JMS I   ERROR           /DC02-F KEYBOARD FLAG
          7215  0000            0000
          7216  0000    DCBAD,  0                       /DC02F KEYBOARD FLAG ON THIS CHANNEL
          7217  0000            0000
          7220  6113            MTPF                    /READ PRINTER FLAGS
          7221  7104    DC02FC, RAL CLL                 /FIND THE LINE ACTIVE
          7222  7430            SZL
          7223  5230            JMP     .+5
          7224  7450            SNA
          7225  5255            JMP     DC02FD
          7226  2277            ISZ     DCSTAT          /
          7227  5221            JMP     DC02FC
          7230  7300            CLA CLL
          7231  3057            DCA     INTRPT          /CLEAR INTERRUPT
          7232  1277            TAD     DCSTAT          /GET STATION POINTER
          7233  1306            TAD     TABPT           /ADD TABLE POINTER
          7234  3302            DCA     DCSAV3
          7235  1702    DC02FA, TAD I   DCSAV3
          7236  3301            DCA     DCSAV2          /SAVE IT
          7237  1277            TAD     DCSTAT
          7240  7160            CMA CLL CML
          7241  3303            DCA     DCSAV4
          7242  7010            RAR
          7243  2303            ISZ     DCSAV4
          7244  5242            JMP     .-2
          7245  1276            TAD     GROUP           /NO, GET THE GROUP NUMBER
          7246  6117            MTON                    /SELECT ACTIVE LINE
          7247  7300            CLA CLL
          7250  1701            TAD I   DCSAV2
          7251  7450            SNA                     /END OF MESSAGE ?
          7252  5271            JMP     DC02FB          /YES
```

```
7253  2702            ISZ I   DCSAV3          /INCREMENT POINTER
7254  6126            MTLS                    /PRINT THE DATA
7255  4263  DC02FD,   JMS     GODC            /RE INITIATE THE LINES
7256  7300            CLA CLL
7257  1112            TAD     API
7260  7650            SNA CLA                 /API ?
7261  5201            JMP     DC02F+1         /NO
7262  6771            RESTOR                  /YES
7263  0000  GODC,     0
7264  7300            CLA CLL
7265  1276            TAD     GROUP
7266  1304            TAD     K7760           /ADD 7760\
7267  6117            MTON                    /RESELECT ALL LINES
7270  5663            JMP I   GODC            /EXIT

7271  1305  DC02FB,   TAD     KTYBUF
7272  3702            DCA I   DCSAV3          /RESET POINTER
7273  1277            TAD     DCSTAT          /GET LINE
7274  1300            TAD     K260            /ADD 0260
7275  5254            JMP     DC02FD+1        /PRINT IT

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
```

```
7317  0215    TTYBUF, 0215
7320  0212            0212
7321  0320                    "P;"D;"P;"-;"1;"2;" ;"S;"Y;"S;"T;"E;"M
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                    " ;"E;"X;"E;"R;"C;"I;"S;"E;"R
7337  0305
7340  0330
7341  0305
7342  0322
7343  0303
7344  0311
7345  0323
7346  0305
7347  0322
7350  0211                    "       ;" ;"D;"7;"C;"D
7351  0240
7352  0304
7353  0267
7354  0303
7355  0304
7356  0211                    "       ;" ;"T;"T;"Y;" ;"L;"I;"N;"E;"
7357  0240
7360  0324
7361  0324
7362  0331
7363  0240
7364  0314
7365  0311
7366  0316
7367  0305
7370  0240
7371  0000            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
7401    3035            DCA     KILLIT          /RESET RANDOM DISK ADDRESS
7402    3033            DCA     PASS            /RESET PASS COUNT
7403    3031            DCA     CLOCK           /RESET CLOCK COUNT
7404    3117            DCA     ERCNT           /RESET ERROR COUNT
7405    1224            TAD     TX1L            /SET UP TYPE OUT POINTER
7406    3017            DCA     17              / LOCATION
7407    1417            TAD I   17              /GET A CHARACTER
7410    7450            SNA                     /IS IS ZERO ?
7411    5614            JMP I   LWLD            /YES, EXIT TO START THE PROGRAM
7412    4215            JMS     PRT             /NO, PRINT IT
7413    5207            JMP     .-4             /DO SOME MORE
7414    1241    LWLD,   WORLD

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

7424    7424    TX1L,   TX1-1

                        /TYPE OUT MESSAGE
                        / "PASS     TIME     PC      GOOD     BAD      FIELD
7425    0215    TX1,    0215
7426    0212            0212
7427    0315            0315
7430    0255            0255
7431    0261            0261
7432    0262            0262
7433    0255            0255
7434    0304            0304
7435    0267            0267
7436    0303            0303
7437    0304            0304
7440    0215            0215
7441    0212            0212
7442    0212            0212
7443    0320            0320
7444    0301            0301
7445    0323            0323
7446    0323            0323
7447    0240            0240
7450    0240            0240
7451    0240            0240
7452    0240            0240
7453    0324            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
7502  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 HSR: ON THE CORRECT STARTING
                    / CHARACTER,

7543  7022    HSRST,  2
7544  6016            6016
7545  3365            DCA     HSRSV
7546  2365            ISZ     HSRSV
7547  5346            JMP     .-1
7550  2365            ISZ     HSRSV
7551  5350            JMP     .-1
7552  6011            6011
7553  5743            JMP I   HSRST
7554  6016            6016
7555  6011            6011
7556  5355            JMP     .-1
7557  7640            SZA     CLA
7560  5354            JMP     .-4
7561  7001            IAC
7562  3764            DCA I   LLAST
7563  5743            JMP I   HSRST
7564  1457    LLAST,  HGOOD
7565  0000    HSRSV,  0
```

```
0000  01100000  00000000  11111111  11111111  11111111  11111111  11111111  11111111
0100  11111111  11111111  11111111  11111100  11111111  11111111  11111000  11111111

0200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0300  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

0400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0500  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

0600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0700  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11000000

1000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1100  11111111  11111111  11111111  11111111  11111111  11111111  11110000  00000000

1200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1300  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11000000

1400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1500  11111111  11111111  11111111  11111111  11111111  11111111  11111110  00000000

1600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1700  11111111  11111111  11111111  11111111  11111111  11111111  00000000  00000000

2000  00000000  00000000  11111111  11111111  11111111  11111111  11111111  11111111
2100  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11100000

2200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
2300  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

2400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
2500  11111111  11111111  11111111  11111111  11111111  11111111  11111110  00000000

2600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
2700  11111111  11111111  11111111  11111111  11111111  11111111  11111110  00000000

3000  11111111  11111111  11111111  11111111  00000000  00000000  00000000  00000000
3100  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000

3200
3300

3400  10000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000
3500  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000

3600
3700
```

```
000
100

200
300

400
500

600
700


000
100

200
300

400
500

600
700


000
100

200
300

400
500

600
700


000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
100  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11100000

200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
300  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11000000

400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
500  11111111  11111111  11111111  11111111  11111111  11111111  11111100  00000000

600
700
```

```
                2021    FIELD 1

                        /PDP-12 CP TEST PART 3- BACKROUND - 1 PASS THRU
                        /ENTER BY A JMS TO LOC', 177 , WILL EXIT WITH 0 A',C', IF NO ERROR DETECTED
                        /XXXX 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
0020    7777    K7777,  7777
0021    5252    K5252,  5252
0022    0000    TEMPL,  0000
0023    0007    KP0007, 0007
0024    0601    K0601,  0601
0025    7007            7007
0026    7707            7707
0027    7770            7770
0030    0770            0770
0031    2552            2552
0032    7752            7752
0033    7725            7725
0034    7700            7700
0035    0000    K0000,  0000
0036    2525    K2525,  2525
0037    0000    TEMPH,  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             CDF CIF 0               /RESET DF
0041  5442             JMP I   .+1             /EXIT
0042  0000     CPST,   0000
0043  7604             LAS                     /READ RSW
0044  0133             AND     AK0007          /MASK TO BITS 9-11
0045  7041             CIA                     /NEGATI IT
0046  3104             DCA     ACNT            /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     CPST1,  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  7104             RAL CLL                 /INTO BITS 6-8
0060  1106             TAD     ACDFX           /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     CPST2,  6211                    /CHANGE TO THE OLD FIELD
0066  1510             TAD I   AAFDD           /GET THE NEXT WORD
0067  6221     CDFXX,  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
0074  1510             TAD I   AAFDD
0075  7640             SZA CLA
0076  7402             HLT                     /ERROR IN DUPLICATING FIELD 0
                                               / INTO THE EXTENDED MEMORY
0077  2110             ISZ     AAFDD           /INCREMENT POINTER LOCATION
0100  2107             ISZ     ACKNT           /INCREMENT THE COUNTER, DONE ?
0101  5065             JMP     CPST2           /NO MORE TO DO
0102  5051             JMP     CPST1           /YES COMPLETED WITH THIS MEMORY FIELD

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     0
0171  1560              BCL+20
0172  6000              6000
0173  0032    CPOUTA,   PDP
0174  7000              7000
0175  6203    CPOUT,    CIF CDF 0
0176  5577              JMP I   ,+1
0177  0000    CPEXIT,   2

                0200    *0200
0200  6141              LINC
0201  6202              LJMP    ,+1
0202  0462              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          LDA+20
0244  5252          5252
0245  1440          SAE
0246  0036          K2525
0247  0456          LSKP
0250  6167          CPHLT           /SAE SKIPPED IN ERROR AC=5252 MEM=2525

0251  1020          LDA+20
0252  2525          2525
0253  1440          SAE
0254  0036          K2525
0255  6167          CPHLT           /SAE FAILED TO SKIP AC=2525 MEM=2525


                    /
                    /SAE TEST     I=0 B=X ADDRESS OF OPERAND IS IN BETA REGISTER
                    /
0256  0077          SET+20+17
0257  0035          K0000
0260  0011          CLR
0261  1457          SAE 17
0262  6167          CPHLT           /SAE FAILED TO SKIP AC=0000 MEM=0000 B=17

0263  0075          SET+20+15
0264  0035          K0000
0265  1020          LDA+20
0266  7777          7777
0267  1455          SAE 15
0270  0456          LSKP
0271  6167          CPHLT           /SAE SKIPPED IN ERROR AC=7777 MEM=0000 B=14

0272  0076          SET+20+16
0273  0021          K5252
0274  1020          LDA+20
0275  5252          5252
0276  1456          SAE 16
0277  6167          CPHLT           /SAE FAILED TO SKIP AC=5252 MEM=5252 B=16

0300  0073          SET+20+13
0301  0020          K7777
0302  0011          CLR
0303  1453          SAE 13
0304  0456          LSKP
0305  6167          CPHLT           /SAE SKIPPED IN ERROR AC=0000 MEM=7777 B=13

0306  0075          SET+20+15
0307  0020          K7777
0310  1020          LDA+20
0311  7777          7777
0312  1455          SAE 15
0313  6167          CPHLT           /SAE FAILED TO SKIP AC=7777 MEM=7777 B=15

0314  0072          SET+20+12
0315  0021          K5252
```

```
                0167    *0167

          0167  0011            CLR
          0170  2000            ADD     0
          0171  1563            BCL+20
          0172  6000            6000
          0173  0032    CPOUTA, PDP
          0174  7020            7230
          0175  6203    CPOUT,  CIF CDF 0
          0176  5577            JMP I   ,+1
          0177  0000    CPEXIT, 2

                0200    *0200
          0200  6141            LINC
          0201  6202            LJMP    ,+1
          0202  0462            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
```

```
0370  2066          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  0071          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          SAE
0445  0013          0013
0446  6167          CPHLT           /SET+3 FAILED TO SET B13 AC=2525

0447  2054          SET+14
0450  0035          K0000
0451  1020          LDA+20
0452  0000          0000
0453  1440          SAE
0454  0014          0014
0455  6167          CPHLT           /SET 4 FAILED TO SET B14 AC=0000

0456  0054          SET+14
0457  0020          K7777
0460  1020          LDA+20
0461  7777          7777
0462  1440          SAE
0463  0014          0014
0464  6167          CPHLT           /SET+14 FAILED TO SET B14 AC=7777

0465  0055          SET+15
0466  0021          K5252
0467  1020          LDA+20
0470  5252          5252
0471  1440          SAE
0472  0015          0015
0473  6167          CPHLT           /SET+15 FAILED TO SET B15 AC=5252

0474  0056          SET+16
0475  0036          K2525
0476  1020          LDA+20
0477  2525          2525
0500  1440          SAE
0501  0016          0016
0502  6167          CPHLT           /SET+16 FAILED TO SET B16 AC=2525

0503  0057          SET+17
0504  0035          K0000
0505  1020          LDA+20
0506  0000          0000
0507  1440          SAE
0510  0017          0017
0511  6167          CPHLT           /SET+17 FAILED TO SET B17 AC=0000


                /LDA ALL MODE TEST
                /I=0 B=0 ADDRESS OF OPERAND IS IN SECOND WORD
                /
0512  1000          LDA
0513  0035          K0000
0514  1460          SAE+20
0515  0000          0000
0516  6167          CPHLT           /LDA FAILED AC=0000
```

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

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

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

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

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

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

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

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


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

0566  0075          SET+20+15
```

```
3557  0034          K2002-1
3570  1035          LDA+20+15
3571  1460          SAE+20
3572  2000          2002
3573  6167          CPHLT           /LDA I B FAILED AC=0000

3574  0076          SET+20+16
3575  0017          K7777-1
3576  1036          LDA+20+16
3577  1460          SAE+20
3600  7777          7777
3601  6167          CPHLT           /LDA I B FAILEDAC=7777

3602  0077          SET+20+17
3603  0020          K5252-1
3604  1037          LDA+20+17
3605  1460          SAE+20
3606  5252          5252
3607  6167          CPHLT           /LDA I B FAILED AC=5252

3610  0071          SET+20+11
3611  0035          K2525-1
0612  1031          LDA+20+11
0613  1460          SAE+20
0614  2525          2525
0615  6167          CPHLT           /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          CLR
0617  1040          STA
0620  0022          TEMPL
0621  1440          SAE
0622  0022          TEMPL
0623  6167          CPHLT           /STA FAILED AC=0000 TEMPL=0000

0624  1020          LDA+20
0625  7777          7777
0626  1040          STA
0627  0037          TEMPH
0630  1440          SAE
0631  0037          TEMPH
0632  6167          CPHLT           /STA FAILED AC=7777 TEMPH=7777

0633  1020          LDA+20
0634  5252          5252
0635  1040          STA
0636  0022          TEMPL
0637  1440          SAE
0640  0022          TEMPL
0641  6167          CPHLT           /STA FAILED AC=5252 TEMPL=5252
```

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

```
0720  1046          STA 6
0721  1440          SAE
0722  0037          TEMPH
0723  6167          CPHLT           /STA A FAILED AC=7777 TEMPH=7777


0724  0077          SET+20+17
0725  0037          TEMPH
0726  1020          LDA+20
0727  5252          5252
0730  1057          STA+17
0731  1440          SAE
0732  0037          TEMPH
0733  6167          CPHLT           /STA A FAILED AC=5252 TEMPH=5252 B=17

0734  0076          SET+20+16
0735  0037          TEMPH
0736  1020          LDA+20
0737  2525          2525
0740  1056          STA+16
0741  1440          SAE
0742  0037          TEMPH
0743  6167          CPHLT           /STA A FAILED AC=2525 TEMPH=2525 B=16

0744  0067          SET+20+7
0745  0022          TEMPL
0746  1020          LDA+20
0747  0000          0000
0750  1047          STA+7
0751  1440          SAE
0752  0022          TEMPL
0753  6167          CPHLT           /STA A FAILED AC=0000 TEMPL=0000 B=7

0754  0071          SET+20+11
0755  0022          TEMPL
0756  1020          LDA+20
0757  7777          7777
0760  1051          STA+11
0761  1440          SAE
0762  0022          TEMPL
0763  6167          CPHLT           /STA A FAILED AC=7777 TEMPL=7777 B=11

0764  0075          SET+20+15
0765  0022          TEMPL
0766  1020          LDA+20
0767  5252          5252
0770  1055          STA+15
0771  1440          SAE
0772  0022          TEMPL
0773  6167          CPHLT           /STA A FAILED AC=5252 TEMPL=5252 B=15

0774  0074          SET+20+14
0775  0022          TEMPL
0776  1020          LDA+20
```

```
          2777  2525            2525
          1000  1054            STA+14
          1001  1440            SAE
          1002  0022            TEMPL
          1003  6167            CPHLT           /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            SET+20+10
          1005  0021            TEMPL-1
          1006  1020            LDA+20
          1007  5252            5252
          1010  1070            STA 20+10
          1011  1440            SAE
          1012  0022            TEMPL
          1013  6167            CPHLT           /STA I A FAILED AC=5252 TEMPL=5252 B=10

          1014  0067            SET+20+7
          1015  0021            TEMPL-1
          1016  1020            LDA+20
          1017  2525            2525
          1020  1067            STA 20+7
          1021  1440            SAE
          1022  0022            TEMPL
          1023  6167            CPHLT           /STA I A FAILED AC=2525 TEMPL=2525 B=7

          1024  0071            SET+20+11
          1025  0036            TEMPH-1
          1026  1020            LDA+20
          1027  5252            5252
          1030  1071            STA+20+11
          1031  1440            SAE
          1032  0037            TEMPH
          1033  6167            CPHLT           /STA I A FAILED AC=5252 TEMPH=5252 B=11

          1034  0066            SET+20+6
          1035  0036            TEMPH-1
          1036  1020            LDA+20
          1037  2525            2525
          1040  1066            STA+20+6
          1041  1440            SAE
          1042  0037            TEMPH
          1043  6167            CPHLT           /STA I A FAILED AC=2525 TEMPH=2525 B=6


                          /
                          /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
          1044  0011            CLR
          1045  1100            ADA
          1046  0035            K0000
          1047  1100            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
1065  6167          CPHLT           /ADA FAILED A=5252 B=5252 AC=2525

1066  0454          FLO             /FLO FAILED F=1
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
1077  6167          CPHLT           /ADA FAILED A=7777 B=0000 AC=7777

1100  0474          FLO+20          /FLOW FAILED FLO=0
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
1111  6167          CPHLT           /ADA FAILED A=2525 B=2525 AC=5252

1112  0454          FLO             /FLO FAILED
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
1123  6167          CPHLT           /ADA FAILED A=5252 B=2525 AC=7777

1124  0474          FLO+20          /FLO FAILED
1125  6167          CPHLT
1126  0011          CLR
1127  1100          ADA
1130  0036          K2525
```

```
1131  1100          ADA
1132  0021          K5252
1133  1460          SAE+20
1134  7777          7777
1135  6167          CPHLT           /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
```

```
1205  0017          K7777=1
1206  0011          CLR
1207  1127          ADA+20+7
1210  1137          ADA+20+17
1211  1460          SAE+20
1212  7777          7777
1213  6167          CPHLT           /ADA I A FAILED A=0000 B=7777 AC=7777 B=7,17

1214  0067          SET+20+07
1215  0020          K5252=1
1216  0070          SET+20+10
1217  0035          K2525=1
1220  0011          CLR
1221  1127          ADA+20+07
1222  1130          ADA+20+10
1223  1460          SAE+20
1224  7777          7777
1225  6167          CPHLT           /ADA I A FAILED A=0000 B=0000 AC=0000 B=7,10

1226  0072          SET+20+12
1227  0034          K0000=1
1230  0065          SET+20+05
1231  0034          K0000=1
1232  0011          CLR
1233  1132          ADA+20+12
1234  1125          ADA+20+05
1235  1460          SAE+20
1236  0000          0000
1237  6167          CPHLT           /ADA I A FAILED A=0000 B=0000 AC=0000 B=12,5

1240  0072          SET+20+12
1241  0035          K2525=1
1242  0076          SET+20+16
1243  0020          K5252=1
1244  0011          CLR
1245  1132          ADA+20+12
1246  1136          ADA+20+16
1247  1460          SAE+20
1250  7777          7777
1251  6167          CPHLT           /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          LDA+20
1253  7777          7777
1254  1640          BCO
1255  0021          K5252
1256  1460          SAE+20
1257  2525          2525
1260  6167          CPHLT           /BCO FAILED A=7777 B=5252 AC=2525
```

```
1261  1020          LDA+20
1262  5252          5252
1263  1640          BCO
1264  0036          K2525
1265  1460          SAE+20
1266  7777          7777
1267  6167          CPHLT           /BCO FAILED A=5252 B=2525 AC=7777

1270  1020          LDA+20
1271  2525          2525
1272  1640          BCO
1273  0020          K7777
1274  1460          SAE+20
1275  5252          5252
1276  6167          CPHLT           /BCO FAILED A=2525 B=7777 AC=5252

1277  0011          CLR
1300  1640          BCO
1301  0035          K0000
1302  1460          SAE+20
1303  0000          0000
1304  6167          CPHLT           /BCO FAILED A=0000 B=0000 AC=0000

                /BCO A TEST

1305  0071          SET+20+11
1306  0020          K7777
1307  1020          LDA+20
1310  5252          5252
1311  1651          BCO+11
1312  1460          SAE+20
1313  2525          2525
1314  6167          CPHLT           /BCO FAILED A=5252 B=7777 AC=2525

1315  0077          SET+20+17
1316  0035          K0000
1317  1020          LDA+20
1320  2525          2525
1321  1657          BCO+17
1322  1460          SAE+20
1323  2525          2525
1324  6167          CPHLT           /BCO FAILED A=2525 B=0000 AC=2525

1325  0075          SET+20+15
1326  0036          K2525
1327  1020          LDA+20
1330  0000          0000
1331  1655          BCO+15
1332  1460          SAE+20
1333  2525          2525
1334  6167          CPHLT           /BCO FAILED A=0000 B=2525 AC=2525

1335  0072          SET+20+12
1336  0021          K5252
```

```
1337  1020          LDA+20
1340  2525          2525
1341  1652          BCO+12
1342  1460          SAE+20
1343  7777          7777
1344  6167          CPHLT           /BCO FAILED A=2525 B=5252 AC=7777


                /BCO I+A TEST

1345  0066          SET+20+6
1346  0017          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  0020          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


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

```
1412  6167            CPHLT           /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          SET+20+10
1466  0020          K7777
1467  1020          LDA+20
1470  5777          5777
1471  1610          BSE 10
1472  1460          SAE+20
1473  7777          7777
1474  6167          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          SET+20+12
1476  0035          K2525-1
1477  1020          LDA+20
1500  5252          5252
1501  1632          BSE+20+12
1502  1460          SAE+20
1503  7777          7777
1504  6167          CPHLT           /BSE FAILED A=5252 B=2525 AC=7777 B=12

1505  0076          SET+20+16
1506  0020          K5252-1
1507  1020          LDA+20
1510  2525          2525
1511  1636          BSE+20+16
1512  1460          SAE+20
1513  7777          7777
1514  6167          CPHLT           /BSE FAILED A=5252 B=2525 AC=7777 B=16

1515  0074          SET+20+14
1516  0034          K0000-1
1517  0011          CLR
1520  1634          BSE+20+14
1521  1460          SAE+20
1522  0000          0000
1523  6167          CPHLT           /BSE FAILED A=0000 AC=0000 B=14

1524  0073          SET+20+13
1525  0017          K7777-1
1526  1020          LDA+20
1527  2525          2525
1530  1633          BSE+20+13
1531  1460          SAE+20
1532  7777          7777
1533  6167          CPHLT           /BSE FAILED A=2525 B=7777 AC=7777 B=13

                /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
1534  1020          LDA+20
1535  7777          7777
1536  1540          BCL
1537  0036          K2525
```

```
1542  1460          SAE+20
1541  5252          5252
1542  6167          CPHLT           /BCL FAILED A=7777 B=2525 AC=5252

1543  1020          LDA+20
1544  2525          2525
1545  1540          BCL
1546  0036          K2525
1547  1460          SAE+20
1550  0000          0000
1551  6167          CPHLT           /BCL FAILED A=2525 B=2525 AC=0000

1552  1020          LDA+20
1553  5252          5252
1554  1540          BCL
1555  0036          K2525
1556  1460          SAE+20
1557  5252          5252
1560  6167          CPHLT           /BCL FAILED A=5252 B=2525 AC=5252

1561  1020          LDA+20
1562  0000          0000
1563  1540          BCL
1564  0020          K7777
1565  1460          SAE+20
1566  0000          0000
1567  6167          CPHLT           /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          7777
1574  1555          BCL+15
1575  1460          SAE+20
1576  5252          5252
1577  6167          CPHLT           /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          2525
1604  1552          BCL+12
1605  1460          SAE+20
1606  2525          2525
1607  6167          CPHLT           /BCL B FAILED A=2525 B=5252 AC=2525

1610  0074          SET+20+14
1611  0036          K2525
1612  1020          LDA+20
1613  5252          5252
1614  1554          BCL+14
1615  1460          SAE+20
```

```
1616  5252          5252
1617  6167          CPHLT          /BCL B FAILED A=5252 B=2525 AC=5252

1620  0076          SET+20+16
1621  0020          K7777
1622  7011          CLR
1623  1556          BCL+16
1624  1460          SAE+20
1625  0000          0000
1626  6167          CPHLT          /BCL B FAILED A=0000 B=7777 AC=0000

                /BCL I A TEST AUTO INDEX

1627  0077          SET+20+17
1630  0020          K5252=1
1631  1020          LDA+20
1632  2525          2525
1633  1577          BCL+20+17
1634  1460          SAE+20
1635  2525          2525
1636  6167          CPHLT          /BCL I B FAILED A=2525 B=5252 AC=2525 B=17

1637  0073          SET+20+13
1640  0034          K0000=1
1641  1020          LDA+20
1642  7777          7777
1643  1573          BCL+20+13
1644  1460          SAE+20
1645  7777          7777
1646  6167          CPHLT          /BCL I B FAILED A=7777 B=0000 AC=7777 B=13


1647  0075          SET+20+15
1650  0017          K7777=1
1651  1020          LDA+20
1652  0000          0000
1653  1575          BCL+20+15
1654  1460          SAE+20
1655  0000          0000
1656  6167          CPHLT          /BCL I B FAILED A=0000 B=7777 AC=0000 B=15

1657  0073          SET+20+13
1660  0035          K2525=1
1661  1020          LDA+20
1662  5252          5252
1663  1573          BCL+20+13
1664  1460          SAE+20
1665  5252          5252
1666  6167          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          5252
1671  1040          STA
1672  0022          TEMPL
1673  1500          SRO
1674  0022          TEMPL
1675  6167          CPHLT           /DID NOT EXECUTE SKIP
1676  1020          LDA+20
1677  2525          2525
1700  1440          SAE
1701  0022          TEMPL
1702  6167          CPHLT           /SRO FAILED TO ROTATE PROPERLY

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

1717  1020          LDA+20
1720  0002          0002
1721  1040          STA
1722  0037          TEMPH
1723  1500          SRO
1724  0037          TEMPH
1725  6167          CPHLT           /DID NOT EXECUTE SKIP
1726  1020          LDA+20
1727  0001          0001
1730  1440          SAE
1731  0037          TEMPH
1732  6167          CPHLT           /SRO FAILED TO ROTATE PROPERLY
1733  1020          LDA+20
1734  2525          2525
1735  1040          STA
1736  0037          TEMPH
1737  1500          SRO
1740  0037          TEMPH
1741  0016          CPNOP
1742  1020          LDA+20
1743  5252          5252
1744  1440          SAE
1745  0037          TEMPH
1746  6167          CPHLT           /SRO FAILED TO ROTATE PROPERLY

                /CHANGE FIELDS
1747  0002          PDP
1750  5751          JMP I   .+1
1751  2051          TAPE6
```

```
                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

                6040            CPHLT=6040

                2040    *2040
2040  0011              CLR
2041  2000              ADD     0
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

2051  6141    TAPE6,    LINC
2052  6053              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                   /STH FAILED A=7777 B=0007 C=7707 D=R E=6,7
```

```
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                   /STH MODIFIED WRONG HALF

2104  0011          CLR
2105  0067          SET+20+7
2106  0006          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  1100          ADA
2121  0027          0027
2122  1460          SAE+20
2123  7777          7777
2124  6040          CPHLT                   /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                   /STH MODIFIED WRONG HALF

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

```
2156  0011          CLR
2157  1300          LDH
2160  0006          0006
2161  1100          ADA
2162  0034          0034
2163  1460          SAE+20
2164  7777          7777
2165  6040          CPHLT                   /STH MODIFIED WRONG HALF
2166  0011          CLR
2167  0067          SET+20+7
2170  0006          0006
2171  0011          CLR
2172  0066          SET+20+6
2173  7777          7777
2174  1300          LDH
2175  4031          4031
2176  1347          STH+7
2177  0011          CLR
2200  1300          LDH
2201  0006          0006
2202  1100          ADA
2203  0033          0033
2204  1460          SAE+20
2205  7777          7777
2206  6040          CPHLT                   /STH FAILED A=7777 B=0052 C=5277 D=L E=6,7

2207  0011          CLR
2210  1300          LDH
2211  4006          4006
2212  1100          ADA
2213  0034          0034
2214  1460          SAE+20
2215  7777          7777
2216  6040          CPHLT                   /STH MODIFIED WRONG HALF

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

2217  0011          CLR
2220  1040          STA
2221  0007          0007
2222  1140          ADM
2223  0007          0007
2224  1460          SAE+20
2225  0000          0000
2226  6040          CPHLT                   /ADM FAILED A=0000 B=0000 E=7

2227  0474          FLO+20                  /FLO FAILED FLO=0
2230  6040          CPHLT
2231  0011          CLR
2232  0017          COM
2233  1040          STA
2234  0007          0007
```

```
2235  1140          ADM
2236  0007          0007
2237  1460          SAE+20
2240  7777          7777
2241  6040          CPHLT                   /ADM FAILED A=7777 B=0000 C=7777 E=7

2242  0011          CLR
2243  0067          SET+20+7
2244  2525          2525
2245  1020          LDA+20
2246  5252          5252
2247  1140          ADM
2250  0007          0007
2251  1460          SAE+20
2252  7777          7777
2253  6040          CPHLT                   /ADM FAILED A=2525 B=5252 C=7777 E=7


2254  0011          CLR
2255  0067          SET+20+7
2256  7777          7777
2257  1020          LDA+20
2260  0001          0001
2261  1140          ADM
2262  0007          0007
2263  0452          LZE
2264  6040          CPHLT                   /ADM CHANGED LINK
2265  1460          SAE+20
2266  0001          0001
2267  6040          CPHLT                   /ADM FAILED AC SHOULD = 0001

2270  0011          CLR
2271  0067          SET+20+7
2272  2525          2525
2273  1020          LDA+20
2274  5253          5253
2275  1140          ADM
2276  0007          0007
2277  0452          LZE
2300  6040          CPHLT                   /ADM CHANGED LINK
2301  1460          SAE+20
2302  0001          0001
2303  6040          CPHLT                   /ADM FAILED A=2525 B=5253 C=0001 E=7

2304  0011          CLR
2305  1020          LDA+20
2306  4000          4000
2307  0261          ROL+20+1
2310  0452          LZE
2311  0456          LSKP
2312  6040          CPHLT                   /ROL FAILED LINK = 0
2313  0067          SET+20+7
2314  7777          7777
2315  1020          LDA+20
2316  0001          0001
```

```
2317  1140          ADM
2320  0007          0007
2321  0452          LZE
2322  0456          LSKP
2323  6040          CPHLT                   /ADM CHANGED LINK
2324  1460          SAE+20
2325  0001          0001
2326  6040          CPHLT                   /ADM FAILED A=7777 B=0001 C=0001 E=7

2327  0011          CLR
2330  1020          LDA+20
2331  0001          0001
2332  0321          ROR+20+1
2333  0452          LZE
2334  0456          LSKP
2335  6040          CPHLT                   /ROR FAILED L=0
2336  0067          SET+20+7
2337  5252          5252
2340  1020          LDA+20
2341  5252          5252
2342  1140          ADM
2343  0007          0007
2344  0452          LZE
2345  0456          LSKP
2346  6040          CPHLT                   /ADM CHANGED LINK L=1
2347  1460          SAE+20
2350  2525          2525
2351  6040          CPHLT                   /ADM FAILED A=5252 B=5252 C= E=7

2352  0454          FLO                     /FLO FAILED FLO=1
2353  6040          CPHLT
                /ADM I=0 B=X
                /ADM I=0 B=X OPERAND ADDRESS IS IN THE B REGISTER

2354  0011          CLR
2355  0066          SET+20+6
2356  7777          7777
2357  0067          SET+20+7
2360  0006          0006
2361  1020          LDA+20
2362  0001          0001
2363  1147          ADM+7
2364  1460          SAE+20
2365  0001          0001
2366  6040          CPHLT                   /ADM FAILED
2367  1000          LDA
2370  0006          0006
2371  1460          SAE+20
2372  0001          0001
2373  6040          CPHLT                   /ADM FAILED A=7777 B=0001 C=0001 E=6,7

2374  0011          CLR
2375  0066          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                   /ROL FAILED L=0
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                   /ADM CHANGED LINK L=0
2430  1460          SAE+20
2431  0001          0001
2432  6040          CPHLT
2433  1000          LDA
2434  0006          0006
2435  1460          SAE+20
2436  0001          0001
2437  6040          CPHLT                   /ADM FAILED A=7777 B=0001 C=0001 E=6,7

                /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=7777

2454  1000          LDA
2455  0450          .+2005
2456  1460          SAE+20
```

```
2457  7777          7777
2460  6040          CPHLT                   /ADM FAILED TO CHANGE DATA

2461  0011          CLR
2462  1020          LDA+20
2463  0001          0001
2464  1040          STA
2465  0471                  ,+4-2000

2466  1020          LDA+20
2467  7777          7777
2470  1160          ADM+20
2471  0001          0001
2472  1460          SAE+20
2473  0001          0001
2474  6040          CPHLT                   /ADM FAILED A=7777 B=0001 C=0001

2475  1000          LDA
2476  0471          ,-2005
2477  1460          SAE+20
2500  0001          0001
2501  6040          CPHLT                   /ADM FAILED

2502  0011          CLR
2503  1020          LDA+20
2504  5253          5253
2505  1040          STA
2506  0512                  ,+4-2000
2507  1020          LDA+20
2510  2525          2525
2511  1160          ADM+20
2512  5253          5253
2513  1460          SAE+20
2514  0001          0001
2515  6040          CPHLT                   /ADM FAILED A=2525 B=5253 C=0001

2516  1000          LDA
2517  0512          ,-2005
2520  1460          SAE+20
2521  0001          0001
2522  6040          CPHLT                   /ADM FAILED


2523  0011          CLR
2524  1020          LDA+20
2525  2525          2525
2526  1040          STA
2527  0533                  ,+4-2000
2530  1020          LDA+20
2531  5252          5252
2532  1160          ADM+20
2533  2525          2525
2534  1460          SAE+20
2535  7777          7777
```

```
2536  6040          CPHLT                   /ADM FAILED A=5252 B=2525 C=7777

2537  1000          LDA
2540  2533          .-2005
2541  1460          SAE+20
2542  7777          7777
2543  6040          CPHLT                   /ADM FAILED

2544  0011          CLR
2545  1020          LDA+20
2546  2526          2526
2547  1040          STA
2550  0554                .+4-2000
2551  1020          LDA+20
2552  5252          5252
2553  1160          ADM+20
2554  2526          2526
2555  1460          SAE+20
2556  0001          0001
2557  6040          CPHLT                   /ADM FAILED A=5252 B=2526 C=0001

2560  1000          LDA
2561  0554          .-2005
2562  1460          SAE+20
2563  0001          0001
2564  6040          CPHLT                   /ADM FAILED


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

2565  0011          CLR
2566  0067          SET+20+7
2567  0005          0005
2570  0066          SET+20+6
2571  7776          7776
2572  1020          LDA+20
2573  0001          0001
2574  1167          ADM+20+7
2575  1460          SAE+20
2576  7777          7777
2577  6040          CPHLT                   /ADM FAILED A=7776 B=0001 C=7777 E=6,7
2600  1000          LDA
2601  0006          0006
2602  1460          SAE+20
2603  7777          7777
2604  6040          CPHLT                   /ADM FAILED

2605  0011          CLR
2606  0067          SET+20+7
2607  0016          0016
2610  0077          SET+20+17
2611  7776          7776
2612  1020          LDA+20
```

```
2613  7001          0001
2614  1167          ADM+20+7
2615  1460          SAE+20
2616  7777          7777
2617  6040          CPHLT                   /ADM FAILED A=7776 B=0001 C=7777 E=7,17

2620  1000          LDA
2621  0017          0017
2622  1460          SAE+20
2623  7777          7777
2624  6040          CPHLT                   /ADM FAILED
2625  0011          CLR
2626  0067          SET+20+7
2627  0016          0016
2630  0077          SET+20+17
2631  2525          2525
2632  1020          LDA+20
2633  5252          5252
2634  1167          ADM+20+7
2635  1460          SAE+20
2636  7777          7777
2637  6040          CPHLT                   /ADM FAILED A=2525 B=5252 C=7777 E=7,17

2640  1000          LDA
2641  0017          0017
2642  1460          SAE+20
2643  7777          7777
2644  6040          CPHLT                   /ADM FAILED


2645  0011          CLR
2646  0067          SET+20+7
2647  0016          0016
2650  0077          SET+20+17
2651  5252          5252
2652  1020          LDA+20
2653  2526          2526
2654  1167          ADM+20+7
2655  1460          SAE+20
2656  0001          0001
2657  6040          CPHLT                   /ADM FAILED A=5252 B=2526 C=0001 E=7,17

2660  1000          LDA
2661  0017          0017
2662  1460          SAE+20
2663  0001          0001
2664  6040          CPHLT                   /ADM FAILED

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

2665  0011          CLR
2666  1020          LDA+20
```

```
2667  4000            4000
2670  0261            ROL+20+1
2671  2067            SET+20+7
2672  6517            6517
2673  1020            LDA+20
2674  3743            3743
2675  1200            LAM
2676  0007            0007
2677  1460            SAE+20
2700  2463            2463
2701  6040            CPHLT                   /LAM FAILED AC SHOULD = 2463
2702  0474            FLO+20                  /FLO FAILED FLO=0
2703  6040            CPHLT

2704  0452            L2E
2705  0456            LSKP
2706  6040            CPHLT                   /LINK SHOULD = 1

2707  1000            LDA
2710  0007            0007
2711  1460            SAE+20
2712  2463            2463
2713  6040            CPHLT                   /LAM FAILED TO MODIFY LOCATION 7

2714  0011            CLR
2715  0067            SET+20+7
2716  5253            5253
2717  1020            LDA+20
2720  2525            2525
2721  1200            LAM
2722  0007            0007
2723  1460            SAE+20
2724  0000            0000
2725  6040            CPHLT                   /LAM FAILED AC SHOULD BE 0000
2726  0452            L2E
2727  0456            LSKP
2730  6040            CPHLT                   /LINK SHOULD BE SET
2731  1000            LDA
2732  0007            0007
2733  1460            SAE+20
2734  0000            0000
2735  6040            CPHLT                   /LAM FAILED TO MODIFY CORRECT ADDRESS
                /CHANGE FIELDS

2736  0002            PDP
2737  5175            JMP     CPOUT
```

```
                /TC58 FILIT ROUTINE FILLS THE TC58 BUFFER WITH THE NUMBER ENTERED IN
                /THE AC, EXIT WITH A CLEAR AC

2740  0000      FILIT,  0
2741  3363              DCA     FILSV1                  /SAVE AC
2742  6201              CDF     0
2743  1762              TAD I   LTCFLD                  /GET FIELD
2744  1770              TAD I   LCDFX                   /ADD 6201
2745  3346              DCA     .+1                     /SAVE IT
2746  6211              CDF     10                      /CHANGE TO THAT FIELD
2747  1366              TAD     FT7600                  /GET -200
2750  3364              DCA     FILSV2                  /SET UP A COUNT
2751  1367              TAD     FTCBF                   /GET CURRENT ADDRESS POINTER
2752  3365              DCA     FILSV3                  /SAVE IT
2753  1363              TAD     FILSV1                  /GET GOOD DATA
2754  3765              DCA I   FILSV3                  /SAVE IT IN THE NEW FIELD
2755  2365              ISZ     FILSV3                  /INCREMENT ADDRESS
2756  2364              ISZ     FILSV2                  /FINISHED 200 WORDS ?
2757  5353              JMP     .-4                     /NO, MORE TO DO
2760  6203              CIF CDF 0                       /YES, RETURN TO FIELD 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  3000      FTCBF,  TCBUFF
2770  0075      LCDFX,  CDFX


      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      ST1,    CLA CLL
3201  1260              TAD     KLPJMP          /SET UP RETURN JUMP
3202  3661              DCA I   LPTC5           / LOCATION
3203  1111              TAD     AK212           /GET A 0212
3204  6666              6666                    /PRINT IT
3205  6665              6665                    /ENABLE LP08 INTERRUPTS
3206  7000              NOP
3207  6203              CIF CDF 0               /EXIT TO FIELD 0
3210  5611              JMP I   .+1
3211  0000              0                       /ENTER HERE
3212  7300      ST,     CLA CLL
3213  6201              CDF     0
3214  1250              TAD     KSETTP
3215  3652              DCA I   ASETTP
3216  3013              DCA     13              /RESET A COUNT LOCATION
3217  6141              LINC
3220  0517              LSW                     /GET LEFT SWITCHES
3221  0267              ROL+20  7               /MOVE LEFT 7
3222  0002              PDP                     /
3223  7510              SPA                     /BIT 0 SET ?
3224  5207              JMP     ST-3            /YES, EXIT
3225  7430              SZL                     /132 COLUMN LP08 ONLY ?
3226  5243              JMP     ST2             /YES
3227  6662              6662                    /CLEAR LP12 BUFFER [FUN AND GAMES ]
3230  2013              ISZ     13              /DELAY
3231  5230              JMP     .-1             /
3232  6661              6661                    /FLAG ? IF NO FLAG LP08 OR NO PRINTER
3233  5200              JMP     ST1             /LP08 OR NO PRINTER
3234  7300              CLA CLL                 /LP12 CHANGE SOME LOCATIONS
3235  1654              TAD I   AKACR           /
3236  3655              DCA I   AST3X           /
3237  1246              TAD     KLPOT           /
3240  3656              DCA I   ALPOUT          /
3241  1251              TAD     K6651           /
3242  3653              DCA I   LSETTP          /
3243  1247      ST2,    TAD     M206            /132 COLUMN LP08 OR LP12
3244  3657              DCA I   AULINE          /
3245  5200              JMP     ST1             /

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      AKACR,  KACR
3255  2271      AST3X,  LST4
3256  2222      ALPOUT, LPOUT
3257  2327      AULINE, FULINE
3260  4574      KLPJMP, JMS I   PATC3
3261  3732      LPTC5,  PTCH5
```

```
                3400    *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  2000              2000
3555  0000              0000
3556  7776              7776
3557  0002              0002
3560  0000              0000
3561  0001              0001
3562  5777              5777
3563  7777              7777
3564  0000              000
3565  0000              0000
3566  0000              0000
3567  0000              0000
3570  0000              0000
3571  0000              0000
3572  0000              0000
3573  0000      BASA,   0000
3574  0000              0000
3575  0007              0007
3576  0002              0002
3577  0000              0000
3600  3000              3000
3601  2000              2000
3602  0000              0
3603  0000              0
3604  0000              0
```

```
3605  0000          2
3606  0000          2
3607  0001          1
3610  3626          TJAC
3611  0030          0030
3612  3777          3777
3613  7777          7777

                    /FPP-12 INSTRUCTION CODE

3614  0002    FPPRG,  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  0212            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  0041            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
```

```
3671  0004          FNORM
3672  1121          JSA 1
3673  3677          TJSA
3674  1031          JEQ 1
3675  3703          TJSB
3676  0000          FEXIT
3677  0041    TJSA, FNOP
3700  0041          FNOP
3701  1031          JA 1
3702  3674          .+6
3703  0213    TJSB, FLDA 213
3704  1071          JAL 1
3705  3707          .+2
3706  0000          FEXIT
3707  0203          FLDA 203
3710  0003          FNEG
3711  3201          FDIV 201
3712  6211          FSTR 211
3713  0204          FLDA 204
3714  5211          FADDM 211
3715  0211          FLDA 211
3716  4201          FMUL 201
3717  1207          FADD 207
3720  2201          FSUB 201
3721  4202          FMUL 202
3722  6204          FSTR 204
3723  0002          FCLR
3724  1111          SETB 1
3725  3550          BASE
3726  1131          JSR 1
3727  3733          .+4
3730  1031          JA 1
3731  3736          .+5
3732  0000          FEXIT
3733  1031          JA 1
3734  3551          BASE+1
3735  0000          FEXIT
3736  0203          FLDA 203
3737  1051          JLT 1
3740  3742          .+2
3741  0000          FEXIT
3742  0210          FLDA 210
3743  0101          LDX 1
3744  0027          0027
3745  0011          ALN 1
3746  0003          FNEG
3747  1001          JEQ 1
3750  3752          .+2
3751  0000          FEXIT
3752  0207          FLDA 207
3753  6211          FSTR 211
3754  0202          FLDA 202
3755  7211          FMULM 211
3756  0211          FLDA 211
3757  6205          FSTR 205
```

```
3760  0002          FCLR
3761  0204          FLDA 204
3762  0205          FDIV 205
3763  1206          FADD 206
3764  6206          FSTR 206
3765  2171          JXN 171
3766  3614          FPPRG
3767  6205          FSTR 205
3770  0002          FCLR
3771  6206          FSTR 206
3772  0205          FLDA 205
3773  0000          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    1030    DDISP,  LDA                     /SAVE RETURN ADDRESS
        6021    0000            0
        6022    4364            STC     DDEX-2000
        6023    0640            LDF     0               /RESET LINC DATA FIELDS
        6024    6025            LJMP    .+1             /RESET INTERRUPT ENABLE
        6025    1020            LDA+20
        6026    1254            1254                    /RED
        6027    0004            ESF
        6030    0446            446
        6031    0456            LSKP
        6032    6030            LJMP    .-2
        6033    0011            CLR
        6034    4001            STC     1
        6035    0075            SET+20  15
        6036    7761            -17
        6037    0070            SET+20  10
        6040    4477            T3-2001
        6041    1020            LDA+20
        6042    0400            400
        6043    1040            STA
        6044    4114            XAXIS-2000
        6045    6131            LJMP    DISPIT
        6046    0061            SET+20  1
        6047    0300            300
        6050    1000            LDA                     /GET THE CLOCK VALUE
        6051    2031            CLOCK+2000              / LOCATION
        6052    6062            LJMP    SHUFF
        6053    6410            LJMP    X1
        6054    6410            LJMP    X1
        6055    6410            LJMP    X1
        6056    1000            LDA
        6057    2117            ERCNT+2000
        6060    6062            LJMP    SHUFF
        6061    6147            LJMP    DEROR
        6062    1040    SHUFF,  STA
        6063    4415            DCKS-2000
        6064    0241            ROL     1
        6065    1540            BCL
        6066    4416            M1-2000
        6067    2417            ADD     G1-4000
        6070    4013            STC     13
        6071    2000            ADD     0
        6072    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    XAXIS,  0
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    SHUFEX, LJMP    .

6131  4135    DISPIT, STC     DISAV-2000
6132  2000            ADD     0
6133  4141            STC     DISEX-2000
6134  1020            LDA+20
6135  0000    DISAV,  0
6136  1770            DSC+20  10
6137  0235            XSK+20  15
6140  6134            LJMP    .-4
6141  6141    DISEX,  LJMP    .

6142  0302    SHFD,   ROR     2
6143  1540            BCL
6144  4416            M1-2000
6145  2417            ADD     G1-4000
6146  6000            LJMP    0
```

```
6147  1020    DEROR,  LDA+20
6150  1250            1250                    /GREEN
6151  0004            ESF
6152  0446            446
6153  0456            LSKP
6154  6152            LJMP    .-2
6155  0011            CLR                     /GET AND CONVERT THE DIGITS FOR:
6156  1100            ADA
6157  2105            CPFLD+2000              /CP
6160  6142            LJMP    SHFD
6161  4014            STC     14
6162  1100            ADA
6163  2114            DKFELD+2000             /RK08
6164  6142            LJMP    SHFD
6165  4013            STC     13
6166  1100            ADA
6167  2072            DDFELD+2000             /DF32 OR RF08 DISK
6170  6142            LJMP    SHFD
6171  4012            STC     12
6172  1100            ADA
6173  2110            FFPELD+2000             /FPP-12
6174  6142            LJMP    SHFD
6175  4011            STC     11
6176  4001            STC     1
6177  0075            SET+20  15
6200  7771            -7
6201  0070            SET+20  10
6202  4515            T4-2001                 /CP
6203  1020            LDA+20
6204  0300            300
6205  6131            LJMP    DISPIT
6206  0061            SET+20  1
6207  0300            300
6210  1754            DSC     14              /CP FIELD DIGITS
6211  1774            DSC+20  14
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              /RK08 FIELD DIGITS
6226  1773            DSC+20  13
```

```
6227  7011          CLR
6230  4001          STC     1
6231  7075          SET+20  15
6232  7761          -17
6233  1000          LDA                     /DETERMINE IF RF08 OR DF32
6234  2153          DF+2000
6235  0472          AZE+20
6236  6242          LJMP    .+4
6237  0070          SET+20  10
6240  4557          T7-2001
6241  6244          LJMP    .+3
6242  0070          SET+20  10
6243  4541          T6-2001
6244  1020          LDA+20
6245  0100          100
6246  6131          LJMP    DISPIT
6247  0061          SET+20  1
6250  0300          0300
6251  1752          DSC     12
6252  1772          DSC+20  12
6253  0011          CLR                     /FPP-12
6254  4001          STC     1
6255  0075          SET+20  15
6256  7755          -23
6257  0070          SET+20  10
6260  4617          T9-2001
6261  6131          LJMP    DISPIT
6262  0061          SET+20  1
6263  0300          0300
6264  1751          DSC     11
6265  1771          DSC+20  11
6266  0011          CLR                     /A,I,P,
6267  1100          ADA
6270  2113          AIPFLD+2000
6271  6142          LJMP    SHFD
6272  4011          STC     11
6273  4001          STC     1
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          LJMP    DISPIT
6303  0061          SET+20  1
6304  0300          0300
6305  1751          DSC     11
6306  1771          DSC+20  11
6307  0011          CLR                     /KF-12
6310  4001          STC     1
6311  0075          SET+20  15
6312  7755          -23
6313  0070          SET+20  10
6314  4641          T10-2001
6315  1020          LDA+20
```

```
6316  7500          500
6317  6131          LJMP    DISPIT
6320  0061          SET+20  1
6321  0300          300
6322  1000          LDA
6323  2112          API+2000
6324  0470          AZE+20
6325  6333          LJMP    ADEXA
6326  0075          SET+20  15
6327  7771          -7
6330  0070          SET+20  10
6331  4663          T13-2001
6332  6337          LJMP    DAEX
6333  0075  ADEXA,  SET+20  15
6334  7765          -13
6335  0070          SET+20  10
6336  4671          T14-2001
6337  1020  DAEX,   LDA+20
6340  0500          500
6341  6131          LJMP    DISPIT
6342  0011          CLR
6343  1100          ADA
6344  2115          TCFDL+2000
6345  6142          LJMP    SHFD
6346  4011          STC     11
6347  4001          STC     1
6350  0075          SET+20  15
6351  7761          -17
6352  0070          SET+20  10
6353  4751          T15-2001
6354  1020          LDA+20
6355  0600          600
6356  6131          LJMP    DISPIT
6357  0061          SET+20  1
6360  0300          300
6361  1751          DSC     11
6362  1771          DSC+20  11
6363  0600          LIF     0
6364  6364  DDEX,   LJMP    .

6365  1000  DXER,   LDA
6366  0000          0
6367  4407          STC     DXEX-2000
6370  1020          LDA+20
6371  1254          1254                    /RED
6372  0004          ESF
6373  0446          446
6374  0456          LSKP
6375  6373          LJMP    .-2
6376  0061          SET+20  1
6377  0550          550
6400  0075          SET+20  15
6401  7755          -23
6402  0070          SET+20  10
```

```
6403  4575            T8-2001
6404  3011            CLR
6405  6131            LJMP    DISPIT
6406  0600            LIF     0
6407  6407    DXEX,   LJMP    .

6410  1760    X1,     DSC+20
6411  0000            2000
6412  1760            DSC+20
6413  0000            2000
6414  6000            LJMP    0

6415  0000    DCKS,   0000
6416  7761    M1,     7761
6417  4456    G1,     T2-2000

6420  6141    REAL,   LINC
6421  1020            LDA+20
6422  0214            214
6423  0004            ESF
6424  0446            446
6425  0456            LSKP
6426  6424            LJMP    .-2
6427  0011    REAL1,  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  6036            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 CDF 0
6454  5655            JMP I   .+1
6455  7400            MESSG
```

```
6456  4136    T2,     4136
6457  3641            3641
6460  2131            2131
6461  0177            0177
6462  4523            4523
6463  2151            2151
6464  4122            4122
6465  2651            2651
6466  2414            2414
6467  0477            0477
6470  5172            5172
6471  0651            0651
6472  1506            1506
6473  4225            4225
6474  4443            4443
6475  6050            6050
6476  0000            0000
6477  0000            0000

6500  4040    T3,     4040
6501  4077            4077
6502  0000            0000
6503  0000            0000
6504  7741            7741
6505  0041            0041
6506  0000            0000
6507  0000            0000
6510  3077            3077
6511  7730            7730
6512  0000            0000
6513  0000            0000
6514  4577            4577
6515  4145            4145

6516  4136    T4,     4136
6517  2241            2241
6520  0000            0000
6521  0000            0000
6522  4477            4477
6523  3044            3044
```

```
6524  4477    T5,     4477
6525  3146            3146
6526  0000            0000
6527  0000            0000
6530  1077            1277
6531  4324            4324
6532  0000            0000
6533  0000            0000
6534  4136            4136
6535  3641            3641
6536  0000            0000
6537  0000            0000
6540  5126            5126
6541  2651            2651

6542  4477    T6,     4477                    /RF08
6543  3146            3146
6544  0000            0000
6545  0000            0000
6546  4477            4477
6547  4044            4044
6550  0000            0000
6551  0000            0000
6552  4136            4136
6553  3641            3641
6554  0000            0000
6555  0000            0000
6556  5126            5126
6557  2651            2651


6560  4177    T7,     4177                    /DF32
6561  3641            3641
6562  0000            0
6563  0000            0
6564  4477            4477
6565  4044            4044
6566  0000            0000
6567  0000            0
6570  4122            4122
6571  2651            2651
6572  0000            0
6573  0000            0
6574  4523            4523
6575  2151            2151
```

```
6576  4577    T8,     4577                    /ERROR
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    T9,     4477                    /FPP-12
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
```

```
6642  1077    T10,    1077                    /KF12
6643  4324            4324
6644  0000            0
6645  0000            0
6646  4477            4477
6647  4044            4044
6650  0000            0
6651  0000            0
6652  2101            2101
6653  0177            0177
6654  0000            0
6655  0000            0
6656  4523            4523
6657  2151            2151
6660  0000            0
6661  0000            0
6662  5177            5177
6663  2651            2651
6664  4177    T13,    4177
6665  7741            7741
6666  0000            0
6667  0000            0
6670  3077            3077
6671  7706            7706

6672  4177    T14,    4177                    /OFF
6673  7741            7741
6674  0000            0
6675  0000            0
6676  4477            4477
6677  4044            4044
6700  0000            0
6701  0000            0
6702  4477            4477
6703  4044            4044

6704  4477    T11,    4477                    /A,I,P,
6705  7744            7744
6706  0000            0
6707  0000            0
6710  7741            7741
6711  0041            0041
6712  0000            0
6713  0000            0
6714  4477            4477
6715  3044            3044

6716  4477    T12,    4477                        /REALLY ?
6717  3146            3146
6720  0000            0
6721  0000            0
6722  4577            4577
6723  4145            4145
6724  0000            0
6725  0000            0
```

```
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    T15,    4040                    /TC58
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
```

```
                /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    BCL=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    LDH=1300
1340    STH=1340
6141    LINC=6141
0415    KST=415
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
2000    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
```

```
1060    JGT=1060
6643    DXAL=6643
6615    DIML=6615
```

```
0000  00000000  00000000  11111111  11111111  11111111  11111111  11111111  11111111
0100  11111111  11000000  00000000  00000000  00002000  00000000  00000001  11111111

0200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0300  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

0400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0500  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

0600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0700  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111


1000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1100  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

1200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1300  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

1400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1500  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

1600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1700  11111111  11111111  11111111  11111111  11111111  11000000  00000000  00000000


2000  00000000  00000000  11111111  11111111  11111111  11111111  11111111  11111111
2100  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

2200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
2300  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

2400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
2500  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

2600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
2700  11111111  11111111  11111111  11111111  11111111  11111111  11111111  10000000


3000  10000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000
3100  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000

3200  11111111  11111111  11111111  11111111  11111111  11111111  11000000  00000000
3300  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000

3400  10000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000
3500  00000000  00000000  00000000  11111111  11111111  11111111  11111111  11111111

3600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
3700  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11110000
```

```
4000
4100

4200
4300

4400
4500

4600
4700


5000
5100

5200
5300

5400
5500

5600
5700


6000  00000000  00000000  11111111  11111111  11111111  11111111  11111111  11111111
6100  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

6200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
6300  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

6400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
6500  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

6600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
6700  11111111  11111111  11111111  11111111  11111111  11111111  11111111  00000000


7000
7100

7200
7300

7400
7500

7600
7700
```

```
A0010   2712    BCO     1640    DCBAD   7216    FAILED  0150
A0011   2713    BCRLF   2312    DCKS    6415    FCLR    0002
A0014   2714    BLKTBL  3400    DCLA    6751    FDIV    3000
A1000   2715    BSE     1600    DCLS    6742    FEXIT   0000
A1001   2716    BUFF    2717    DCSAV2  7301    FFPELD  0110
A7000   2605    BUFFER  3400    DCSAV3  7302    FILIT   2740
AAFDD   0110    C4TEMA  0424    DCSAV4  7303    FILSV1  2763
ACDFX   0106    CDFX    0075    DCST    2332    FILSV2  2764
ACHTOT  2707    CDFXX   0067    DCSTAT  7277    FILSV3  2765
ACKNT   0107    CFHECK  1103    DDEX    6364    FINOP   2157
ACNT    0104    CHECKA  2105    DDFELD  0072    FIXNP   0130
ACPFLD  0105    CHECKB  2114    DDISP   6020    FLDA    0000
ACRLF   2237    CHECKC  2123    DEROR   6147    FLO     0454
ADA     1100    CHECKD  2132    DF      0153    FMUL    4000
ADD     2000    CHECKE  2141    DF325   0147    FMULM   7000
ADDX    0110    CHEKFL  2075    DFATA   1162    FNEG    0003
ADEXA   6333    CHEXIT  2145    DFBAD   1151    FNOP    0041
ADM     1140    CHK     0707    DFST    1512    FNORM   0004
AERROR  0747    CKHEC   2451    DFST1   1532    FORG    1340
AFDD    1163    CKHECK  2435    DFST2   1535    FPBAD   1652
AFEA    0100    CKNT    0070    DIML    6615    FPBFLD  1653
AIP     2600    CLOCK   0031    DISAV   6135    FPCOM   6553
AIP1    2617    CLR     0011    DISEX   6141    FPELD   1751
AIPFLD  0113    COM     0017    DISPCH  0272    FPER    1650
AIPST   2657    CPBAD   1224    DISPIT  6131    FPGOOD  1651
AK0007  0103    CPBFLD  1225    DJR     0006    FPICL   6552
AK212   0111    CPDSP   1226    DKFELD  0114    FPIST   6557
AKACR   3254    CPEXIT  0177    DLCA    6755    FPPRG   3614
AKDD    0067    CPFLD   0105    DLDC    6732    FPST    6555
ALN     0010    CPFRN   1213    DLDR    6733    FPTIME  0125
ALPOUT  3256    CPGOOD  1223    DLDW    6735    FSAPP   0157
API     0112    CPHLT   6040    DLWC    6753    FSAPPL  0160
APION   6006    CPJMP   6000    DMNT    6743    FSTR    6000
APIST   1543    CPNOP   0016    DRANG   0065    FSUB    2000
APO     0451    CPOUT   0175    DRDA    6734    FT7600  2766
APT     3530    CPOUTA  0173    DRDS    6741    FTCBF   2767
APTIME  0124    CPRUN   1201    DSC     1740    FUDG1   1130
ARKBAD  2407    CPST    0042    DSKD    6745    FUDGE1  1537
ASETTP  3252    CPST1   0051    DSKE    6747    FULINE  2327
AST3X   3255    CPST2   0065    DWCA    1160    FXELD   0073
ASTCH   2711    CRLF    0671    DXAL    6643    G1      6417
ASTFPP  1752    CRLFE   0703    DXER    6365    GET     2037
ATR     0014    DAEX    6337    DXEX    6407    GETRAN  2056
ATX     0020    DATA    2564    ERCNT   0117    GETSAV  2073
AULINE  3257    DATLUP  0212    ERROR   0145    GODC    7263
AXO     0001    DATUM   0200    ESF     0004    GOOD    0151
AZE     0450    DC02F   7200    EXT1    0247    GROUP   7276
BAD     0152    DC02FA  7235    EXT2    0256    HALFX   0527
BADFLD  0116    DC02FB  7271    EXT4    0264    HALFY   0530
BASA    3573    DC02FC  7221    EXTUND  0217    HBAD    1460
BASE    3550    DC02FD  7255    FADD    1000    HFLD    1461
BCL     1540    DCAA    1161    FADDM   5000    HGOOD   1457
```

HSER	1456	K240	0704	LCH	6302	M1	0[illegible]
HSR	1462	K2525	0036	LDA	1000	M10	0[illegible]
HSREA	1532	K260	7300	LDCST	1366	M1000	1[illegible]
HSRST	7543	K3000	1565	LDF	0640	M12	0126
HSRSV	7565	K3040	1566	LDH	1300	M206	3247
HSRTS	0163	K3700	0107	LDX	0100	M3	2736
INCR	0314	K3777	0060	LFILIT	7171	M400	2421
INCRA	0321	K4000	0550	LGETR	0111	M5	2172
INTFP	1656	K4777	0061	LGODC	2363	MAGTAP	0055
INTRPT	0057	K5252	0021	LGROUP	2362	MASTER	0022
IOB	0500	K6651	3251	LIF	0600	MESSG	7400
IOF	6002	K6777	2561	LINC	6141	MINS	6125
ION	6001	K7377	2562	LIRB	0161	MINT	6115
IR	3540	K7760	7304	LJMP	6000	ML400	0451
IW0	1507	K7777	0020	LL58	2766	MTCA	7167
JA	1030	KACR	2247	LLAST	7564	MTEXIT	0470
JAC	0007	KCIDF	0106	LP08P	2223	MTGO	6722
JAL	1070	KDXAL	1541	LP12P	2231	MTINST	0472
JEQ	1000	KFP1	1741	LPATC0	0056	MTKF	6123
JGE	1010	KFP2	1742	LPCH	2326	MTLC	6716
JGT	1060	KFP3	1743	LPEX	2200	MTLS	6126
JLE	1020	KFP5	1744	LPNOP	2233	MTON	6117
JLT	1050	KFP6	1745	LPOUT	2222	MTPF	6113
JNE	1040	KFP8	1746	LPSTCH	2325	MTRS	6706
JSA	1120	KFP9	1747	LPTC1	1542	MTSET	0452
JSR	1130	KILLIT	0035	LPTC2	0131	MTSF	6121
JXN	2000	KJMPAP	2720	LPTC3	1655	MTTR	6721
K0000	0035	KJMPDF	1540	LPTC4	2721	MTWC	7170
K0006	2566	KJMPFP	1654	LPTC5	3261	NRDK	0101
K0007	0074	KJMPTC	0135	LPTC6	0133	OCT	0647
K0010	2321	KLPJMP	3260	LPTCH7	0164	OCTE	0670
K0017	0034	KLPOT	3246	LREAL	0162	PASS	0033
K0020	2361	KNOP	1411	LSETTP	3253	PATC1	0170
K0030	7162	KP0007	0023	LSKP	0456	PATC10	0177
K0037	1564	KPT2	0132	LST0	2250	PATC2	0171
K0040	7161	KPTC9	0134	LST1	2253	PATC3	0174
K0070	2074	KR58	2743	LST2	2255	PATC4	0175
K0100	0036	KSETTP	3250	LST3	2257	PATC5	0076
K0200	0037	KST	0415	LST4	2271	PATC6	0077
K0212	2330	KT7600	7124	LST5	2301	PATC7	0173
K0215	2331	KTCBF	7166	LST58	1367	PATC8	0172
K0240	2322	KTYBUF	7305	LSTAIP	1364	PATC9	0176
K0260	0663	KW12	1400	LSTFPP	1365	PATCH	0715
K0340	2323	KW12A	1431	LSTKW	1371	PATCH0	0724
K0400	0155	KW12B	1444	LSW	0517	PATCHA	0735
K0601	0024	KW12C	1447	LTCAV	2744	PATCHB	0743
K0607	7165	KW12RT	0146	LTCEXE	2764	PATCHC	0745
K0770	0510	KWST	2364	LTCFLD	2762	PDP	0002
K1111	1750	KXOBWD	0511	LTCP	1370	PRINTR	0705
K1600	2563	LAM	1200	LTLP	0154	PRT	7415
K205	0063	LAPI	1363	LWLD	7414	PTCH1	0725
K206	0062	LCDFX	2770	LZE	0452	PTCH2	0726

```
PTCH3   0730
PTCH4   0731
PTCH5   0732
PTCH6   0733
PTCH7   0727
QNBN    0032
RANDOM  0512
RANGET  0532
RANXIT  0531
RCHK    0342
RDCCON  0471
RDSUB   0312
READ    0324
REAL    6420
REAL1   6427
RESTAR  0202
RESTOR  6771
REXIT   0371
RF8EX   1141
RF8EXA  1153
RF8SA   1000
RFBAD   1114
RFEAD   1063
RFFLD   1115
RFGOOD  1113
RFTIME  0122
RK8     2400
RK8A    2411
RKADK   2476
RKAKD   2471
RKBAD   2462
RKBFLD  2463
RKDAV   0102
RKDOK   2510
RKEAD   2431
RKEX    2417
RKGOOD  2461
RKSVA   2565
RKTIME  0123
ROL     0240
ROR     0300
RSTACK  6774
RSW     0516
RTA     0015
SAE     1440
SAM     0100
SBF     6307
SCH     6301
SET     0040
SET1    2543
SETB    1110
SETLEV  6772
SETSTK  6776
SETTP   2206
SETTPA  2215
SETUP   1122
SETUPA  1132
SETUPB  1137
SETVEC  6777
SETX    1100
SFTAT   0064
SHFD    6142
SHUFEX  6130
SHUFF   6062
SNS     0440
SPACE   0634
SPEX    0646
SR0     1500
ST      3212
ST1     3200
ST2     3243
ST58    2722
STA     1040
STAR    1053
START   1025
STARTD  0006
STARTF  0005
STAT    0071
STC     4000
STCH    2710
STD     0416
STFPP   1600
STH     1340
SUBT1   0601
T10     6642
T11     6704
T12     6716
T13     6664
T14     6672
T15     6752
T2      6456
T3      6500
T4      6516
T5      6524
T6      6542
T7      6560
T8      6576
T9      6620
TABLE1  0302
TABPT   7306
TAC     0003
TAPE6   2051
TBAD    0364
TC10    2765
TC58    7113
TC58A   7000
TC58B   7060
TC58C   7041
TCAVIL  7156
TCBAD   7137
TCBUFF  3000
TCCHIT  7172
TCCIT   2745
TCDR    7155
TCERR   7135
TCEXE   7074
TCEXEA  7131
TCFDL   0115
TCFLD   7140
TCGOOD  7136
TCRWND  2760
TCSAV   7160
TCSET   7141
TCTIME  0024
TDFLAG  0503
TEMP    0657
TEMPH   0037
TEMPL   0022
TESTIT  2304
TFLD    0365
TGOOD   0363
TIC10   0127
TICKS   0120
TIMOUT  2155
TJAC    3626
TJSA    3677
TJSB    3703
TK0020  7164
TK0070  7163
TK3000  7100
TM5     7157
TMA     0023
TSPACE  7147
TSTDAT  0353
TSTMOR  0041
TTY0    7307
TTY1    7310
TTY2    7311
TTY3    7312
TTY4    7313
TTY5    7314
TTY6    7315
TTY7    7316
TTYBUF  7317
TX1     7425
TX1L    7424
UNBNSV  0447
UNIT    0027
V1007   0156
WAIT    1012
WCHK    0440
WCONT2  0443
WD1     0023
WD3     0025
WD4     0026
WEXIT   0450
WIDTH   2324
WKD1    0066
WKRITE  2467
WLD2    0103
WLD3    0104
WNEXIT  2053
WORLD   1241
WORLD1  1321
WPAT    0444
WRC     0704
WRI     0706
WRITE   0372
WRITEN  2020
WSAVE   2054
X1      6410
XAXIS   6114
XOBWD   0030
XSK     0200
XTA     0030
XX      0607
XXR     0553
XXRE    0570
XXRX    0545
XXX     0537
XXXAC   0002
XXXPC   0600
```

ERRORS DETECTED: 0

LINKS GENERATED: 0

RUN-TIME: 43 SECONDS

3K CORE USED

digital

MAINDEC CHANGE NOTICE

12-D7CD-2
CHANGE NO.

Sheet 1 of 1

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

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/DF32	1Ø23	6772	72ØØ
FPP-12	1737	6772	72ØØ
RKØ8	2427	6772	72ØØ
AIP-12	2614	6772	72ØØ
TC58	71Ø5	6772	72ØØ