IDENTIFICATION

PRODUCT CODE:	MAINDEC-08-DJKMA-A-D
PRODUCT NAME:	KM8-A OPTION TEST #2
DATE CREATED:	DECEMBER 16, 1974
MAINTAINER:	DIAGNOSTIC GROUP
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1.0 ABSTRACT

KM8-A OPTION TEST 2 IS A PROGRAM TO CHECKOUT THE PDP-8A OPTION BOARD #2 (M8317). THE DEVICES TESTED BY THE PROGRAM ARE THE MEMORY EXTENSION/TIME SHARE CONTROL LOGIC, POWER FAIL/AUTO-RESTARTS, AND THE BOOTSTRAP LOADERS. A OPTION 1 + 2 TEST MODULE (G5041) CAN BE USED IN CONJUNCTION WITH THE M8317 AND THE PROGRAM TO DECREASE THE TEST TIME AND TO ALLEVIATE OPERATOR INTERVENTION.

THE PROGRAM IS STRUCTURED SO THAT IT MAY RUN ON OR OFF THE PDP-8A ACT TEST LINE, WITH OR WITHOUT THE OPTION 1 + 2 TEST MODULE, OR ANY COMBINATION OF THE ABOVE WITH THE PDP-8A OPTION BOARD #2.

THE PROGRAM IS A 4K PROGRAM BUT IT IS ALSO SUPPLIED IN FOUR 1K SEGMENTS FOR USE ON COMPUTERS WITH LESS THAN 4K OF MEMORY.

2.0 REQUIREMENTS

2.1 HARDWARE

THE FOLLOWING HARDWARE IS REQUIRED FOR THE EXECUTION OF THIS PROGRAM.

PROCESSOR(S):

PDP-8A

MEMORY:

MINIMUM OF 4K OF MEMORY FOR THE COMPLETE PROGRAM
MINIMUM OF 1K OF MEMORY FOR THE SEGMENTED 1K VERSIONS OF THE PROGRAM.

OPTIONS:

IF OPTION BOARD #2 IS TO BE TESTED ALONE WITHOUT THE OPTION 1 + 2 TEST MODULE, THE FOLLOWING HARDWARE IS REQUIRED, OTHERWISE, SEE THE HARDWARE REQUIRED UNDER THE NEXT SECTION LABELED "SPECIAL".

1. PDP-8A OPTION BOARD #2 (M8317)
2. ONE QUAD EXTENDER MODULE

SPECIAL:

1. PDP-8A OPTION BOARD #2 (M8317)
2. OPTION 1 + 2 TEST MODULE (G5041)
3. ONE QUAD EXTENDER MODULE
4. TWO IC SOCKET CONNECTOR CABLES (PN-7008612)

2.2 STORAGE

THE 4K VERSION AND THE 1K VERSIONS OF THE KM8-A OPTION TEST 2 MUST RESIDE IN FIELD 0. THE 4K VERSION OF THE PROGRAM OCCUPIES LOCATIONS 0000 TO 5177 AND USES LOCATIONS 5200 TO 7777 AS A BUFFER AREA. THE 1K VERSIONS OF THE PROGRAM OCCUPIES FOR THE MOST PART LOCATIONS 0000 TO 1777, AND IT MUST RESIDE IN THE 1ST 1K.

2,3 PREREQUISITE SOFTWARE

PDP-8A CPU TEST
PDP-8A MEMORY TEST
IF 4K OF MEMORY = 2K TO 32K PDP-8A PROCESSOR EXERCISER
IF LESS THAN 4K = 1K TO 32K RANDOM MEMORY REFERENCE INSTRUCTION EXERCISER,

3,0 RESTRICTIONS

1, ONCE THE PROGRAM HAS BEEN STARTED, BINARY LOADER WILL BE DESTROYED IF USED,

2, ALL OPTIONS ASSOCIATED WITH THE BOOTSTRAP LOADERS MUST BE UNPLUGGED FROM THE COMPUTER,

4,0 STANDARD TEST PROCEDURE

THE FOLLOWING PARAGRAPHS MUST BE FOLLOWED EXPLICITLY TO SETUP THE HARDWARE, LOAD THE PROGRAM, AND TO INITIALIZE THE PROGRAM,

4,2 HARDWARE SETUP
4,3 LOADING THE PROGRAM
4,4 PROGRAM INITIALIZATION

THE PROGRAM IS DIVIDED INTO FOUR SECTIONS AND EACH SECTION MUST BE RUN SEPARATELY UNLESS A OPTION 1 + 2 TEST MODULE IS UTILIZED WITH THE PROGRAM, IF THE OPTION 1 + 2 TEST MODULE IS USED, RUN MEMORY EXTENSION/TIME SHARE TEST, PARAGRAPH 4,5, WHICH WILL INCLUDE THE MEMORY EXTENSION/TIME SHARE TESTS ENABLED AND DISABLED, THE BOOTSTRAP TEST, AND AUTO RESTART TEST, IF THE OPTION 1 + 2 TEST MODULE IS NOT USED, DO THE FOLLOWING TEST:

RUN MEMORY EXTENSION/TIME SHARE TEST = PARAGRAPH 4,5
RUN TIME SHARE DISABLE TEST = PARAGRAPH 4,6
RUN BOOTSTRAP/SIMULATOR TEST = PARAGRAPH 4,7
RUN AUTO RESTART/POWER FAIL TEST = PARAGRAPH 4,8

4,1 CHANGING IOT CODES

NOT APPLICABLE

4,2 HARDWARE SETUP

BEFORE LOADING THE PROGRAM, THE FOLLOWING STEPS MUST BE DONE:

A, POWER THE COMPUTER DOWN
B, UNPLUG THE M8317 MODULE FROM THE COMPUTER
C, PLUG THE QUAD EXTENDER INTO THE SLOT THE M8317 OCCUPIED
D, PLUG THE M8317 MODULE INTO THE QUAD EXTENDER
E, SET ALL THE SWITCHES ON THE M8317 MODULE TO THE OFF POSITION
F, IF THE OPTION 1 + 2 TEST MODULE IS TO BE USED DO THE FOLLOWING , IF NOT GO TO STEP G IN THIS SECTION,
   1, TAKE ONE END OF THE IC SOCKET CONNECTOR CABLE AND PLUG IT INTO E93 ON THE M8317 MODULE(OBSERVING PIN 1 ORIENTATION),

2, TAKE THE OTHER END OF THE CABLE AND PLUG IT INTO TS-1 (ABOVE E63) ON THE G5041 MODULE,
3, TAKE ONE END OF THE NEXT IC SOCKET CONNECTOR CABLE AND PLUG IT INTO E80 ON THE M8317 MODULE,
4, TAKE THE OTHER END OF THE CABLE AND PLUG IT INTO TS-2 (ABOVE E70) ON THE G5041 MODULE,
5, PLUG THE OPTION 1 & 2 TEST MODULE(G5041) INTO THE COMPUTER,

G, POWER THE COMPUTER BACK UP,
H, GO TO PARAGRAPH 4,3, LOADING THE PROGRAM,

4,3 LOADING THE PROGRAM

COMPUTERS WITH 4K OF MEMORY WILL USE THE BINARY PAPER TAPE LABELED MAINDEC-08-DJKMA-A-PB1, COMPUTERS WITH LESS THAN 4K OF MEMORY WILL USE THE FOUR 1K SEGMENTED RIM PAPER TAPES WHICH ARE LABELED AS FOLLOWS:

1, MAINDEC-08-DJKMA-A-PM1 - 1K VERSION PART 1
2, MAINDEC-08-DJKMA-A-PM2 - 1K VERSION PART 2
3, MAINDEC-08-DJKMA-A-PM3 - 1K VERSION PART 3
4, MAINDEC-08-DJKMA-A-PM4 - 1K VERSION PART 4

A, IF THE COMPUTER CONTAINS 4K OF MEMORY OR MORE, DO STEP B, OTHERWISE, DO STEP C BELOW FOR COMPUTERS WITH LESS THAN 4K OF MEMORY,

B, LOAD THE BINARY TAPE MENTIONED ABOVE USING THE STANDARD BINARY LOADER TECHNIQUE, AFTER THE TAPE HAS BEEN SUCCESSFULLY LOADED GO TO PARAGRAPH 4,4, PROGRAM INITIALIZATION,

C, TO LOAD THE 1K SEGMENTED RIM PAPER TAPES MENTIONED ABOVE, DEPOSIT INTO LOCATIONS LISTED BELOW THE APPROPRIATE RIM LOADER FOR THE LOADING DEVICE TO BE USED,

HIGH SPEED READER		LOW SPEED READER	
ADDRESS	CONTENT	ADDRESS	CONTENT
0156	6014	0156	6032
0157	6011	0157	6031
0160	5357	0160	5357
0161	6016	0161	6036
0162	7100	0162	7106
0163	7000	0163	7006
0164	7510	0164	7510
0165	5374	0165	5357
0166	7000	0166	7006
0167	6011	0167	6031
0170	5367	0170	5367
0171	6016	0171	6034
0172	7420	0172	7420
0173	3776	0173	3776
0174	3376	0174	3376
0175	5357	0175	5356

D, PLACE THE APPROPRIATE 1K SEGMENT INTO THE READER, "LOAD ADDRESS" TO 0156, PRESS "INIT" AND THEN "RUN",

E, WHEN THE TAPE HAS BEEN LOADED, STOP THE COMPUTER, GO TO PARAGRAPH 4,4, PROGRAM INITIALIZATION,

4,4 PROGRAM INITIALIZATION

THE PROGRAM WHEN LOADED IS INITIALIZED TO RUN WITHOUT THE HARDWARE FRONT PANEL SWITCH REGISTER, WITHOUT OPTION 1 + 2 TEST MODULE, AND THE AMOUNT OF MEMORY REQUIRED TO RUN THE PROGRAM (4K FOR THE COMPLETE PROGRAM AND 1K FOR THE SEGMENTED 1K VERSIONS OF THE PROGRAM), IF IT IS DESIRED TO CHANGE THE HARDWARE CONFIGURATION, LOAD ADDRESS TO 0021 AND DEPOSIT INTO THIS LOCATION THE APPROPRIATE HARDWARE CONFIGURATION FOR THE BITS LISTED BELOW:

NOTE: IF MEMORY SIZE IS LARGER OR SMALLER THAN LISTED ABOVE, IT SHOULD BE CHANGED IN LOCATION 0021,

BIT 0 = 0 THE PROGRAM WILL USE LOCATION 0020 AS A PSEUDO SWITCH REGISTER
BIT 0 = 1 THE PROGRAM WILL USE THE HARDWARE FRONT PANEL SWITCH REGISTER

BIT 2 = 1 HAS A M8317 OPTION 2 MODULE

BIT 4 = 0 THE PROGRAM WILL NOT USE THE OPTION 1 + 2 TEST MODULE TO TEST THE M8317,
BIT 4 = 1 THE PROGRAM WILL USE THE OPTION 1 + 2 TEST MODULE TO TEST THE M8317,

BITS 7-11 SPECIFIES THE PDP-8A'S MEMORY SIZE, ALL ZEROES INDICATES 1K OF MEMORY, AN ADDITION OF 1 TO THE NUMBER IN BITS 7-11 INCREASES MEMORY SIZE BY 1K,

GO TO PARAGRAPH 4,5, MEMORY EXTENSION/TIME SHARE TEST,

4,5 RUN MEMORY EXTENSION/TIME SHARE TEST,

THE TAPE(S) TO BE USED TO RUN THIS TEST ARE AS FOLLOWS:

COMPUTERS WITH AT LEAST 4K OF MEMORY

MAINDEC-08-DJKMA-A-PB1

COMPUTERS WITH LESS THAN 4K OF MEMORY

MAINDEC-08-DJKMA-A-PM1
MAINDEC-08-DJKMA-A-PM2

NOTE: IF OPTION 1 + 2 TEST MODULE IS SELECTED AND THE COMPUTER CONTAINS 4K OF MEMORY OR MORE, THIS TEST IS THE ONLY TEST REQUIRED TO BE RUN WITH THE 4K PROGRAM LISTED ABOVE,

A, LOAD ADDRESS TO ONE OF THE FOLLOWING ADDRESSES FOR THE TAPE(S) TO BE RUN:

ADDRESS 0200 (RESTART 0201 IF OPTION 1 + 2 TEST MODULE IS USED) =MAINDEC=08=DJKMA=A=
ADDRESS 0200 =MAINDEC=08=DJKMA=A=PM1
ADDRESS 0200 =MAINDEC=08=DJKMA=A=PM2

B, SET THE SWITCH REGISTER OR PSEUDO SWITCH REGISTER, WHICHEVER WAS SELECTED, TO 0000,

C, PRESS "INIT" AND THEN "RUN",

D, SETTING THE SWITCH REGISTER OR PSEUDO SWITCH REGISTER, WHICHEVER WAS SELECTED, TO 0400 WILL CAUSE THE COMPUTER TO HALT AT THE END OF A PROGRAM PASS, THE LOCATION AT WHICH IT WILL HALT, WILL BE ONE OF THE FOLLOWING FOR THE TAPE THAT IS BEING RUN:

LOCATION 5040 = MAINDEC=08=DJKMA=A=PB1
LOCATION 1634 = MAINDEC=08=DJKMA=A=PM1
LOCATION 1634 = MAINDEC=08=DJKMA=A=PM2

E, THE PROGRAM WILL NOW RUN UNTIL AN ERROR IS ENCOUNTERED OR THE PROGRAM IS STOPPED BY THE OPERATOR OR SR3=1,

F, AN ERROR MAY RESULT IN AN ERROR HALT OR A JMP SELF,

4,6 RUN TIME SHARE DISABLE TEST

THE TAPE(S) TO BE USED TO RUN THIS TEST ARE AS FOLLOWS:

COMPUTERS WITH AT LEAST 4K OF MEMORY

MAINDEC=08=DJKMA=A=PB1

COMPUTERS WITH LESS THAN 4K OF MEMORY

MAINDEC=08=DJKMA=A=PM3

A, ON THE MR317 MODULE, SET SWITCH 1 TO THE ON POSITION ON THE SWITCH PACKAGE WHICH LIES ABOVE I.C. E87, SETTING OF THIS SWITCH WILL DISABLE THE TIME SHARE LOGIC,

B, LOAD ADDRESS TO ONE OF THE FOLLOWING ADDRESSES FOR THE TAPE TO BE RUN:

ADDRESS 4255 = MAINDEC=08=DJKMA=A=PB1
ADDRESS 1255 = MAINDEC=08=DJKMA=A=PM3

C, SET SWITCH REGISTER OR PSEUDO SWITCH REGISTER, WHICHEVER WAS SELECTED, TO 0000, PRESS "INIT" AND THEN "RUN",

D, THE PROGRAM SHOULD HALT ON A SUCCESSFULL PASS AT LOCATION 4275 FOR MAINDEC=08=DJKMA=A=PB1 AND AT LOCATION 1275 FOR MAINDEC=08=DJKMA=A=PM3

E, SET THE SWITCH THAT WAS SET IN STEP A ABOVE TO THE OFF POSITION,

F, GO TO PARAGRAPH 4,7, RUN BOOTSTRAP/SIMULATOR TEST,

4,7 RUN BOOTSTRAP/SIMULATOR TEST

IF A OPTION 1 * 2 TEST MODULE IS NOT USED WITH THE PROGRAM, GO TO PARAGRAPH 4,7,2, RUN BOOTSTRAP TEST,

IF A OPTION 1 * 2 TEST MODULE IS USED WITH THE PROGRAM AND THE COMPUTER CONTAINS LESS THAN 4K OF MEMORY, GO TO PARAGRAPH 4,7,1, RUN SIMULATOR TEST,

4,7,1, RUN SIMULATOR TEST

THE TAPE TO BE USED WITH THIS TEST IS MAINDEC-08-DJKMA-A-PM3,

THIS TEST USES THE OPTION 1 * 2 TEST MODULE TO CHECK THE EMA LINES, TIME SHARE DISABLE, AC LOW AND BATTERY EMPTY FLIP-FLOPS,

A, LOAD ADDRESS TO 0201

B, SET THE SWITCH REGISTER OR THE PSEUDO SWITCH REGISTER, WHICHEVER WAS SELECTED, TO 0000,

C, PRESS "INIT" , AND THEN "RUN" ;

D, THE PROGRAM WILL NOW RUN UNTILL AN ERROR IS ENCOUNTERED, STOPPED BY THE OPERATOR, OR SWITCH REGISTER 3 SET TO A 1,

E, SETTING SWITCH REGISTER 3 TO A 1 WILL CAUSE THE COMPUTER TO HALT AT LOCATION 1690,

F, WHILE RUNNING THIS PROGRAM THE RUN LIGHT WILL BE BLINKING ON AND OFF,

4,7,2 RUN BOOTSTRAP TEST

THE TAPE(S) TO BE USED TO RUN THIS TEST ARE AS FOLLOWS:

COMPUTERS WITH AT LEAST 4K OF MEMORY

MAINDEC-08-DJKMA-A-PB1

COMPUTERS WITH LESS THAN 4K OF MEMORY

MAINDEC-08-DJKMA-A-PM3

NOTE: DISABLE OR UNPLUG FROM THE COMPUTER ANY DEVICES ASSOCIATED WITH THE BOOTSTRAPS,

A, SET ALL THE SWITCHES ON THE M8317 MODULE TO THE OFF POSITION,

B, SET THE SWITCHES S1-6,S1-7,S1-8 ON THE SWITCH PACKAGE WHICH LIES ABOVE I,C, E79 ON THE M8317 MODULE TO THE ON POSITION;

C, SET THE SWITCHES ON THE M8317 MODULE TO THE BOOTSTRAP TO BE TESTED FROM THE TABLE BELOW:

NOTE: ONLY THE RK8E BOOTSTRAP CAN BE TESTED ON 1K COMPUTERS,

WHEN REFERENCING SWITCHES IN THE TABLE BELOW, S2 IS THE SWITCH PACKAGE LOCATED ABOVE I.C. E87, AND S1 IS LOCATED ABOVE I.C. E79.

BOOTSTRAP	S2 SWITCHES				S1 SWITCHES		
	S2-5	S2-6	S2-7	S2-8	S1-1	S1-2	S1-3
HI-LO PT RDR	ON	ON	ON	OFF	ON	ON	ON
RK8E	ON	OFF	ON	OFF	ON	OFF	ON
TC08	ON	OFF	OFF	ON	OFF	ON	ON
RF08/DF32D	OFF	ON	ON	ON	ON	OFF	OFF
TA8E	OFF	ON	ON	OFF	ON	OFF	OFF

D. LOAD ADDRESS TO ONE OF THE FOLLOWING ADDRESSES FOR THE TAPE THAT IS TO BE RUN:

ADDRESS 4465 = MAINDEC-08-DJKMA-A-PB1
ADDRESS 1465 = MAINDEC-08-DJKMA-A-PM3

E. PRESS "INIT" AND THEN "RUN, THIS WILL CLEAR THE BOOTSTRAP LOCATIONS IN MEMORY THAT THE BOOTSTRAPS WILL LOAD INTO.

F. THE PROGRAM WILL HALT AT LOCATION 4515 FOR MAINDEC-08-DJKMA-A-PB1 OR 1515 FOR MAINDEC-08-DJKMA-A-PM3.

G. TOGGLE THE BOOT SWITCH OR BOOT KEY, THE MODULE SHOULD DO A BOOTSTRAP AND THE COMPUTER SHOULD BE RUNNING.

H. HALT THE COMPUTER AND LOAD ADDRESS TO ONE OF THE FOLLOWING ADDRESSES FOR THE TAPE THAT IS BEING RUN:

ADDRESS 4400 = MAINDEC-08-DJKMA-A-PB1
ADDRESS 1400 = MAINDEC-08-DJKMA-A-PM3

I. THE PROGRAM WILL HALT AT ADDRESS 4400 FOR MAINDEC-08-DJKMA-A-PB1 OR 1400 FOR MAINDEC-08-DJKMA-A-PM3.

J. SET THE SWITCH REGISTER OR THE PSEUDO SWITCH REGISTER, WHICHEVER WAS SELECTED, TO THE BOOTSTRAP TO BE COMPARED FROM THE TABLE BELOW:

BOOTSTRAP	S.R. SETTINGS
HI-LO PT RDR	0000
TC08	0001
RF08/DF32D	0002
TA8E	0003
RK8E	0004

K. PRESS "INIT" AND THEN "RUN" .

L. THE PROGRAM SHOULD HALT AT LOCATION 4461 FOR MAINDEC-08-DJKMA-A-PB1 OR 1461 FOR MAINDEC-08-DJKMA-A-PM3 IF THE BOOTSTRAP COMPARED OK.

M. DO STEPS A THROUGH L FOR EACH BOOTSTRAP

N. GO TO PARAGRAPH 4.8, RUN AUTO RESTART/POWER FAIL TEST.

4.8 RUN AUTO RESTART/POWER FAIL TEST

THE TAPE(S) TO BE USED TO RUN THIS TEST ARE AS FOLLOWS:

COMPUTERS WITH AT LEAST 4K OF MEMORY

MAINDEC-08-DJKMA-A-PB1

COMPUTERS WITH LESS THAN 4K OF MEMORY

MAINDEC-08-DJKMA-A-PM4

THE BATTERY SUPPLY SHOULD BE FULLY CHARGED TO RUN THIS TEST

A. SET ALL SWITCHES TO THE OFF POSITION ON THE M8317 MODULE.

B. SET SWITCHES 1, 3, 6, 7, AND 8 TO THE ON POSITION ON THE SWITCH PACKAGE WHICH IS LOCATED ABOVE E79 ON THE M8317 MODULE.

C. SET SWITCHES 5 AND 7 TO THE ON POSITION ON THE SWITCH PACKAGE WHICH IS LOCATED ABOVE E87 ON THE M8317 MODULE.

D. SET THE SWITCHES ON THE M8317 MODULE TO THE AUTO RESTART TO BE TESTED FROM THE TABLE BELOW.

NOTE: ON 1K COMPUTERS THE ONLY RESTARTS THAT CAN BE TESTED ARE AT 0000 AND 0200.

AUTO RESTART	S2 SWITCHES(ABOVE E87)		
	S2-2	S2-3	S2-4
0000	OFF	OFF	OFF
0200	OFF	ON	OFF
2000	ON	OFF	OFF
4200	ON	ON	OFF

F. LOAD ADDRESS TO 4000 FOR MAINDEC-08-DJKMA-A-PB1 OR TO 0201 FOR MAINDEC-08-DJKMA-A-PM4.

G. PRESS "INIT" AND THEN "RUN" .

H. THE PROGRAM WILL NOW FILL A BUFFER AREA WITH A COMPLEMENTING 5252 DATA PATTERN, AND THEN HALT AT LOCATION 4640 FOR MAINDEC-08-DJKMA-A-PB1 OR AT 0227 FOR MAINDEC-08-DJKMA-A-PM4.

I. NOW SET THE SWITCH REGISTER OR THE PSEUDO SWITCH REGISTER, WHICHEVER WAS SELECTED, TO THE AUTO RESTART TO BE TESTED FROM THE TABLE BELOW.

AUTO RESTART	S.R. SETTINGS
0000	0003
0200	0002
2000	0001
4200	0000

J, PRESS "INIT" AND THEN "RUN" .

K, THE PROGRAM NOW STARTS COMPARING THE DATA THAT WAS PUT IN THE BUFFER AREA,

L, THE OPERATOR AT THIS TIME MUST UNPLUG THE AC LINE CORD, WHEN THE LINE CORD HAS BEEN UNPLUGGED, THE PROGRAM SHOULD HALT AT LOCATION 4763 FOR MAINDEC-08-DJKMA-A-PB1, OR AT LOCATION 0352 FOR MAINDEC-08-DJKMA-A-PM4,

M, WITH A MINIMAL AMOUNT OF DELAY, THE OPERATOR MUST PLUG THE AC LINE CORD BACK IN, AT THIS TIME THE M8317 SHOULD DO A AUTO RESTART TO THE AUTO RESTART SELECTED, THE PROGRAM THEN CHECKS FOR THE CORRECT AUTO RESTART AND THEN GOES BACK TO COMPARING DATA,

N, STEPS L AND M SHOULD BE REPEATED SEVERAL TIMES FOR EACH OF THE AUTO RESTARTS,

5,0 ERRORS

5,1 MEMORY EXTENSION/TIME SHARE TEST ERRORS

ALL ERRORS DETECTED UNDER THIS TEST WILL RESULT IN A HALT, AN ERROR HALT OR A JMP SELF FOR THE TAPES LISTED BELOW;

MAINDEC-08-DJKMA-A-PB1
MAINDEC-08-DJKMA-A-PM1
MAINDEC-08-DJKMA-A-PM2

REFER TO THE APPROPRIATE LISTING FOR THE ERROR, THE TEST BEING EXERCISED AND FOR THE TEST SEQUENCE BEING EXECUTED,

5,1,1 MEMORY EXTENSION/TIME SHARE TEST ERROR RECOVERY

REFER TO THE APPROPRIATE SECTION BELOW FOR THE ACTION TO BE TAKEN;

ERROR HALT ERRORS

A ERROR HALT IS WHEN THE COMPUTER HALTS AT LOCATION 5133 FOR PAPER TAPE MAINDEC-08-DJKMA-A-PB1 OR AT LOCATION 1727 FOR PAPER TAPES MAINDEC-08-DJKMA-A-PM1 AND -PM2, THE CONTENTS OF THE ACCUMULATOR FOR THIS ERROR HALT WILL CONTAIN THE LOCATION AT WHICH THE ERROR WAS DETECTED BY THE PROGRAM, REFER TO THE APPROPRIATE PROGRAM LISTING FOR THE CAUSE OF THE ERROR, SET THE SWITCH REGISTER TO 7000 AND PRESS "INIT" AND THEN "RUN", THERE MAY BE 1 OR MORE ERROR HALTS, IF THE ERROR WAS A DATA ERROR, OR THE OPTION 1 + 2 TEST MODULE WAS BEING USED, THE PROGRAM IS NOW IN A SCOPE LOOP,

HALT/JMP SELF ERRORS

ANY ERROR ENCOUNTERED DURING A TEST SEQUENCE WHICH RESULTS IN A HALT OR A JMP SELF, REPLACE THE HALT OR JMP SELF WITH A JMP TEST(X) (X=TEST BEING EXECUTED I,E, JMP TEST1, JMP TEST2, ETC,),

5,2 TIME SHARE DISABLE TEST ERRORS

ANY ERRORS DETECTED BY THIS TEST WILL RESULT IN A HALT AT LOCATION 5133 FOR TAPE MAINDEC-08-DJKMA-A-PB1, OR AT LOCATION 1733 FOR TAPE MAINDEC-08-DJKMA-A-PM3, THE CONTENTS OF THE AC WILL CONTAIN THE ADDRESS WHERE THE ERROR WAS DETECTED BY THE PROGRAM,

5,2,1 TIME SHARE DISABLE TEST ERROR RECOVERY

SET THE SWITCH REGISTER OR PSEUDO SWITCH REGISTER WHICHEVER WAS SELECTED AT PROGRAM INITIALIZATION TO 7000 AND PRESS "INIT" AND "RUN", THE PROGRAM IS NOW IN A SCOPE LOOP,

5,3 BOOTSTRAP TEST ERRORS

BOOTSTRAP ERRORS WILL BE GENERALLY OF TWO TYPES, WHICH ARE: 1) FAILED TO DO A BOOTSTRAP; 2) BOOTSTRAP FAILED TO COMPARE, ANY ERRORS DUE TO 2 ABOVE WILL RESULT IN A ERROR HALT AT LOCATION 5133 FOR MAINDEC-08-DJKMA-A-PB1 OR AT LOCATION 1733 FOR MAINDEC-08-DJKMA-A-PM3, THE CONTENTS OF THE AC WILL CONTAIN THE ADDRESS WHERE THE ERROR WAS DETECTED BY THE PROGRAM,

5,3,1 BOOTSTRAP TEST ERROR RECOVERY

FOR FAILURE TYPE 1 ABOVE, CHECK FOR CORRECT SWITCH SETTINGS ON THE M8317 MODULE AND TRY AGAIN, IF THIS STILL DOES NOT PRODUCE A BOOTSTRAP, USE A SCOPE AND THE LOGIC PRINTS TO TROUBLE SHOOT THE ERROR,

FOR FAILURE TYPE 2 ABOVE, PRESSING CONTINUE 3 MORE TIMES WILL RESULT IN 3 MORE HALTS, WHICH WILL GIVE THE ADDRESS WHICH DIDN'T COMPARE, THE EXPECTED CONTENT OF THAT ADDRESS AND THE ACTUAL CONTENT OF THAT ADDRESS, IF THE OPTION 1 + 2 TEST MODULE WAS UTILIZED WITH THE PROGRAM, SET THE SWITCH REGISTER OR PSEUDO SWITCH REGISTER WHICH EVER WAS SELECTED TO 7000 AND PRESS "INIT" AND THEN "RUN", THE PROGRAM MAY HALT ONE MORE TIME AND THEN REPEAT THE SEQUENCE, THE PROGRAM IS NOW IN A SCOPE LOOP DOING THE BOOTSTRAPS, IF THE TEST MODULE WAS NOT USED, REPEAT THE BOOTSTRAP SEQUENCE SEVERAL TIMES, USING THE SCOPE AND LOGIC PRINTS TO TROUBLE SHOOT WITH,

5,4 AUTO RESTART/POWER FAIL TEST ERRORS

ANY ERRORS ENCOUNTERED DURING THIS TEST MAY BE DO TO THE BATTERY BEING DISCHARGED, IMPROPER MODULE SWITCH SETUP, FAILURE TO DO A AUTO RESTART, A AUTO RESTART TO THE WRONG ADDRESS, OR A DATA COMPARE ERROR,

5,4,1 AUTO RESTART/POWER FAIL TEST ERROR RECOVERY

AFTER ASSURING THE MODULE TO BE SETUP CORRECTLY AND RETRYING THE TEST, USE A SCOPE AND THE LOGIC PRINTS TO TROUBLE SHOOT THE PROBLEM,

6,0 SWITCH REGISTER SETTINGS

6,1 NORMAL OPERATING SWITCHES

SR3=1 (0400) HALT PROGRAM AT COMPLETION OF A PROGRAM PASS,

6,2 ERROR RELATED SWITCHES

SR0=1 (4000) INHIBIT ERROR HALT
SR1=1 (2000) LOOP ON ERROR
SR2=1 (1000) LOOP ON TEST SUCH AS TEST1, TEST2, ETC,,

7,0 REVISIONS

NONE

8,0 PROGRAM DESCRIPTION

TEST 1 = CHECKS THE CDF AND RDF INSTRUCTIONS TO LOAD AND READ THE DATA FIELD REGISTER, A RIF INSTRUCTION IS ISSUED AFTER EACH DATA FIELD CHANGE TO CHECK THAT THE INSTRUCTION FIELD REMAINS A ZERO, THE INCLUSIVE OR FUNCTION OF THE DATA FIELD AND THE AC IS CHECKED WITH THE RDF INSTRUCTION,

TEST 2 = CHECKS THAT USER MODE CAN BE ENTERED AND EXITED BY DOING A ION=SUF=JMP=HLT, THE USER INTERRUPT IS CHECKED TO BE SET BY SINT AND CLEARED BY CINT, GTF AND RIB INSTRUCTIONS ARE ISSUED TO CHECK THAT THE SAVE FIELD REGISTERS GOT LOADED AND THAT THE INSTRUCTIONS CAN READ THE SAVE FIELD REGISTERS,

TEST 3 = CHECKS THAT USR WILL TRAP IN USER MODE AND THAT IT WILL NOT AFTER A USER INTERRUPT, RIB,GTF,RIF AND RDF INSTRUCTIONS ARE ISSUED TO CHECK THAT THEY READ THE APPROPRIATE REGISTERS,

TEST 4 = CHECKS THAT AN IOT WILL TRAP IN USER MODE AND THAT IT WILL NOT AFTER A USER INTERRUPT, THE USER INTERRUPT IS CHECKED TO BE CLEARED BY CAF, RIB AND GTF INSTRUCTIONS ARE ALSO ISSUED AND CHECKED,

TEST 5 = CHECKS THAT THE CUF INSTRUCTION WILL CLEAR THE USER MODE FLIP-FLOP BY DOING A SUF-CUF-JMP-IOT, THE IOT INSTRUCTION SHOULD NOT TRAP, RIB AND GTF INSTRUCTIONS ARE ISSUED AND CHECKED,

TEST 6 = CHECKS THAT USER MODE IS NOT ENTERED UNTIL A JMS INSTRUCTION IS ISSUED BY DOING A ION-SUF-IOT-OSR-LAS-JMS-HLT, INTERRUPT REQUEST AND LINK ARE CHECKED WITH THE GTF INSTRUCTION,

TEST 7 = CHECKS THAT THE USER FLAG IN THE SAVE FIELD REGISTER CAN BE CLEARED, THIS IS DONE BY LEAVING THE USER INTERRUPT F/F SET AFTER A TRAP AND THEN TURNING THE INTERRUPT BACK ON,

TEST 8 = CHECKS THAT THE RIF INSTRUCTION WILL RESET THE USER MODE AFTER A INTERRUPT,

TEST 9 = CHECKS THAT THE RMF INSTRUCTION WILL RESET THE USER MODE AFTER A INTERRUPT,

TEST 10 = CHECKS THAT USER MODE, LINK, AND ION CAN BE SET BY THE AC AND THE RTF INSTRUCTION AND THAT IT CAN BE CLEARED BY RTF,

TEST 11 = USING THE USER INTERRUPT F/F AND INTERRUPT ENABLE, THE INSTRUCTION FIELD REGISTER CAN BE INDIRECTLY CHECKED TO HAVE SET BY CHECKING THE SAVE FIELD REGISTER AFTER A INTERRUPT, THE INSTRUCTION FIELD REGISTER IS CHECKED NOT TO CHANGE UNTIL A JMP OR JMS INSTRUCTION IS ISSUED, THE INTERRUPT INHIBIT F/F IS CHECKED NOT TO CLEAR BEFORE A JMP OR JMS IS ISSUED,

TEST 12 = USES THE USER INTERRUPT F/F TO CAUSE INTERRUPTS TO CHECK THAT THE CIF AND CDF INSTRUCTIONS WILL LOAD THE APPROPRIATE SAVE FIELD REGISTERS, A DCA INDIRECT IS CHECKED NOT TO CHANGE A LOCATION IN FIELD ZERO WHEN THE DATA FIELD IS NON ZERO, A JMS INDIRECT IS CHECKED NOT TO CHANGE A LOCATION IN FIELD ZERO WHEN THE INSTRUCTION FIELD IS NON ZERO,

TEST 13 = CHECKS THE MICRO PROGRAM INSTRUCTIONS CUFCIF (62X3), A DCA INDIRECT AND A JMS INSTRUCTION ARE ALSO ISSUED TO CHECK THAT THESE INSTRUCTIONS DO NOT DESTROY LOCATIONS IN FIELD ZERO, THE USER INTERRUPT F/F IS USED TO CAUSE INTERRUPTS,

TEST 14 = CHECKS THAT THE RTF INSTRUCTION CAN LOAD THE INSTRUCTION FIELD AND DATA FIELD, AND THAT THE RMF INSTRUCTION CAN RELOAD IT, THE USER INTERRUPT F/F IS USED TO CAUSE INTERRUPTS,

TEST 15 = SETS THE USER BUFFER F/F, THE IF AND DF ARE SET TO FIELD 6, THE PROGRAM THEN ISSUES A DCA, TAD, AND, AND ISZ INDIRECTS TO CHECK THAT THE PROGRAM DOESN'T INTERRUPT UNTIL A JMP INSTRUCTION IS ISSUED,

TEST 16 = REQUIRES MORE THAN 4K OF MEMORY TO BE RUN, THIS TEST IS A SIMPLE DATA TEST TO CHECK THAT THE DATA CAN BE DEPOSITED INTO EACH SELECTED EXTENDED FIELD, DATA IS DEPOSITED INTO THE LAST ADDRESS OF EACH 1K MEMORY SEGMENT IN THE EXTENDED MEMORY FIELD, THE USER INTERRUPT IS SET FOR THIS TEST, THE PROGRAM CHANGES THE DATA FIELD TO A EXTENDED FIELD, CHECKS THE DF, THEN TURNS THE INTERRUPT ON AND DOES A DCA INDIRECT TO THE LAST ADDRESS IN A 1K MEMORY SEGMENT OF THAT FIELD, THE PROGRAM THEN DOES THE SAME AS ABOVE ONLY DOING A TAD INDIRECT TO THE LAST ADDRESS OF A 1K MEMORY SEGMENT, THE DATA THAT IS PUT INTO THE LAST ADDRESS OF EACH EXTENDED 1K MEMORY SEGMENT CONTAINS THE FIELD IN BITS 6-8 AND THE NUMBER

OF THE 1K SEGMENT IN BITS 9-11,

TEST 17 - REQUIRES MORE THAN 4K OF MEMORY TO BE RUN, THIS TEST CHECKS THE RIF INSTRUCTION TO READ THE INSTRUCTION FIELD REGISTER, THE PROGRAM DEPOSITS THE FOLLOWING CODE INTO LOCATIONS 0000 TO 0003 OF EACH SELECTED EXTENDED FIELD; RIF-ION-JMP I 3-T17RET-1, THE PROGRAM USES THE USER INTERRUPT F/F TO RETURN TO THE PROGRAM,

TEST 18 - IS ONLY EXECUTED IF THE OPTION 1 + 2 TEST MODULE IS SELECTED, THIS TEST CHECKS THAT THE CORRECT EMA LINE IS LOADED ONTO THE BUS DURING A DCA INDIRECT FOLLOWING A CDF 10, CDF 20 AND A CDF 40, THE TEST MODULE IS USED TO CAUSE A INTERRUPT FOLLOWING A EMA CHANGE ON THE BUS, THE TEST MODULE STORES THE EMA INTO A EMA CATCHER REGISTER AND THEN THE PROGRAM READS AND COMPARES IT,

TEST 19 - IS ONLY EXECUTED IF THE OPTION 1 + 2 TEST MODULE IS SELECTED, THIS TEST IS THE SAME AS TEST 18, ONLY IT CHECKS THAT THE CIF INSTRUCTION LOADS THE APPROPRIATE EMA LINES,

TEST 20 - IS ONLY EXECUTED IF THE OPTION 1 + 2 TEST MODULE IS SELECTED, THIS TEST CHECKS THAT THE TIME SHARE LOGIC CAN BE DISABLED, THIS IS DONE WITH THE TEST MODULE BY PULLING KMTS TIME SHARE DISABLE L LOW, THE PROGRAM THEN ISSUES A IOT, LAS, OSR AND CHECKS THAT THE PROGRAM DIDN'T INTERRUPT,

TEST 21 - USES THE OPTION 1 + 2 TEST MODULE TO CAUSE THE M8317 MODULE TO DO A BOOTSTRAP, AFTER EACH BOOTSTRAP, THE PROGRAM CHECKS THE BOOTSTRAPS TO COMPARE CORRECTLY,

TEST 22 - USES THE OPTION 1 + 2 TEST MODULE TO CAUSE A AUTO RESTART ON THE M8317 MODULE, AFTER EACH AUTO RESTART, THE PROGRAM CHECKS THAT THE AUTO RESTART OCCURED AT THE APPROPRIATE LOCATION,

TEST 23 - USES THE OPTION 1 + 2 TEST MODULE TO TEST THAT THE AC LOW AND BATTERY EMPTY F/F'S CAN BE SET, CAUSE A INTERRUPT, AND THAT THEY CAN BE CLEARED,

TIMDIS - IS A OPERATOR INTERVENTION TEST TO CHECK THAT THE TIME SHARE LOGIC CAN BE DISABLED,

BOTCMP - IS A OPERATOR INTERVENTION TEST TO CHECK THAT THE BOOTSTRAPS GOT LOADED CORRECTLY,

AUTO - IS A OPERATOR INTERVENTION TEST TO CHECK AUTO RESTARTS AND POWER FAIL,

9,0 FLOWCHARTS

NOT APPLICABLE

10,0 LISTING

ATTACHED

```
                        /KM8-A OPTION TEST 2 MAINDEC-08-DJKMA-A-L 4K
                        /
                        /COPYRIGHT (C) 1974, DIGITAL EQUIPMENT CORPORATION
                        /
                        /PROGRAMMER: BRUCE HANSEN
                        /
```

```
                        ////////////////////////////////////////////////////////////////////////////////
                        /THE FOLLOWING LISTING WILL CORRESPOND TO THE PAPER TAPE LABELED MAINDEC-08-DJKMA-A-PB1,
                        /THIS PAPER TAPE AND LISTING WILL BE USED WITH COMPUTERS WITH 4K OF MEMORY OR MORE,
                        /THERE ARE FOUR 1K SEGMENTED LISTINGS ATTACHED TO THE END OF THIS LISTING FOR
                        /COMPUTERS WITH LESS THAN 4K OF MEMORY, REFER TO THE APPROPRIATE 1K LISTING
                        /FOR ANY ERRORS WHICH MAY HAVE OCCURED WHILE RUNNING THE 1K SEGMENTED PROGRAMS,
                        ////////////////////////////////////////////////////////////////////////////////
```



```
                        /KM8-A OPTION TEST 2 MAINDEC-08-DJKMA-A-L 4K
                        /
                        /COPYRIGHT 1974, DIGITAL EQUIPMENT CORP.,, MAYNARD, MASS.,, 01754
                        /
                        /POP-8A OPTION TEST 2 TESTS THE MEMORY EXTENTION/TIME SHARE CONTROL,
                        /POWER FAIL/AUTO RESTART, AND BOOTSTRAP LOADERS


        6000    SKON=6000
        6007    CAF=6007
        7402    HLT=7402

                /SWITCH REGISTER SETTINGS

                /SR0=1  INHIBIT ERROR HALT
                /SR1=1  LOOP ON ERROR
                /SR2=1  LOOP ON TEST
                /SR3=1  HALT AT COMPLETION OF A PROGRAM PASS

                /MEMORY EXTENTION/TIME SHARE INSTRUCTIONS

        6004    GTF=6004                /GET FLAGS;  READS THE FOLLOWING MACHINE STATES
                                        /INTO THE INDICATED BITS OF THE AC:
                                        /AC0  LINK
                                        /AC2  INTERRUPT REQUEST
                                        /AC4  INTERRUPT ENABLE F/F
                                        /AC5  USER FLAG
                                        /AC6-11  SAVE FIELD REGISTER

        6005    RTF=6005                /RESTORE THE FLAGS;  RTF LOADS THE LINK FROM AC0,
                                        /LOADS THE USER BUFFER F/F, INSTRUCTION BUFFER AND
                                        /DATA FIELD WITH AC5, AC6-8, AC 9-11 AND INHIBITS
                                        /PROCESSOR INTERRUPTS UNTIL NEXT  JMP OR JMS INSTRUCTION,
                                        /AT THE END OF THE JMP OR JMS, THE CONTENTS OF THE U.B, + I.B,
                                        /ARE LOADED INTO USER FIELD F/F, AND THE I.F,,  INTERRUPT ENABLE
                                        /IS SET AND INTERRUPT INHIBIT AS CLEARED

        6234    RIB=6234                /READ THE INTERRUPT BUFFER

        6244    RMF=6244                /RESTORES MEMORY FLAGS

        6204    CINT=6204               /CLEAR USER INTERRUPT FLIP-FLOP

        6254    SINT=6254               /SKIP ON USER INTERRUPT FLIP-FLOP

        6264    CUF=6264                /CLEAR USER BUFFER FLIP-FLOP

        6274    SUF=6274                /SET USER BUFFER FLIP-FLOP (ENTER TIME SAME MODE)AND
                                        /INHIBITS PROCESSOR INTERRUPTS UNTIL THE NEXT JMP OR
                                        /JMS INSTRUCTION,  AT THE END OF THE JMP OR JMS
                                        /INSTRUCTION, THE USER BUFER IS LOADED INTO THE USER
                                        /FIELD F/F,

        6201    CDF=6201                /CHANGE DATA FIELD
```

```
                6202    CIF=6202                        /CHANGE INSTRUCTION FIELD
                6214    RDF=6214                        /READ THE DATA FIELD INTO AC BITS 6=8
                6224    RIF=6224                        /READ THE INSTRUCTION FIELD INTO AC BITS 6=8
                6203    CIFCDF=6203                     /PERFORMS THE CIF AND CDF FUNCTIONS

                        /POWER FAIL INSTRUCTIONS

                6102    SPL=6102                        /SKIP ON AC LOW FLIP=FLOP

                6103    CAL=6103                        /CLEAR AC LOW FLIP=FLOP

                6101    SBE=6101                        /SKIP ON BATTERY EMPTY FLIP=FLOP


                        /OPTION BOARD 2 SIMULATOR IOT'S

                6150    CLRSIM=6150                     /CLEAR CONTROL REGISTERS
                6152    LODMG2=6152                     /LOAD CONTROL REGISTER 2
                6153    LODMG3=6153                     /LOAD CONTROL REGISTER 3
                6154    CLREMA=6154                     /CLEAR EMA CATCHER LOGIC
                6155    REDEMA=6155                     /READ EMA CATCHER REGISTER
                6160    CLRMOD=6160                     /CLEAR TEST MODULE LOGIC
                6164    EXECUT=6164                     /EXECUT AND CONTROL WORD 3 BIT 7 =1 ISSUE A POWER ON PULSE
                                                        /EXECUT AND CONTROL WORD 3 BIT 7 =0 ISSUE A SWITCH SW PULSE
                6166    SKPEMA=6166                     /SKPEMA AND CONTROL WORD 3 BIT 3 =1 EMA INTERRUPT AND SKIP ENABLE
                                                        /SKPEMA AND CONTROL WORD 3 BIT 3 =0 EMA INTERRUPT AND SKIP DISABLE

                        /OPTION BOARD2 SIMULATOR CONTROL WORD 2 BIT ASSIGNMENTS
                        /
                        /BITS 0 = 1     NOT USED
                        /BITS 2 = 8     BOOT STRAP PROGRAM SELECT
                        /BITS 9 = 11    AUTO=RESTART ADDRESS SELECT

                        /OPTION BOARD 2 SIMULATOR CONTROL WORD 3 BIT ASSIGNMENTS
                        /
                        /BIT 0          TIME SHARE 0=ENABLED  1=DISABLED
                        /BIT 1          AC LOW (L) 1=PULLED LOW  0=FREE STATE
                        /BIT 2          BATT EMPTY 1=BATT EMPTY PULLED LOW  0=FREE STATE
                        /BIT 3          1=EMA INTERRUPT/SKIP ENABLE  0=EMA INTERRUPT SKIP DISABLE
                        /BITS 4 = 6     NOT USED
                        /BIT 7          1=POWER ON PULSE WITH EXECUT 0=SWITCH SW PULSE WITH EXECUT
                        /BIT 8          1=DISABLES BOOTSTRAP WHILE RUNNING  0=ENABLES BOOTSTRAP WHILE RUNNING
                        /BIT 9 = 11     AUTO=RESTART/BOOT STRAP ENABLE CODE



        0000    *0

0000    0000    INTSER, 0                               /JMS I AUTRST PLACED HERE FOR SIMULATOR AUTO RESTART
0001    3035            DCA     DATREC
0002    6102            SPL                             /SKIP ON AC LOW
0003    7410            SKP
0004    5457            JMP  I  XPWRFL                  /POWER GOING DOWN
0005    6101            SBE                             /SKIP ON BATTERY EMPTY
```



```
0006    7410            SKP
0007    5660            JMP  I  XBAT                   /GO HALT THE COMPUTER ,ITS ALL OVER
0010    6224            RIF                             /READ THE INSTRUCTION FIELD
0011    7640            SZA     CLA
0012    4454            ERROR                           /I,F, IS NOT 0 AFTER A INTERRUPT
0013    6214            RDF                             /READ THE DATA FIELD
0014    7640            SZA     CLA
0015    4454            ERROR                           /D,F, IS NOT 0 AFTER A INTERRUPT
0016    2000            ISZ     INTSER                  /ADD 1 TO THE INTERRUPTED PC
0017    5400            JMP  I  INTSER                  /RETURN TO THE PROGRAM


        0020    *20
0020    0000    SWITCH, 0                               /PSEUDO SWITCH REGISTER IF BIT 0=0 OF OP1SEL
0021    1003    OP1SEL, 1003

                                                        /BIT 0=0 USE LOC 20 AS A PSEUDO S,R,
                                                        /BIT 0=1 USE HARDWARE FRONT PANEL S,R,
                                                        /BIT 1=1 HAS 8A OPTION 1
                                                        /BIT 2=1 HAS 8A OPTION 2
                                                        /BIT 3=1 HAS 8A CPU SIMULATOR
                                                        /BIT 4=1 HAS 8A OPTION 1 + 2 TEST MODULE
                                                        /BIT 5=1 PROGRAM ON 8A XOR
                                                        /BIT 6=1 HAS PDP=8E TYPE CPU
                                                        /BITS 7=11 MEMORY SIZE = 0'S = 1K, 37=32K,
                                                        /MEMORY SIZE CAN BE INCREASED IN 1K INCREMENTS
                                                        /BY ADDING A 1 TO THE NUMBER IN BITS 7=11,
0022    0000    OP2SEL, 0
                /RK8E BOOT STRAP WILL LOAD INTO THE FOLLOWING LOCATIONS

0023    7402    RK8E,   HLT                             /2000
0024    7402            HLT                             /6745
0025    7402            HLT                             /0023
0026    7402            HLT                             /7650
0027    7402            HLT                             /5024
0030    7402            HLT                             /6733
0031    7402            HLT                             /5031
0032    7402            HLT                             /TERMINATOR
0033    0000    CDFCHK, 0
0034    0033    CHKCDF, CDFCHK
0035    0000    DATREC, 0
0036    0000    SAVESE, 0
0037    0000    FLDLIM, 0
0040    0000    UPERLM, 0
0041    0000    WRKFLD, 0
0042    0000    DATPAT, 0
0043    0000    WRKADD, 0
0044    0000    HGHLIM, 0
0045    6201    K6201,  6201
0046    0000    SAVWFD, 0
0047    0000    ADDCNT, 0
0050    6520    BADMAS, 6520
0051    6500    GOODPS, 6520
0052    5053    AUTRST, PRGRST
0053    0000    TEST,   0                               /SCOPE LOOP AND TEST LOOP ADDRESS
```

```
                4454    ERROR=  JMS  I  .
0054            5110                    ERRORX
                4455    LOOP=   JMS  I  .
0055            5152                    TSTLOP
                4456    SCOPLP= JMS  I  .
0056            5060                    TESTAD

0057            5043    XPWRFL, POWFAL
0060            5067    XBAT,   BATEMT
0061            5017    PASENU, ENDPAS

                        /CONSTANTS USED BY THE PROGRAM

0062    7777    M1,     -1
0063    7776    M2,     -2
0064    7774    M4,     -4
0065    7773    M5,     -5
0066    7771    M7,     -7
0067    7770    M10,    -10
0070    7767    M11,    -11
0071    7762    M16,    -16
0072    7760    M20,    -20
0073    7756    M22,    -22
0074    7753    M25,    -25
0075    7750    M30,    -30
0076    7745    M33,    -33
0077    7744    M34,    -34
0100    7740    M40,    -40
0101    7735    M43,    -43
0102    7734    M44,    -44
0103    7730    M50,    -50
0104    7726    M52,    -52
0105    7723    M55,    -55
0106    7720    M60,    -60
0107    7717    M61,    -61
0110    7712    M66,    -66
0111    7710    M70,    -70
0112    7701    M77,    -77
0113    7700    M100,   -100
0114    7653    M125,   -125
0115    7626    M152,   -152
0116    7500    M300,   -300
0117    7000    M1000,  -1000
0120    6771    M1007,  -1007
0121    6762    M1016,  -1016
0122    6733    M1025,  -1025
0123    6744    M1034,  -1034
0124    6735    M1043,  -1043
0125    6726    M1052,  -1052
0126    6717    M1061,  -1061
0127    6710    M1070,  -1070
0130    6700    M1100,  -1100
0131    3700    M4100,  -4100
```



```
0132    3000    M5000,  -5000
0133    2700    M5100,  -5100

0134    0007    K7,     7
0135    0010    K10,    10
0136    0037    K37,    37
0137    0070    K70,    70
0140    0077    K77,    77
0141    0125    K125,   125
0142    0152    K152,   152
0143    0200    K200,   200
0144    0400    K400,   400
0145    1777    K1777,  1777
0146    2000    K2000,  2000
0147    7774    K7774,  7774
0150    7707    K7707,  7707
0151    7757    K7757,  7757
0152    7677    K7677,  7677
0153    4100    K4100,  4100

        0200    *200


                /**********************************************************************************************
                /TEST 1 = CHECKS THE CDF AND RDF INSTRUCTIONS TO LOAD AND READ
                /THE DATA FIELD,  A RIF IS ISSUED AFTER EACH DATA FIELD CHANGE
                /TO CHECK THAT THE INSTRUCTION FIELD REMAINS A ZERO,
                /THE INCLUSIVE OR OF THE D,F, WITH THE AC IS CHECKED WITH THE RDF INSTRUCTION,
                /SET TIME SHARE ENABLE SWITCH TO TIME SHARE ENABLE POSITION
                /**********************************************************************************************

0200    7000            NOP/JMS I AUTRST        /IF SIMULATOR SELECTED THIS LOCATION WILL CHANGE TO JMS I AUTRST
0201    6160    TEST1,  CLSMOD                  /CLEAR SIMULATOR TEST LOGIC
0202    3777+           DCA     ACNLOK
0203    4456            SCOPLP                  /SETUP SCOPE ANND TEST LOOPING ADDRESS
0204    6007            CAF                     /CLEAR ALL FLAGS
0205    6264            CUF                     /CLEAR USER FLAG
0206    7410            SKP
0207    4454            ERROR                   /CUF SKIPPED
0210    6254            SINT                    /SKIP IF USER INTERRUPT FLIP=FLOP SET
0211    7410            SKP
0212    4454            ERROR                   /SINT SKIPPED OR CAF FAILED TO 0 USER INTERRUPT
0213    6001            ION                     /TURN THE INTERRUPT ON
0214    6201            CDF     00              /CHANGE DATA FIELD TO FIELD 0
0215    7410            SKP
0216    4454            ERROR                   /CDF SKIPPED
0217    6214            RDF                     /READ THE DATA FIELD
0220    7410            SKP
0221    4454            ERROR                   /RDF SKIPPED
0222    7640            SZA     CLA             /WAS IF FIELD 07
0223    4454            ERROR                   /RDF READ BACK SOMETHING OTHER THAN D,F, 0
0224    6224            RIF                     /READ THE INSTRUCTION FIELD
0225    7410            SKP
0226    4454            ERROR                   /RIF SKIPPED
```

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0227  7640          SZA     CLA             /WAS THE I,F, 0?
0230  4454          ERROR                   /NO HEAD BACK SOMETHING OTHER THAN I,F, 0
0231  6271          CDF     70              /CHANGE DATA FIELD TO FIELD 7
0232  6214          RDF                     /READ THE DATA FIELD
0233  1111          TAD     M70             /CHECK THAT DATA FIELD 7 WAS READ BACK
0234  7640          SZA     CLA             /INTO AC BITS 6,7 & 8,
0235  4454          ERROR                   /CDF OR RDF TO FIELD 7 FAILED
0236  1130          TAD     K7707           /CHECK THE INCLUSIVE OR FUNCTION OF RDF
0237  6214          RDF                     /READ THE DATA FIELD
0240  7040          CMA
0241  7640          SZA     CLA
0242  4454          ERROR                   /THE INCLUSIVE OR OF THE DF WITH AC FAILED
0243  6224          RIF                     /READ THE INSTRUCTION FIELD
0244  7640          SZA     CLA             /IS IT STILL 0?
0245  4454          ERROR                   /THE INSTRUCTION FIELD CHANGED
0246  6221          CDF     20              /CHANGE TO DATA FIELD 2
0247  6214          RDF                     /READ THE DATA FIELD
0250  1072          TAD     M20             /CHECK TO SEE IF DF 2 WAS READ BACK
0251  7640          SZA     CLA             /WAS IT DATA FIELD 2?
0252  4454          ERROR                   /NO, CDF 20 OR RDF FAILED
0253  1151          TAD     K7757           /CHECK THE INCLUSIVE OR OF THE DF WITH THE AC
0254  6214          RDF                     /READ THE DATA FIELD
0255  7040          CMA
0256  7640          SZA     CLA
0257  4454          ERROR                   /THE INCLUSIVE OR OF DF WITH AC FAILED
0260  6224          RIF                     /READ THE INSTRUCTION FIELD
0261  7640          SZA     CLA             /IS THE IF STILL 0?
0262  4454          ERROR                   /THE INSTRUCTION FIELD CHANGED
0263  6251          CDF     50              /CHANGE TO DATA FIELD 5
0264  6214          RDF                     /READ THE DATA FIELD
0265  1103          TAD     M50
0266  7640          SZA     CLA             /WAS IT DATA FIELD 5?
0267  4454          ERROR                   /NO, CDF 50 OR RDF FAILED
0270  6224          RIF                     /READ THE INSTRUCTION FIELD
0271  7640          SZA     CLA             /IS THE I,F, STILL 0
0272  4454          ERROR                   /NO, THE INSTRUCTION FIELD CHANGED
0273  6231          CDF     30              /CHANGE THE DATA FIELD TO 3
0274  6214          RDF                     /READ THE DATA FIELD
0275  1075          TAD     M30             /
0276  7640          SZA     CLA             /IS IT EQUAL TO FIELD 3
0277  4454          ERROR                   /NO, CDF 30 OR RDF FAILED
0300  6224          RIF                     /READ THE INSTRUCTION FIELD
0301  7640          SZA     CLA             /IS THE I,F, STILL EQUAL TO 3?
0302  4454          ERROR                   /NO, THE I,F, CHANGED
0303  6241          CDF     40              /CHANGE THE DATA FIELD TO FIELD 4
0304  6214          RDF                     /READ THE DATA FIELD
0305  1100          TAD     M40
0306  7640          SZA     CLA             /IS IT EQUAL TO D,F, 4
0307  4454          ERROR                   /NO, CDF 40 OR RDF FAILED
0310  6224          RIF                     /READ THE INSTRUCTION FIELD
0311  7640          SZA     CLA             /IS IT STILL EQUAL TO 3
0312  4454          ERROR                   /NO, THE I,F, CHANGED
0313  6211          CDF     10              /CHANGE THE DATA FIELD TO FIELD 1
0314  6214          RDF                     /READ THE DATA FIELD
0315  1067          TAD     M10
```



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0316  7640          SZA     CLA             /IS IT EQUAL TO DATA FIELD 1
0317  4454          ERROR                   /NO, CDF 10 OR RDF FAILED
0320  6224          RIF                     /READ THE INSTRUCTION FIELD
0321  7640          SZA     CLA             /IS IT STILL EQUAL TO 3
0322  4454          ERROR                   /NO, THE I,F, CHANGED
0323  6261          CDF     60              /CHANGE DATA FIELD TO FIELD 6
0324  6214          RDF                     /READ THE DATA FIELD
0325  1106          TAD     M60
0326  7640          SZA     CLA             /IS THE D,F, EQUAL TO 6?
0327  4454          ERROR                   /NO, CDF 60 OR RDF FAILED
0330  6224          RIF                     /READ THE INSTRUCTION FIELD
0331  7640          SZA     CLA             /IS IT STILL EQUAL TO ZERO?
0332  4454          ERROR                   /NO, INSTRUCTION FIELD CHANGED
0333  6201          CDF     00              /CHANGE DATA FIELD TO FIELD 0
0334  6214          RDF                     /READ THE DATA FIELD
0335  7640          SZA     CLA             /IS IT EQUAL TO FIELD 0
0336  4454          ERROR                   /NO, CDF 00 OR RDF FAILED
0337  6224          RIF                     /READ THE INSTRUCTION FIELD
0340  7640          SZA     CLA             /IS IT STILL EQUAL TO ZERO
0341  4454          ERROR                   /NO, INSTRUCTION FIELD CHANGED,
0342  4455          LOOP                    /LOOP ON TEST IF SR = 1000

              /**********************************************************************************************************
              /TEST 2 - CHECKS THAT USER MODE CAN BE ENTERED AND EXITED BY DOING A
              /ION-SUF-JMP-HLT, THE USER INTERRUPT IS CHECKED TO BE SET BY SINT AND
              /CLEARED BY CINT, GTF AND RIB ARE ISSUED TO CHECK THAT THE SAVE FIELD
              /GOT LOADED AND THAT THE INSTRUCTIONS CAN READ THE SAVE FIELD,
              /**********************************************************************************************************

0343  4456  TEST2,  SCOPLP                  /SETUP SCOPE AND TEST LOOPING ADDRESS
0344  6007          CAF                     /CLEAR ALL FLAGS
0345  6264          CUF                     /CLEAR USER BUFFER F/F
0346  7410          SKP
0347  4454          ERROR                   /CUF SKIPPED
0350  6204          CINT                    /CLEAR USER INTERRUPT FLIP-FLOP
0351  7410          SKP
0352  4454          ERROR                   /CINT SKIPPED
0353  6254          SINT                    /SKIP ON USER INTERRUPT FLIP-FLOP
0354  7410          SKP
0355  4454          ERROR                   /SINT SKIPPED OR USER INTERRUPT F/F SET
0356  6001          ION                     /TURN THE INTERRUPT ON
0357  6274          SUF                     /SET USER BUFFER F/F, SET INT INHIBIT AT TP3
0360  5362          JMP     .+2             /LOAD UB INTO I,F, REGISTER, CLEAR INT INHIBIT F/F
0361  5361          JMP     .               /SUF SKIPPED OR TRAPPED,
0362  7402          HLT                     /USER INTERRUPT FAILED TO SET OR HALT FAILED TO TRAP
0363  5363          JMP     .               /HLT FAILED TO TRAP
0364  6254          SINT                    /SKIP ON USER INTERRUPT FLIP-FLOP
0365  5365          JMP     .               /USER INTERRUPT NOT SET OR SINT FAILED TO SKIP,
0366  6204          CINT                    /CLEAR USER INTERRUPT FLIP-FLOP
0367  6254          SINT                    /SKIP ON USER INTERRUPT FLIP-FLOP
0370  7410          SKP
0371  5371          JMP     .               /CINT FAILED TO 0 USER INTERRUPT FLIP-FLOP
0372  5776          JMP     TST2CN          /CONTINUE THE TEST

0376  0402
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0377  5173
      0400    PAGE

0400  5601          JMP  I  .+1             /SIMULATOR RETURNS HERE AFTER A BOOTSTRAP
0401  3671          BOTRT1                  /THIS LOCATION WILL CHANGE TO BOTRT1,BOTRT2,BOTRT3
0402  6004  TST2CN, GTF                     /GET THE FLAGS
0403  7410          SKP
0404  5204          JMP  .                  /GTF SKIPPED
0405  1113          TAD  M100               /CHECK USER FLAG TO BE SET
0406  7640          SZA  CLA                /WAS THE CORRECT IF, D,F, AND USER FIELD FLIP-FLOP LOADED?
0407  5207          JMP  .                  /NO, USER FIELD F/F NOT LOADED OR OTHER BITS SET
0410  7300          CLA  CLL                /OR GTF FAILED,
0411  6234          RIB                     /READ THE INTERRUPT BUFFER
0412  7410          SKP
0413  5213          JMP  .                  /RIB SKIPPED
0414  1113          TAD  M100               /CHECK FOR USER FLAG
0415  7640          SZA  CLA
0416  5216          JMP  .                  /RIB FAILED OR SAVE FIELDS CLEARED
0417  1152          TAD  K7677              /CHECK THE INCLUSIVE OR OF SF WITH AC
0420  6234          RIB                     /READ THE INTERRUPT BUFFER
0421  7040          CMA
0422  7640          SZA  CLA
0423  5223          JMP  .                  /INCLUSIVE OR OF SAVE FIELD WITH AC FAILED
0424  7340          CLA CLL CMA             /SET THE AC TO ALL ONES
0425  6004          GTF                     /GET THE FLAGS
0426  1113          TAD  M100
0427  7640          SZA  CLA
0430  5230          JMP  .                  /GTF FAILED TO DO A JAM TRANSFER TO AC
                                            /OR SAVE FIELDS CLEARED,
0431  4455          LOOP                    /LOOP ON TEST IF SR = 1000

                /**********
                /TEST 3= CHECKS THAT OSR WILL TRAP IN USER MODE AND THAT
                /IT WILL NOT AFTER A INTERRUPT, RIB, GTF, RIF, ROF ARE CHECKED TO
                /READ THE SAVE FIELDS AND I,F, AND D,F',
                /**********
0432  4456  TEST3, SCOPLP                  /SETUP SCOPE AND TEST LOOPING ADDRESS
0433  6007          CAF                     /CLEAR ALL FLAGS
0434  6001          ION                     /TURN THE INTERRUPT ON
0435  6274          SUF                     /SET USER BUFFER F/F, SET INT INH AT TP3
0436  5237          JMP  .+1                /ENTER USER MODE
0437  7404          OSR                     /OSR SHOULD SET USER INTERRUPT F/F + CAUSE A TRAP
0440  5240          JMP  .                  /OSR FAILED TO TRAP
0441  6254          SINT                    /SKIP ON USER INTERRUPT F/F
0442  5242          JMP  .                  /USER INTERRUPT F/F NOT SET
0443  6204          CINT                    /CLEAR USER INTERRUPT F/F
0444  6254          SINT                    /SKIP ON USER INTERRUPT F/F
0445  7410          SKP
0446  5246          JMP  .                  /CINT FAILED TO CLEAR USER INTERRUPT F/F
0447  6001          ION                     /TURN THE INTERRUPT ON,
0450  5251          JMP  .+1                /CHECK THAT THE INTERRUPT HAD CLEARED THE USER FIELD F/F
0451  7404          OSR                     /OSR SHOULD NOT TRAP
0452  7610          SKP  CLA
0453  5253          JMP  .                  /OSR TRAPPED AFTER A INTERRUPT OCCURED ABOVE
                                            /CHECK THE USER BUFFER AND I,F,,
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0454  6234          RIB                     /READ THE INTERRUPT BUFFER
0455  1113          TAD  M100               /CHECK THE SAVE FIELD FOR USER FLAG
0456  7640          SZA  CLA
0457  4454          ERROR                   /USER FLAG NOT SET OR OTHER BITS SET
0460  7340          CLA CLL CMA             /SET THE AC TO ALL ONES
0461  6004          GTF                     /GET THE FLAGS
0462  1116          TAD  M300               /CHECK FOR INT ENA, AND USER FLAG
0463  7640          SZA  CLA
0464  4454          ERROR                   /USER FLAG AND INT ENA NOT SET OR OTHER BITS SET
0465  6224          RIF                     /READ THE INSTRUCTION FIELD
0466  7640          SZA  CLA
0467  4454          ERROR                   /THE INSTRUCTION FIELD IS NON ZERO
0470  6214          RDF
0471  7640          SZA  CLA
0472  4454          ERROR                   /THE DATA FIELD IS NON ZERO,
0473  4455          LOOP                    /LOOP ON TEST IF SR = 1000

                /**********
                /TEST 4= CHECKS THAT AN IOT WILL TRAP OUT IN USER MODE AND NOT
                /AFTER A USER INTERRUPT,  THE USER INTERRUPT IS CHECKED TO BE
                /CLEARED BY CAF,  RIB AND GTF ARE ISSUED AND CHECKED,
                /**********

0474  4456  TEST4, SCOPLP                  /SETUP SCOPE AND TEST LOOPING ADDRESS
0475  6007          CAF                     /CLEAR ALL FLAGS
0476  6001          ION                     /TURN THE INTERRUPT ON
0477  6274          SUF                     /SET THE USER BUFFER FLIP-FLOP
0500  5301          JMP  .+1                /TRANSFER USER BUFFER TO THE USER FIELD F/F
0501  6001          ION                     /SHOULD TRAP HERE
0502  5302          JMP  .                  /THE IOT FAILED TO TRAP,
0503  6254          SINT                    /SKIP ON USER INTERRUPT FLIP-FLOP,
0504  5304          JMP  .                  /USER INTERRUPT F/F FAILED TO SET ON SINT FAILED
0505  6007          CAF                     /CLEAR USER INTERRUPT WITH INITIAIZE
0506  6254          SINT                    /SKIP ON USER INTERRUPT
0507  7410          SKP
0510  5310          JMP  .                  /CAF FAILED TO CLEAR USER INTERRUPT,
0511  6001          ION                     /TURN THE INTERRUPT ON
0512  5313          JMP  .+1                /CHECK THAT THE INTERRUPT CLEARED UF F/F
0513  6001          ION                     /IOT SHOULD NOT TRAP HERE
0514  7410          SKP
0515  5315          JMP  .                  /ION TRAPPED,
0516  6234          RIB                     /READ THE INTERRUPT BUFFER
0517  1113          TAD  M100
0520  7640          SZA  CLA
0521  4454          ERROR                   /USER FLAG NOT SET OR OTHER BITS SET
0522  7340          CLA CLL CMA             /SET THE AC TO ALL ONES
0523  6004          GTF                     /GET THE FLAGS
0524  1116          TAD  M300
0525  7640          SZA  CLA
0526  4454          ERROR                   /USER FLAG AND INT ENA NOT SET OR GTF FAILED
0527  4455          LOOP                    /LOOP ON TEST IF SR = 1000

                /**********
                /TEST 5= CHECKS THAT CUF WILL CLEAR THE USER MODE BY DOING ION, SUF,
                /CUF,  JMP, IOT, THE IOT, SHOULD NOT TRAP,  RIB AND GTF ARE
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                    /ISSUED AND CHECKED,
                    /*****************************************************************************************************

0030  4456    TEST5,  SCOPLP                  /SETUP SCOPE AND TEST LOOPING ADDRESS
0031  6007            CAF                     /CLEAR ALL FLAGS
0032  6001            ION                     /TURN THE INTERRUPT ON
0033  6274            SUF                     /SET THE USER BUFFER F/F
0034  5335            JMP     .+1             /ENTER USER MODE
0035  7402            HLT                     /HLT FAILED TO TRAP
0036  5336            JMP     .               /HLT FAILED TO TRAP
0037  6254            SINT                    /SKIP ON USER INTERRUPT
0040  4454            ERROR                   /USER INTERRUPT NOT SET
0041  6007            CAF                     /CLEAR ALL FLAGS
0042  6254            SINT                    /SKIP ON USER INTERRUPT F/F
0043  7410            SKP
0044  4454            ERROR                   /CAF FAILED TO CLEAR USER INTERRUPT
0045  6234            RIB                     /READ THE INTERRUPT BUFFER
0046  1113            TAD     M100            /CHECK FOR THE USER FLAG
0047  7640            SZA     CLA
0050  4454            ERROR                   /USER FLAG NOT SET OR OTHER BITS SET
0051  6001            ION                     /TURN THE INTERRUPT BACK ON
0052  6274            SUF                     /SET USER FLAG
0053  6264            CUF                     /CLEAR USER FLAG
0054  7410            SKP
0055  5355            JMP     .               /CUF TRAPPED BEFORE A JMP WAS ISSUED
0056  5357            JMP     .+1
0057  6001            ION                     /ISSUE A IOT TO CHECK THAT PROGRAM DOESN'T TRAP,
0060  7410            SKP
0061  5361            JMP     .               /CUF FAILED TO CLEAR USER BUFFER FLIP=FLOP
0062  6254            SINT                    /SKIP ON USER INTERRUPT SET
0063  7410            SKP
0064  4454            ERROR                   /SINT SKIPPED, USER INTERRUPT SHOULD NOT BE SET
0065  7340            CLA CLL CMA
0066  6004            GTF                     /GET THE FLAGS
0067  1116            TAD     M300            /
0070  7640            SZA     CLA             /CHECK FOR INTERRUPT ENABLE + USER FLAG
0071  4454            ERROR                   /INTERRUPT ENABLE OR USER FLAG NOT SET
0072  6234            RIB                     /READ THE INTERRUPT BUFFER
0073  1113            TAD     M100
0074  7640            SZA     CLA
0075  4454            ERROR                   /USER FLAG NOT SET OR OTHER BITS SET
0076  4455            LOOP                    /LOOP ON TEST IF SR = 1000

                    /*****************************************************************************************************
                    /TEST =6 CHECKS THAT USER MODE IS NOT ENTERED UNTIL A JMS INSTRUCTION IS ISSUED BY DOING A
                    /ION, SUF,IOT, OSR; LAS,JMS,HLT,  INTERRUPT REQUEST AND LINK ARE CHECKED TO
                    /BE SET AND CLEARED BY GTF,
                    /*****************************************************************************************************

0077  4456    TEST6,  SCOPLP                  /SETUP SCOPE AND TEST LOOPING ADDRESS
0100  6007            CAF                     /CLEAR ALL FLAGS
0101  6001            ION                     /TURN THE INTERRUPT ON
0102  6274            SUF                     /SET USER BUFFER F/F
0103  6001            ION                     /ISSUE A IOT
0104  7410            SKP
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0105  5205            JMP     .               /ION TRAPPED,  USER MODE NOT SET UNTIL A JMP, JMS
0106  7404            OSR                     /OR THE SWITCH REGISTER WITH AC
0107  7610            SKP     CLA
0110  5210            JMP     .               /OSR TRAPPED OR USER MODE SET
0111  7604            LAS                     /LOAD THE AC WITH THE SWITCH REGISTER
0112  7610            SKP     CLA
0113  5213            JMP     .               /LAS TRAPPED OR USER MODE SET
0114  4215            JMS     .+1             /SET USER BUFFER F/F
0115  7402            HLT/XXXX                /THE PC OF THE JMS
0116  7402            HLT                     /SHOULD TRAP HERE = IF NOT USER FIELD F/F PROBABLY NOT SET
0117  5217            JMP     .               /HALT FAILED TO TRAP
0120  6254            SINT                    /SKIP ON USER INTERRUPT F/F
0121  4454            ERROR                   /USER INTERRUPT F/F NOT SET
0122  6234            RIB                     /READ THE INTERRUPT BUFFER
0123  1113            TAD     M100            /CHECK FOR USER FLAG
0124  7640            SZA     CLA
0125  4454            ERROR                   /USER FLAG NOT SET OR OTHER FLAGS SET
0126  7340            CLA CLL CMA             /SET THE AC TO ALL ONE'S
0127  6004            GTF                     /GET THE FLAGS
0130  1130            TAD     M1100           /CHECK FOR INTERRUPT REQUEST AND USER FLAG
0131  7640            SZA     CLA
0132  4454            ERROR                   /INTERRUPT REQUEST OR USER FLAG NOT SET
0133  6204            CINT                    /CLEAR USER INTERRUPT FLIP=FLOP
0134  7360            CLA CLL CML CMA         /SET AC + LINK TO A 1
0135  6004            GTF
0136  1131            TAD     M4100           /CHECK FOR LINK AND USER FLAG
0137  7640            SZA     CLA
0140  4454            ERROR                   /SHOULD ONLY BE LINK AND USER FLAG SET
0141  7100            CLL                     /CLEAR THE LINK
0142  6004            GTF                     /GET THE FLAGS
0143  1113            TAD     M100            /CHECK FOR USER FLAG
0144  7640            SZA     CLA             /IS IT SET?
0145  4454            ERROR                   /USER FLAG SHOULD BE ONLY FLAG SET,
0146  4455            LOOP                    /LOOP ON TEST IF SR = 1000

                    /*****************************************************************************************************
                    /TEST 7= CHECKS THAT THE USER FLAG IN THE SAVE FIELD CAN BE CLEARED,
                    /THIS IS DONE BY LEAVING THE USER INTERRUPT F/F SET AFTER A TRAP AND
                    /THEN TURNING THE INTERRUPT BACK ON,
                    /*****************************************************************************************************

0147  4456    TEST7,  SCOPLP                  /SETUP SCOPE AND TEST LOOPING ADDRESS
0150  6007            CAF                     /CLEAR ALL FLAGS
0151  6001            ION                     /TURN THE INTERRUPT ON
0152  6274            SUF                     /SET USER BUFFER FLIP=FLOP
0153  5254            JMP     .+1             /ENTER USER MODE
0154  7402            HLT                     /HLT FAILED TO TRAP
0155  5255            JMP     .               /HLT FAILED TO TRAP
0156  6254            SINT                    /SKIP ON USER INTERRUPT
0157  4454            ERROR                   /USER INTERRUPT NOT SET
0160  7240            CLA CMA                 /SET THE AC TO ALL ONES
0161  6004            GTF                     /GET THE FLAGS
0162  1130            TAD     M1100           /CHECK FOR USER FLAG AND INTERRUPT REQUEST
0163  7640            SZA     CLA             /IS IT THERE?
0164  4454            ERROR                   /SHOULD ONLY BE INT, REQ, AND USER FLAG
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0065  6001          ION                     /TURN THE INTERRUPT ON
0066  7000          NOP                     /SHOULD INTERRUPT HERE
0067  4454          ERROR                   /FAILED TO INTERRUPT
0070  7340          CLA CLL CMA             /SET THE AC TO ALL ONE'S
0071  6004          GTF                     /GET THE FLAGS
0072  1117          TAD     M1000           /CHECK FOR INTERRUPT REQUEST
0073  7640          SZA     CLA
0074  4454          ERROR                   /SHOULD ONLY BE INTERRUPT REQUEST SET
0075  6204          CINT                    /CLEAR USER INTERRUPT REQUEST,
0076  6254          SINT                    /SKIP ON USER INTERRUPT FLIP-FLOP
0077  7410          SKP
0100  4454          ERROR                   /CINT FAILED TO CLEAR USER INT F/F
0101  7340          CLA CLL CMA
0102  6004          GTF
0103  7640          SZA     CLA
0104  4454          ERROR                   /INTERRUPT REQUEST FAILED TO CLEAR
0105  4455          LOOP                    /LOOP ON TEST IF SR = 1000

              /**********************************************************************************************
              /TEST8- CHECKS THAT RTF WILL RESET THE USER MODE AFTER A
              /USER INTERRUPT.
              /**********************************************************************************************

0106  4456  TEST8,  SCOPLP                 /SETUP SCOPE AND TEST LOOPING ADDRESS
0107  6007          CAF                     /CLEAR ALL FLAGS
0110  6001          ION                     /TURN THE INTERRUPT ON
0111  6274          SUF                     /SET USER BUFFER FLIP FLOP
0112  5313          JMP     .+1
0113  7402          HLT                     /HALT FAILED TO TRAP OR USER FIELD FAILED TO SET
0114  5314          JMP     .               /HALT FAILED TO TRAP
0115  6254          SINT                    /SKIP ON USER INTERRUPT F/F
0116  4454          ERROR                   /USER INTERRUPT FAILED TO SET
0117  6204          CINT                    /CLEAR USER INTERRUPT FLIP-FLOP
0120  6254          SINT
0121  7410          SKP
0122  4454          ERROR                   /CINT FAILED TO CLEAR USER INTERRUPT
0123  6234          RIB                     /READ THE INTERRUPT BUFFER
0124  1113          TAD     M100            /CHECK FOR USER FLAG
0125  7640          SZA     CLA
0126  4454          ERROR                   /USER FLAG NOT SET OR PICKED UP BITS
0127  7100          CLL
0130  1153          TAD     K4100           /SET AC0 +3 TO A 1 TO SET LINK + USER BUFFER
0131  6005          RTF                     /RESTORE THE FLAGS + SET USER BUFFER F/F
0132  7610          SKP     CLA
0133  5333          JMP     .               /RTF SKIPPED
0134  6224          RIF                     /READ THE INSTRUCTION FIELD
0135  7640          SZA     CLA             /IS IT NON ZERO
0136  5336          JMP     .               /RIF TRAPPED WITH OUT USER INT OR I,F, NON ZERO
0137  6214          RDF                     /READ THE DATA FIELD
0140  7640          SZA     CLA
0141  5341          JMP     .               /RDF TRAPPED WITH OUT USER INT OR D,F, IS NON-ZERO
0142  5343          JMP     .+1             /SET USER FIELD F/F, USER MODE, AND TURN INT ENA ON
0143  7402          HLT                     /RTF FAILED TO SET USER BUFFER F/F OR ION NOT SET
0144  5344          JMP     .               /HLT FAILED TO TRAP
0145  6254          SINT                    /SKIP ON USER INTERRUPT F/F
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0146  4454          ERROR                   /USER INTERRUPT NOT SET
0147  6004          GTF                     /GET THE FLAGS
0150  1133          TAD     M5100           /CHECK FOR LINK, INTERRUPT REQUEST AND USER FLAG
0151  7640          SZA     CLA
0152  4454          ERROR                   /THE LINK, OR INTERRUPT REQUEST OR USER FLAG NOT SET
0153  7100          CLL                     /CLEAR THE LINK BUT LEAVE INTERRUPT REQUEST UP
0154  6001          ION                     /TURN THE INTERRUPT ON
0155  5356          JMP     .+1             /SHOULD INTERRUPT AT TP4
0156  4454          ERROR                   /PROGRAM FAILED TO INTERRUPT WITH INT REQUEST SET
0157  6004          GTF                     /GET THE FLAGS
0160  1117          TAD     M1000           /CHECK FOR INTERRUPT REQUEST
0161  7640          SZA     CLA             /IS IT THE ONLY BIT SET
0162  4454          ERROR                   /NO, OTHER BITS SET BESIDES INT REQ OR INT REQ NOT SET
0163  6254          SINT                    /SKIP ON USER INTERRUPT F/F
0164  4454          ERROR                   /USER INTERRUPT NOT SET
0165  6204          CINT                    /CLEAR USER INTERRUPT F/F
0166  6254          SINT
0167  7610          SKP     CLA
0170  4454          ERROR                   /CINT FAILED TO CLEAR USER INTERRUPT F/F
0171  7340          CLA CLL CMA             /SET THE AC TO ALL ONES
0172  6004          GTF                     /GET THE FLAGS
0173  7640          SZA     CLA             /SHOULD BE ALL ZEROS
0174  4454          ERROR                   /THE SAVE FIELD OR STATUS IS NON-ZERO
0175  4455          LOOP                    /LOOP ON TEST IF SR = 1030

              /**********************************************************************************************
              /TEST9- CHECKS THAT RMF WILL RESET THE USER MODE AFTER A USER
              /INTERRUPT
              /**********************************************************************************************

0176  4456  TEST9,  SCOPLP                 /SETUP SCOPE AND TEST LOOPING ADDRESS
0177  7000          NOP                     ////////////////////////////////////////
1000  6007          CAF                     /CLEAR ALL FLAGS
1001  6001          ION                     /TURN THE INTERRUPT ON
1002  6274          SUF                     /SET USER BUFFER FLIP-FLOP
1003  5204          JMP     .+1             /GO INTO USER MODE
1004  7402          HLT                     /HLT FAILED TO TRAP OR NOT IN USER MODE
1005  5205          JMP     .               /HLT FAILED TO TRAP
1006  6254          SINT                    /SKIP ON USER INTERRUPT
1007  4454          ERROR                   /SINT FAILED OR USER INTERRUPT NOT SET
1010  6204          CINT                    /CLEAR USER INTERRUPT FLIP-FLOP
1011  6254          SINT                    /SKIP ON USER INTERRUPT
1012  7410          SKP
1013  4454          ERROR                   /CINT FAILED TO CLEAR USER INTERRUPT
1014  6234          RIB                     /READ THE INTERRRUPT BUFFER
1015  1113          TAD     M100
1016  7640          SZA     CLA
1017  4454          ERROR                   /USER FLAG NOT SET OR OTHER BITS SET
1020  6001          ION                     /TURN THE INTERRUPT ON
1021  6244          RMF                     /RESTORE IB, DF AND UB
1022  7610          SKP     CLA
1023  5223          JMP     .               /RMF SKIPPED
1024  5225          JMP     .+1             /ENTER USER MODE
1025  7402          HLT                     /RMF + JMP FAILED TO SET USER FIELD OR RMF FAILED
1026  5226          JMP     .               /HLT FAILED TO TRAP
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1027  6254          SINT                    /SKIP ON USER INTERRUPT
1030  4454          ERROR                   /USER INTERRUPT NOT SET
1031  7100          CLL
1032  6004          GTF                     /GET THE FLAGS
1033  1130          TAD     M1100           /CHECK FOR INTERUPT REQUEST AND USER FLAG
1034  7640          SZA     CLA             /WHERE THEY SET
1035  4454          ERROR                   /NO, INT REQUEST OR USER FLAG NOT SET OR RMF
                                            /SET OTHER BITS IN THE IF AND DF
1036  6001          ION                     /TURN THE INTERRUPT BACK ON
1037  5240          JMP     .+1             /INTERRUPT WITH INTERRUPT REQUEST SET
1040  4454          ERROR                   /PROGRAM FAILED TO INTERRUPT
1041  6234          RIB                     /READ THE INTERRUPT BUFFER
1042  7640          SZA     CLA
1043  4454          ERROR                   /USER FLAG NOT CLEARED ON INTERRUPT
1044  6254          SINT                    /CHECK USER INTERRUPT TO BE SET
1045  4454          ERROR                   /USER INTERRUPT GOT CLEARED
1046  6204          CINT                    /CLEAR USER INTERRUPT
1047  6254          SINT                    /SKIP ON USER INTERRUPT
1050  7410          SKP
1051  4454          ERROR                   /USER INTERRUPT SET
1052  4455          LOOP                    /LOOP ON TEST IF SR # 1000
```

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/*****************************************************************************************************
/TEST 10= CHECKS THAT USER MODE AND LINK AND ION CAN BE SET BY THE AC AND
/THE RTF INSTRUCTION AND THAT IT CAN BE CLEAR BY RTF,
/*****************************************************************************************************

1053  4456  TEST10, SCOPLP                  /SETUP SCOPE AND TEST LOOPING ADDRESS
1054  6007          CAF                     /CLEAR ALL FLAGS
1055  1153          TAD     K4100           /SET THE LINK AND USER BIT INTO THE AC
1056  6005          RTF                     /RESTORE THE FLAGS
1057  7620          SNL     CLA             /CHECK THE LINK
1060  7402          HLT                     /LINK NOT SET BY RTF
1061  6000          SKON                    /SKIP IF INTERRUPT ON AND TURN OFF
1062  7402          HLT                     /RTF FAILED TO SET INTERRUPT ENABLE
1063  6000          SKON                    /SKIP IF INTERRUPT ON AND TURN OFF
1064  7410          SKP
1065  7402          HLT                     /SKON FAILED TO CLEAR INTERRUPT ENABLE
1066  6001          ION                     /TURN THE INTERRUPT ON
1067  5270          JMP     .+1             /ENTER USER MODE
1070  7402          HLT                     /RTF FAILED TO SET U,B OR JMP FAILED TO LOAD I,F,
1071  5271          JMP     .               /HLT FAILED TO TRAP
1072  6254          SINT                    /SKIP ON USER INTERRUPT
1073  4454          ERROR                   /USER INTERRUPT NOT SET
1074  6004          GTF                     /GET THE FLAGS
1075  1133          TAD     M5100           /CHECK LINK, INTERRUPT REQUEST AND USER FLAG
1076  7640          SZA     CLA
1077  4454          ERROR                   /LINK, INT REQ OR USER FLAG NOT SET
1100  7300          CLA     CLL             /LEAVE INTERRUPT REQUEST SET
1101  6005          RTF                     /RESTORE THE FLAGS TO 0
1102  5303          JMP     .+1             /SHOULD INTERRUPT
1103  4454          ERROR                   /FAILED TO INTERRUPT
1104  6254          SINT                    /SKIP ON USER INTERRUPT
1105  4454          ERROR                   /USER INTERRUPT GOT CLEARED
1106  6204          CINT                    /CLEAR USER INTERRUPT
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1107  6234          RIB                     /READ THE INTERRUPT BUFFER
1110  7640          SZA     CLA
1111  4454          ERROR                   /THE SAVE FIELDS ARE NON ZERO
1112  6004          GTF                     /GET THE FLAGS
1113  7640          SZA     CLA
1114  4454          ERROR                   /THE SAVE FIELDS ARE NON ZERO
1115  4455          LOOP                    /LOOP ON TEST IF SR # 1000
```

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/*****************************************************************************************************
/TEST 11 = USING THE USER INTERRUPT FLIP=FLOP AND INTERRUPT ENABLE
/THE IF REGISTER CAN BE INDIRECTLY CHECKED TO BE BY CHECKING THE
/SAVE FIELD REGISTER AFTER A INTERRUPT, THE I,F IS CHECKED NOT TO CHANGE
/UNTIL A JMP OR JMS IS ISSUED, THE INT INHIBIT F/F IS CHECKED NOT
/TO CLEAR BEFORE A JMP OR JMS IS ISSUED,
/*****************************************************************************************************

1116  4456  TEST11, SCOPLP                  /SETUP SCOPE AND TEST LOOPING ADDRESS
1117  6007          CAF                     /CLEAR ALL FLAGS
1120  6001          ION                     /TURN THE INTERRUPT ON
1121  6274          SUF                     /SET USER BUFFER F/F
1122  5323          JMP     .+1             /ENTER USER MODE
1123  7402          HLT                     /FAILED TO ENTER USER MODE
1124  5324          JMP     .               /HLT FAILED TO TRAP IN USER MODE
1125  6254          SINT                    /SKIP ON USER INTERRUPT
1126  4454          ERROR                   /USER INTERRUPT FLIP=FLOP NOT SET
1127  6004          GTF                     /GET THE FLAGS
1130  1130          TAD     M1100           /CHECK FOR INTERRUPT REQUEST AND USER FLAG
1131  7640          SZA CLA
1132  4454          ERROR                   /USER FLAG OR INT REQUEST NOT SET
1133  6234          RIB                     /READ THE INTERRUPT BUFFER
1134  1113          TAD     M100
1135  7640          SZA CLA
1136  4454          ERROR                   /USER FLAG GOT CLEARED
1137  6202  TST11A, CIF     00              /CHANGE INSTRUCTION FIELD TO FIELD 0
1140  7300          CLA CLL                 /CLEAR THE LINK
1141  6001          ION                     /TURN THE INTERRUPT ON
1142  6224          RIF                     /READ THE INSTRUCTION FIELD
1143  7440          SZA                     /IS IT ZERO
1144  7402          HLT                     /THE IF IS NON ZERO OR INTERRUPTED
1145  5346          JMP     .+1             /CLEAR INTERRUPT INHIBIT
1146  4454          ERROR                   /PROGRAM FAILED TO INTERRUPT
1147  6004          GTF                     /GET THE FLAGS
1150  1117          TAD     M1000           /CHECK FOR USER INTERRUPT REQUEST
1151  7640          SZA CLA
1152  4454          ERROR                   /INT REQ NOT SET OR SAVE FIELD NON ZERO
1153  6234          RIB                     /READ THE INTERRUPT BUFFER
1154  7640          SZA CLA                 /IS THE SAVE FIELD 0?
1155  4454          ERROR                   /NO, SAVE FIELD OR USER FIELD NON ZERO
1156  7240  TST11B, CLA CMA                 /SET A LOCATION TO ALL ONE'S TO CHECK THAT
1157  3366          DCA     CJMS01          /THE JMS TO FIELD 7 DIDN'T JMS TO FIELD 7
1160  6272          CIF     70              /CHANGE INSTRUCTION FIELD TO FIELD 7
1161  6001          ION                     /SET INTERRUPT ENABLE
1162  6224          RIF                     /READ THE INSTRUCTION FIELD
1163  7440          SZA                     /IS IT STILL ZERO
1164  7402          HLT                     /THE IF IS NON ZERO OR IT INTERRUPTED
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1165  4360            JMS     .+1             /CLEAR INTERRUPT INHIBIT
1166  7402  CJMS01,   HLT                     /THIS LOCATION PRESET TO 1'S SHOULDN'T CHANGE
1167  4454            ERROR                   /PROGRAM FAILED TO INTERRUPT
1170  7360            CLA CLL CML CMA         /SET AC AND LINK TO ALL ONES
1171  6004            GTF                     /GET THE FLAGS
1172  1132            TAD     M5000           /CHECK FOR LINK, USER INTERRUPT REQUEST,
1173  1111            TAD     M70             /AND SAVE FIELD REGISTER OF 70
1174  7640            SZA CLA
1175  4454            ERROR                   /GTF FAILED OR READ SOMETHING OTHER THAN ABOVE
1176  6234            RIB                     /READ THE INTERRUPT BUFFER
1177  1111            TAD     M70             /IN THE SF SET TO 1,5,F, 7 ONLY?
1200  7640            SZA CLA
1201  4454            ERROR                   /SAVE FIELD IS NOT EQUAL TO FIELD 7
1202  2777            ISZ     CJMS01          /CHECK THAT THE JMS DIDN'T GO TO FIELD 0
1203  4454            ERROR                   /THE JMS TO FIELD 7 WENT TO FIELD 0
1204  7240  TST11C,  CLA CMA                 /SET A LOCATION TO ALL ONE'S TO CHECK THAT A
1205  3216            DCA     CJMS02          /JMS TO FIELD 5 DIDN'T CHANGE FIELD 0
1206  6254            SINT                    /SKIP ON USER INTERRUPT REQUEST
1207  4454            ERROR                   /USER INTERRUPT F/F GOT CLEARED
1210  6252            CIF     50              /CHANGE TO INSTRUCTION FIELD 5
1211  6001            ION                     /SET INTERRUPT ENABLE
1212  6224            RIF                     /READ THE INSTRUCTION FIELD
1213  7440            SZA                     /IS IT STILL ZERO
1214  7402            HLT                     /THE IF IS NON ZERO OR IT INTERRUPTED
1215  4216            JMS     .+1             /CLEAR INTERRUPT INHIBIT AND INTERRUPT
1216  7402  CJMS02,   HLT                     /THIS LOCATION PRESET TO 1'S SHOULDN'T CHANGE
1217  4454            ERROR                   /PROGRAM FAILED TO INTERRUPT
1220  7340            CLA CLL CMA             /SET THE AC TO ALL ONES
1221  6004            GTF                     /GET THE FALGS
1222  1117            TAD     M1000           /CHECK FOR USER INTERRUPT REQUEST AND SAVE
1223  1103            TAD     M50             /FIELD REGISTER OF 50
1224  7640            SZA CLA
1225  4454            ERROR                   /GTF FAILED OR READ SOMETHING OTHER THAN ABOVE
1226  6234            RIB                     /READ THE INTERRUPT BUFFER
1227  1103            TAD     M50             /CHECK THE INTERRUPT BUFFER FOR ISF 50
1230  7640            SZA CLA
1231  4454            ERROR                   /SAVE FIELD IS NOT EQUAL TO 1,F, 5
1232  2216            ISZ     CJMS02          /CHECK THAT JMS DIDN'T GO TO FIELD 0
1233  4454            ERROR                   /THE JMS TO 1,F,5, WENT TO FIELD 0
1234  7240  TST11D,  CLA CMA                 /SET A LOCATION TO ALL ONE'S TO CHECK THAT A JMS
1235  3244            DCA     CJMS03          /TO FIELD 2 DIDN'T CHANGE FIELD 0
1236  6222            CIF     20              /CHANGE INSTRUCTION FIELD TO FIELD 2
1237  6001            ION                     /SET INTERRUPT ENABLE
1240  6224            RIF                     /READ THE INSTRUCTION FIELD
1241  7440            SZA                     /IS IT STILL EQUAL TO ZERO
1242  7402            HLT                     /THE IF IS NON ZERO OR IT INTERRUPTED
1243  4244            JMS     .+1             /CLEAR INTERRUPT INHIBIT AND INTERRUPT
1244  7402  CJMS03,   HLT                     /THIS LOCATION PRESET TO 1'S SHOULDN'T CHANGE
1245  4454            ERROR                   /PROGRAM FAILED TO INTERRUPT
1246  7360            CLA CLL CML CMA         /SET THE AC AND LINK TO 1'S
1247  6004            GTF                     /GET THE FLAGS
1250  1132            TAD     M5000           /CHECK FOR LINK AND USER INTERRUPT REQUEST
1251  1072            TAD     M20             /AND SAVE FIELD REGISTER OF 20
1252  7640            SZA CLA
1253  4454            ERROR                   /GTF FAILED OR READ SOMETHING OTHER THAN ABOVE
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1254  6234            RIB                     /READ THE INTERRUPT BUFFER
1255  1072            TAD     M20
1256  7640            SZA CLA                 /DOES THE INTERRUPT BUFFER CONTAIN 20
1257  4454            ERROR                   /NO, ERROR SAVE FIELD IS NOT EQUAL TO 20
1260  2244            ISZ     CJMS03          /CHECK THAT JMS DIDN'T GO TO FIELD 0
1261  4454            ERROR                   /THE JMS TO FIELD 2 WENT TO FIELD 0
1262  7240  TST11E,  CLA CMA                 /SET A LOCATION TO ALL ONE'S TO CHECK THAT THE
1263  3272            DCA     CJMS04          /JMS TO FIELD 1 DIDN'T JMS TO FIELD 0
1264  6212            CIF     10              /CHANGE INSTRUCTION FIELD TO FIELD 1,
1265  6001            ION                     /TURN THE INTERRUPT ON
1266  6224            RIF                     /READ THE INSTRUCTION FIELD
1267  7440            SZA                     /IS IT STILL ZERO
1270  7402            HLT                     /THE IF IS NON ZERO OR IT INTERRUPTED
1271  4272            JMS     .+1             /CLEAR INTERRUPT INHIBIT AND INTERRUPT
1272  7402  CJMS04,   HLT                     /THIS LOCATION PRESET TO ALL ONE'S SHOULDN'T CHANGE
1273  4454            ERROR                   /PROGRAM FAILED TO INTERRUPT
1274  7340            CLA CLL CMA             /SET THE AC TO ALL ONE'S
1275  6004            GTF                     /GET THE FLAGS
1276  1117            TAD     M1000           /CHECK FOR USER INTERRUPT REQUEST AND
1277  1067            TAD     M10             /SAVE FIELD OF 10
1300  7640            SZA CLA
1301  4454            ERROR                   /GTF FAILED OR READ SOMETHING OTHER THAN ABOVE
1302  6234            RIB                     /READ THE INTERRUPT BUFFER
1303  1067            TAD     M10
1304  7640            SZA CLA
1305  4454            ERROR                   /SAVE FIELD IS NOT EQUAL TO FIELD 10
1306  2272            ISZ     CJMS04          /CHECK THAT THE JMS DIDN'T GO TO FIELD 0
1307  4454            ERROR                   /THE JMS TO FIELD 1 WENT TO FIELD 0
1310  7240  TST11F,  CLA CMA                 /SET A LOCATION TO ALL ONES TO CHECK THAT THE
1311  3320            DCA     CJMS05          /JMS TO FIELD 6 DIDN'T JMS TO FIELD 0
1312  6262            CIF     60              /CHANGE INSTRUCTION FIELD TO FIELD 6
1313  6001            ION                     /TURN THE INTERRUPT ON
1314  6224            RIF                     /READ THE INSTRUCTION FIELD
1315  7440            SZA                     /IS IT STILL ZERO
1316  7402            HLT                     /THE IF IS NON ZERO OR IT INTERRUPTED
1317  4320            JMS     .+1             /CLEAR INTERRUPT INHIBIT AND INTERRUPT
1320  7402  CJMS05,   HLT                     /THIS LOCATION SET TO ALL ONE'S, IT SHOULDN'T CHANGE
1321  4454            ERROR                   /PROGRAM FAILED TO INTERRUPT
1322  7360            CLA CLL CML CMA         /SET THE AC AND LINK TO ALL ONE'S
1323  6004            GTF                     /GET THE FLAG
1324  1132            TAD     M5000           /CHECK FOR LINK, USER INTERRUPT REQUEST
1325  1106            TAD     M60             /AND SAVE FIELD OF 60
1326  7640            SZA CLA
1327  4454            ERROR                   /GTF FAILED OR READ SOMETHING OTHER THAN ABOVE
1330  6234            RIB                     /READ THE INTERRUPT BUFFER
1331  1106            TAD     M60
1332  7640            SZA CLA
1333  4454            ERROR                   /SAVE FIELD IS NOT EQUAL TO FIELD 60
1334  2320            ISZ     CJMS05          /CHECK THAT THE JMS DIDN'T GO TO FIELD 0
1335  4454            ERROR                   /THE JMS TO FIELD 6 WENT TO FIELD 0
1336  7240  TST11G,  CLA CMA                 /SET A LOCATION TO ALL 1'S TO CHECK THAT THE
1337  3346            DCA     CJMS06          /JMS TO FIELD 3 DIDN'T JMS TO FIELD 0
1340  6232            CIF     30              /CHANGE INSTRUCTION FIELD TO FIELD 3
1341  6001            ION                     /TURN THE INTERRUPT ON
1342  6224            RIF                     /READ THE INSTRUCTION FIELD
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1343  7440          SZA                     /IS THE IF STLL ZERO
1344  7402          HLT                     /THE IF IS NON ZERO OR IT INTERRUPTED
1345  4346          JMS     .+1             /CLEAR INTERRUPT INHIBIT AND INTERRUPT
1346  7402  CJMS00, HLT                     /THIS LOCATION PRESET TO ALL ONES, IT SHOULDN'T CHANGE
1347  4454          ERROR                   /PROGRAM FAILED TO INTERRUPT
1350  7340          CLA CLL CMA             /SET THE AC TO ALL ONE'S
1351  6004          GTF                     /GET THE FLAGS
1352  1117          TAD     M1000           /CHECK FOR USER INTERRUPT REQUEST AND
1353  1075          TAD     M30             /SAVE FIELD OF 30
1354  7640          SZA CLA
1355  4454          ERROR                   /GTF FAILED OR READ SOMETHING OTHER THAN ABOVE
1356  6234          RIB                     /READ THE INTERRUPT BUFFER
1357  1075          TAD     M30
1360  7640          SZA CLA
1361  4454          ERROR                   /SAVE FIELD NOT EQUAL TO FIELD 3
1362  2346          ISZ     CJMS06
1363  4454          ERROR                   /JMS TO FIELD 3 WENT TO FIELD 0
1364  5776'         JMP     TST11H          /GO TO NEXT SECTION

1376  1400
1377  1166
      1400          PAGE
1400  7240  TST11H, CLA CMA                 /SET A LOCATION TO ALL ONES TO CHECK
1401  3210          DCA     CJMS07          /THAT A JMS TO FIELD 4 DIDN'T JMS TO FIELD 0
1402  6242          CIF     40              /CHANGE INSTRUCTION FIELD TO FIELD 4
1403  6001          ION                     /SET INTERRUPT ENABLE
1404  6224          RIF                     /READ THE INSTRUCTION FIELD
1405  7440          SZA                     /IS THE IF STILL ZERO
1406  7402          HLT                     /THE IF IS NON ZERO OR IT INTERRUPTED
1407  4210          JMS     .+1
1410  7402  CJMS07, HLT                     /THIS LOCATION PRESET TO ALL ONE'S
1411  4454          ERROR                   /PROGRAM FAILED TO INTERRUPT
1412  7360          CLA CLL CML CMA         /SET THE AC AND LINK TO 1'S
1413  6004          GTF                     /GET THE FLAGS
1414  1132          TAD     M5000           /CHECK FOR USER INTERRUPT REQUEST AND LINK
1415  1100          TAD     M40             /AND SAVE FIELD OF 40
1416  7640          SZA CLA
1417  4454          ERROR                   /GTF FAILED OR READ SOMETHING OTHER THAN ABOVE
1420  6234          RIB                     /READ THE INTERRUPT BUFFER
1421  1100          TAD     M40
1422  7640          SZA CLA
1423  4454          ERROR                   /SAVE FIELD NOT EQUAL TO 40
1424  2210          ISZ     CJMS07
1425  4454          ERROR                   /JMS TO FIELD 4 WENT TO FIELD 0
1426  7340  TST11I, CLA CLL CMA             /SETUP A LOCATION TO CHECK THAT A JMS TO
1427  3236          DCA     CJMS10          /FIELD 0 GETS EXECUTED
1430  6202          CIF     00              /CHANGE INSTRUCTION FIELD TO FIELD 00
1431  6001          ION                     /TURN THE INTERRUPT ON
1432  6224          RIF                     /READ THE INSTRUCTION FIELD
1433  7440          SZA                     /IS THE IF STILL ZERO
1434  7402          HLT                     /THE IF IS NON ZERO OR IT INTERRUPTED
1435  4236          JMS     .+1             /CLEAR INTERRUPT ENABLE AND INTERRUPT
1436  7402  CJMS10, HLT                     /THIS LOCATION PREVIOUSLY SET TO 1'S
1437  4454          ERROR                   /PROGRAM FAILED TO INTERRUPT
1440  6004          GTF                     /GET THE FLAGS
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1441  1117          TAD     M1000           /CHECK FOR INTERRUPT REQUEST AND
1442  7640          SZA CLA                 /SAVE FIELD OF 0
1443  4454          ERROR                   /GTF FAILED OR READ SOMETHING OTHER THAN ABOVE
1444  6234          RIB                     /READ THE INTERRUPT BUFFER
1445  7640          SZA CLA
1446  4454          ERROR                   /SAVE FIELD NON ZERO OR RIB FAILED
1447  2236          ISZ     CJMS10          /CHECK THAT THE JMS DID CHANGE LOCATION CJMS10
1450  7610          SKP     CLA
1451  4454          ERROR                   /JMS TO FIELD 0 FAILED TO STORE ITS PC IN CJMS10
1452  6007          CAF                     /CLEAR ALL FLAGS INCLUDING USER INTERRUPT
1453  6004          GTF                     /GET THE FLAGS
1454  7640          SZA CLA
1455  4454          ERROR                   /INIT FAILED TO CLEAR USER INTERRUPT F/F
1456  4455          LOOP                    /LOOP ON TEST IF SR = 1000
1457  5777'         JMP     TEST12

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                    /*****************************************************************************************
                    /TEST 12 - CHECKS THAT A CIF AND CDF WILL LOAD THE APPROPIATE
                    /SAVE FIELD REGISTERS, A DCA INDIRECT IS CHECKED NOT TO CHANGE
                    /A LOCATION IN FIELD 0 WHEN THE DATA FIELD IS NON ZERO;  A
                    /JMS I IS CHECKED NOT TO CHANGE A LOCATION IN FIELD ZERO WHEN
                    /THE INSTRUCTION FIELD IS NON ZERO;
                    /*****************************************************************************************

1000  4456  TEST12, SCOPLP                  /SETUP TEST AND SCOPE LOOPING ADDRESS
1001  6007          CAF                     /CLEAR ALL FLAGS
1002  6001          ION                     /TURN ON THE INTERRUPT ON
1003  6274          SUF                     /SET USER BUFFER FLIP-FLOP
1004  5205          JMP     .+1             /ENTER TIME SHARE MODE
1005  7402          HLT                     /PROGRAM FAILED TO ENTER USER MODE
1006  5206          JMP     .               /HLT FAILED TO TRAP
1007  6254          SINT                    /SKIP ON USER INTERRUPT
1010  4454          ERROR                   /SINT FAILED OR USER INTERRUPT NOT SET
1011  6004          GTF                     /GET THE FLAGS
1012  1130          TAD     M1100           /CHECK FOR USER INTERRUPT AND USER FLAG
1013  7640          SZA CLA
1014  4454          ERROR                   /GTF HEAD SOMETHING DIFFERENT THAN ABOVE
1015  7340  TST12A, CLA CLL CMA             /SET THE AC TO ALL ONES
1016  3033          DCA     CDFCHK          /STORE IT TO CHECK THAT THE DATA FIELD CHANGED
1017  7340          CLA CLL CMA             /SET THE AC TO ALL ONES
1020  3227          DCA     CKJMS1          /SAVE IT TO CHECK THE JMS TO ANOTHER FIELD
1021  6261          CDF     60              /CHANGE DATA FIELD TO FIELD 6
1022  6212          CIF     10              /CHANGE INSTRUCTION FIELD TO FIELD 1
1023  3434          DCA I   CHKCDF          /CHANGE EMA LINES TO CHECK THAT THE
                                            /DCA WENT TO ANOTHER FIELD THAN FIELD 0
1024  6001          ION                     /TURN THE INTERRUPT ON
1025  4626          JMS I   .+1             /CLEAR INTERRUPT INHIBIT AND INTERRUPT
1026  1627          CKJMS1
1027  7402  CKJMS1, HLT                     /THIS LOCATION PRESET TO ONE'S TO CHECK JMS TO ANOTHER FIELD
1030  4454          ERROR                   /PROGRAM FAILED TO INTERRUPT
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1031  6004            GTF
1032  1121            TAD     M1016           /GET THE FLAGS
1033  7640            SZA CLA                 /CHECK FOR INT REQ, ISF OF 10 AND DSF OF 6
1034  4454            ERROR                   /IN SAVE FIELD REGISTER
1035  6234            RIB                     /SAVE FIELD NOT EQUAL TO ABOVE
1036  1071            TAD     M16             /READ THE INTERRUPT BUFFER
1037  7640            SZA CLA                 /CHECK FOR ISF OF 10 AND DSF OF 6
1040  4454            ERROR
1041  2033            ISZ     CDFCHK          /RIB FAILED OR SAVE FIELD NOT EQUAL TO 16
1042  4454            ERROR                   /CHECK THAT THE DCA I WENT TO ANOTHER FIELD
1043  2227            ISZ     CKJMS1          /DCA I WENT TO FIELD 0 INSTEAD OF FIELD 6
1044  4454            ERROR                   /CHECK THAT JMS I WENT TO ANOTHER FIELD
1045  7340  TST12B,  CLA CLL CMA             /JMS I WENT TO FIELD 0 INSTEAD OF FIELD 1
1046  3033            DCA     CDFCHK          /SET LOCATION CDFCHK AND CKJMS2 TO ONES
1047  7340            CLA CLL CMA             /TO CHECK DCA I AND JMS I WENT TO
1050  3257            DCA     CKJMS2          /ANOTHER FIELD THAN FIELD 0
1051  6211            CDF     10
1052  6262            CIF     60              /CHANGE DATA FIELD TO FIELD 1
1053  3434            DCA I   CHKCDF          /CHANGE INSTRUCTION FIELD TO FIELD 6
                                              /CHANGE EMA LINES TO FIELD 1
                                              /CDFCHK SHOULD NOT CHANGE IN FIELD 0
1054  6001            ION                     /TURN THE INTERRUPT ON
1055  4656            JMS I   .+1             /CLEAR INTERRUPT INHIBIT
1056  1057            CKJMS2                  /INDIRECT ADDRESS
1057  7402  CKJMS2,  HLT                     /THIS LOCATION PRESET TO ONE'S TO CHECK JMS TO FIELD 6
1060  4454            ERROR                   /PROGRAM FAILED TO INTERRUPT
1061  7340            CLA CLL CMA             /SET THE AC TO ALL ONES
1062  6004            GTF                     /GET THE FLAGS
1063  1126            TAD     M1061           /CHECK FOR INT REQ, ISF OF 60 AND DSF OF 1
1064  7640            SZA CLA
1065  4454            ERROR
1066  6234            RIB                     /THE SAVE FIELD NOT EQUAL TO ABOVE
1067  1107            TAD     M61             /READ THE INTERRUPT BUFFER
1070  7640            SZA CLA                 /CHECK FOR I,S,F, OF 6 AND I,D,F, OF 1
1071  4454            ERROR
1072  2033            ISZ     CDFCHK          /THE SAVE FIELD NOT EQUAL TO ABOVE
1073  4454            ERROR                   /CHECK THAT DCA I WENT TO ANOTHER FIELD
1074  2257            ISZ     CKJMS2          /DCA I WENT TO FIELD 0 INSTEAD OF FIELD 1
1075  4454            ERROR                   /CHECK THAT JMS I WENT TO ANNOTHER FIELD
1076  7340  TST12C,  CLA CLL CMA             /JMS I WENT TO FIELD 0 INSTEAD OF FIELD 16,
1077  3033            DCA     CDFCHK          /SET LOCATIONS CDFCHK AND CKJMS3 TO ONE'S
1100  7340            CLA CLL CMA             /TO CHECK THAT DCA I AND JMS I WENT
1101  3310            DCA     CKJMS3          /TO ANOTHER FIELD THAN FIELD 0
1102  6232            CIF     30
1103  6241            CDF     40              /CHANGE INSTRUCTIN FIELD TO FIELD 3
1104  3434            DCA I   CHKCDF          /CHANGE DATA FIELD TO FIELD 4
1105  6001            ION                     /CHANGE EMA LINES TO FIELD 4
1106  4707            JMS I   .+1             /TURN THE INTERRUPT ON
1107  1110            CKJMS3                  /CLEAR INTERRUPT INHIBIT
1110  7402  CKJMS3,  HLT                     /INDIRECT ADDRESS
1111  4454            ERROR                   /THIS LOCATION PRESET TO ONES TO CHECK JMS TO FIELD 3
1112  7340            CLA CLL CMA             /PROGRAM FAILED TO INTERRUPT
1113  6004            GTF                     /SET THE AC TO ALL ONES
1114  1123            TAD     M1034           /GET THE FLAGS
1115  7640            SZA CLA                 /CHECK FOR INT REQ, ISF OF 3 AND DSF OF 4
1116  4454            ERROR                   /THE SAVE FIELD REGISTER NOT EQUAL TO ABOVE
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1117  6234            RIB                     /READ THE INTERRUPT BUFFER
1120  1077            TAD     M34             /CHECK FOR ISF OF 3 AND DSF OF 4
1121  7640            SZA CLA
1122  4454            ERROR                   /THE SAVE FIELD REGISTER NOT EQUAL TO ABOVE
1123  2033            ISZ     CDFCHK
1124  4454            ERROR                   /DCA I WENT TO FIELD 0 INSTEAD OF FIELD 4
1125  2310            ISZ     CKJMS3
1126  4454            ERROR                   /JMS I WENT TO FIELD 0 INSTEAD OF FIELD 3
1127  7340  TST12D,  CLA CLL CMA             /SET LOCATIONS CDFCHK AND CKJMS4 TO ONES,
1130  3033            DCA     CDFCHK          /TO CHECK THAT DCA I OR JMS I TO ANOTHER
1131  7340            CLA CLL CMA             /FIELD DOESN'T GO TO FIELD 0
1132  3341            DCA     CKJMS4
1133  6252            CIF     50              /CHANGE INSTRUCTION FIELD TO FIELD 5
1134  6221            CDF     20              /CHANGE DATA FIELD TO FIELD 2
1135  3434            DCA I   CHKCDF          /CHANGE EMA LINES TO FIELD 2
1136  6001            ION                     /TURN THE INTERRUPT ON
1137  4740            JMS I   .+1             /CLEAR INTERRUPT INHIBIT
1140  1141            CKJMS4                  /INDIRECT ADDRESS
1141  7402  CKJMS4,  HLT                     /THIS LOCATION PRESET TO ONES TO CHECK JMS TO FIELD 5
1142  4454            ERROR                   /PROGRAM FAILED TO INTERRUPT
1143  7340            CLA CLL CMA             /SET THE AC TO ALL ONES
1144  6004            GTF                     /GET THE FLAGS
1145  1125            TAD     M1052           /CHECK FOR INT, REQ,, ISF OF 5, AND DSF OF 2
1146  7640            SZA CLA
1147  4454            ERROR                   /THE SAVE FIELD REGISTER NOT EQUAL TO ABOVE
1150  6234            RIB                     /READ THE INTERRUPT BUFFER
1151  1104            TAD     M52             /CHECK FOR ISF OF 5 AND DSF OF 2
1152  7640            SZA CLA
1153  4454            ERROR                   /SAVE FIELD NOT EQUAL TO ABOVE
1154  2033            ISZ     CDFCHK
1155  4454            ERROR                   /DCA I TO FIELD 2 WENT TO FIELD 0
1156  2341            ISZ     CKJMS4
1157  4454            ERROR                   /JMS I TO FIELD 5 WENT TO FIELD 0
1160  5777            JMP     TST12E

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2000  4452            JMS  I  AUTRST          //AUTO RESTART HANDLER
2001  7340  TST12E,  CLA CLL CMA             /SETUP LOCATIONS CDFCHK AND CKJMS5 TO ONES
2002  3033            DCA     CDFCHK          /TO CHECK THAT DCA I OR JMP I TO ANOTHER
2003  7240            CLA CMA                 /FIELD DOESN'T GO TO FIELD 0
2004  3213            DCA     CKJMS5
2005  6251            CDF     50              /CHANGE DATA FIELD TO FIELD 5
2006  6222            CIF     20              /CHANGE INSTRUCTION FIELD TO 2
2007  3434            DCA I   CHKCDF          /CHANGE EMA LINES TO 5 (OF ON)
2010  6001            ION                     /TURN INTERRUPT ENABLE ON
2011  4612            JMS I   .+1             /CLEAR INTERRUPT INHIBIT
2012  2013            CKJMS5                  /INDIRECT ADDRESS
2013  7402  CKJMS5,  HLT                     /THIS LOCATION PRESET TO ONES TO CHECK JMS TO FIELD 2
2014  4454            ERROR                   /PROGRAM FAILED TO INTERRUPT
2015  7340            CLA CLL CMA             /SET THE AC TO ALL ONES
2016  6004            GTF                     /GET THE FLAGS
2017  1122            TAD     M1025           /CHECK FOR INT, REQ,, ISF=2 AND DSF=5
2020  7640            SZA CLA
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2021  4454              ERROR                   /THE SAVE FIELD REGISTER NOT EQUAL TO ABOVE
2022  6234              RIB                     /READ THE INTERRUPT BUFFER
2023  1074              TAD     M25             /CHECK FOR ISF OF 2 AND DSF=5
2024  7640              SZA CLA
2025  4454              ERROR                   /SAVE FIELD REGISTER NOT EQUAL TO ABOVE
2026  2033              ISZ     CDFCHK
2027  4454              ERROR                   /DCA I TO FIELD 5 WENT TO FIELD 0
2030  2213              ISZ     CKJMS5
2031  4454              ERROR                   /JMS I TO FIELD 2 WENT TO FIELD 0
2032  7340    TST12F,   CLA CLL CMA             /SET LOCATIONS CDFCHK AND CKJMS6 TO
2033  3033              DCA     CDFCHK          /ONES TO CHECK THAT DCA I AND JMS I
2034  7240              CLA CMA                 /TO ANOTHER FIELD DOESN'T GO TO FIELD 0
2035  3244              DCA     CKJMS6
2036  6231              CDF     30              /CHANGE DATA FIELD TO FIELD 3
2037  6242              CIF     40              /CHANGE INSTRUCTION FIELD TO FIELD 4
2040  3434              DCA I   CHKCDF          /CHANGE EMA LINES TO 3
2041  6001              ION                     /TURN THE INTERRUPT ON
2042  4643              JMS I   .+1             /CLEAR INTERRUPT INHIBIT
2043  2044              CKJMS6                  /INDIRECT ADDRESS
2044  7402    CKJMS6,   HLT                     /THIS LOCATION PRESET TO ONES TO CHECK JMS TO FIELD 4
2045  4454              ERROR                   /PROGRAM FAILED TO INTERRUPT
2046  7340              CLA CLL CMA             /SET THE AC TO ALL ONE'S
2047  6004              GTF                     /GET THE FLAGS
2050  1124              TAD     M1043           /CHECK FOR INT, REQ,, ISF OF 4 AND DSF OF 3,
2051  7640              SZA CLA
2052  4454              ERROR                   /SAVE FIELD NOT EQUAL TO ABOVE
2053  6234              RIB                     /READ THE INTERRUPT BUFFER
2054  1101              TAD     M43             /CHECK FOR ISF OF 4 AND DSF OF 3
2055  7640              SZA CLA
2056  4454              ERROR                   /SAVE FIELD NOT EQUAL TO ABOVE
2057  2033              ISZ     CDFCHK
2060  4454              ERROR                   /DCA I WENT TO FIELD 0 INSTEAD OF FIELD 3
2061  2244              ISZ     CKJMS6
2062  4454              ERROR                   /JMS I WENT TO FIELD 0 INSTEAD OF FIELD 4
2063  7340    TST12G,   CLA CLL CMA             /SET CDFCHK AND CKJMS7 TO ONES TO
2064  3033              DCA     CDFCHK          /CHECK FOR DCA I TO ANOTHER FIELD AND A
2065  7240              CLA CMA                 /JMS I TO ANOTHER FIELD
2066  3275              DCA     CKJMS7
2067  6271              CDF     70              /CHANGE DATA FIELD TO FIELD 7
2070  6202              CIF     00              /CHANGE INSTRUCTION FIELD TO FIELD 0
2071  3434              DCA I   CHKCDF          /CHANGE EMA LINES TO 7
2072  6001              ION                     /TURNN INTERRUPT ON
2073  4674              JMS I   .+1             /CLEAR INTERRUPT INHIBIT
2074  2075              CKJMS7                  /INDIRECT ADDRESS
2075  7402    CKJMS7,   HLT                     /THIS LOCATION WAS SET TO ONE'S BUT SHOULD CHANGE
2076  4454              ERROR                   /PROGRAM FAILED TO INTERRPT
2077  7340              CLA CLL CMA
2100  6004              GTF                     /GET THE FLAGS
2101  1120              TAD     M1007           /CHECK FOR INT, REQ,, ISF=0, DSF=7
2102  7640              SZA CLA
2103  4454              ERROR                   /SAVE FIELD NOT EQUAL TO ABOVE
2104  6234              RIB                     /READ THE INTERRUPT BUFFER
2105  1066              TAD     M7              /CHECK FOR DSF OF 7
2106  7640              SZA CLA
2107  4454              ERROR                   /SAVE FIELD NOT EQUAL TO DSF OF 7
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2110  2033              ISZ     CDFCHK
2111  4454              ERROR                   /DCA I WENT TO FIELD 0 INSTEAD OF FIELD 7
2112  2275              ISZ     CKJMS7
2113  7410              SKP
2114  4454              ERROR                   /JMS I TO FIELD 0 WENT TO ANOTHER FIELD
2115  7340    TST12H,   CLA CLL CMA             /SET UP CDFCHK TO ONES TO CHECK THAT
2116  3033              DCA     CDFCHK          /DCA I TO FIELD 0 WILL CLEAR IT AND SET
2117  7340              CLA CLL CMA             /LOCATION CKJMS8 TO 1'S TO CHECK THAT
2120  3327              DCA     CKJMS8          /JMS I TO FIELD 7 WON'T CLEAR IT
2121  6201              CDF     00              /CHANGE DATA FIELD TO FIELD 0
2122  6272              CIF     70              /CHANGE INSTRUCTION FIELD TO FIELD 7
2123  3434              DCA I   CHKCDF          /CLEAR LOCATION CDFCHK IF EMA LINES WENT TO ZERO
2124  6001              ION                     /TURN THE INTERRUPT ON
2125  4726              JMS I   .+1             /CLEAR INTERRUPT INHIBIT
2126  2127              CKJMS8                  /INDIRECT ADDRESS
2127  7402    CKJMS8,   HLT                     /THIS LOCATION PRESET TO 1'S, IT SHOULD NOT CHANGE
2130  4454              ERROR                   /PROGRAM FAILED TO INTERRUPT
2131  7340              CLA CLL CMA             /SET THE AC TO ALL ONES
2132  6004              GTF                     /GET THE FLAGS
2133  1127              TAD     M1070           /CHECK FOR INT, REQ,, ISF=7 AND DSF=0
2134  7640              SZA CLA
2135  4454              ERROR                   /SAVE FIELD REGISTER NOT EQUAL TO ABOVE
2136  6234              RIB                     /READ THE INTERRUPT BUFFER
2137  1111              TAD     M70             /CHECK SAVE FIELDS FOR ISF OF 7 AND DSF OF 0
2140  7640              SZA CLA
2141  4454              ERROR                   /SAVE FIELD NOT EQUAL TO ABOVE
2142  2033              ISZ     CDFCHK
2143  7410              SKP
2144  4454              ERROR                   /DCA I TO FIELD 0 WENT TO ANOTHER FIELD
2145  2327              ISZ     CKJMS8
2146  4454              ERROR                   /JMS I TO FIELD 7 WENT TO FIELD 0
2147  7240    TST12I,   CLA CMA                 /SETUP CDFCHK AND CKJMS9 TO ONES TO
2150  3033              DCA     CDFCHK          /CHECK THAT DCA I AND JMS I TO FIELD 0
2151  7340              CLA CLL CMA             /WILL CHANGE THESE LOCATIONS
2152  3361              DCA     CKJMS9
2153  6201              CDF     00              /CHANGE DATA FIELD TO FIELD 0
2154  6202              CIF     00              /CHANGE INSTRUCTION FIELD TO FIELD 0
2155  3434              DCA I   CHKCDF          /CLEAR LOCATION CDFCHK
2156  6001              ION                     /SET INTERRUPT ENABLE
2157  4760              JMS I   .+1             /CLEAR INTERRUPT INHIBIT
2160  2161              CKJMS9                  /INDIRECT ADDRESS
2161  7402    CKJMS9,   HLT                     /THIS LOCATION PRESET TO ONES, SHOULD CHANGE
2162  4454              ERROR                   /PROGRAM FAILED TO INTERRUPT
2163  7340              CLA CLL CMA             /SET THE AC TO ALL ONE'S
2164  6004              GTF                     /GET THE FLAGS
2165  1117              TAD     M1000           /CHECK FOR INTERRUPT REQUEST
2166  7640              SZA CLA
2167  4454              ERROR                   /SAVE FIELD NOT EQUAL TO ABOVE
2170  6234              RIB                     /READ THE INTERRUPT BUFFER
2171  7640              SZA CLA                 /IS THE SAVE FIELD EQUAL TO 0
2172  4454              ERROR                   /SAVE FIELD NOT EQUAL TO ZERO
2173  2033              ISZ     CDFCHK
2174  7410              SKP
2175  4454              ERROR                   /DCA I TO FIELD 0 DID NOT GO TO FIELD 0
2176  2361              ISZ     CKJMS9
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2177  7410            SKP
2200  4454            ERROR                   /JMS I TO FIELD 0 DID NOT GO TO FIELD 0
2201  1150            TAD     K7707           /CHECK THE INCLUSIVE OR OF RIF WITH AC
2202  6224            RIF
2203  1137            TAD     K70
2204  7040            CMA
2205  7640            SZA CLA
2206  4454            ERROR                   /THE INCLUSIVE OR OF IF WITH AC FAILED
2207  6254            SINT                    /SKIP ON USER INTERRUPT
2210  4454            ERROR                   /USER INTERRUPT FLIP=FLOP GOT CLEARED
2211  6007            CAF                     /CLEAR ALL FLAGS
2212  6254            SINT                    /SKIP ON USER INTERRUPT
2213  7410            SKP
2214  4454            ERROR                   /INIT FAILED TO CLEAR USER INTERRUPT F/F
2215  4455            LOOP                    /LOOP ON TEST IF SR = 1000

                /**********************************************************************************************************
                /TEST 13 = CHECKS THE MICRO PROGRAM INSTRUCTIONS CDF CIF (62X3),  A DCA I
                /AND JMS ARE ALSO ISSUED TO CHECK THAT THESE INSTRUCTIONS DO NOT DESTROY
                /LOCATIONS IN FIELD 0,  THE USER INTERRUPT F/F IS USED TO CAUSE INTERRUPTS.
                /**********************************************************************************************************

2216  4456  TEST13, SCOPLP                    /SETUP TEST AND SCOPLE LOOPING ADDRESS
2217  6007            CAF                     /CLEAR ALL FLAGS
2220  6202            CIF     00              /INITIALIZE THE IF AND DF TO FIELD 0
2221  6201            CDF     00              /
2222  5223            JMP     .+1             /LOAD THE IF BY A JMP
2223  6001            ION                     /TURN THE INTERRUPT ON
2224  6274            SUF                     /SET THE USER BUFFER F/F
2225  5226            JMP     .+1             /ENTER USER MODE
2226  7402            HLT                     /PROGRAM FAILED TO TRAP
2227  5227            JMP     .               /HALT FAILED TO TRAP
2230  6254            SINT                    /SKIP ON USER INTERRUPT FLIP=FLOP
2231  4454            ERROR                   /USER INTERRUPT FLIP=FLOP NOT SET
2232  6234            RIB                     /READ THE INTERRUPT BUFFER
2233  1113            TAD     M100
2234  7640            SZA CLA
2235  4454            ERROR                   /USER FLAG NOT SET OR SAVE FIELD NON ZERO
2236  7240  TST13A, CLA CMA                    /SETUP TWO LOCATIONS TO CHECK THAT A CIF,CDF
2237  3033            DCA     CDFCHK          /WENT TO ANOTHER FIELD BY DOING A DCA I AND JMS
2240  7240            CLA CMA
2241  3246            DCA     JMSCK1
2242  6273            CIFCDF  70              /CHANGE IF AND DF TO FIELD 7
2243  3434            DCA I   CHKCDF          /TRY TO CLEAR CDFCHK IN FIELD 7
2244  6001            ION                     /SET INTERRUPT ENABLE
2245  4246            JMS     JMSCK1          /CLEAR INTERRUPT INHIBIT AND INTERRUPT
2246  7402  J1SCK1, HLT                      /THIS LOCATION PRESET TO 7777
2247  4454            ERROR                   /PROGRAM FAILED TO INTERRUPT
2250  6234            RIB                     /READ THE INTERRUPT BUFFER
2251  1112            TAD     M77             /CHECK SAVE FIELD FOR ISF OF 7 AND DSF OF 7
2252  7640            SZA CLA
2253  4454            ERROR                   /CIFCDF TO FIELD 7 FAILED OR SAVE FIELD NOT=TO 77
2254  2033            ISZ     CDFCHK
2255  4454            ERROR                   /DCA I TO FIELD 7 WENT TO FIELD 0
2256  2246            ISZ     JMSCK1
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2257  4454            ERROR                   /JMS TO FIELD 7 WENT TO FIELD 0
2260  6254            SINT                    /SKIP ON USER INTERRUPT F/F
2261  4454            ERROR                   /USER INTERRUPT F/F GOT CLEARED
2262  7240  TST13B, CLA CMA                    /SETUP TWO LOCATIONS TO CHECK THAT CIFCDF 20
2263  3033            DCA     CDFCHK          /WENT TO ANOTHER FIELD THAN FIELD 0
2264  7240            CLA CMA
2265  3272            DCA     JMSCK2
2266  6223            CIFCDF  20              /CHANGE INSTRUCTION FIELD AND DATA FIELD TO 2
2267  3434            DCA I   CHKCDF          /TRY TO CLEAR CDFCHK IN FIELD 2
2270  6001            ION                     /SET INTERRUPT ENABLE
2271  4272            JMS     JMSCK2          /CLEAR INTERRUPT INHIBIT AND INTERRUPT
2272  7402  JMSCK2, HLT                      /THIS LOCATIONS PRESET TO 7777
2273  4454            ERROR                   /PROGRAM FAILED TO INTERRUPT
2274  6234            RIB                     /READ THE INTERRUPT BUFFER
2275  1073            TAD     M22             /CHECK SAVE FIELD FOR ISF=2 & DSF=2
2276  7640            SZA CLA
2277  4454            ERROR                   /SAVE FIELD NTO EQUAL OT CIFCDF 20 FAILED
2300  2033            ISZ     CDFCHK
2301  4454            ERROR                   /DCA I TO FIELD 2 WENT TO FIELD 0
2302  2272            ISZ     JMSCK2
2303  4454            ERROR                   /JMS TO FIELD 2 WENT TO FIELD 0
2304  7240  TST13C, CLA CMA                    /SETUP TWO LOCATIONS TO CHECK THAT CIFCDF 50
2305  3033            DCA     CDFCHK          /WENT TO ANOTHER FIELD THAN FIELD 0
2306  7240            CLA CMA
2307  3314            DCA     JMSCK3
2310  6253            CIFCDF  50              /CHANGE INSTRUCTION FIELD AND DATA FIELD TO FIELD 5
2311  3434            DCA I   CHKCDF          /TRY TO CLEAR CDFCHK IN FIELD 5
2312  6001            ION                     /SET INTERRUPT ENABLE
2313  4314            JMS     JMSCK3          /CLEAR INTERRUPT INHIBIT AND INTERRUPT
2314  7402  JMSCK3, HLT                      /THIS LOCATIONS PRESET TO 7777
2315  4454            ERROR                   /PROGRAM FAILED TO INTERRUPT
2316  6234            RIB                     /READ THE INTERRUPT BUFFER
2317  1105            TAD     M55             /CHECK FOR ISF OF 5 AND DSF OF 5
2320  7640            SZA CLA
2321  4454            ERROR                   /SAVE FIELD NOT EQUAL TO ISF,DSF OF 5
2322  2033            ISZ     CDFCHK
2323  4454            ERROR                   /DCA I TO FIELD 5 WENT TO FIELD 0
2324  2314            ISZ     JMSCK3
2325  4454            ERROR                   /JMS TO FIELD 5 WENT TO FIELD 0
2326  6254            SINT                    /SKIP ON USER INTERRUPT F/F
2327  4454            ERROR                   /USER INTERRUPT F/F GOT CLEARED
2330  7240  TST13D, CLA CMA                    /SETUP TWO LOCATIONS TO ONE'S TO CHECK
2331  3033            DCA     CDFCHK          /THAT CIFCDF TO FIELD 4 WENT TO ANOTHER
2332  7240            CLA CMA                 /FIELD THAN FIELD 0
2333  3340            DCA     JMSCK4
2334  6243            CIFCDF  40              /CHANGE INSTRUCTION FIELD AND DATA FIELD TO FIELD 4
2335  3434            DCA I   CHKCDF          /TRY TO CLEAR CDFCHK IN FIELD 4
2336  6001            ION                     /SET INTERRUPT ENABLE
2337  4340            JMS     JMSCK4          /CLEAR INTERRUPT INHIBIT AND INTERRUPT
2340  7402  J1SCK4, HLT                      /THIS LOCATION PRESET TO ONE'S
2341  4454            ERROR                   /PROGRAM FAILED TO INTERRUPT
2342  6234            RIB                     /READ THE INTERRUPT BUFFER
2343  1102            TAD     M44             /CHECK ISF FOR 4 AND DSF FOR 4
2344  7640            SZA CLA
2345  4454            ERROR                   /SAVE FIELD NOT EQUAL TO 44
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2346  2033            ISZ     CDFCHK
2347  4454            ERROR                   /DCA I TO FIELD 4 WENT TO FIELD 0
2350  2340            ISZ     JMSCK4
2351  4454            ERROR                   /JMS TO FIELD 4 WENT TO FIELD 0
2352  6254            SINT                    /SKIP ON USER INTERRUPT F/F
2353  4454            ERROR                   /USER INTERRUPT F/F GOT CLEARED
2354  7340  TST13E,  CLA CLL CMA               /SETUP TWO LOCATIONS TO CHECK THAT CIFCDF 30
2355  3033            DCA     CDFCHK          /WENT TO ANOTHER FIELD THAN FIELD 0
2356  7240            CLA CMA
2357  3364            DCA     JMSCK5
2360  6233            CIFCDF  30              /CHANGE INSTRUCTION AND DATA FIELD TO FIELD 3
2361  3434            DCA I   CHKCDF          /TRY TO CLEAR CDFCHK IN FIELD 3
2362  6001            ION                     /SET INTERRUPT ENABLE
2363  4364            JMS     JMSCK5          /CLEAR INTERRUPT INHIBIT AND INTERRUPT
2364  7402  JMSCK5,  HLT                     /THIS LOCATION PRESET TO ONES
2365  4454            ERROR                   /PROGRAM FAILED TO INTERRUPT
2366  6234            RIB                     /READ THE INTERRUPT BUFFER
2367  1076            TAD     M33             /CHECK FOR ISF OF 3 AND DSF OF 3
2370  7640            SZA CLA
2371  4454            ERROR                   /SAVE FIELD NOT EQUAL TO ABOVE OR CIFCDF 30 FAILED
2372  2033            ISZ     CDFCHK
2373  4454            ERROR                   /DCA I TO FIELD 3 WENT TO FIELD 0
2374  2364            ISZ     JMSCK5
2375  4454            ERROR                   /JMS TO FIELD 3 WENT TO FIELD 0
2376  6254            SINT                    /SKIP ON USER INTERRUPT F/F
2377  4454            ERROR                   /USER INTERRUPT F/F GOT CLEARED
2400  7240  TST13F,  CLA CMA                 /SETUP TWO LOCATIONS TO CHECK THAT
2401  3033            DCA     CDFCHK          /CIFCDF 60 WENT TO ANOTHER FIELD
2402  7240            CLA CMA                 /THEN FIELD ZERO
2403  3210            DCA     JMSCK6
2404  6263            CIFCDF  60              /CHANGE INSTRUCTION AND DATA FIELD TO FIELD 6,
2405  3434            DCA I   CHKCDF          /TRY TO CLEAR CDFCHK IN FIELD 6
2406  6001            ION                     /SET INTERRUPT ENABLE
2407  4210            JMS     JMSCK6          /CLEAR INTERRUPT INHIBIT AND INTERRUPT
2410  7402  JMSCK6,  HLT                     /THIS LOCATIONS PRESET TO ONES
2411  4454            ERROR                   /PROGRAM FAILED TO INTERRUPT
2412  6234            RIB                     /READ THE INTERRUPT BUFFER
2413  1110            TAD     M66             /CHECK FOR ISF OF 6 AND DSF OF 6
2414  7640            SZA CLA
2415  4454            ERROR                   /SAVE FIELD NOT EQUAL ABOVE OR CIFCDF 60 FAILED
2416  2033            ISZ     CDFCHK
2417  4454            ERROR                   /DCA I TO FIELD 6 WENT TO FIELD 0
2420  2210            ISZ     JMSCK6
2421  4454            ERROR                   /JMS TO FIELD 6 WENT TO FIELD 0
2422  6254            SINT                    /SKIP ON USER INTERRUPT F/F
2423  4454            ERROR                   /USER INTERRUPT GOT CLEARED
2424  7240  TST13G,  CLA CMA                 /SETUP 2 LOCATIONS TO CHECK THAT
2425  3033            DCA     CDFCHK          /CIFCDF 10 WENT TO ANOTHER FIELD
2426  7240            CLA CMA                 /THAN FIELD 0
2427  3234            DCA     JMSCK7
2430  6213            CIFCDF  10              /CHANGE INSTRUCTION FIELD + DATA FIELD TO FIELD 1
2431  3434            DCA I   CHKCDF          /TRY TO CLEAR CDFCHK IN FIELD 1
2432  6001            ION                     /SET INTERRUPT ENABLE
2433  4234            JMS     JMSCK7          /CLEAR INTERRUPT INHIBIT AND INTERRUPT
2434  7402  JMSCK7,  HLT                     /THIS LOCATION PRESET TO ONES
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2435  4454            ERROR                   /PROGRAM FAILED TO INTERRUPT
2436  6234            RIB                     /READ THE INTERRUPT BUFFER
2437  1070            TAD     M11             /CHECK FOR ISF OF 1 AND DSF OF 1
2440  7640            SZA CLA
2441  4454            ERROR                   /SAVE FIELD NOT EQUAL ABOVE OR CIFCDF 10 FAILED
2442  2033            ISZ     CDFCHK
2443  4454            ERROR                   /DCA I TO FIELD 1 WENT TO FIELD 0
2444  2234            ISZ     JMSCK7
2445  4454            ERROR                   /JMS TO FIELD 1 WENT TO FIELD 0
2446  6254            SINT                    /SKIP ON USER INTERRUPT F/F
2447  4454            ERROR                   /USER INTERRUPT F/F GOT CLEARED
2450  7240  TST13H,  CLA CMA                 /SET UP 2 LOCATIONS TO CHECK THAT
2451  3033            DCA     CDFCHK          /CIFCDF 00 WENT TO FIELD 0 INSTEAD
2452  7240            CLA CMA                 /OF ANOTHER FIELD
2453  3260            DCA     JMSCK8
2454  6203            CIFCDF  00              /CHANGE INSTRUCTION AND DATA FIELD TO 0
2455  3434            DCA I   CHKCDF          /CLEAR CDFCHK IN FIELD 0
2456  6001            ION                     /SET INTERRUPT ENABLE
2457  4260            JMS     JMSCK8          /CLEAR INTERRUPT INHIBIT AND INTERRUPT
2460  7402  JMSCK8,  HLT                     /THIS LOCATIONS PRESET TO ONES
2461  4454            ERROR                   /PROGRAM FAILED TO INTERRUPT
2462  6234            RIB                     /READ THE INTERRUPT BUFFER
2463  7640            SZA CLA
2464  4454            ERROR                   /SAVE FIELD IS NOT EQUAL TO 0
2465  2033            ISZ     CDFCHK
2466  7410            SKP
2467  4454            ERROR                   /DCA I FAILED TO CLEAR CDFCHK IN FIELD 0
2470  2260            ISZ     JMSCK8
2471  7410            SKP
2472  4454            ERROR                   /JMS FAILED TO CHANGE JMSCK8 IN FIELD 0
2473  6204            CINT                    /CLEAR USER INTERRUPT F/F
2474  6254            SINT                    /SKIP ON USER INTERRUPT F/F
2475  7410            SKP
2476  4454            ERROR                   /CINT FAILED TO CLEAR USER INTERRUPT F/F
2477  4455            LOOP                    /LOOP ON TEST IF SR 2 = 1000

                /**********************************************************************************************
                /TEST 14 - CHECKS THAT RTF CAN LOAD THE IF AND DF AND THAT RMF CAN
                /RELOAD IT.
                /**********************************************************************************************

2500  4456  TEST14,  SCOPLP                  /SETUP SCOPE AND TEST LOOPING ADDRESS
2501  6007            CAF                     /CLEAR ALL FLAGS
2502  6001            ION                     /SET INTERRUPT ENABLE
2503  6274            SUF                     /SET USER BUFFER
2504  5305            JMP     .+1             /LOAD THE UB INTO THE IF
2505  7402            HLT                     /HALT SHOULD TRAP
2506  5306            JMP     .               /HLT FAILED TO TRAP
2507  6254            SINT                    /SKIP ON USER INTERRUPT
2510  4454            ERROR                   /USER INTERRUPT NOT SET
2511  6234            RIB                     /READ THE INTERRUPT BUFFER
2512  1113            TAD     M100            /CHECK FOR USER FLAG
2513  7640            SZA     CLA
2514  4454            ERROR                   /USER FLAG OR INT REQ NOT SET
2515  1141  TST14A,  TAD     K125
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2516  6005           RTF                 /LOAD THE UB, IB, & DF WITH USER FLAG, IF OF 2 & DF OF 5
2517  7300           CLA CLL             /AND SET INTERRUPT ENABLE
2520  6214           RDF                 /READ THE DATA FIELD TO CHECK THAT FIELD 5 GOT LOADED
2521  1103           TAD     M50
2522  7640           SZA CLA
2523  7402           HLT                 /RTF FAILED TO LOAD DATA FIELD TO 5
2524  5325           JMP     .+1         /ENTER USER MODE,CLEAR INT INHIBIT,AND INTERRUPT
2525  4454           ERROR               /FAILED TO INTERRUPT , RTF OR JMP FAILED
2526  6254           SINT                /SKIP ON USER INTERRUPT F/F
2527  4454           ERROR               /SINT FAILED OR USER INTERRUPT F/F CLEARED
2530  6234           RIB                 /CHECK FOR USER FLAG, ISF OF 2 AND DSF OF 5
2531  1114           TAD     M125
2532  7640           SZA CLA
2533  4454           ERROR               /SAVE FIELD NOT EQUAL TO ABOVE
2534  6244           RMF                 /LOAD THE UB, IB, & DF FROM THE SAVE FIELD
2535  6214           RDF                 /READ THE DATA FIELD
2536  1103           TAD     M50         /CHECK THAT RMF LOADED THE DF
2537  7640           SZA CLA
2540  4454           ERROR               /RMF FAILED TO LOAD DF TO FIELD 5
2541  6001           ION                 /SET INTERRUPT ENABLE
2542  5343           JMP     .+1         /LOAD THE IF, CLEAR INTERRUPT INHIBIT, ENTER USER MODE
2543  4454           ERROR               /FAILED TO INTERRUPT OR RMF JMP FAILED
2544  6254           SINT                /SKIP ON USER INTERRUPT FLIP-FLOP
2545  4454           ERROR               /USER INTERRUPT FLIP-FLOP NOT SET
2546  6234           RIB                 /READ THE INTERRUPT BUFFER
2547  1114           TAD     M125        /CHECK FOR USER FLAG, ISF OF 2 AND DSF OF 5
2550  7640           SZA CLA
2551  4454           ERROR               /RMF FAILED TO LOAD THE ABOVE
2552  1142   TST14B, TAD     K152
2553  6005           RTF                 /LOAD THE UB, IB, & DF WITH UF, ISF OF 5 AND DSF OF 2
2554  7300           CLA CLL             /AND SET INTERRUPT ENABLE
2555  6214           RDF                 /READ THE DATA FIELD
2556  1072           TAD     M20         /CHECK FOR A DF SET TO FIELD 2
2557  7640           SZA CLA
2560  7402           HLT                 /RTF FAILED TO LOAD DF WITH 2
2561  5362           JMP     .+1         /ENTER USER MODE CLEAR INTERRUPT INHIBIT
2562  4454           ERROR               /FAILED TO INTERRUPT
2563  6254           SINT                /SKIP ON USER INTERRUPT
2564  4454           ERROR               /USER INTERRUPT NOT SET
2565  6234           RIB                 /READ THE INTERRUPT BUFFER
2566  1115           TAD     M152        /CHECK FOR USER FLAG, ISF OF 5 AND DSF OF 2
2567  7640           SZA CLA
2570  4454           ERROR               /SAVE FIELD NOT EQUAL TO ABOVE
2571  6244           RMF                 /RESTORE MEMORY FIELDS
2572  6214           RDF                 /READ THE DATA FIELD
2573  1072           TAD     M20         /CHECK THAT RMF LOADED DF TO FIELD 2
2574  7640           SZA CLA
2575  4454           ERROR               /RMF FAILED TO LOAD DF TO FIELD 2
2576  7000           NOP
2577  6001           ION                 /SET INTERRUPT ENABLE
2600  5201           JMP     .+1         /CLEAR INTERRUPT INHIBIT, LOAD IF, ENTER USER MODE
2601  4454           ERROR               /FAILED TO INTERRUPT
2602  6254           SINT                /SKIP ON USER INTERRUPT
2603  4454           ERROR               /USER INTERRUPT NOT SET
2604  6234           RIB                 /READ THE INTERRUPT BUFFER
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2605  1115           TAD     M152        /CHECK SF FOR USER FLAG, ISF OF 5 AND DSF OF 2
2606  7640           SZA CLA
2607  4454           ERROR               /RMF FAILED TO LOAD THE ABOVE
2610  6254   TST14C, SINT                /SKIP ON USER INTERRUPT FLIP-FLOP
2611  4454           ERROR               /USER INTERRUPT FLIP-FLOP GOT CLEARED,
2612  1140           TAD     K77         /LOAD DATA FIELD AND IB TO FIELD 7
2613  6005           RTF                 /RESTORE THE FLAGS AND SET INTERRUPT ENABLE
2614  7300           CLA CLL
2615  6214           RDF                 /READ THE DATA FIELD
2616  1111           TAD     M70         /CHECK FOR DATA FIELD SET TO FIELD 7
2617  7640           SZA CLA
2620  7402           HLT                 /RTF FAILED TO SET DF TO FIELD 7
2621  5222           JMP     .+1         /CLEAR INTERRUPT INHIBIT AND INTERRUPT
2622  4454           ERROR               /PROGRAM FAILED TO INTERRUPT ON USER INTERRUPT
2623  6234           RIB                 /READ THE INTERRUPT BUFFER
2624  1112           TAD     M77         /CHECK FOR UF=0, ISF=7 AND DSF=7
2625  7640           SZA CLA
2626  4454           ERROR               /SAVE FIELD NOT EQUAL TO ABOVE
2627  6254           SINT                /SKIP ON USER INTERRUPT
2630  4454           ERROR               /USER INTERRUPT GOT CLEARED
2631  6244           RMF                 /RESTORE MEMORY FIELDS
2632  6214           RDF                 /CHECK THAT RMF RESTORED THE DF
2633  1111           TAD     M70
2634  7640           SZA CLA
2635  4454           ERROR               /RMF FAILED TO LOAD DF TO 7
2636  6224           RIF                 /CHECK INSTRUCTION FIELD TO BE SET 0
2637  7640           SZA CLA
2640  4454           ERROR               /IF IS NON ZERO AFTER A RMF
2641  6001           ION                 /SET INTERRUPT ENABLE
2642  5243           JMP     .+1         /CLEAR INTERRUPT INHIBIT AND INTERRUPT
2643  4454           ERROR               /PROGRAM FAILED TO INTERRUPT,
2644  6234           RIB                 /READ THE INTERRUPT BUFFER
2645  1112           TAD     M77         /CHECK FOR ISF AND DSF = TO 7
2646  7640           SZA CLA
2647  4454           ERROR               /RMF FAILED TO RESTORE IF AND DF TO 7
2650  6254   TST14D, SINT                /SKIP ON USER INTERRUPT FLIP-FLOP
2651  4454           ERROR               /USER INTERRUPT CLEARED
2652  6005           RTF                 /RESTORE THE FLAGS, SET IB=DF TO ZERO
2653  5254           JMP     .+1         /CLEAR INTERRUPPT INHIBIT AND INTERRUPT
2654  4454           ERROR               /PROGRAM FAILED TO INTERRUPT
2655  6234           RIB                 /READ THE INTERRUPT BUFFER
2656  7640           SZA CLA
2657  4454           ERROR               /THE ISF OR DSF IS NON ZERO
2660  6244           RMF                 /RESTORE MEMORY FIELDS
2661  6001           ION                 /SET INTERRUPT ENABLE
2662  5263           JMP     .+1         /CLEAR INTERRUPT INHIBIT AND INTERRUPT
2663  4454           ERROR               /PROGRAM FAILED TO INTERRUPT
2664  6234           RIB                 /READ THE INTERRUPT BUFFER
2665  7640           SZA CLA
2666  4454           ERROR               /RMF FAILED TO RELOAD IF AND DF TO ZERO
2667  6204           CINT                /CLEAR USER INTERRUPT FLIP-FLOP
2670  6254           SINT                /SKIP ON USER INTERRUPT FLIP-FLOP
2671  7610           SKP     CLA
2672  4454           ERROR               /CINT FAILED TO CLEAR USER INTERRUPT
2673  4455           LOOP                /LOOP ON TEST IF SR = 1000
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                    /**********************************************************************************************
                    /TEST 19 - SETS THE UB TO A 1, THE IF AND DF TO FIELD 6, THE PROGRAM
                    /THEN ISSUES AND, TAD, ISZ, AND DCA INDIRECTS TO CHECK THAT THE
                    /PROGRAM DOESN'T INTERRUPT UNTIL A JUMP INSTRUCTION IS ISSUED,
                    /**********************************************************************************************

2674  4456  TEST19, SCOPLP                  /SETUP SCOPE AND TEST LOOPING ADDRESS
2675  6007        CAF                       /CLEAR ALL FLAGS
2676  6203        CIFCDF                    /CHANGE DATA AND INSTRUCTION FIELD TO 0
2677  5300        JMP     .+1               /CLEAR INTERRUPT INHIBIT
2700  6264        CUF                       /CLEAR USER FLAG
2701  6204        CINT                      /CLEAR USER INTERRUPT FLIP-FLOP
2702  6001        ION                       /SET INTERRUPT ENABLE
2703  6274        SUF                       /SET USER BUFFER FLIP-FLOP
2704  5305        JMP     .+1               /CLEAR INTERRUPT INHIBIT
2705  7402        HLT                       /FAILED TO ENTER USER MODE
2706  5306        JMP     .                 /HLT FAILED TO TRAP
2707  6254        SINT                      /SKIP ON USER INTERRUPT FLIP-FLOP
2710  4454        ERROR                     /USER INTERRUPT FLIP-FLOP NOT SET
2711  6234        RIB                       /READ THE INTERRUPT BUFFER
2712  1113        TAD     M100              /CHECK FOR USER FLAG
2713  7640        SZA CLA
2714  4454        ERROR                     /USER FLAG NOT SET
2715  6263        CIFCDF  60                /CHANGE IB AND DF TO FIELD 6 AND SET INTERRUPT INHIBIT
2716  6001        ION                       /SET INTERRUPT ENABLE, THE PROGRAM
                                            /SHOULDN'T INTERRUPT UNTIL A JMP OR JMS IS ISSUED,
2717  7000        NOP                       /CHECK THAT PROGRAM DOESNIT INTERRUPT
2720  7410        SKP
2721  7402        HLT                       /PROGRAM INTERRUPTED BEFORE A JMP WAS ISSUED
2722  3723        DCA I   .+1               /DO A DCA I TO NEXT LOCATIONS
2723  7410        SKP
2724  7402        HLT                       /PROGRAM INTERRUPTED BEFORE A JMP WAS ISSUED
2725  1720        TAD I   .+1               /DO A TAD I TO NEXT LOCATION
2726  7410        SKP
2727  7402        HLT                       /PROGRAM INTERRUPTED BEFORE A JMP WAS ISSUED
2730  0731        AND I   .+1               /DO A AND I TO THE NEXT LOCATION
2731  7410        SKP
2732  7402        HLT                       /PROGRAM INTERRUPTED BEFORE A JMP WAS ISSUED
2733  2734        ISZ I   .+1               /DO A ISZ I TO THE NEXT LOCATION
2734  7410        SKP
2735  7402        HLT                       /PROGRAM INTERRUPTED BEFORE A JMP WAS ISSUED
2736  5337        JMP     .+1               /CLEAR INTERRUPT INHIBIT AND INTERRUPT
2737  4454        ERROR                     /PROGRAM FAILED TO INTERRUPT
2740  6234        RIB                       /READ THE INTERRUPT BUFFER
2741  1110        TAD     M66               /CHECK FOR ISF AND DSF OF 6
2742  7640        SZA CLA
2743  4454        ERROR                     /SAVE FIELD NOT EQUAL TO 66
2744  6254        SINT                      /SKIP ON USER INTERRUPT F/F
2745  4454        ERROR                     /USER INTERRUPT F/F NOT SET
2746  7300        CLA CLL                   /CLEAR AC AND LINK
2747  6203        CIFCDF                    /SET IB AND DF TO 0
2750  6001        ION                       /SET INTERRUPT ENABLE
2751  5352        JMP     .+1               /CLEAR INTERRUPT INHIBIT
2752  4454        ERROR                     /PROGRAM FAILED TO INTERRUPT
```



```
2753  6254        SINT                      /SKIP ON USER INTERRUPT
2754  4454        ERROR                     /USER INTERRUPT NOT SET
2755  6204        CINT                      /CLEAR USER INTERRUPT
2756  7340        CLA CLL CMA               /SET THE AC TO ONES AND LINK TO 0
2757  6004        GTF                       /GET THE FLAGS
2760  7640        SZA CLA
2761  4454        ERROR                     /THE LINK, INT REQ, OR SAVE FIELD NON ZERO
2762  4455        LOOP                      /LOOP ON TEST IF SR = 1000

                    /**********************************************************************************************
                    /TEST 19 - IS A DATA TEST TO CHECK THAT DATA CAN BE DEPOSITED INTO EACH
                    /SELECTED EXTENDED FIELD, DATA IS DEPOSITED INTO THE LAST ADDRESS OF
                    /EACH 1K MEMORY SEGMENT IN THE EXTENDED MEMORY FIELD, THE USER INTERRUPT
                    /IS SET FOR THIS TEST,THE PROGRAM CHANGES THE DATA FIELD TO THE NEW FIELD
                    /CHECKS, IT THEN TURNS THE INTERRUPT ON AND AND DOES A DCA I TO THE LAST
                    /ADDRESS IN A 1K MEMORY SEGMENT OF THAT FIELD, THE PROGRAM THEN DOES THE
                    /SAME AS ABOVE, ONLY DOING A TAD I TO THE LAST ADDRESS OF A 1K MEMORY
                    /SEGMENT, THE DATA THAT IS PUT INTO THE LAST ADDRESS OF EACH EXTENDED
                    /1K MEMORY SEGMENT CONTAINS THE FIELD IN BITS 6-8 AND THE 1K SEGMENT IN
                    /BITS 9-11,
                    /**********************************************************************************************

2763  4456  TEST19, SCOPLP                  /SETUP TEST AND SCOPE LOOPING ADDRESS
2764  6007        CAF                       /CLEAR ALL FLAGS
2765  6001        ION                       /TURN THE INTERRUPT ON
2766  1021        TAD     DF1SEL            /GET MEMORY SIZE FROM LOCATION 21
2767  0130        AND     K37               /MASK OFF THE MEMORY BITS
2770  7104        CLL     RAL               /ROTATE BITS LEFT ONCE TO SETUP FOR FIELD
2771  3036        DCA     SAVES2            /LIMIT AND LAST ADDRESS IN LAST FIELD
2772  1036        TAD     SAVES2            /GET THE NUMBER
2773  0137        AND     K70               /MASK OFF BITS 6-8 FOR FIELD LIMIT
2774  3037        DCA     FLDLIM            /SAVE THE NUMBER AS THE LAST SELECTED FIELD
2775  1036        TAD     SAVES2            /GET THE ROTATED NUMBER
2776  0134        AND     K7                /MASK OFF ADDRESS BITS
2777  7112        CLL     RTR               /ROTATE THE NUMBER 4 PLACES TO THE RIGHT
3000  7012        RTR
3001  1145        TAD     K1777             /ADD 1K TO THE NUMBER
3002  3040        DCA     UPERLM            /SAVE THIS NUMBER AS THE LAST ADDRESS IN LAST FIELD
3003  1037        TAD     FLDLIM            /GET THE FIELD LIMIT
3004  7650        SNA     CLA               /IS THE LAST FIELD = TO FIELD 0
3005  5777'       JMP     TEST18            /YES,ABORT THIS TEST, GO CHECK FOR SIMULATOR EMA TEST
3006  4776'       JMS     ACTLIN            /CHECK FOR ACT LINE AND 32K OF MEMORY
3007  6001        ION                       /TURN THE INTERRUPT ON
3010  6274        SUF                       /SET USER BUFFER F/F
3011  5212        JMP     .+1
3012  7402        HLT                       /SHOULD TRAP HERE
3013  5213        JMP     .                 /HALT FAILED TO TRAP
3014  6254        SINT                      /SKIP ON USER INTERRUPT
3015  4454        ERROR                     /USER INTERRUPT NOT SET
3016  7340        CLA CLL CMA               /SET THE AC TO ALL ONES
3017  6004        GTF                       /GET THE FLAGS
3020  1130        TAD     M1100             /CHECK FOR USER FLAG AND INT REQ
3021  7640        SZA     CLA
3022  4454        ERROR                     /SAVE FIELD NOT EQUAL TO ABOVE
```

```
3023  3041            DCA     WRKFLD          /CLEAR WORKING FIELD
3024  3042            DCA     DATPAT          /CLEAR DATA PATTERN
3025  1145  BEGT19,   TAD     K1777           /GET UPPER ADDRESS OF 1K FIELD
3026  3043            DCA     WRKADD          /SET FIRST ADDRESS EQUAL TO 1777
3027  1041            TAD     WRKFLD          /GET THE WORKING FIELD
3030  1135            TAD     K10             /ADD A FIELD TO IT
3031  3041            DCA     WRKFLD
3032  1041            TAD     WRKFLD          /GET THE WORKING FIELD
3033  7041            CIA                     /NEGATE IT
3034  1037            TAD     FLDLIM          /COMPARE IT TO THE FIELD LIMIT
3035  7510            SPA                     /IS THE NEW FIELD GREATER THAN FIELD LIMIT
3036  5344            JMP     ENDTST          /YES END OF TEST
3037  7640            SZA     CLA             /IS NEW FIELD EQUAL TO LAST FIELD
3040  7240            CLA     CMA             /NO,THE LAST ADDRESS IN THIS FIELD WILL BE 7777
3041  7450            SNA                     /YES,THE LAST ADDRESS WILL BE EQUAL TO UPERLM
3042  1040            TAD     UPERLM
3043  3044            DCA     HGHLIM          /SAVE THE LAST ADDRESS IN THIS FIELD
3044  1044            TAD     HGHLIM          /GET THE HIGH LIMIT
3045  7040            CMA                     /COMPLEMENT IT
3046  7106            CLL     RTL             /ROTATE 3 PLACES TO THE RIGHT
3047  7004            RAL                     /
3050  1147            TAD     K7774           /ADD IN 4K ADDRESS CONSTANT
3051  3047            DCA     ADDCNT          /SAVE IT
3052  1041            TAD     WRKFLD          /GET THE NEW FIELD
3053  7001            IAC                     /ADD 1 TO IT
3054  3042            DCA     DATPAT          /SAVE THE WORD AS THE DATA PATTERN
3055  6254  T16LCD,   SINT                    /SKIP ON USER INTERRUPT
3056  4454            ERROR                   /USER INTERRUPT GOT CLEARED
3057  1041            TAD     WRKFLD          /GET THE NEW FIELD
3060  1045            TAD     K6201           /GET THE CDF INSTRUCTION
3061  3262            DCA     .+1             /PUT CDF TO NEW FIELD IN NEXT ADDRESS

3062  7402  CDFNEW,   HLT/CDF                 /CHANGE DATA FIELD TO NEW FIELD
3063  6214            RDF                     /READ THE DATA FIELD
3064  7041            CIA                     /NEGATE IT
3065  1041            TAD     WRKFLD          /GET THE NEW FIELD
3066  7640            SZA     CLA
3067  4454            ERROR                   /CDF TO NEW FIELD FAILED
3070  1042            TAD     DATPAT          /GET THE DATA PATTERN
3071  6001            ION                     /TURN THE INTERRUPT ON
3072  3443            DCA  I  WRKADD          /PUT THE WORD UP IN NEW FIELD AND INTERRUPT
3073  4454            ERROR                   /PROGRAM FAILED TO INTERRUPT
3074  1041            TAD     WRKFLD
3075  7112            CLL     RTR
3076  7010            RAR
3077  3046            DCA     SAVWFD          /SAVE THE WORKING FIELD IN BITS 9-11
3100  6234            RIB                     /READ THE INTERRUPT BUFFER
3101  7041            CIA                     /NEGATE IT
3102  1046            TAD     SAVWFD          /GET THE EXPECTED WORKING SAVE FIELD
3103  7640            SZA     CLA
3104  4454            ERROR                   /SAVE FIELD NOT EQUAL TO EXPECTED FIELD
3105  6254            SINT                    /SKIP ON USER INTERRUPT F/F
3106  4454            ERROR                   /USER INTERRUPT GOT CLEARED
3107  1262            TAD     CDFNEW          /GET THE CDF INSTRUCTION TO THE NEW FIELD
3110  3311            DCA     .+1             /PUT IT IN THE NEXT LOCATION
```



```
3111  7402            HLT/CDF                 /CDF TO NEW FIELD
3112  6214            RDF                     /READ THE DATA FIELD
3113  7041            CIA                     /NEGATE IT
3114  1041            TAD     WRKFLD          /GET THE WORKING FIELD
3115  7640            SZA     CLA
3116  4454            ERROR                   /CDF TO NEW FIELD FAILED
3117  6001            ION                     /TURN THE INTERRUPT ON
3120  1443            TAD  I  WRKADD          /GET DATA PATTERN FROM NEW FIELD
3121  4454            ERROR                   /PROGRAM FAILED TO INTERRUPT
3122  6234            RIB                     /READ THE INTERRUPT BUFFER
3123  7041            CIA                     /NEGATE IT
3124  1046            TAD     SAVWFD          /GET THE EXPECTED SAVE FIELD
3125  7640            SZA     CLA             /ARE THEY EQUAL
3126  4454            ERROR                   /NO,EXPECTED SAVE FIELD NOT EQUAL TO FIELD READ
3127  1042            TAD     DATPAT          /GET THE DATA PATTERN
3130  7041            CIA                     /NEGATE IT
3131  1035            TAD     DATREC          /GET THE WORD RECEIVED
3132  7640            SZA     CLA             /ARE THEY EQUAL?
3133  4454            ERROR                   /NO, DATA ERROR IN WRKFLD
3134  2047            ISZ     ADDCNT          /GET NEXT ADDRESS IN THIS FIELD?
3135  7610            SKP     CLA             /YES
3136  5225            JMP     BEGT16          /NO,GO GET NEXT FIELD IF ANY LEFT
3137  1043            TAD     WRKADD          /GET THE WORKING ADDRESS
3140  1146            TAD     K2000           /ADD 1K TO IT
3141  3043            DCA     WRKADD          /SAVE NEW 1K UPPER ADDRESS BOUNDRY
3142  2042            ISZ     DATPAT          /ADD ANOTHER 1K TO DATA WORD
3143  5255            JMP     T16LCD          /GO LOAD AND COMPARE THIS ADDRESS
3144  6204  ENDTST,   CINT                    /CLEAR USER INTERRUPT
3145  6254            SINT                    /SKIP ON USER INTERRUPT
3146  7610            SKP     CLA
3147  4454            ERROR                   /CINT FAILED TO CLEAR USER INTERRUPT
3150  4455            LOOP                    /LOOP ON TEST IF SR = 1000
3151  5775            JMP     TEST17

3175  3200
3176  5000
3177  3321
      3200            PAGE
```

```
/*****************************************************************************************************
/TEST 17 - CHECKS THE RIF INSTRUCTION TO READ THE INSTRUCTION FIELD
/REGISTER,THE PROGRAM DEPOSITS THE FOLLOWING CODE INTO LOCATIONS 0000-
/0004 OF EACH SELECTED EXTENDED FIELD; RIF-ION- JMP I 3-T17RET-1,
/THE PROGRAM USES THE USER INTERRUPT TO RETURN TO THE PROGRAM,
/*****************************************************************************************************

3200  4456  TEST17,  SCOPLP                  /SETUP TEST AND SCOPE LOOP ADDRESS
3201  6007            CAF                     /CLEAR ALL FLAGS
3202  6001            ION                     /TURN THE INTERRUPT ON
3203  6274            SUF                     /SET USER BUFFER F/F
3204  5205            JMP     .+1             /ENTER TIME SHARE MODE
3205  7402            HLT                     /RAISE INTERRUPT REQUEST AND INTERRUPT
3206  5206            JMP     .               /HALT FAILED TO TRAP
```

```
3207  6254          SINT                    /SKIP ON USER INTERRUPT FLIP - FLOP
3210  4454          ERROR                   /USER INTERRUPT F/F NOT SET
3211  7340          CLA CLL CMA             /SET THE AC TO ALL ONES
3212  6004          GTF                     /GET THE FLAGS
3213  1130          TAD     M1100           /CHECK FOR USER FLAG AND INT REQ
3214  7640          SZA     CLA
3215  4454          ERROR                   /USER FLAG OR USER INT NOT SET
3216  3041          DCA     WRKFLD          /CLEAR THE WORKING FIELD
3217  3043  BEGT17, DCA     WRKADD          /SET THE FIRST ADDRESS TO 0
3220  1041          TAD     WRKFLD          /GET THE FIELD
3221  1135          TAD     K10             /ADD ONE FIELD TO IT
3222  3041          DCA     WRKFLD          /SAVE THIS AS THE NEW FIELD
3223  1041          TAD     WRKFLD          /GET THE FIELD
3224  7041          CIA                     /NEGATE IT
3225  1037          TAD     FLDLIM          /COMPARE IT TO THE FIELD LIMIT
3226  7710          SPA     CLA             /IS THE NEW FIELD GREATER THAN FIELD LIMIT
3227  5314          JMP     ENDT17          /YES GO CHECK LOOP ON TEST
3230  1306          TAD     TABLE           /GET THE BEGINNING OF THE TABLE TO
3231  3313          DCA     POINTR          /LOAD UP THE FIRST 4 LOCATIONS IN THE
3232  1147          TAD     K7774           /NEW FIELD, SET UP A COUNT OF FOUR
3233  3047          DCA     ADDCNT          /SAVE THE COUNT,
3234  1041          TAD     WRKFLD          /GET THE NEW FIELD
3235  7112          CLL     RTR             /SETUP LOCATION HGHLIM TO EQUAL
3236  7010          RAR                     /THE EXPECTED SAVE FIELD AFTER A INT,
3237  1041          TAD     WRKFLD          /
3240  3044          DCA     HGHLIM          /SAVE THE NUMBER AS THE EXPECTED S,F,
3241  1041          TAD     WRKFLD          /GET THE NEW FIELD
3242  1045          TAD     K6201           /GET THE CDF INSTRUCTION
3243  3246          DCA     T17CDF          /STORE IT
3244  6201          CDF                     /CHANGE DATA FIELD TO PROGRAM FIELD
3245  1713          TAD   I PDINTR          /GET THE INSTRUCTION FROM PROGRAM FIELD
3246  7402  T17CDF, HLT/CDF                 /CHANGE DATA FIELD TO NEW FIELD
3247  3443          DCA   I WRKADD          /PUT THE INSTRUCTION INTO NEW FIELD
3250  1443          TAD   I WRKADD          /BRING IT BACK OUT
3251  6201          CDF     M0              /CHANGE THE DATA FIELD BACK TO PROG
3252  7041          CIA                     /NEGATE IT
3253  1713          TAD   I POINTR          /GET THE WORD THAT WAS PUT UP THERE
3254  7640          SZA     CLA
3255  4454          ERROR                   /WORDS DO NOT COMPARE BETWEEN 2 FIELDS
3256  2313          ISZ     POINTR          /ADD ONE TO THE POINTER ADDRESS
3257  2043          ISZ     WRKADD          /ADD ONE TO THE ADDRESS
3260  2047          ISZ     ADDCNT          /ADD ON TO THE LOCATION COUNTER
3261  5245          JMP     T17CDF+1        /GO DO NEXT LOCATION
3262  3043          DCA     WRKADD          /RESET THE ADDRESS TO 0
3263  7326          CLA CLL CML RTL         /ADD TWO TO THE CDF INSTR TO NEW FIELD
3264  1246          TAD     T17CDF          /GET THE CDF INSTRUCTION TO NEW FIELD
3265  3266          DCA     .+1             /PUT CIF CDF TO NEW FIELD IN NEXT ADDRESS
3266  7402          HLT/CDF CIF             /CHANGE DF AND IF TO NEW FIELD
3267  5443          JMP   I WRKADD          /GO UP TO THE NEW FIELD
3270  4454          ERROR                   /PROGRAM RETURNED TO THE WRONG LOC,
3271  6234  T17RET, RIB                     /READ THE SAVE FIELD REGISTER
3272  7041          CIA                     /NEGATE IT
3273  1044          TAD     HGHLIM          /GET THE EXPECTED SAVE FIELD REGISTER
3274  7640          SZA     CLA             /ARE THEY EQUAL
3275  4454          ERROR                   /NO,SAVE FIELD NOT EQUAL EXPECTED
```



```
3276  1035          TAD     DATREC          /GET THE I,F, THAT WAS READ IN NEW FIELD
3277  7041          CIA                     /NEGATE IT
3300  1041          TAD     WRKFLD          /GET THE EXPECTED FIELD
3301  7640          SZA     CLA             /ARE THEY EQUAL
3302  4454          ERROR                   /RIF FAILED OR WENT TO WRONG FIELD
3303  6254          SINT                    /SKIP ON USER INTERRUPT F/F
3304  4454          ERROR                   /USER INTERRUPT GOT CLEARED
3305  5217          JMP     BEGT17          /GO DO NEXT FIELD IF SELECTED

3306  3307  TABLE,  .+1
3307  6224          RIF
3310  6001          ION
3311  5403          JMP   I 3
3312  3270          T17RET+1
3313  0000  POINTR, 0

3314  6204  ENDT17, CINT                    /CLEAR USER INTERRUPT F/F
3315  6254          SINT                    /SKIP ON USER INTERRUPT F/F
3316  7610          SKP     CLA
3317  4454          ERROR                   /CINT FAILED TO CLEAR USER INT F/F,
3320  4455          LOOP                    /LOOP ON TEST IF SR = 1000
```

```
/*****************************************************************************************************
/TEST 18 - 19 ONLY EXECUTED WHEN THE SIMULATOR IS SELECTED (BIT 4 OF LOCATION 21 SET TO A 1).
/TEST 18 CHECKS THAT THE EMA IS LOADED ONTO THE BUS DURING A DCA I FOLLOWING
/A CDF 10 CDF 20 CDF 40,  THE SIMULATOR IS USED TO CAUSE A INTERRUPT
/FOLLOWING A EMA CHANGE ON THE BUS, THE SIMULATOR STORES THE EMA INTO A
/EMA CATCHER REGISTER AND THEN THE PROGRAM READS AND COMPARES IT.
/*****************************************************************************************************
```

```
3321  4456  TEST18, SCOPLP                 /SETUP TEST AND SCOPE LOOPING ADDRESS
3322  6007          CAF                     /CLEAR ALL FLAGS
3323  1021          TAD     OP1SEL          /CHECK BIT 4 OF LOCATION 21 FOR SIMULATOR SELECT
3324  0143          AND     K200            /
3325  7650          SNA     CLA             /WAS THE SIMULATOR SELECTED ?
3326  5461          JMP   I PASEND          /NO, END OF ONE PROGRAM PASS
3327  4331          JMS     EMACLR          /LOAD CONTROL WORD AND CLEAR EMA REGISTER
3330  5345          JMP     TST18A          /GO TO FIRST TEST
3331  0000  EMACLR, 0                       /ROUTINE TO LOAD CONTROL WORD AND CLEAR EMA CATCHER REGISTER
3332  1144          TAD     K400
3333  6153          LOADEQ3                 /LOAD CONTROL REGISTER 3 FOR INT AND SKIP ENABLE
3334  6154          CLREMA                  /CLEAR EMA CATCHER REGISTER
3335  6166          SKPEMA                  /SKIP ON EMA CATCHER REGISTER SET
3336  7610          SKP     CLA
3337  4454          ERROR                   /CLREMA FAILED TO CLEAR CATCHER F/F
3340  6155          REDEMA                  /READ THE EMA CATCHER REGISTER
3341  1066          TAD     M7              /CLEARING THE REGISTER SET IT TO 7
3342  7640          SZA     CLA             /IS THE REGISTER SET TO 7 ?
3343  4454          ERROR                   /NO, CLREMA FAILED TO SET REGISTER TO 7
3344  5731          JMP   I EMACLR
3345  6211  TST18A, CDF     10              /CHANGE DATA FIELD TO FIELD 10
3346  6001          ION                     /TURN THE INTERRUPT ON
3347  3750          DCA   I .+1             /CHANGE THE EMA LINES TO 1 AND INTERRUPT
```

```
3350  7402            HLT                     /SIMULATOR FAILED TO INT, OR EMA DIDN'T CHANGE
3351  6166            SKPEMA                  /SKIP ON EMA REGISTER SET
3352  4454            ERROR                   /SIMULATOR EMA CATCHER REGISTER NOT SET
3353  6234            RIB                     /READ THE INTERRUPT BUFFER
3354  1062            TAD     M1
3355  7640            SZA     CLA             /IS THE SAVE FIELD EQUAL TO 1 ?
3356  4454            ERROR                   /NO,SAVE FIELD NOT EQUAL TO 1
3357  6155            REDEMA                  /READ THE SIMULATOR EMA CATCHER REGISTER
3360  1062            TAD     M1
3361  7640            SZA     CLA             /IS THE EMA CATCHER REGISTER = 1 ?
3362  4454            ERROR                   /NO,EMA LINES OTHER THAN EMA2 MUST HAVE BEEN SET
3363  4331            JMS     EMACLR          /LOAD CONTROL WORD AND CLEAR EMA CARCHER REGISTTER
3364  6221  TST18B,   CDF     20              /CHANGE DATA FIELD TO FIELD 2
3365  6001            ION                     /TURN THE INTERRUPT ON
3366  3767            DCA  I  .+1             /CHANGE THE EMA LINES TO 2 AND INTERRUPT
3367  7402            HLT                     /PROGRAM FAILED TO INTERRUPT OR EMA DID NOT CHANGE
3370  6166            SKPEMA                  /SKIP ON EMA REGISTER SET
3371  4454            ERROR                   /EMA CATCHER REGISTER NOT SET
3372  6155            REDEMA                  /READ THE EMA CATCHER REGISTER
3373  1063            TAD     M2
3374  7640            SZA     CLA             /DID THE DF SET EMA1 ON TO THE BUS
3375  4454            ERROR                   /NO, EMA REGISTER NOT EQUAL TO 2
3376  4331            JMS     EMACLR          /LOAD CONTROL WORD CLEAR EMA REGISTER
3377  6241  TST18C,   CDF     40              /CHANGE DATA FIELD TO FIELD 4
3400  6001            ION                     /TURN THE INTERRUPT ON
3401  3767            DCA  I  .+1             /CHANGE EMA LINES TO 4 AND INTERRUPT
3402  7402            HLT                     /PROGRAM FAILED TO INTERRUPT OR EMA DID NOT CHANGE
3403  6166            SKPEMA                  /SKIP ON EMA CATCHER REGISTER SET
3404  4454            ERROR                   /EMA CATCHER F/F NOT SET
3405  6155            REDEMA                  /READ THE EMA CATCHER REGISTER
3406  1064            TAD     M4
3407  7640            SZA     CLA             /DID THE DF SET EMA0 ONTO THE BUS
3410  4454            ERROR                   /NO,EMA CATCHER REGISTER NOT EQUAL TO 4
3411  4612            JMS  I  .+1             /LOAD CONTROL WORD AND CLEAR EMA CATCHER REGISTER
3412  3331            EMACLR
3413  6150            CLRSIM                  /CLEAR SIMULATOR CONTROL WORD
3414  4455            LOOP                    /LOOP ON TEST IF SR = 1000
```

```
/**********************************************************************************************************
/TEST 19 = IS A CONTINUATION OF TEST 18 ONLY TESTING THAT THE CIF
/INSTRUCTION LOADS THE APPROPRIATE EMA LINE, THE TEST WILL BE FOR CIF 10,
/CIF 20, AND CIF 40, THE SIMULATOR IS USED FOR INTERRUPTS AND TO READ
/THE EMA LINES,
/**********************************************************************************************************
```

```
3415  4456  TEST19, SCOPLP                   /SETUP TEST AND SCOPE LOOPING ADDRESS
3416  6007            CAF                     /CLEAR ALL FLAGS
3417  6160            CLRMOD                  /CLEAR SIMULATOR MODULE
3420  6211            CDF     10              /CHANGE DATA FIELD TO FIELD 1
3421  3741            DCA  I  EMA1            /CLEAR THE FIRST TEST LOCATION
3422  6221            CDF     20              /CHANGE DATA FILED TO FIELD 2
3423  3742            DCA  I  EMA2
3424  6241            CDF     40              /CHANGE DATA FIELD TO FIELD 4
3425  3743            DCA  I  EMA3            /CLEAR A LOCATION IN FIELD 4
3426  6201            CDF     00              /CHANGE DATA FIELD BACK TO FIELD 0
```



```
3427  4740            JMS  I  CLRERG          /LOAD CONTROL WORD AND CLEAR EMA CATCHER REGISTER
3430  6212  TST19A,   CIF     10              /CHANGE INSTRUCTION FIELD TO 1
3431  6001            ION                     /TURN THE INTERRUPT ON
3432  5232  EMAIF1,   JMP     .               /CLEAR  INT INHIBIT AND INTERRUPT
3433  7402            HLT                     /PROGRAM FAILED TO INTERRUPT
3434  6166            SKPEMA                  /SKIP ON EMA CATCHER F/F SET
3435  4454            ERROR                   /EMA CATCHER F/F NOT SET
3436  6234            RIB                     /READ THE INTERRUPT BUFFER
3437  1067            TAD     M10
3440  7640            SZA     CLA             /IS THE SAVE FIELD EQUAL TO IF OF 1
3441  4454            ERROR                   /SAVE FIELD NOT EQUAL TO IF OF 1
3442  6155            REDEMA                  /READ THE EMA CATCHER REGISTER
3443  1062            TAD     M1
3444  7640            SZA     CLA             /IS THE EMA CATCHER REGISTER EQUAL TO 1
3445  4454            ERROR                   /NO,EMA CATCHER GEGISTER NOT EQUAL TO 1
3446  4740  TST19B,   JMS  I  CLRERG          /LOAD CONTROL WORD, CLEAR EMA CATCHER REGISTER
3447  6222            CIF     20              /CHANGE INSTRUCTION FIELD TO FIELD 2
3450  6001            ION                     /TURN THE INTERRUPT ON
3451  5251  EMAIF2,   JMP     .               /CLEAR INT INHIBIT AND INTERRUPT
3452  7402            HLT                     /PROGRAM FAILED TO INTERRUPT OR EMA DID NOT CHANGE
3453  6166            SKPEMA                  /SKIP ON EMA CATCHER F/F SET
3454  4454            ERROR                   /EMA CATCHER REGISTER NOT SET
3455  6155            REDEMA                  /READ THE EMA CATCHER REGISTER
3456  1063            TAD     M2
3457  7640            SZA     CLA             /IS THE EMA CATCHER REGISTER EQUAL TO 2
3460  4454            ERROR                   /NO, EMA WASNIT SET TO 2
3461  4740  TST19C,   JMS  I  CLRERG          /LOAD CONTROL WORD, CLEAR EMA REGISTER
3462  6242            CIF     40              /CHANGE INSTRUCTION FIELD TO FIELD 4
3463  6001            ION                     /TURN THE INTERRUPT ON
3464  5264  EMAIF3,   JMP     .               /CLEAR INTERRUPT INHIBIT AND INTERRUPT
3465  7402            HLT                     /PROGRAM FAILED TO INTERRUPT
3466  6166            SKPEMA                  /SKIP ON EMA CATCHER F/F SET
3467  4454            ERROR                   /EMA CATCHER REGISTER NOT SET
3470  6155            REDEMA                  /READ THE EMA CATCHER REGISTER
3471  1064            TAD     M4
3472  7640            SZA     CLA             /IS THE EMA CATCHER REGISTER SET TO 4
3473  4454            ERROR                   /NO, EMA WASNIT SET TO 4
3474  4740            JMS  I  CLRERG          /LOAD CONTROL WORD CLEAR CATCHER F/F'S
3475  6150            CLRSIM                  /CLEAR SIMULATOR CONTROL WORDS
3476  4455            LOOP                    /LOOP ON TEST IF SR = 1000
```

```
/**********************************************************************************************************
/TEST 20 = IS EXECUTED WHEN THE SIMULATOR IS SELECTED, TEST 20 CHECKS
/THAT THE TIME SHARE LOGIC CAN BE DISABLED, THIS IS DONE WITH THE
/SIMULATOR BY PULLING KMTS TIME SHARE DISA, L LOW, THE PROGRAM THEN
/TRIES TO LOAD THE USER BUFFER AND THEN DOES A IOT, LAS, OSR AND CHECKS
/THAT THE PROGRAM DIDN'T INTERRUPT,
/**********************************************************************************************************
```

```
3477  4456  TEST20,  SCOPLP                  /SETUP TEST AND SCOPE LOOPING ADDRESS
3500  6007            CAF                     /CLEAR ALL FLAGS
3501  6160            CLRMOD                  /CLEAR SIMULATOR LOGIC
3502  7330            CLA CLL CML RAR         /SET BIT 0 TO A ONE
3503  6153            LOCK03                  /LOAD CONTROL REGISTER 3 WITH TIME SHARE DISABLE
```

```
3504  7300            CLA     CLL
3505  6001            ION                     /TURN THE INTERRUPT ON
3506  6274            SUF                     /TRY TO SET USER BUFFER
3507  5310            JMP     .+1             /TRY TO ENTER TIME SHARE MODE
3510  7404            OSR                     /SHOULD TRAP HERE IF TIME SHARE NOT DISABLED
3511  7410            SKP
3512  4454            ERROR                   /TIME SHARE NOT DISABLED-PROGRAM INTERRUPTED
3513  7604            LAS                     /SHOULD TRAP HERE IF TIME SHARE NOT DISABLED
3514  7410            SKP
3515  4454            ERROR                   /LAS TRAPPED WITHOUT TIME SHARE ENABLED
3516  6001            ION                     /ISSUE A IOT
3517  7610            SKP     CLA
3520  4454            ERROR                   /IOT TRAPPED WITHOUT TIME SHARE ENABLED
3521  6007            CAF                     /CLEAR ALL FLAGS
3522  7610            SKP     CLA
3523  4454            ERROR                   /CAF TRAPPED
3524  6150            CLRSIM                  /CLEAR THE SIMULATOR CONTROL REGISTERS
3525  6001            ION                     /TURN INTERRUPT ENABLE ON
3526  6274            SUF                     /SET THE USER BUFFER F/F
3527  5330            JMP     .+1             /ENTER TIME SHARE MODE
3530  7402            HLT                     /SHOULD TRAP HERE
3531  5331            JMP     .               /HALT FAILED TO TRAP IN USER MODE
3532  6254            SINT                    /SKIP ON USER INTERRUPT F/F SET
3533  4454            ERROR                   /USER INTERRUPT F/F NOT SET
3534  6007            CAF                     /CLEAR USER INTERRUPT F/F
3535  4455            LOOP                    /LOOP ON TEST IF SR = 1000
3536  5737            JMP  I  .+1
3537  3627            TEST21

3540  3331    CLRERR, EMACLR

3541  3432    EMA1,   EMA1F1
3542  3451    EMA2,   EMA1F2
3543  3464    EMA3,   EMA1F3

                /THE FOLLOWING LOCATIONS CONTAIN THE CONTENTS OF THE TABE CASSETTE BOOTSTRAP

3544  4000    TABADD, 4000                    /BOOTSTRAP WILL START LOADING INTO THIS ADDRESS
3545  7740            TABCMP-TABEND-1
3546  1237    TABCMP, 1237
3547  1206            1206
3550  6704            6704
3551  6706            6706
3552  6703            6703
3553  5204            5204
3554  7264            7264
3555  6702            6702
3556  7610            7610
3557  3211            3211
3560  3636            3636
3561  1205            1205
3562  6704            6704
3563  6706            6706
3564  6701            6701
```



```
3565  5210            5210
3566  7002            7002
3567  7430            7430
3570  1636            1636
3571  7022            7022
3572  3636            3636
3573  7420            7420
3574  2236            2236
3575  2235            2235
3576  5215            5215
3577  7346            7346
3600  7002            7002
3601  3235            3235
3602  5201            5201
3603  7737            7737
3604  3557            3557
3605  7730    TABEND, 7730
3606  0000            0000                    /TERMINATOR

3607  4301    BOOTTB, PTPADD
3610  4343            TCBADD
3611  4363            DSKADD
3612  3544            TABADD
3613  3615            RK8ADD
3614  0000            0

                /THE FOLLOWING LOCATIONS CONTAIN THE CONTENTS OF THE RK8E BOOTSTRAP

3615  0023    RK8ADD, 0023                    /BOOTSTRAP WILL LOAD INTO THIS ADDRESS
3616  7771            RK8CMP-RK8END-1         /NUMBER OF LOCATIONS TO COMPARE
3617  2000    RK8CMP, 2000
3620  6745            6745
3621  0023            0023
3622  7650            7650
3623  5024            5024
3624  6743            6743
3625  5031    RK8END, 5031
3626  0000            0000                    /TERMINATOR



                /*****************************************************************************************
                /THE FOLLOWING TEST CHECKS THE BOOTSTRAP TO LOAD AND TO COMPARE CORRECTLY
                /*****************************************************************************************

3627  4456    TEST21, SCOPLP                  /SETUP TEST COUNT AND SCOPE LOOPING ADDRESS
3630  1377            TAD     (JMS I AUTRST   /SETUP LOCATIONS 0 AND 200
3631  3000            DCA     INTSER
```

```
3032  1377          TAD     (JMS I AUTRST
3033  3776'         DCA     TEST1-1
3034  1375          TAD     (NOBOOT         /SET UP A LOCATION IN CASE LOGIC DID A AUTO RESTART
3035  3052          DCA     AUTRST          /SAVE IT
3036  5241          JMP     .+3
3037  0000  NOBOOT, 0
3040  4454          ERROR                   /PROGRAM DID A AUTO-RESTART INSTEAD OF A BOOT
3041  6160          CLRMOD                  /CLEAR SIMULATOR TEST LOGIC
3042  4774'         JMS     SETUP           /GO SETUP FOR BOOTSTRAPS
3043  1373  NXTBOT, TAD     (BOTSEL         /GET THE ADDRESS OF THE BOOT SELECT TABLE
3044  1347          TAD     SIMBOT          /GET THE BOOTSTRAP TO BE EXECUTED
3045  3351          DCA     CONTW2          /SAVE THE ADDRESS OF BOOTSTRAP SELECT
3046  1372          TAD     (BOTENA         /GET THE ADDRESS OF THE BOOTSTRAP ENABLE BITS
3047  3352          DCA     CONTW3          /SAVE THE ADDRESS OF BOOT ENABLE CODE
3050  7346          CLA CLL CMA RTL         /SETUP TO DO 3 BOOTSTRAP COMBINATIONS
3051  3354          DCA     BTSUBT          /SAVE SUB-TEST COUNT
3052  6160  BTTST1, CLRMOD                 /CLEAR SIMULATOR MODULE
3053  4771'         JMS     CLEARB          /CLEAR BOOTSTRAP LOCATIONS IN MEMORY
3054  1022          TAD     DP2SEL          /CHECK FOR THE ACT LINE
3055  7710          SPA     CLA             /IS PROGRAM RUNNING ON ACT LINE?
3056  6305          6305                    /YES,DISABLE ACT UNTIL BOOTSTRAP IS COMPLETED
3057  1751          TAD  I  CONTW2          /GET THE BOOTSTRAP SELECT ADDRESS
3060  6152          LOADG2                  /LOAD SIMULATOR CONTROL REGISTER 2
3061  7300          CLA     CLL
3062  1355          TAD     BOOTR1          /GET BOOT STRAP RETURN ADDRESS FOR BOOT RETURN
3063  3753          DCA  I  AD0401          /PUT IT INTO LOCATION 401
3064  1752          TAD  I  CONTW3          /GET BOOTSTRAP ENABLING CODE
3065  6153          LOADG3                  /LOAD SIMULATOR CONTROL REGISTER 3
3066  7300          CLA     CLL
3067  6164          EXECUT                  /LOAD THE BOOTSTRAP
3070  5270          JMP     .                       /PROGRAM FAILED TO BOOTSTRAP ON 1 OF THE FOLLOWING CONDITIONS
                                            /0001 SW-SW ENABLE BOOT WHEN RUNNING
                                            /0003 SW-SW ENABLE BOOT WHEN RUNNING
                                            /0005 SW-SW ENABLE BOOT WHEN RUNNING
3071  6160  BOTHT1, CLRMOD                 /CLEAR SIMULATOR LOGIC
3072  7301          CLA CLL IAC             /BOOTSTRAP SHOULD RETURN HERE VIA SIMULATOR
3073  1022          TAD     DP2SEL          /CHECK FOR THE ACT LINE
3074  7510          SPA                     /IS THE PROGRAM ON THE ACT LINE
3075  6305          6305                    /YES, ENABLE THE ACT LINE
3076  7300          CLA     CLL
3077  1347          TAD     SIMBOT          /GET THE BOOT BEING EXECUTED
3700  4770'         JMS     BOTCMP+2        /GO COMPARE THE BOOT THAT WAS LOADED
3701  2352          ISZ     CONTW3          /ADD 1 TO THE BOOTSTRAP ENABLE ADDRESS
3702  2354          ISZ     BTSUBT          /DONE WITH THIS SUB TEST?
3703  5252          JMP     BTTST1          /NO,DO NEXT ENABLING CONDITION
3704  4767'         JMS     GOODBO          /SIGNAL ACT LINE IF SELECTED
3705  1065          TAD     M5              /SETUP TO DO NEXT SUB TEST 5 TIMES
3706  3354          DCA     BTSUBT          /SAVE SUB-TEST COUNT
3707  6160  BTTST2, CLRMOD                 /CLEAR SIMULATOR MODULE
3710  4771'         JMS     CLEARB          /CLEAR BOOTSTRAP LOCATIONS IN MEMORY
3711  1022          TAD     DP2SEL          /CHECK FOR THE ACT LINE
3712  7710          SPA     CLA             /IS IT ON THE ACT LINE
3713  6305          6305                    /YES, DISABLE ACT LINE UNTIL BOOT IS DONE
3714  1751          TAD  I  CONTW2          /GET THE BOOTSTRAP SELECT ADDRESS
3715  6152          LOADG2                  /LOAD CONTROL REGISTER 2
```



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3716  7300          CLA     CLL
3717  1356          TAD     BOOTR2          /GET BOOT RETURN ADDRESS FOR BOOT RETURN
3720  3753          DCA  I  AD0401          /PUT IT IN LOCATION 401
3721  1752          TAD  I  CONTW3          /GET BOOT STRAP ENABLE CODE
3722  6153          LOADG3                  /LOAD CONTROL REGISTER 3
3723  7300          CLA     CLL
3724  6164          EXECUT                  /LOAD THE BOOTSTRAP
3725  7602          HLT     CLA             /IF PROGRAM HALTED IT FAILED TO DO 1 OF FOLLOWING
                                            /0011 SW-SW DISABLE BOOT WHEN RUNNING
                                            /0032 POWER ON DISABLE BOOT WHEN RUNNING
                                            /0013 SW-SW DISABLE BOOT WHEN RUNNING
                                            /0033 POWER ON DISABLE BOOT WHEN RUNNING
                                            /0015 SW-SW DISABLE BOOT WHEN RUNNING
3726  6160  BOTHT2, CLRMOD                 /CLEAR SIMULATOR LOGIC
3727  7301          CLA CLL IAC
3730  1022          TAD     DP2SEL
3731  7510          SPA
3732  6305          6305
3733  7300          CLA     CLL
3734  1347          TAD     SIMBOT          /GET THE BOOTSTRAP BEING EXECUTED
3735  4770'         JMS     BOTCMP+2        /GO COMPARE THE BOOTSTRAP THAT WAS LOADED
3736  2352          ISZ     CONTW3          /ADD 1 TO BOOTSTRAP ENABLE ADDRESS
3737  2354          ISZ     BTSUBT          /DONE WITH THE SUB-TEST ?
3740  5307          JMP     BTTST2          /NO, DO NEXT ENABLING CODE
3741  4767'         JMS     GOODBO          /SIGNAL ACT LINE IF SELECTED
3742  2347          ISZ     SIMBOT          /ADD 1 TO THE BOOTSTRAP SELECT
3743  2350          ISZ     CNTBOT          /DONE ALL 5 BOOTSTRAPS?
3744  5243          JMP     NXTBOT          /NO,GO DO NEXT BOOTSTRAP
3745  4455          LOOP                    /LOOP ON TEST IF SR = 1000
3746  5766'         JMP     TEST22          /GO TO THE NEXT TEST

3747  0000  SIMBOT, 0
3750  0000  CNTBOT, 0
3751  0000  CONTW2, 0
3752  0000  CONTW3, 0
3753  0401  AD0401, 0401
3754  0000  BTSUBT, 0

              /BOOTSTRAP RETURN ADDRESSES

3755  3671  BOOTR1, BOTHT1
3756  3726  BOOTR2, BOTHT2

3766  4041
3767  5101
3770  4402
3771  4463
3772  4135
3773  4130
3774  4517
3775  3637
3776  0200
3777  4452
      4000
```

```
                    /THE CAPS8 CASSETTE BOOT STRAP WILL LOAD INTO THE FOLLOWING LOCATIONS,

4000  7402  CAPS8,  HLT                     /1237
4001  7402          HLT                     /1206
4002  7402          HLT                     /6704
4003  7402          HLT                     /6706
4004  7402          HLT                     /6703
4005  7402          HLT                     /5204
4006  7402          HLT                     /7264
4007  7402          HLT                     /6702
4010  7402          HLT                     /7610
4011  7402          HLT                     /3211
4012  7402          HLT                     /3636
4013  7402          HLT                     /1205
4014  7402          HLT                     /6704
4015  7402          HLT                     /6706
4016  7402          HLT                     /6701
4017  7402          HLT                     /5216
4020  7402          HLT                     /7002
4021  7402          HLT                     /7430
4022  7402          HLT                     /1636
4023  7402          HLT                     /7022
4024  7402          HLT                     /3636
4025  7402          HLT                     /7420
4026  7402          HLT                     /2236
4027  7402          HLT                     /2235
4030  7402          HLT                     /5215
4031  7402          HLT                     /7346
4032  7402          HLT                     /7002
4033  7402          HLT                     /3235
4034  7402          HLT                     /5201
4035  7402          HLT                     /7737
4036  7402          HLT                     /3557
4037  7402          HLT                     /7730
4040  7402          HLT                     /TERMINATOR


                    /**************************************************************************************************
                    /TEST 22 CHECKS THAT THE AUTO RESTART OCCURS AT THE APPROPRIATE ADDRESS, THIS
                    /TEST USES THE SIMULATOR TO SELECT AND CAUSE A AUTO RESTART,
                    /**************************************************************************************************

4041  4456  TEST22, SCOPLP                 /SETUP TEST AND SCOPE LOOP ADDRESS
4042  1377          TAD     (JMS I AUTRST   /SETUP LOCATIONS 0 AND 230
4043  3000          DCA     INTSER          /
4044  1377          TAD     (JMS I AUTRST   /
4045  3776'         DCA     TEST1+1         /
4046  1375          TAD     (RSTAUT         /GET THE AUTO RESTART ADDRESS
4047  3052          DCA     AUTRST          /SAVE IT
4050  1374          TAD     (NOAUTO         /GET BOOT STRAP ADDRESS
4051  3653          DCA  I  .+2
4052  5255          JMP     .+3
```



```
4053  0401          0401
4054  4454  NOAUTO, ERROR                 /LOGIC DID A BOOT INSTEAD OF A AUTO RESTART
4055  4773' SETUP:  JMS     SETUP         /GO SETUP FOR TEST
4056  6160  AUTTST, CLRMOD          /CLEAR SIMULATOR MODULE
4057  1372          TAD     (RESADD       /GET THE ADDRESS OF AUTO RESTART TABLE
4060  1334          TAD     AUTSEL        /GET THE PROGRAM AUTO - RESTART TO BE EXECUTED
4061  3335          DCA     ADDRES        /SAVE THE TABLE ADDRESS
4062  1371          TAD     (SELAUT       /GET THE CONTROL WORD 2 TABLE ADDRESS
4063  1334          TAD     AUTSEL        /ADD IN THE RESTART TO BE EXECUTED
4064  3336          DCA     CONW2         /SAVE THIS ADDRESS TO GET THE CONTROL WORD
4065  1022          TAD     OP2SEL        /CHECK TO SEE IF PROGRAM IS ON ACT LINE
4066  7710          SPA     CLA
4067  6305          6305                  /DISABLE ACT LINE UNTIL AUTO RESTART IS DONE
4070  1736          TAD  I  CONW2         /GET THE CONTROL WORD
4071  6152          LODRQ2                /LOAD CONTROL REGISTER 2
4072  7300          CLA     CLL
4073  1347          TAD     AUTENA        /GET THE ENABLE CONTROL WORD
4074  6153          LODRQ3                /LOAD CONTROL REGISTER 3
4075  7300          CLA     CLL
4076  6164          EXECUT                /EXECUTE A AUTO RESTART
4077  7602          HLT     CLA           /SHOULD DO A AUTO RESTART HERE-PRESS CONT FOR RETRY
4100  5256          JMP     AUTTST        /RETRY
4101  0000  RSTAUT, 0                     /A AUTO RESTART SHOULD COME HERE
4102  6160          CLRMOD                /CLEAR SIMULATOR LOGIC
4103  7301          CLA CLL IAC           /SET BIT 11 TO A ONE
4104  1022          TAD     OP2SEL        /CHECK FOR THE ACT LINE
4105  7510          SPA                   /IS IT RUNNING ON ACT LINE
4106  6305          6305                  /YES, ENABLE ACT LINE
4107  7340          CLA CLL CMA           /SET THE AC TO MINUS 1
4110  1301          TAD     RSTAUT        /GET THE PC FROM THE AUTO RESTART
4111  7041          CIA                   /NEGATE IT
4112  1735          TAD  I  ADDRES        /GET THE EXPECTED AUTO RESTART PC
4113  7650          SNA     CLA           /ARE THEY EQUAL?
4114  5325          JMP     GODAUT        /YES GO DO NEXT ADDRESS
4115  4454          ERROR                 /EXPECTED AUTO RESTART ADDRESS NOT EQUAL TO
                                          /RETURN ADDRESS, PRESS CONT TO GET EXP AND ACT ADDRESS
4116  1735          TAD  I  ADDRES        /
4117  7402          HLT                   /AC EQUALS EXPECTED AUTO RESTART ADDRESS
4120  7340          CLA CLL CMA
4121  1301          TAD     RSTAUT        /
4122  7402          HLT                   /AC EQUALS ACTUAL AUTO RESTART ADDRESS
4123  7200          CLA                   /
4124  5256          JMP     AUTTST        /DO SAME RESTART OVER AGAIN
4125  2334  GODAUT, ISZ     AUTSEL        /ADD 1 TO PROGRAM SELECT RESTART
4126  2333          ISZ     AUTCNT        /DONE ALL FOUR AUTO RESTARTS?
4127  5256          JMP     AUTTST        /NO,GO DO NEXT ONE
4130  4770' GOODBD: JMS     GOODBD        /SIGNAL ACT LINE OF A GOOD PASS IF ON IT
4131  4455          LOOP                  /LOOP ON TEST IF SR = 1000
4132  5767'         JMP      TEST23

4133  0000  AUTCNT, 0
4134  0000  AUTSEL, 2
4135  0000  ADDRES, 0
4136  0000  CONW2,  0
```

```
4137  4200    RESADD, 4200
4140  2000            2000
4141  0200            0200
4142  0000            0000

4143  1670    SELAUT, 1670                    /AUTO RESTART AT 4200
4144  1670            1670                    /AUTO RESTART AT 2000
4145  1672            1672                    /AUTO RESTART AT 200
4146  1670            1670                    /AUTO RESTART AT 0000

4147  0037    AUTENA, 0037                    /POWER ON TRIGGERED AUTO RESTART


                /CONTROL WORD 2 BOOTSTRAP SELECT

4150  1672    BOTSEL, 1672                    /HI-LOW PAPER TAPE SELECT
4151  1132            1132                    /TC08 BOOTSTRAP SELECT
4152  0742            0742                    /RF08/DF32D BOOTSTRAP SELECT

4153  0642            0642                    /TAPE CASSETTE BOOTSTRAP SELECT
4154  1252            1252                    /RK8-E BOOTSTRAP SELECT

                /CONTROL WORD 3 BOOTSTRAP ENABLES (POWER ON OR SWITCH SW)

4155  0001    BOTENA, 0001                    /SW-SW ENABLE BOOT WHEN RUNNING
4156  0003            0003                    /SW-SW ENABLE BOOT WHEN RUNNING
4157  0007            0007                    /SW-SW ENABLE BOOT WHEN RUNNING
4160  0011            0011                    /SW-SW DISABLE BOOT WHEN RUNNING
4161  0032            0032                    /POWER ON DISABLE BOOT WHEN RUNNING
4162  0013            0013                    /SW-SW DISABLE BOOT WHEN RUNNING
4163  0033            0033                    /POWER ON DISABLE BOOT WHEN RUNNING
4164  0017            0017                    /SW-SW DISABLE BOOT WHEN RUNNING


4167  4201
4170  5101
4171  4143
4172  4137
4173  4517
4174  4054
4175  4101
4176  0200
4177  4452
      4200            PAGE

                /**********************************************************************************************************
                /TEST 29- USES THE SIMULATOR TO CHECK THAT AC LOW AND BATTERY EMPTY F/F'S
                /CAN SKIP AND INTERRUPT AND THAT THEY CAN BE CLEARED.
                /**********************************************************************************************************
4200  4452            JMS  I  AUTRST          /AUTO RESTART HANDLER
4201  4456    TEST29, SCOPLP                  /SETUP TEST AND SCOPE LOOP ADDRESS
4202  1377            TAD     (ACLBAT
4203  3052            DCA     AUTRST
4204  6007            CAF                     /CLEAR ALL FLAGS
```



```
4205  6160            CLRMOD                  /CLEAR SIMULATOR MODULE
4206  3776'           DCA     ACNLOK
4207  6101            SBE                     /SKIP ON BATTERY EMPTY
4210  7410            SKP
4211  4454            ERROR                   /BATTERY EMPTY IS SET
4212  6102            SPL                     /SKIP ON AC LOW
4213  7410            SKP
4214  4454            ERROR                   /AC LOW F/F IS SET
4215  1253            TAD     K3000           /SET BITS 2 + 3 TO A 1
4216  6153            LODMG3                  /LOAD REGISTER 3 TO PULL AC LOW AND BATTERY EMPTY LOW
4217  7300            CLA     CLL
4220  6001            ION                     /TURN THE INTERRUPT ON
4221  5222            JMP     .+1
4222  4454            ERROR                   /AC LOW NOT SET OR FAILED TO INTERRUPT
4223  7610            SKP     CLA
4224  4454            ERROR                   /AC LOW NOT SET BUT BATTERY EMPTY IS
4225  6102            SPL                     /SKIP ON AC LOW AS A LEVEL
4226  4454            ERROR                   /AC LOW AS A LEVEL DID NOT SKIP
4227  6101            SBE                     /SKIP ON BATTERY EMPTY
4230  4454            ERROR                   /BATTERY EMPTY NOT SET WITH BATTERY EMPTY HELD LOW
4231  1254            TAD     K1000           /SET CONTROL BIT 3 HIGH
4232  6153            LODMG3                  /LOAD THE CONTROL REGISTER
4233  7340            CLA CLL CMA
4234  3776'           DCA     ACNLOK
4235  6001            ION                     /TURN THE INTERRUPT ON
4236  5237            JMP     .+1
4237  4454            ERROR                   /BATTERY EMPTY NOT SET OR FAILED TO INT
4240  4454            ERROR                   /AC LOW SET BUT BATTERY EMPTY ISN'T
4241  6153            LODMG3                  /OK, BATTERY EMPTY SET,LET AC LOW GO HIGH
4242  6101            SBE                     /SKIP ON BATTERY EMPTY
4243  7410            SKP
4244  4454            ERROR                   /AC LOW FAILED TO CLEAR BATTERY EMPTY
4245  6102            SPL                     /SKIP ON AC LOW
4246  7410            SKP
4247  4454            ERROR                   /AC LOW AS A LEVEL STILL SKIPPED
4250  6160            CLRMOD                  /CLEAR SIMULATOR TEST MODULE
4251  4455            LOOP                    /LOOP ON TEST IF SR = 1000
4252  5461            JMP  I  PASEND          /END OF PROGRAM

4253  3000    K3000,  3000
4254  1000    K1000,  1000


                /**********************************************************************************************************
                /TIMDIS - IS AN OPERATOR INTERVENTION TEST, THE OPERATOR MUST SET THE
                /TIME SHARE ENABLE SWITCH TO THE TIME SHARE DISABLE POSITION, THE PROGRAM
                /TRIES TO SET THE USER FLAG AND CHECKS THAT LAS, OSR, IOT, AND HALT
                /DO NOT TRAP AND THAT HLT HALTS.
                /**********************************************************************************************************

4255  4456    TIMDIS, SCOPLP                  /SETUP TEST AND SCOPE LOOPING ADDRESS
4256  6007            CAF                     /CLEAR ALL FLAGS
4257  6264            CUF                     /CLEAR USER BUFFER F/F
4260  6204            CINT                    /CLEAR USER INTERRUPT F/F
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4261  6001          ION                     /TURN THE INTERRUPT ON
4262  6274          SUF                     /TRY TO SET THE USER BUFFER F/F
4263  5264          JMP     .+1             /TRY TO ENTER TIME SHARE MODE
4264  7404          OSR                     /SHOULD TRAP HERE IF TIME SHARE NOT DISABLED
4265  7610          SKP     CLA
4266  4454          ERROR                   /TIME SHARE NOT DISABLED=PROGRAM INTERRUPTED
4267  7604          LAS                     /SHOULD TRAP HERE IF TIME SHARE NOT DISABLED
4270  7610          SKP     CLA
4271  4454          ERROR                   /LAS TRAPPED WITHOUT TIME SHARE ENABLED
4272  6254          SINT                    /SKIP ON USER INTERRUPT
4273  7610          SKP     CLA
4274  4454          ERROR                   /IOT TRAPPED OR USER INTERRUPT SET
4275  7402          HLT                     /PROGRAM SHOULD HALT HERE FOR COMPLETION
                                            /OF TIME SHARE DISABLE TEST
4276  7610          SKP     CLA
4277  4454          ERROR                   /HLT TRAPPED
4300  5255          JMP     TIMDIS          /RETRY THE TEST

              /THE FOLLOWING LOCATIONS CONTAINS THE CONTENTS OF THE HI=LOW PAPER TAPE
              /BOOTSTRAP

4301  7737    PTPADD, 7737                  /BOOTSTRAP WILL START LOADING INTO THIS ADDRESS
4302  7741          PTPCMP=PTPEND=1         /NUMBER OF LOCATIONS TO COMPARE
4303  6014    PTPCMP, 6014
4304  0776          0776
4305  7320          7320
4306  1337          1337
4307  2376          2376
4310  5340          5340
4311  6011          6011
4312  5350          5350
4313  3361          3361
4314  1361          1361
4315  3371          3371
4316  1345          1345
4317  3357          3357
4320  1345          1345
4321  3367          3367
4322  6032          6032
4323  6031          6031
4324  5357          5357
4325  6036          6036
4326  7106          7106
4327  7006          7006
4330  7510          7510
4331  5374          5374
4332  7000          7000
4333  6031          6031
4334  5367          5367
4335  6034          6034
4336  7420          7420
4337  3776          3776
4340  3370          3370
```



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4341  5350    PTPEND, 5350
4342  0000          0000                    /TERMINATOR


              /THE FOLLOWING LOCATIONS CONTAIN THE CONTENTS OF THE TC08 BOOTSTRAP

4343  7613    TC8ADD, 7613                  /BOOTSTRAP WILL START LOADING INTO THIS ADDRESS
4344  7767          TC8CMP=TC8END=1
4345  6774    TC8CMP, 6774
4346  1222          1222
4347  6766          6766
4350  6771          6771
4351  5210          5210
4352  1223          1223
4353  5215          5215
4354  0600          0600
4355  0220    TC8END, 0220
4356  7754          7754                    /BOTSTRAP WILL ALSO LOAD INTO 7754 + 7755
4357  7770          =2                      /NUMBER OF LOCATIONS TO COMPARE
4360  7577          7577
4361  7577          7577
4362  0000          0                       /TERMINATOR

              /THE FOLLOWING LOCATIONS CONTAINS THE CONTENTS OF THE RF08/DF32D BOOTSTRAP

4363  7750    DSKADD, 7750                  /BOOTSTRAP WILL START LOADING INTO THIS ADDRESS
4364  7773          RFDFCP=RFDFED=1         /NUMBER OF LOCATIONS TO COMPARE
4365  7600    RFDFCP, 7600
4366  6603          6603
4367  6622          6622
4370  5352          5352
4371  5752    RFDFED, 5752
4372  0000          0000                    /TERMINATOR

4376  5173
4377  5160
      4400          PAGE
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              /*****************************************************************************************************
              /TO RUN THE OPERATOR INTERVENTION BOOT STRAP COMPARE TEST,DO THE FOLLOWING!
              /1,     RUN CLRBOT TO CLEAR THE BOOTSTRAP LOCATIONS IN MEMORY
              /2,     DISABLE ALL OPTIONS ASSOCIATED WITH THE BOOTSTRAP
              /3,     SET THE APPROPRIATE SELECT AND ENABLE SWITCHES FOR THE BOOTSTRAP
              /4,     SET THE HALT KEY
              /5,     TOGGLE THE BOOT KEY OR SWITCH
              /6,     START THE BOOT COMPARE TEST (BOTCMP)
              /7,     THE PROGRAM WILL HALT
              /8,     SET THE APPROPRIATE SWITCH REGISTER OR PSEUDO SWITCH REGISTER
              /       TO THE BOOTSTRAP TO COMPARE AND PRESS CONTINUE,
              /       SR=0000=HI=LOW PAPER TAPE READER BOOTSTRAP
              /       SR=0001=TC08 BOOTSTRAP
              /       SR=0002=RF08/DF32D BOOTSTRAP
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                    /       SR#0003=TABE CASSETTE BOOTSTRAP
                    /       SR#0004=RK8E BOOTSTRAP
                    /9,     THE PROGRAM SHOULD HALT AT ADDRESS BOOTOK IF NO ERRORS
                    /*****************************************************************************************************

 4400  7402   BOTCMP, HLT                     /SET THE SR FOR THE APPROPRIATE BOOTSTRAP COMPARE
 4401  5204           JMP     .+3
 4402  0000           0                       /SIMULATOR BOOTSTRAP CHECK ENTERS HERE
 4403  5213           JMP     .+10
 4404  1021           TAD     OP1SEL          /GET THE HARDWARE OPTIONS
 4405  7700           SMA     CLA             /IS THE HARDWARE SR BIT SET
 4406  5211           JMP     .+3             /NO,USE THE PSEUDO SWITCH REGISTER
 4407  7604           LAS                     /USE THE HARDWARE SWITCH REGISTER
 4410  7410           SKP
 4411  1020           TAD     SWITCH          /GET THE PSEUDO SWITCH REGISTER
 4412  0134           AND     K7              /MASK OFF BITS 9-11
 4413  1377           TAD     (BOOTTB         /ADD IT TO THE BOOTSTRAP TABLE ADDRESS
 4414  3366           DCA     SAVSTR          /SAVE IT
 4415  1766           TAD  I  SAVSTR          /GET THE ADDRESS FROM THE TABLE
 4416  3367           DCA     BOTADD          /SAVE IT
 4417  1767           TAD  I  BOTADD          /GET THE BOOTSTRAP STARTING ADDRESS
 4420  3370           DCA     BOTSAD          /THIS IS THE BOOTSTRAP STARTING ADDRESS
 4421  2367           ISZ     BOTADD
 4422  1767           TAD  I  BOTADD          /GET THE WORD COUNT
 4423  3371           DCA     BOTCNT          /SAVE IT
 4424  2367           ISZ     BOTADD          /BOTADD IS THE STARTING ADDRESS OF BOOT COMPARE
 4425  1770   COMPAR, TAD  I  BOTSAD          /GET THE CONTENTS THAT BOOTSTRAP LOADED
 4426  7041           CIA                     /NEGATE IT
 4427  1767           TAD  I  BOTADD          /GET THE EXPECTED BOOTSTRAP CONTENTS
 4430  7650           SNA     CLA             /ARE THEY EQUAL
 4431  5243           JMP     GOODCP          /YES, GO GET NEXT WORD
 4432  4454           ERROM                   /BOOTSTRAP COMPARE ERROR, PRESS "CONT" TO
                                              /GET BAD PC, GOOD CONTENTS, AND BAD CONTENTS
 4433  1370           TAD     BOTSAD          /GET BOOTSTRAP ADDRESS THAT WAS BAD
 4434  7402           HLT                     /AC=THE ADDRESS THAT DIDN'T COMPARE
 4435  7200           CLA
 4436  1767           TAD  I  BOTADD
 4437  7402           HLT                     /AC=EXPECTED CONTENTS OF BOOTSTRAP
 4440  7200           CLA
 4441  1770           TAD  I  BOTSAD
 4442  7402           HLT                     /AC=ACTUAL CONTENTS OF BOOTSTRAP
 4443  7300   GOODCP, CLA     CLL
 4444  2370           ISZ     BOTSAD
 4445  7000           NOP
 4446  2367           ISZ     BOTADD
 4447  7000           NOP
 4450  2371           ISZ     BOTCNT          /END OF COMPARE
 4451  5225           JMP     COMPAR          /NO,GO GET NEXT WORD
 4452  1767           TAD  I  BOTADD          /CONTINUE FOR TCO8
 4453  7440           SZA
 4454  5220           JMP     COMPAR+5
 4455  1021           TAD     OP1SEL          /GET HARDWARE OPTIONS
 4456  0143           AND     K200
 4457  7640           SZA     CLA             /WAS THE SIMULATOR BEING USED
 4460  5602           JMP  I  BOTCMP+2        /YES, RETURN TO SIMULATOR BOOTSTRAP CHECK
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 4461  7402   BOOTOK, HLT                     /BOOT STRAP COMPARED OK
 4462  5200           JMP     BOTCMP          /DO AGAIN

                    /*****************************************************************************************************
                    /THE FOLLOWING SECTIONS WILL CLEAR THE LOCATIONS THAT THE BOOT STRAP WILL LOAD INTO,
                    /THIS SHOULD BE DONE BEFORE EACH BOOTSTRAP IS ATTEMPTED,
                    /*****************************************************************************************************

 4463  0000   CLEARB, 0                       /SIMULATOR ENTERS HERE
 4464  7610           SKP     CLA
 4465  4317   CLRBOT, JMS     SETUP           /GET MEMORY SIZE TO SEE WHAT BOOTS TO CLEAR
 4466  1365           TAD     BOTCLR          /GET THE NUMBER TO START CLEARING BOOT
 4467  1377           TAD     (BOOTTB         /GET THE ADDRESS OF BOOT STRAP TABLE
 4470  3366           DCA     SAVSTR          /SAVE IT
 4471  1766           TAD  I  SAVSTR          /GET THE ADDRESS FROM TABLE
 4472  7450           SNA
 4473  5311           JMP     BOTEND          /END OF CLEARING BOOTSTRAP LOCATIONS
 4474  3367           DCA     BOTADD          /SAVE IT
 4475  1767           TAD  I  BOTADD          /GET THE BOOTSTRAP STARTING ADDRESS
 4476  3370           DCA     BOTSAD          /SAVE IT
 4477  2367           ISZ     BOTADD
 4500  1767           TAD  I  BOTADD          /GET THE WORD COUNT
 4501  3371           DCA     BOTCNT          /SAVE IT
 4502  3770           DCA  I  BOTSAD
 4503  2370           ISZ     BOTSAD
 4504  7000           NOP
 4505  2371           ISZ     BOTCNT
 4506  5302           JMP     .+4
 4507  2366           ISZ     SAVSTR
 4510  5271           JMP     CLRBOT+4
 4511  1021   BOTEND, TAD     OP1SEL
 4512  0143           AND     K200
 4513  7640           SZA     CLA
 4514  5663           JMP  I  CLEARB          /RETURN TO SIMULATOR BOOTSTRAP TEST
 4515  7402           HLT                     /END OF CLEARING BOOTSTRAPS
 4516  5265           JMP     CLRBOT          /DO IT AGAIN


 4517  0000   SETUP,  0
 4520  3776'          DCA     AUTSEL
 4521  3775'          DCA     SIMBOT
 4522  1021           TAD     OP1SEL          /GET THE HARDWARE CONFIGURATION
 4523  7104           CLL     RAL             /MOVE FIELD BITS INTO BITS 6-8
 4524  0137           AND     K70             /MASK OUT FIELD BITS
 4525  7650           SNA     CLA             /IS MEMORY SIZE GREATER THAN 4K
 4526  5341           JMP     SETUP2          /NO, GO GET THE MEMORY SIZE
 4527  3775'  SETUP1, DCA     SIMBOT          /YES THAN DO ALL BOOTS
 4530  1775'          TAD     SIMBOT          /GET BOOTSTRAP SELECT
 4531  1065           TAD     M5              /SUBTRACT 5
 4532  3774'          DCA     CNTBOT          /SAVE IT
 4533  1775'          TAD     SIMBOT          /GET BOOT NUMBER
 4534  3365           DCA     BOTCLR          /SAVE IT
 4535  1776'          TAD     AUTSEL          /GET AUTO RESTART SELECT
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4536  1064          TAD     M4
4537  3773'         DCA     AUTCNT          /SAVE THE NUMBER OF AUTO'S TO DO
4540  5717          JMP   I SETUP           /RETURN TO DO BOOT OR AUTO-RESTART
4541  1021  SETUP2, TAD     OP1SEL          /GET THE HARDWARE CONFIGURATION
4542  0372          AND     KK3             /MASK OFF FIELD 3 MEMORY SIZE
4543  7450          SNA                     /IS IT 1K OF MEMORY
4544  5354          JMP     SET1K           /YES,SETUP TO DO 1 BOOT OR 2 AUTO-RESTART
4545  1062          TAD     M1              /SUBTRACT 1
4546  7450          SNA                     /IS IT 2K OF MEMORY
4547  5360          JMP     SET2K           /YES,DO ONE BOOT AND 3 AUTO'S
4550  1062          TAD     M1              /SUBTRACT 1
4551  7650          SNA     CLA             /IS IT 3K OF MEMORY
4552  5363          JMP     SET3K           /YES, SETUP TO DO 2 BOOTS AND 4 AUTO'S
4553  5327          JMP     SETUP1          /MUST BE 4K OF MEMORY-DO ALL
4554  7385  SET1K,  CLA CLL IAC RAL
4555  3776'         DCA     AUTSEL
4556  7307          CLA CLL IAC RTL
4557  5327          JMP     SETUP1
4560  7301  SET2K,  CLA CLL IAC
4561  3776'         DCA     AUTSEL
4562  5356          JMP     .+4
4563  7325  SET3K,  CLA CLL CML IAC RAL
4564  5327          JMP     SETUP1

4565  0000  BOTCLK, 0

4566  0000  SAVSTK, 0
4567  0000  BOTADD, 0
4570  0000  BOTSAV, 0
4571  0000  BOTCNT, 0
4572  0003  KK3,    3

4573  4133
4574  3750
4575  3747
4576  4134
4577  3607
      4600          PAGE
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/**********************************************************************************************************************
/AUTO - IS AN OPERATOR INTERVENTION TEST TO CHECK POWER-FAIL/AUTO-RESTART,
/WHEN THE PROGRAM IS STARTED, IT FILLS LOCATIONS 5200 TO 7777 (4K) OR 5200 TO 5777 (3K) WITH A
/COMPLEMENTING DATA PATTERN (5252 - 2525), AND THEN HALTS, THE OPERATOR
/AT THIS TIME MUST SET THE APPROPRIATE AUTO RESTART SWITCHES ON THE
/MODULE, HE THEN MUST SIGNIFY TO THE PROGRAM VIA FRONT PANEL SWITCH
/REGISTER OR THE PSEUDO SWITCH REGISTER, WHICHEVER IS SELECTED, THE
/AUTO RESTART TO BE TESTED (0000-RESTART AT 4200; 0001-RESTART AT 2000)
/0002-RESTART AT 0200; 0003-RESTART AT 0000), THE OPERATOR THEN PRESSES
/"CONTINUE",THE PROGRAM THEN STARTS COMPARING DATA ,WAITING FOR THE
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/OPERATOR TO PULL THE LINE CORD, WHEN THE AC LINE CORD IS PULLED, THE
/PROGRAM SHOULD HALT AT LOCATION ACDOWN, THE OPERATOR SHOULD THEN PLUG
/THE LINE CORD BACK IN, AT THIS TIME THE PROGRAM SHOULD DO A AUTO RESTART
/TO THE ADDRESS SELECTED, THE PROGRAM THEN CHECKS FOR THE CORRECT
/AUTO RESTART AND THEN GOES BACK TO COMPARING DATA, THE ABOVE SEQUENCE
/OF UNPLUGGING AND PLUGGING LINE CORD SHOULD BE DONE SEVERAL TIMES FOR EACH
/AUTO RESTART.
///WARNING-THE BATTERY SUPPLY SHOULD BE FULLY CHARGED////////
/**********************************************************************************************************************

4000  4456  AUTO,   SCOPLP                  /SETUP TEST AND SCOPE LOOP ADDRESS
4001  6007          CAF                     /CLEAR ALL FLAGS
4002  1021          TAD     OP1SEL          /GET THE HARDWARE CONFIGURATION
4003  0143          AND     K200
4004  7640          SZA     CLA
4005  6160          CLEMOD                  /SIMULATOR SELECTED CLEAR TEST MODULE
4006  1377          TAD     (DPRINT         /GET THE ADDRESS FOR THE INTERRUPT ROUTINE
4007  3352          DCA     AUTRST          /SAVE IT
4010  1376          TAD     (BUFFER         /GET THE ADDRESS OF TEST BUFFER
4011  3313          DCA     FILLIT          /SAVE IT
4012  1021          TAD     OP1SEL          /GET HARDWARE CONFIGURAATION
4013  0352          AND     K34             /CHECK TO  SEE IF MORE THAN 4K
4014  7640          SZA     CLA             /IS IT GREATER THEN 4K?
4015  5222          JMP     .+5             /YES, THAN FIELD 0 EQUALS 4K
4016  1021          TAD     OP1SEL          /NO, THAN IT MUST BE 3K OR 4K
4017  0353          AND     K1              /CHECK FOR 3K OR 4K
4020  7650          SNA     CLA             /IS IT 3K OR 4K?
4021  7332          CLA CLL CML RTR         /ONLY 3K ADD 2000 TO COUNTER
4022  1376          TAD     (BUFFER
4023  3314          DCA     BUFCNT
4024  1314          TAD     BUFCNT          /GET THE NUMBER OF WORDS TO FILL THE BUFFER
4025  3315          DCA     CNTBUF          /SAVE IT
4026  1317          TAD     K5252           /THE FIRST WORD IN THE BUFFER WILL BE 5252
4027  3316          DCA     BUFPAT          /SAVE THE WORD
4030  1316          TAD     BUFPAT          /GET THE WORD
4031  3713          DCA   I FILLIT          /PUT IT IN THE BUFFER
4032  1316          TAD     BUFPAT          /GET THE WORD
4033  7040          CMA                     /COMPLEMENT IT
4034  3316          DCA     BUFPAT
4035  2313          ISZ     FILLIT          /INCREMENT BUFFER ADDRESS
4036  2315          ISZ     CNTBUF          /DONE?
4037  5230          JMP     .-7             /NO KEEP FILLING THE BUFFER
4040  7402          HLT                     /SET THE SWITCH REGISTER OR PSEUDO S,R
                                            /TO THE AUTO-RESTART TO BE EXECUTED
4041  1021          TAD     OP1SEL          /GET THE HARDWARE CONFIGURATION
4042  7500          SMA                     /IS THE HARDWARE S,R, BEING USED
4043  5246          JMP     .+3             /NO USE THE PSEUDO SWITCH REGISTER
4044  7604          LAS
4045  7410          SKP
4046  1020          TAD     SWITCH
4047  0320          AND     K3              /MASK OFF BITS 10 AND 11
4050  1375          TAD     (RESADD         /ADD THE AUTO RESTART TABLE ADDRESS TO IT
4051  3321          DCA     MANRST          /SAVE IT
4052  1721          TAD   I MANRST          /GET THE AUTO RESTART TO BE EXECUTED
4053  3321          DCA     MANRST          /SAVE IT FOR COMPARISON AFTER RESTART
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4654  1376   STRCMP, TAD     (BUFFER         /GET THE BUFFER ADDRESS
4655  3313           DCA     FILLIT          /SAVE IT
4656  1314           TAD     BUFCNT          /GET THE BUFFER SIZE
4657  3315           DCA     CNTBUF          /SAVE IT
4660  1317           TAD     K5252
4661  3316           DCA     BUFPAT          /SETUP INITIAL PATTERN
4662  6001   CMPBUF, ION                     /TURN THE INTERRUPT ON
4663  1713           TAD  I  FILLIT          /GET THE WORD FROM BUFFER
4664  7041           CIA                     /NEGATE IT
4665  1316           TAD     BUFPAT          /GET THE WORD EXPECTED
4666  7650           SNA     CLA
4667  5303           JMP     BUFGOD          /WORD COMPARED GO INCREMENT COUNTER
4670  4454           ERROR                   /DATA WORDS DIDINT COMPARE- PRESS
                                             /"CONT" FOR ADDRESS AND GOOD AND BAD DATA
4671  1313           TAD     FILLIT          /
4672  7402           HLT                     /AC=BUFFER ADDRESS WHERE ERROR WAS DETECTED
4673  7300           CLA     CLL
4674  1316           TAD     BUFPAT
4675  7402           HLT                     /AC = GOOD DATA WORD
4676  7300           CLA     CLL
4677  1713           TAD  I  FILLIT
4700  7402           HLT                     /AC = BAD DATA WORD - PRESS "CONT" TO
4701  7300           CLA     CLL             /RETRY THE COMPLETE TEST
4702  5453           JMP  I  TEST            /DO THE TEST OVER
4703  1316   BUFGOD, TAD     BUFPAT          /GET THE DATA PATTERN
4704  7040           CMA                     /NEGATE IT
4705  3316           DCA     BUFPAT          /SAVE IT FOR NEXT COMPARE
4706  2313           ISZ     FILLIT          /INCREMENT ADDRESS TO COMPARE
4707  7000           NOP                     /THIS IS NEEDED FOR ISZ OVERFLOW
4710  2315           ISZ     CNTBUF          /DONE COMPLETE BUFFER?
4711  5262           JMP     CMPBUF          /NO CONTINUE
4712  5254           JMP     STRCMP          /RE-INITIALIZE COMPARE LOOP AND COMPARE

4713  0000   FILLIT, 0
4714  5200   BUFCNT, 5200-7777-1
4715  0000   CNTBUF, 0
4716  0000   BUFPAT, 0
4717  5252   K5252,  5252
4720  0003   K3,     3
4721  0000   MANRST, 0

4722  0000   OPRRET, 0                       /PROGRAM COMES HERE FROM AN AUTO RESTART
4723  7340           CLA CLL CMA
4724  1322           TAD     OPRRET          /GET THE ADDRESS FROM AUTO RESTART
4725  7041           CIA                     /NEGATE IT
4726  1321           TAD     MANRST          /GET EXPECTED RESTART
4727  7650           SNA     CLA             /ARE THEY EQUAL?
4730  5337           JMP     RESET           /YES RESET AC AND LINK AND RETURN TO COMPARE
4731  4454           ERROR                   /THE AUTO RESTART ADDRESS SELECTED BY
                                             /OPERATOR DOES NOT COMPARE WITH AUTO
                                             /AUTO RESTART THAT RETURNED, PRESS "CONT"
                                             /FOR EXPECTED AND ACTUAL RETURN ADDRESS
4732  1321           TAD     MANRST          /GET THE EXPECTED AUTO RESTART ADDRESS
4733  7402           HLT                     /AC = EXPECTED AUTO RESTART ADDRESS
4734  7340           CLA  CLL CMA
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4735  1322           TAD     OPRRET          /GET ACTUAL
4736  7402           HLT                     /AC = ADDRESS RETURNED FROM AUTO RESTART
4737  7300   RESET,  CLA     CLL
4740  1377           TAD     (OPRINT         /SETUP RETURN ADDRESS FOR POWER FAIL
4741  3052           DCA     AUTRST          /SAVE IT
4742  1774'          TAD     PC
4743  3351           DCA     RETPRG
4744  1773'          TAD     LINK            /GET THE LINK
4745  7004           RAL                     /PUT IT IN THE LINK
4746  1035           TAD     DATREG          /GET THE AC
4747  6001           ION                     /TURN THE INTERRUPT ON
4750  5751           JMP  I  RETPRG

4751  0000   RETPRG, 0

4752  0034   K34,    34
4753  0001   K1,     1


4754  0000   OPRINT, 0                       /OPERATOR INTERVENTION AUTO RESTART
4755  1372           TAD     (JMS I AUTRST
4756  3000           DCA     INTSER
4757  1372           TAD     (JMS I AUTRST
4760  3771'          DCA     TEST1-1
4761  1370           TAD     (OPRRET         /SETUP FOR A AUTO RESTART
4762  3052           DCA     AUTRST
4763  7402   ADDOWN, HLT                     /WAIT FOR LINE CORD TO BE PLUGGED IN
4764  5453           JMP  I  TEST            /RETRY TEST




4770  4722
4771  0200
4772  4452
4773  5051
4774  5052
4775  4137
4776  5200
4777  4754
      5000           PAGE



5000  0000   ACTLIN, 0
5001  1022           TAD     OP2SEL
5002  7700           SMA     CLA             /IS THE PROGRAM RUNNING ON ACT LINE?
5003  5600           JMP  I  ACTLIN          /NO, RETURN
5004  1037           TAD     FLDLIM          /GET THE FIELD LIMIT
5005  1111           TAD     M70
5006  7640           SZA     CLA             /IS THE FIELD LIMIT EQUAL TO FIELD 7?
5007  5600           JMP  I  ACTLIN          /NO, RETURN TO TEST
5010  1040           TAD     UPERLM          /GET THE UPPER ADDRESS LIMIT
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5011  7001            IAC                     /ADD 1 TO IT
5012  7640            SZA     CLA             /WAS IT 7777
5013  5600            JMP  I  ACTLIN          /NO, RETURN
5014  7352            CLA CLL CMA RTR         /SET LAST ADDRESS = 5777
5015  3040            DCA     UPERLM          /SAVE IT
5016  5600            JMP  I  ACTLIN          /RETURN TO PROGRAM


5017  1022    ENDPAS, TAD     OP2SEL          /CHECK FOR ACT LINE
5020  7700            SMA     CLA             /IS THE PROGRAM RUNNING ON ACT LINE
5021  5234            JMP     ENDING          /NO GO CHECK FOR SR 3 TO HALT AT END OF A PASS
5022  1021            TAD     OP1SEL          /GET THE HARDWARE CONFIGURATION
5023  0143            AND     K200            /CHECK FOR THE SIMULATOR
5024  7640            SZA     CLA             /WAS THE SIMULATOR SELECTED
5025  5234            JMP     ENDING          /YES, ALREADY NOTIFIED PROM OF GOOD PAS
5026  2242            ISZ     PRGPAS          /CHECK 1/2 SECOND COUNT
5027  5234            JMP     ENDING          /NOT 1/2 SECOND YET
5030  1377            TAD     (-144           /RESET THE COUNTER
5031  3242            DCA     PRGPAS
5032  6272            CIF     70              /CHANGE INSTRUCTION FIELD TO 7
5033  4451            JMS  I  GOODPS          /SIGNAL THE PROM
5034  4341    ENDING, JMS     SWCHK           /CHECK SR 3 TO HALT ON A PROGRAM PASS
5035  7006            RTL
5036  7004            RAL
5037  7710            SPA     CLA
5040  7402            HLT                     /END OF A COMPLETE PROGRAM PASS
5041  5776            JMP     0201            /RESTART THE PROGRAM


5042  7634    PRGPAS, -144


5043  7010    POWFAL, RAR
5044  3251            DCA     LINK
5045  1000            TAD     INTSER
5046  3252            DCA     PC
5047  6103            CAL                     /CLEAR AC LOW F/F
5050  4452            JMS  I  AUTRST          /RETURN TO THE PROGRAM

5051  0000    LINK,   0
5052  0000    PC,     0

5053  0000    PRGRST, 0
5054  6102            SPL                     /SKIP ON AC LOW AS A LEVEL
5055  7610            SKP     CLA
5056  5254            JMP     .-2
5057  5453            JMP  I  TEST            /RETURN TO TEST BEING EXECUTED AND START OVER

5060  0000    TESTAD, 0
5061  7340            CLA CLL CMA
5062  1260            TAD     TESTAD
5063  3053            DCA     TEST
5064  1375            TAD     (PRGRST
5065  3052            DCA     AUTRST
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5066  5660            JMP  I  TESTAD


5067  1021    BATEMT, TAD     OP1SEL          /GET HARDWARE CONFIGURATION
5070  0143            AND     K200
5071  7650            SNA     CLA
5072  5277            JMP     DEAD            /MACHINE GOING DOWN - STOP EVERYTHING
5073  3373            DCA     ACNLOK
5074  2000            ISZ     INTSER
5075  2000            ISZ     INTSER
5076  5400            JMP  I  INTSER
5077  7402    DEAD,   HLT                     /IT'S ALL OVER NOW - GOOD-BYE
5100  5453            JMP  I  TEST


5101  0000    GOODBD, 0
5102  1022            TAD     OP2SEL          /GET HARDWARE CONFIGURATION
5103  7700            SMA     CLA             /IS THE PROGRAM RUNNING ON ACT LINE
5104  5701            JMP  I  GOODBD          /NO RETURN TO PROGRAM
5105  6272            CIF     70              /CHANGE INSTRUCTION FIELD TO FIELD 7
5106  4451            JMS  I  GOODPS          /SIGNAL ACT LINE PROGRAM STILL RUNNING
5107  5701            JMP  I  GOODBD          /RETURN TO PROGRAM


5110  0000    ERRORX, 0                       /ERROR ROUTINE
5111  7300            CLA     CLL
5112  1022            TAD     OP2SEL          /CHECK FOR ACT LINE
5113  7700            SMA     CLA
5114  5326            JMP     CHKINH
5115  1021            TAD     OP1SEL
5116  0143            AND     K200
5117  7640            SZA     CLA
5120  6160            CLRMOD
5121  6002            IOF                     /TURN THE INTERRUPT OFF
5122  7240            CLA     CMA
5123  1310            TAD     ERRORX
5124  6272            CIF     70
5125  5450            JMP  I  BADPAS          /GO TO MOM FOR ERROR
5126  4341    CHKINH, JMS     SWCHK           /CHECK FOR SR 0(1) TO INHIBIT ERROR HALT
5127  7710            SPA     CLA             /IS SR 0 SET TO A ONE
5130  5334            JMP     ERLPSW          /YES, GO CHECK SR 1 TO LOOP ON ERROR
5131  7340            CLA CLL CMA
5132  1310            TAD     ERRORX          /SUBTRACT ONE FROM JMS ERROR PC
5133  7402            HLT                     /AC CONTAINS THE ADDRESS WHERE THE ERROR
                                              /WAS DETECTED BY THE PROGRAM; REFER
                                              /TO THE PROGRAM LISTING FOR ERROR
                                              /EXPLANATION AND THE TEST DESCRIPTION,
5134  4341    ERLPSW, JMS     SWCHK           /CHECK THE SWITCH REGISTER TO LOOP ON ERROR
5135  7004            RAL
5136  7710            SPA     CLA             /IS SR 1 SET TO A ONE TO LOOP ON TEST
5137  5453            JMP  I  TEST            /YES GO LOOP ON THE TEST
5140  5710            JMP  I  ERRORX          /NO, RETURN TO THE PROGRAM

5141  0000    SWCHK,  0
5142  7300            CLA     CLL
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5143  1021          TAD     OPISEL          /GET THE HARDWARE STATUS WORD
5144  7700          SMA     CLA             /IS THE HARDWARE FRONT PANEL SELECTED
5145  5350          JMP     .+3             /NO, USE THE PSEUDO SWITCH REGISTER
5146  7604          LAS
5147  5741          JMP  I  SWCHK           /RETURN
5150  1022          TAD     SWITCH          /THE PSEUDO SWITCH REGISTER
5151  5741          JMP  I  SWCHK           /RETURN

5152  0000  TSTLOP, 0                       /ROUTINE TO CHECK SR 2 TO LOOP ON TEST
5153  4341          JMS     SWCHK           /GO GET THE SWITCH REGISTER
5154  7006          RTL
5155  7700          SMA     CLA
5156  5752          JMP  I  TSTLOP          /GO TO NEXT TEST
5157  5453          JMP  I  TEST            /LOOP ON SAME TEST


5160  0000  ACLBAT, 0
5161  1373          TAD     ACNLOK          /LOOK AT RETURN FOR AC LOW OR BATTERY EMPTY
5162  7640          SZA     CLA
5163  5366          JMP     .+3
5164  2000          ISZ     INTSER
5165  5400          JMP  I  INTSER
5166  3373          DCA     ACNLOK
5167  6101          SBE                     /SKIP ON BATTERY EMPTY
5170  5364          JMP     .+4
5171  2000          ISZ     INTSER
5172  5364          JMP     .+6
5173  0000  ACNLOK, 0

5175  5053
5176  0201
5177  7634
      5200          PAGE


5200  0000  BUFFER, 0                       /BUFFER IS FROM 5200 TO 7777 FOR 4K
                                            /BUFFER IS FROM 5200 TO 5777 FOR 3K


      0200          *200
```



```
0000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0100  11111111  11111111  11111111  11111111  11111111  11110000  00000000  00000000

0200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0300  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11100011

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  11111000  00000011

1400  11111111  11111111  11111111  11111111  11111111  11111111  00000000  00000000
1500  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000001

1600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1700  11111111  11111111  11111111  11111111  11111111  11111111  10000000  00000001

2000  11111111  11111111  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  11111111

3000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
3100  11111111  11111111  11111111  11111111  11111111  11000000  00000000  00000111

3200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
3300  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

3400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
3500  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

3600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
3700  11111111  11111111  11111111  11111111  11111111  11111110  00000011  11111111
```

```
4000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
4100  11111111  11111111  11111111  11111111  11111111  11111111  11111001  11111111

4200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
4300  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11100011

4400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
4500  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

4600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
4700  11111111  11111111  11111111  11111111  11111111  11111111  11111000  11111111

5000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
5100  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11110111

5200  10000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000
5300  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000

5400
5500

5600
5700


6000
6100

6200
6300

6400
6500

6600
6700


7000
7100

7200
7300

7400
7500

7600
7700
```



```
ACDOWN  4763        CJMS04  1272        GOOUPS  0051        M1070   0127
ACLBAT  5160        CJMS05  1320        GTF     6004        M11     0070
ACNLOK  5173        CJMS06  1346        HGHLIM  0044        M1100   0130
ACTLIN  5000        CJMS07  1410        HLT     7402        M125    0114
ADD401  3753        CJMS10  1436        INTSEN  0000        M152    0115
ADDCNT  0047        CKJMS1  1627        JMSCK1  2246        M16     0071
ADDRES  4135        CKJMS2  1657        JMSCK2  2272        M2      0063
AUTCNT  4133        CKJMS3  1710        JMSCK3  2314        M20     0072
AUTENA  4147        CKJMS4  1741        JMSCK4  2340        M22     0073
AUTO    4600        CKJMS5  2013        JMSCK5  2364        M25     0074
AUTRST  0052        CKJMS6  2044        JMSCK6  2410        M30     0075
AUTSEL  4134        CKJMS7  2075        JMSCK7  2434        M300    0116
AUTTST  4056        CKJMS8  2127        JMSCK8  2460        M33     0076
BADPAS  0050        CKJMS9  2161        K1      4793        M34     0077
BATEMT  5067        CLEAMB  4463        K10     0135        M4      0064
BGT16   3025        CLRBUT  4465        K1000   4254        M40     0100
BGT17   3217        CLREMA  6154        K125    0141        M4100   0131
BOOTOK  4461        CLRENG  3540        K152    0142        M43     0101
BOOTR1  3755        CLRMOD  6160        K1777   0145        M44     0102
BOOTR2  3756        CLRSIM  6150        K200    0143        M5      0065
BOOTTB  3607        CMPBUF  4662        K2000   0146        M50     0103
BOTAND  4567        CNTBOT  3750        K3      4720        M5000   0132
BOTCLR  4565        CNTBUF  4715        K3000   4253        M5100   0133
BOTCMP  4400        COMPAR  4425        K34     4752        M52     0104
BOTCNT  4571        CONTM2  3751        K37     0136        M55     0105
BOTENA  4155        CONTM3  3752        K400    0144        M60     0106
BOTEND  4511        CONM2   4136        K4100   0153        M61     0107
BOTNT1  3671        CUF     6264        K5252   4717        M66     0110
BOTNT2  3726        DATPAT  0042        K6201   0045        M7      0066
BOTSAD  4570        DATREC  0035        K7      0134        M70     0111
BOTSEL  4150        DEAD    5077        K70     0137        M77     0112
BTSURT  3754        DSKADD  4363        K7677   0152        MANRST  4721
BTTST1  3652        EMA1    3541        K77     0140        NOAUTO  4054
BTTST2  3707        EMA2    3542        K7707   0150        NOBOOT  3637
BUFCNT  4714        EMA3    3543        K7737   0151        NXTBOT  3643
BUFFER  5200        EMACLR  3331        K7774   0147        OP1SEL  0021
BUFGOD  4703        EMAIF1  3432        KK3     4572        OP23K   0000
BUFPAT  4716        EMAIF2  3451        LINK    5051        OP2SEL  0022
CAF     6007        EMAIF3  3464        LODMG2  6152        OPRINT  4754
CAL     6103        ENDING  5034        LODMG3  6153        OPRRET  4722
CAPSB   4000        ENDPAS  5017        LOOP    4455        PASEND  0061
CDF     6201        ENDTST  3314        M1      0062        PC      5052
CDFCHK  0033        ENDTST  3144        M10     0067        POINTR  3313
CDFNEW  3062        ERLPSW  5134        M100    0113        POWFAL  5043
CHKCDF  0034        ERROR   4454        M1000   0117        PRGPAS  5042
CHKINH  5126        ERRORX  5110        M1007   0120        PRGRST  5053
CIF     6202        EXECUT  6164        M1016   0121        PTPADD  4301
CIFCDF  6203        FILLIT  4713        M1025   0122        PTPCMP  4303
CINT    6204        FLDLIM  0037        M1034   0123        PTPEND  4341
CJMS01  1166        GODAUT  4125        M1043   0124        RDF     6214
CJMS02  1216        GOODMD  5101        M1052   0125        REDEMA  6155
CJMS03  1244        GOODOP  4443        M1061   0126        RESADD  4137
```

```
RESET   4737        TEST16  2763        TST19B  3446
RETPRG  4751        TEST17  3200        TST19Q  3461
RFDFCP  4365        TEST18  3321        TST2CN  0402
RFDFED  4371        TEST19  3415        TSTLOP  5152
RIB     6234        TEST2   0343        UPERLM  0040
RIF     6224        TEST20  3477        WRKADD  0043
RK8ADD  3615        TEST21  3627        WRKFLD  0041
RK8CMP  3617        TEST22  4041        XBAT    0060
RK8E    0023        TEST23  4201        XPWRFL  0057
RK8END  3625        TEST3   0432
RMF     6244        TEST4   0474
RSTAUT  4101        TEST5   0530
RTF     6005        TEST6   0577
SAVESZ  0036        TEST7   0647
SAVSTR  4560        TEST8   0706
SAVWFD  0046        TEST9   0776
SBE     6101        TESTAD  5060
SCOPLP  4456        TIMOIS  4255
SEL4UT  4143        TST11A  1137
SET1K   4554        TST11B  1156
SET2K   4560        TST11C  1204
SET3K   4563        TST11D  1234
SETUP   4517        TST11E  1262
SETUP1  4527        TST11F  1310
SETUP2  4541        TST11G  1336
SIMBOT  3747        TST11H  1400
SINT    6254        TST11I  1426
SKON    6000        TST12A  1615
SKPEMA  6166        TST12B  1645
SPL     6102        TST12C  1676
STHCMP  4654        TST12D  1727
SUP     6274        TST12E  2001
SWCHK   5141        TST12F  2032
SWITCH  0020        TST12G  2063
T16LCO  3055        TST12H  2115
T17COF  3246        TST12I  2147
T17RET  3271        TST13A  2236
TA8ADD  3544        TST13B  2262
TA8CMP  3546        TST13C  2304
TA8END  3605        TST13D  2330
TABLE   3306        TST13E  2354
TC8ADD  4343        TST13F  2400
TC8CMP  4345        TST13G  2424
TC8END  4355        TST13H  2452
TEST    0053        TST14A  2515
TEST1   0201        TST14B  2552
TEST10  1053        TST14C  2610
TEST11  1116        TST14D  2650
TEST12  1600        TST15A  3345
TEST13  2216        TST15B  3364
TEST14  2500        TST15C  3377
TEST15  2674        TST1VA  3430
```



```
ERRORS DETECTED: 0

LINKS GENERATED: 38

RUN=TIME:  23 SECONDS

3K CORE USED
```

```
                        /KM8=A OPTION TEST 2 MAINDEC=08=DJKMA=A=L 1K PART 1
                        /
                        /COPYRIGHT (C) 1974, DIGITAL EQUIPMENT CORPORATION
                        /
                        /PROGRAMMER: BRUCE HANSEN
                        /



                        ////////////////////////////////////////////////////////////////////////////
                        /THE FOLLOWING LISTING WILL CORRESPOND TO THE PAPER TAPE LABELED MAINDEC=08=DJKMA=A=PM1,
                        /1K PART 1, THIS PAPER TAPE AND LISTING WILL BE THE FIRST OF FOUR 1K SEGMENTED
                        /PAPER TAPES AND LISTINGS FOR COMPUTERS WITH LESS THAN 4K OF MEMORY,
                        ////////////////////////////////////////////////////////////////////////////
```



```
                        /KM8=A OPTION TEST 2 MAINDEC=08=DJKMA=A=L 1K PART 1
                        /
                        /COPYRIGHT 1974, DIGITAL EQUIPMENT CORP,, MAYNARD, MASS,,  01754
                        /
                        /POP=8A OPTION TEST 2 TESTS THE MEMORY EXTENTION/TIME SHARE CONTROL,
                        /POWER FAIL/AUTO RESTART, AND BOOTSTRAP LOADERS


        6000    SKON=6000
        6007    CAF=6007
        7402    HLT=7402

                /SWITCH REGISTER SETTINGS

                /SR0=1  INHIBIT ERROR HALT
                /SR1=1  LOOP ON ERROR
                /SR2=1  LOOP ON TEST
                /SR3=1  HALT AT COMPLETION OF A PROGRAM PASS

                /MEMORY EXTENTION/TIME SHARE INSTRUCTIONS

        6004    GTF=6004                        /GET FLAGS,  READS THE FOLLOWING MACHINE STATES
                                                /INTO THE INDICATED BITS OF THE AC:
                                                /AC0 LINE
                                                /AC2 INTERRUPT REQUEST
                                                /AC4 INTERRUPT ENABLE F/F
                                                /AC5 USER FLAG
                                                /AC6=11 SAVE FIELD REGISTER

        6005    RTF=6005                        /RESTORE THE FLAGS,  RTF LOADS THE LINK FROM AC0,
                                                /LOADS THE USER BUFFER F/F, INSTRUCTION BUFFER AND
                                                /DATA FIELD WITH AC3, AC6=8, AC 9=11 AND INHIBITS
                                                /PROCESSOR INTERRUPTS UNTIL NEXT  JMP OR JMS INSTRUCTION,
                                                /AT THE END OF THE JMP OR JMS, THE CONTENTS OF THE U.B, + I,B,
                                                /ARE LOADED INTO USER FIELD F/F, AND THE I,F,,  INTERRUPT ENABLE
                                                /IS SET AND INTERRUPT INHIBIT AS CLEARED

        6234    RIB=6234                        /READ THE INTERRUPT BUFFER

        6244    RMF=6244                        /RESTORES MEMORY FLAGS

        6204    CINT=6204                       /CLEAR USER INTERRUPT FLIP=FLOP

        6254    SINT=6254                       /SKIP ON USER INTERRUPT FLIP=FLOP

        6264    CUF=6264                        /CLEAR USER BUFFER FLIP=FLOP

        6274    SUF=6274                        /SET USER BUFFER FLIP=FLOP (ENTER TIME SAME MODE)AND
                                                /INHIBITS PROCESSOR INTERRUPTS UNTIL THE NEXT JMP OR
                                                /JMS INSTRUCTION,  AT THE END OF THE JMP OR JMS
                                                /INSTRUCTION, THE USER BUFFER IS LOADED INTO THE USER
                                                /FIELD F/F,

        6201    CDF=6201                        /CHANGE DATA FIELD
```

```
                6202    CIF=6202                        /CHANGE INSTRUCTION FIELD
                6214    RDF=6214                        /READ THE DATA FIELD INTO AC BITS 6-8
                6224    RIF=6224                        /READ THE INSTRUCTION FIELD INTO AC BITS 6-8
                6203    CIFCDF=6203                     /PERFORMS THE CIF AND CDF FUNCTIONS

                        /POWER FAIL INSTRUCTIONS

                6102    SPL=6102                        /SKIP ON AC LOW FLIP-FLOP

                6103    CAL=6103                        /CLEAR AC LOW FLIP-FLOP

                6101    SBE=6101                        /SKIP ON BATTERY EMPTY FLIP-FLOP

                        /OPTION BOARD 2 SIMULATOR IOT'S

                6150    CLRSIM=6150                     /CLEAR CONTROL REGISTERS
                6152    LODMG2=6152                     /LOAD CONTROL REGISTER 2
                6153    LODMG3=6153                     /LOAD CONTROL REGISTER 3
                6154    CLREMA=6154                     /CLEAR EMA CATCHER LOGIC
                6155    REDEMA=6155                     /READ EMA CATCHER REGISTER
                6160    CLRMOD=6160                     /CLEAR TEST MODULE LOGIC
                6164    EXECUT=6164                     /EXECUT AND CONTROL WORD 3 BIT 7 =1 ISSUE A POWER ON PULSE
                                                        /EXECUT AND CONTROL WORD 3 BIT 7 =0 ISSUE A SWITCH SW PULSE
                6166    SKPEMA=6166                     /SKPEMA AND CONTROL WORD 3 BIT 3 =1 EMA INTERRUPT AND SKIP ENABLE
                                                        /SKPEMA AND CONTROL WORD 3 BIT 3 =0 EMA INTERRUPT AND SKIP DISABLE

                        /OPTION BOARD2 SIMULATOR CONTROL WORD 2 BIT ASSIGNMENTS
                        /
                        /BITS 0 - 1     NOT USED
                        /BITS 2 - 8     BOOT STRAP PROGRAM SELECT
                        /BITS 9 - 11    AUTO-RESTART ADDRESS SELECT

                        /OPTION BOARD 2 SIMULATOR CONTROL WORD 3 BIT ASSIGNMENTS
                        /
                        /BIT 0          TIME SHARE 0=ENABLED  1=DISABLED
                        /BIT 1          AC LOW (L) 1=PULLED LOW  0=FREE STATE
                        /BIT 2          BATT EMPTY 1=BATT EMPTY PULLED LOW  2=FREE STATE
                        /BIT 3          1=EMA INTERRUPT/SKIP ENABLE  0=EMA INTERRUPT SKIP DISABLE
                        /BITS 4 - 6     NOT USED
                        /BIT 7          1=POWER ON PULSE WITH EXECUT 0=SWITCH SW PULSE WITH EXECUT
                        /BIT 8          1=DISABLES BOOTSTRAP WHILE RUNNING  2=ENABLES BOOTSTRAP WHILE RUNNING
                        /BIT 9 - 11     AUTO-RESTART/BOOT STRAP ENABLE CODE



                0000    *0

0000  0000     INTSEM, 0                               /JMS I AUTHST PLACED HERE FOR SIMULATOR AUTO RESTART
0001  3035             DCA     DATREC
0002  6102             SPL                             /SKIP ON AC LOW
0003  7410             SKP
0004  5457             JMP  I  XPWRFL                  /POWER GOING DOWN
0005  6101             SBE                             /SKIP ON BATTERY EMPTY
```



```
0006  7410             SKP
0007  5460             JMP  I  XBAT                   /GO HALT THE COMPUTER ,ITS ALL OVER
0010  6224             RIF                             /READ THE INSTRUCTION FIELD
0011  7640             SZA     CLA
0012  4454             ERROR                           /I,F, IS NOT 0 AFTER A INTERRUPT
0013  6214             RDF                             /READ THE DATA FIELD
0014  7640             SZA     CLA
0015  4454             ERROR                           /D,F, IS NOT 0 AFTER A INTERRUPT
0016  2000             ISZ     INTSER                  /ADD 1 TO THE INTERRUPTED PC
0017  5400             JMP  I  INTSER                  /RETURN TO THE PROGRAM


                0020    *20
0020  0000     SWITCH, 0                               /PSEUDO SWITCH REGISTER IF BIT 0=0 OF OP1SEL
0021  1000     OP1SEL, 1000
                                                        /BIT 0=0 USE LOC 20 AS A PSEUDO S,R,
                                                        /BIT 0=1 USE HARDWARE FRONT PANEL S,R,
                                                        /BIT 1=1 HAS 8A OPTION 1
                                                        /BIT 2=1 HAS 8A OPTION 2
                                                        /BIT 3=1 HAS 8A CPU SIMULATOR
                                                        /BIT 4=1 HAS 8A OPTION 1 + 2 TEST MODULE
                                                        /BIT 5=1 PROGRAM ON 8A XOR
                                                        /BIT 6=1 HAS PDP-8E TYPE CPU
                                                        /BITS 7-11 MEMORY SIZE = 0'S = 1K, 37=32K,
                                                        /MEMORY SIZE CAN BE INCREASED IN 1K INCREMENTS
                                                        /BY ADDING A 1 TO THE NUMBER IN BITS 7-11,
0022  0000     OP2SEL, 0
                /RK8E BOOT STRAP WILL LOAD INTO THE FOLLOWING LOCATIONS

0023  7402     RK8E,   HLT                             /2000
0024  7402             HLT                             /6745
0025  7402             HLT                             /0023
0026  7402             HLT                             /7650
0027  7402             HLT                             /5024
0030  7402             HLT                             /6733
0031  7402             HLT                             /5031
0032  7402             HLT                             /TERMINATOR
0033  0000     CDFCHK, 0
0034  0033     CHKCDF, CDFCHK
0035  0000     DATREC, 0
0036  0000     SAVESE, 0
0037  0000     FLDLIM, 0
0040  0000     UPERLM, 0
0041  0000     WRKFLD, 0
0042  0000     DATPAT, 0
0043  0000     WRKADD, 0
0044  0000     HGHLIM, 0
0045  6201     K6201,  6201
0046  0000     SAVWFD, 0
0047  0000     ADDCNT, 0
0050  6520     BADPAS, 6520
0051  6500     GOODPS, 6500
0052  1647     AUTHST, PRGRST
0053  0000     TEST,   0                               /SCOPE LOOP AND TEST LOOP ADDRESS
```

```
                4454    ERROR=  JMS  I  .
0054  1704                               ERRORX
                4455    LOOP=   JMS  I  .
0055  1746                               TSTLOP
                4456    SCOPLP= JMS  I  .
0056  1654                               TESTAD

0057  1637    XPWHFL, POWFAL
0060  1663    XBAT,   BATEMT
0061  1617    PASENU, ENDPAS

                /CONSTANTS USED BY THE PROGRAM

0062  7777    M1,     -1
0063  7776    M2,     -2
0064  7774    M4,     -4
0065  7773    M5,     -5
0066  7771    M7,     -7
0067  7770    M10,    -10
0070  7767    M11,    -11
0071  7762    M16,    -16
0072  7760    M20,    -20
0073  7756    M22,    -22
0074  7753    M25,    -25
0075  7750    M30,    -30
0076  7745    M33,    -33
0077  7744    M34,    -34
0100  7740    M40,    -40
0101  7735    M43,    -43
0102  7734    M44,    -44
0103  7730    M50,    -50
0104  7726    M52,    -52
0105  7723    M55,    -55
0106  7720    M60,    -60
0107  7717    M61,    -61
0110  7712    M66,    -66
0111  7710    M70,    -70
0112  7701    M77,    -77
0113  7700    M100,   -100
0114  7653    M125,   -125
0115  7626    M152,   -152
0116  7500    M300,   -300
0117  7000    M1000,  -1000
0120  6771    M1007,  -1007
0121  6762    M1016,  -1016
0122  6753    M1025,  -1025
0123  6744    M1034,  -1034
0124  6735    M1043,  -1043
0125  6726    M1052,  -1052
0126  6717    M1061,  -1061
0127  6710    M1070,  -1070
0130  6700    M1100,  -1100
0131  3700    M4100,  -4100
```



```
0132  3000    M5000,  -5000
0133  2700    M5100,  -5100

0134  0007    K7,     7
0135  0010    K10,    10
0136  0037    K37,    37
0137  0070    K70,    70
0140  0077    K77,    77
0141  0125    K125,   125
0142  0152    K152,   152
0143  0200    K200,   200
0144  0400    K400,   400
0145  1777    K1777,  1777
0146  2000    K2000,  2000
0147  7774    K7774,  7774
0150  7707    K7707,  7707
0151  7757    K7757,  7757
0152  7677    K7677,  7677
0153  4100    K4100,  4100

      0200    .200
```

```
                /**************************************************************************************************
                /TEST 1 - CHECKS THE CDF AND RDF INSTRUCTIONS TO LOAD AND READ
                /THE DATA FIELD,  A RIF IS ISSUED AFTER EACH DATA FIELD CHANGE
                /TO CHECK THAT THE INSTRUCTION FIELD REMAINS A ZERO,
                /THE INCLUSIVE OR OF THE D.F. WITH THE AC IS CHECKED WITH THE RDF INSTRUCTION,
                /SET TIME SHARE ENABLE SWITCH TO TIME SHARE ENABLE POSITION
                /**************************************************************************************************

0200  7000              NOP/JMS I AUTRST        /IF SIMULATOR SELECTED THIS LOCATION WILL CHANGE TO JMS I AUTRST
0201  6160    TEST1,    CLEMOD                  /CLEAR SIMULATOR TEST LOGIC
0202  3777?             DCA     ACNLOK
0203  4456              SCOPLP                  /SETUP SCOPE AND TEST LOOPING ADDRESS
0204  6007              CAF                     /CLEAR ALL FLAGS
0205  6264              CUF                     /CLEAR USER FLAG
0206  7410              SKP
0207  4454              ERROR                   /CUF SKIPPED
0210  6254              SINT                    /SKIP IF USER INTERRUPT FLIP-FLOP SET
0211  7410              SKP
0212  4454              ERROR                   /SINT SKIPPED OR CAF FAILED TO 0 USER INTERRUPT
0213  6001              ION                     /TURN THE INTERRUPT ON
0214  6201              CDF     00              /CHANGE DATA FIELD TO FIELD 0
0215  7410              SKP
0216  4454              ERROR                   /CDF SKIPPED
0217  6214              RDF                     /READ THE DATA FIELD
0220  7410              SKP
0221  4454              ERROR                   /RDF SKIPPED
0222  7640              SZA     CLA             /WAS IF FIELD 0?
0223  4454              ERROR                   /RDF READ BACK SOMETHING OTHER THAN D.F. 0
0224  6224              RIF                     /READ THE INSTRUCTION FIELD
0225  7410              SKP
0226  4454              ERROR                   /RIF SKIPPED
```

```
0227  7640          SZA     CLA             /WAS THE I,F, 0?
0230  4454          ERROR                   /IF READ BACK SOMETHING OTHER THAN I,F, 0
0231  6271          CDF     70              /CHANGE DATA FIELD TO FIELD 7
0232  6214          RDF                     /READ THE DATA FIELD
0233  1111          TAD     M70             /CHECK THAT DATA FIELD 7 WAS READ BACK
0234  7640          SZA     CLA             /INTO AC BITS 6,7 + 8,
0235  4454          ERROR                   /CDF OR RDF TO FIELD 7 FAILED
0236  1150          TAD     K7707           /CHECK THE INCLUSIVE OR FUNCTION OF RDF
0237  6214          RDF                     /READ THE DATA FIELD
0240  7040          CMA
0241  7640          SZA     CLA
0242  4454          ERROR                   /THE INCLUSIVE OR OF THE DF WITH AC FAILED
0243  6224          RIF                     /READ THE INSTRUCTION FIELD
0244  7640          SZA     CLA             /IS IT STILL 0?
0245  4454          ERROR                   /THE INSTRUCTION FIELD CHANGED
0246  6221          CDF     20              /CHANGE TO DATA FIELD 2
0247  6214          RDF                     /READ THE DATA FIELD
0250  1072          TAD     M20             /CHECK TO SEE IF DF 2 WAS READ BACK
0251  7640          SZA     CLA             /WAS IT DATA FIELD 2?
0252  4454          ERROR                   /NO, CDF 20 OR RDF FAILED
0253  1151          TAD     K7757           /CHECK THE INCLUSIVE OR OF THE DF WITH THE AC
0254  6214          RDF                     /READ THE DATA FIELD
0255  7040          CMA
0256  7640          SZA     CLA
0257  4454          ERROR                   /THE INCLUSIVE OR OF DF WITH AC FAILED
0260  6224          RIF                     /READ THE INSTRUCTION FIELD
0261  7640          SZA     CLA             /IS THE IF STILL 0?
0262  4454          ERROR                   /THE INSTRUCTION FIELD CHANGED
0263  6251          CDF     50              /CHANGE TO DATA FIELD 5
0264  6214          RDF                     /READ THE DATA FIELD
0265  1103          TAD     M50
0266  7640          SZA     CLA             /WAS IT DATA FIELD 5?
0267  4454          ERROR                   /NO, CDF 50 OR RDF FAILED
0270  6224          RIF                     /READ THE INSTRUCTION FIELD
0271  7640          SZA     CLA             /IS THE I,F, STILL 0
0272  4454          ERROR                   /NO, THE INSTRUCTION FIELD CHANGED
0273  6231          CDF     30              /CHANGE THE DATA FIELD TO 3
0274  6214          RDF                     /READ THE DATA FIELD
0275  1075          TAD     M30             /
0276  7640          SZA     CLA             /IS IT EQUAL TO FIELD 3
0277  4454          ERROR                   /NO, CDF 30 OR RDF FAILED
0300  6224          RIF                     /READ THE INSTRUCTION FIELD
0301  7640          SZA     CLA             /IS THE I,F, STILL EQUAL TO 3?
0302  4454          ERROR                   /NO, THE I,F, CHANGED
0303  6241          CDF     40              /CHANGE THE DATA FIELD TO FIELD 4
0304  6214          RDF                     /READ THE DATA FIELD
0305  1100          TAD     M40
0306  7640          SZA     CLA             /IS IT EQUAL TO D,F, 4
0307  4454          ERROR                   /NO, CDF 40 OR RDF FAILED
0310  6224          RIF                     /READ THE INSTRUCTION FIELD
0311  7640          SZA     CLA             /IS IT STILL EQUAL TO 0
0312  4454          ERROR                   /NO, THE I,F, CHANGED
0313  6211          CDF     10              /CHANGE THE DATA FIELD TO FIELD 1
0314  6214          RDF                     /READ THE DATA FIELD
0315  1067          TAD     M10
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0316  7640          SZA     CLA             /IS IT EQUAL TO DATA FIELD 1
0317  4454          ERROR                   /NO, CDF 10 OR RDF FAILED
0320  6224          RIF                     /READ THE INSTRUCTION FIELD
0321  7640          SZA     CLA             /IS IT STILL EQUAL TO 0
0322  4454          ERROR                   /NO, THE I,F, CHANGED
0323  6261          CDF     60              /CHANGE DATA FIELD TO FIELD 6
0324  6214          RDF                     /READ THE DATA FIELD
0325  1106          TAD     M60
0326  7640          SZA     CLA             /IS THE D,F, EQUAL TO 6?
0327  4454          ERROR                   /NO, CDF 60 OR RDF FAILED
0330  6224          RIF                     /READ THE INSTRUCTION FIELD
0331  7640          SZA     CLA             /IS IT STILL EQUAL TO ZERO?
0332  4454          ERROR                   /NO, INSTRUCTION FIELD CHANGED
0333  6201          CDF     00              /CHANGE DATA FIELD TO FIELD 0
0334  6214          RDF                     /READ THE DATA FIELD
0335  7640          SZA     CLA             /IS IT EQUAL TO FIELD 0
0336  4454          ERROR                   /NO, CDF 00 OR RDF FAILED
0337  6224          RIF                     /READ THE INSTRUCTION FIELD
0340  7640          SZA     CLA             /IS IT STILL EQUAL TO ZERO
0341  4454          ERROR                   /NO, INSTRUCTION FIELD CHANGED,
0342  4455          LOOP                    /LOOP ON TEST IF SR = 1000

              /*****************************************************************************************
              /TEST 2 = CHECKS THAT USER MODE CAN BE ENTERED AND EXITED BY DOING A
              /ION-SUF-JMP-HLT, THE USER INTERRUPT IS CHECKED TO BE SET BY SINT AND
              /CLEARED BY CINT, GTF AND RIB ARE ISSUED TO CHECK THAT THE SAVE FIELD
              /GOT LOADED AND THAT THE INSTRUCTIONS CAN READ THE SAVE FIELD,
              /*****************************************************************************************

0343  4456    TEST2,  SCOPLP                  /SETUP SCOPE AND TEST LOOPING ADDRESS
0344  6007          CAF                     /CLEAR ALL FLAGS
0345  6264          CUF                     /CLEAR USER BUFFER F/F
0346  7410          SKP
0347  4454          ERROR                   /CUF SKIPPED
0350  6204          CINT                    /CLEAR USER INTERRUPT FLIP-FLOP
0351  7410          SKP
0352  4454          ERROR                   /CINT SKIPPED
0353  6254          SINT                    /SKIP ON USER INTERRUPT FLIP-FLOP
0354  7410          SKP
0355  4454          ERROR                   /SINT SKIPPED OR USER INTERRUPT F/F SET
0356  6001          ION                     /TURN THE INTERRUPT ON
0357  6274          SUF                     /SET USER BUFFER F/F, SET INT INHIBIT AT TP3
0360  5362          JMP     .+2             /LOAD UB INTO I,F, REGISTER, CLEAR INT INHIBIT F/F
0361  5361          JMP     .               /SUF SKIPPED OR TRAPPED,
0362  7402          HLT                     /USER INTERRUPT FAILED TO SET OR HALT FAILED TO TRAP
0363  5363          JMP     .               /HLT FAILED TO TRAP
0364  6254          SINT                    /SKIP ON USER INTERRUPT FLIP-FLOP
0365  5365          JMP     .               /USER INTERRUPT NOT SET OR SINT FAILED TO SKIP,
0366  6204          CINT                    /CLEAR USER INTERRUPT FLIP-FLOP
0367  6254          SINT                    /SKIP ON USER INTERRUPT FLIP-FLOP
0370  7410          SKP
0371  5371          JMP     .               /CINT FAILED TO 0 USER INTERRUPT FLIP-FLOP
0372  5776          JMP     TST2CN          /CONTINUE THE TEST

0376  0402
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0377  1767
      0400    PAGE

0400  7000            NOP
0401  7000            NOP
0402  6004    TSTZRO, GTF                     /GET THE FLAGS
0403  7410            SKP
0404  5204            JMP     .               /GTF SKIPPED
0405  1113            TAD     M100            /CHECK USER FLAG TO BE SET
0406  7640            SZA     CLA             /WAS THE CORRECT IF, D,F, AND USER FIELD FLIP-FLOP LOADED?
0407  5207            JMP     .               /NO, USER FIELD F/F NOT LOADED OR OTHER BITS SET
0410  7300            CLA     CLL             /OR GTF FAILED,
0411  6234            RIB                     /READ THE INTERRUPT BUFFER
0412  7410            SKP
0413  5213            JMP     .               /RIB SKIPPED
0414  1113            TAD     M100            /CHECK FOR USER FLAG
0415  7640            SZA     CLA
0416  5216            JMP     .               /RIB FAILED OR SAVE FIELDS CLEARED
0417  1152            TAD     K7677           /CHECK THE INCLUSIVE OR OF SF WITH AC
0420  6234            RIB                     /READ THE INTERRUPT BUFFER
0421  7040            CMA
0422  7640            SZA     CLA
0423  5223            JMP     .               /INCLUSIVE OR OF SAVE FIELD WITH AC FAILED
0424  7340            CLA CLL CMA             /SET THE AC TO ALL ONES
0425  6004            GTF                     /GET THE FLAGS
0426  1113            TAD     M100
0427  7640            SZA     CLA
0430  5230            JMP     .               /GTF FAILED TO DO A JAM TRANSFER TO AC
                                              /OR SAVE FIELDS CLEARED,
0431  4455            LOOP                    /LOOP ON TEST IF SR = 1000

                /**********************************************************************************************
                /TEST 3= CHECKS THAT OSR WILL TRAP IN USER MODE AND THAT
                /IT WILL NOT AFTER A INTERRUPT, RIB, GTF, RIF, RDF ARE CHECKED TO
                /READ THE SAVE FIELDS AND I,F, AND D,F,
                /**********************************************************************************************
0432  4456    TEST3,  SCOPLP                  /SETUP SCOPE AND TEST LOOPING ADDRESS
0433  6007            CAF                     /CLEAR ALL FLAGS
0434  6001            ION                     /TURN THE INTERRUPT ON
0435  6274            SUF                     /SET USER BUFFER F/F, SET INT INH AT TP3
0436  5237            JMP     .+1             /ENTER USER MODE
0437  7404            OSR                     /OSR SHOULD SET USER INTERRUPT F/F + CAUSE A TRAP
0440  5240            JMP     .               /OSR FAILED TO TRAP
0441  6254            SINT                    /SKIP ON USER INTERRUPT F/F
0442  5242            JMP     .               /USER INTERRUPT F/F NOT SET
0443  6204            CINT                    /CLEAR USER INTERRUPT F/F
0444  6254            SINT                    /SKIP ON USER INTERRUPT F/F
0445  7410            SKP
0446  5246            JMP     .               /CINT FAILED TO CLEAR USER INTERRUPT F/F
0447  6001            ION                     /TURN THE INTERRUPT ON,
0450  5251            JMP     .+1             /CHECK THAT THE INTERRUPT HAD CLEARED THE USER FIELD F/F
0451  7404            OSR                     /OSR SHOULD NOT TRAP
0452  7610            SKP     CLA
0453  5253            JMP     .               /OSR TRAPPED AFTER A INTERRUPT OCCURED ABOVE
                                              /CHECK THE USER BUFFER AND I,F,,
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0454  6234            RIB                     /READ THE INTERRUPT BUFFER
0455  1113            TAD     M100            /CHECK THE SAVE FIELD FOR USER FLAG
0456  7640            SZA     CLA
0457  4454            ERROR                   /USER FLAG NOT SET OR OTHER BITS SET
0460  7340            CLA CLL CMA             /SET THE AC TO ALL ONES
0461  6004            GTF                     /GET THE FLAGS
0462  1116            TAD     M300            /CHECK FOR INT ENA, AND USER FLAG
0463  7640            SZA     CLA
0464  4454            ERROR                   /USER FLAG AND INT ENA NOT SET OR OTHER BITS SET
0465  6224            RIF                     /READ THE INSTRUCTION FIELD
0466  7640            SZA     CLA
0467  4454            ERROR                   /THE INSTRUCTION FIELD IS NON ZERO
0470  6214            RDF
0471  7640            SZA     CLA
0472  4454            ERROR                   /THE DATA FIELD IS NON ZERO,
0473  4455            LOOP                    /LOOP ON TEST IF SR = 1000

                /**********************************************************************************************
                /TEST 4= CHECKS THAT AN IOT WILL TRAP OUT IN USER MODE AND NOT
                /AFTER A USER INTERRUPT,  THE USER INTERRUPT IS CHECKED TO BE
                /CLEARED BY CAF,  RIB AND GTF ARE ISSUED AND CHECKED,
                /**********************************************************************************************
0474  4456    TEST4,  SCOPLP                  /SETUP SCOPE AND TEST LOOPING ADDRESS
0475  6007            CAF                     /CLEAR ALL FLAGS
0476  6001            ION                     /TURN THE INTERRUPT ON
0477  6274            SUF                     /SET THE USER BUFFER FLIP-FLOP
0500  5301            JMP     .+1             /TRANSFER USER BUFFER TO THE USER FIELD F/F
0501  6001            ION                     /SHOULD TRAP HERE
0502  5302            JMP     .               /THE IOT FAILED TO TRAP,
0503  6254            SINT                    /SKIP ON USER INTERRUPT FLIP-FLOP,
0504  5304            JMP     .               /USER INTERRUPT F/F FAILED TO SET ON SINT FAILED
0505  6007            CAF                     /CLEAR USER INTERRUPT WITH INITIAIZE
0506  6254            SINT                    /SKIP ON USER INTERRUPT
0507  7410            SKP
0510  5310            JMP     .               /CAF FAILED TO CLEAR USER INTERRUPT,
0511  6001            ION                     /TURN THE INTERRUPT ON
0512  5313            JMP     .+1             /CHECK THAT THE INTERRUPT CLEARED UF F/F
0513  6001            ION                     /IOT SHOULD NOT TRAP HERE
0514  7410            SKP
0515  5315            JMP     .               /ION TRAPPED,
0516  6234            RIB                     /READ THE INTERRUPT BUFFER
0517  1113            TAD     M100
0520  7640            SZA     CLA
0521  4454            ERROR                   /USER FLAG NOT SET OR OTHER BITS SET
0522  7340            CLA CLL CMA             /SET THE AC TO ALL ONES
0523  6004            GTF                     /GET THE FLAGS
0524  1116            TAD     M300
0525  7640            SZA     CLA
0526  4454            ERROR                   /USER FLAG AND INT ENA NOT SET OR GTF FAILED
0527  4455            LOOP                    /LOOP ON TEST IF SR = 1000

                /**********************************************************************************************
                /TEST 5= CHECKS THAT CUF WILL CLEAR THE USER MODE BY DOING ION, SUF,
                /CUF,  JMP, IOT, THE IOT, SHOULD NOT TRAP,  RIB AND GTF ARE
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                    /ISSUED AND CHECKED,
                    /*************************************************************************************************
0530  4456    TEST5,  SCOPLP                  /SETUP SCOPE AND TEST LOOPING ADDRESS
0531  6007            CAF                     /CLEAR ALL FLAGS
0532  6001            ION                     /TURN THE INTERRUPT ON
0533  6274            SUF                     /SET THE USER BUFFER F/F
0534  5335            JMP     .+1             /ENTER USER MODE
0535  7402            HLT                     /HLT FAILED TO TRAP
0536  5336            JMP     .               /HLT FAILED TO TRAP
0537  6254            SINT                    /SKIP ON USER INTERRUPT
0540  4454            ERROR                   /USER INTERRUPT NOT SET
0541  6007            CAF                     /CLEAR ALL FLAGS
0542  6254            SINT                    /SKIP ON USER INTERRUPT F/F
0543  7410            SKP
0544  4454            ERROR                   /CAF FAILED TO CLEAR USER INTERRUPT
0545  6234            RIB                     /READ THE INTERRUPT BUFFER
0546  1113            TAD     M100            /CHECK FOR THE USER FLAG
0547  7640            SZA     CLA
0550  4454            ERROR                   /USER FLAG NOT SET OR OTHER BITS SET
0551  6001            ION                     /TURN THE INTERRUPT BACK ON
0552  6274            SUF                     /SET USER FLAG
0553  6264            CUF                     /CLEAR USER FLAG
0554  7410            SKP
0555  5355            JMP     .               /CUF TRAPPED BEFORE A JMP WAS ISSUED
0556  5357            JMP     .+1
0557  6001            ION                     /ISSUE A IOT TO CHECK THAT PROGRAM DOESN'T TRAP,
0560  7410            SKP
0561  5361            JMP     .               /CUF FAILED TO CLEAR USER BUFFER FLIP-FLOP
0562  6254            SINT                    /SKIP ON USER INTERRUPT SET
0563  7410            SKP
0564  4454            ERROR                   /SINT SKIPPED, USER INTERRUPT SHOULD NOT BE SET
0565  7340            CLA CLL CMA
0566  6004            GTF                     /GET THE FLAGS
0567  1116            TAD     M300            /
0570  7640            SZA     CLA             /CHECK FOR INTERRUPT ENABLE + USER FLAG
0571  4454            ERROR                   /INTERRUPT ENABLE OR USER FLAG NOT SET
0572  6234            RIB                     /READ THE INTERRUPT BUFFER
0573  1113            TAD     M100
0574  7640            SZA     CLA
0575  4454            ERROR                   /USER FLAG NOT SET OR OTHER BITS SET
0576  4455            LOOP                    /LOOP ON TEST IF SR = 1000

                    /*************************************************************************************************
                    /TEST #6 CHECKS THAT USER MODE IS NOT ENTERED UNTIL A JMS INSTRUCTION IS ISSUED BY DOING A
                    /ION, SUF,IOT, OSR, LAS,JMS,HLT,  INTERRUPT REQUEST AND LINK ARE CHECKED TO
                    /BE SET AND CLEARED BY GTF,
                    /*************************************************************************************************
0577  4456    TEST6,  SCOPLP                  /SETUP SCOPE AND TEST LOOPING ADDRESS
0600  6007            CAF                     /CLEAR ALL FLAGS
0601  6001            ION                     /TURN THE INTERRUPT ON
0602  6274            SUF                     /SET USER BUFFER F/F
0603  6001            ION                     /ISSUE A IOT
0604  7410            SKP
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0605  5205            JMP     .               /ION TRAPPED,  USER MODE NOT SET UNTIL A JMP, JMS
0606  7404            OSR                     /OR THE SWITCH REGISTER WITH AC
0607  7610            SKP     CLA
0610  5210            JMP     .               /OSR TRAPPED OR USER MODE SET
0611  7604            LAS                     /LOAD THE AC WITH THE SWITCH REGISTER
0612  7610            SKP     CLA
0613  5213            JMP     .               /LAS TRAPPED OR USER MODE SET
0614  4215            JMS     .+1             /SET USER BUFFER F/F
0615  7402            HLT/XXXX                /THE PC OF THE JMS
0616  7402            HLT                     /SHOULD TRAP HERE - IF NOT USER FIELD F/F PROBABLY NOT SET
0617  5217            JMP     .               /HALT FAILED TO TRAP
0620  6254            SINT                    /SKIP ON USER INTERRUPT F/F
0621  4454            ERROR                   /USER INTERRUPT F/F NOT SET
0622  6234            RIB                     /READ THE INTERRUPT BUFFER
0623  1113            TAD     M100            /CHECK FOR USER FLAG
0624  7640            SZA     CLA
0625  4454            ERROR                   /USER FLAG NOT SET OR OTHER FLAGS SET
0626  7340            CLA CLL CMA             /SET THE AC TO ALL ONE'S
0627  6004            GTF                     /GET THE FLAGS
0630  1130            TAD     M1100           /CHECK FOR INTERRUPT REQUEST AND USER FLAG
0631  7640            SZA     CLA
0632  4454            ERROR                   /INTERRUPT REQUEST OR USER FLAG NOT SET
0633  6204            CINT                    /CLEAR USER INTERRUPT FLIP-FLOP
0634  7360            CLA CLL CML CMA         /SET AC + LINK TO A 1
0635  6004            GTF
0636  1131            TAD     M4100           /CHECK FOR LINK AND USER FLAG
0637  7640            SZA     CLA
0640  4454            ERROR                   /SHOULD ONLY BE LINK AND USER FLAG SET
0641  7100            CLL                     /CLEAR THE LINK
0642  6004            GTF                     /GET THE FLAGS
0643  1113            TAD     M100            /CHECK FOR USER FLAG
0644  7640            SZA     CLA             /IS IT SET?
0645  4454            ERROR                   /USER FLAG SHOULD BE ONLY FLAG SET,
0646  4455            LOOP                    /LOOP ON TEST IF SR = 1000

                    /*************************************************************************************************
                    /TEST 7= CHECKS THAT THE USER FLAG IN THE SAVE FIELD CAN BE CLEARED,
                    /THIS IS DONE BY LEAVING THE USER INTERRUPT F/F SET AFTER A TRAP AND
                    /THEN TURNING THE INTERRUPT BACK ON,
                    /*************************************************************************************************
0647  4456    TEST7,  SCOPLP                  /SETUP SCOPE AND TEST LOOPING ADDRESS
0650  6007            CAF                     /CLEAR ALL FLAGS
0651  6001            ION                     /TURN THE INTERRUPT ON
0652  6274            SUF                     /SET USER BUFFER FLIP-FLOP
0653  5254            JMP     .+1             /ENTER USER MODE
0654  7402            HLT                     /HLT FAILED TO TRAP
0655  5255            JMP     .               /HLT FAILED TO TRAP
0656  6234            SINT                    /SKIP ON USER INTERRUPT
0657  4454            ERROR                   /USER INTERRUPT NOT SET
0660  7240            CLA CMA                 /SET THE AC TO ALL ONES
0661  6004            GTF                     /GET THE FLAGS
0662  1130            TAD     M1100           /CHECK FOR USER FLAG AND INTERRUPT REQUEST
0663  7640            SZA     CLA             /IS IT THERE?
0664  4454            ERROR                   /SHOULD ONLY BE INT, REQ, AND USER FLAG
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0665  6001          ION                     /TURN THE INTERRUPT ON
0666  7000          NOP                     /SHOULD INTERRUPT HERE
0667  4454          ERROR                   /FAILED TO INTERRUPT
0670  7340          CLA CLL CMA             /SET THE AC TO ALL ONE'S
0671  6004          GTF                     /GET THE FLAGS
0672  1117          TAD     M1000           /CHECK FOR INTERRUPT REQUEST
0673  7640          SZA     CLA
0674  4454          ERROR                   /SHOULD ONLY BE INTERRUPT REQUEST SET
0675  6204          CINT                    /CLEAR USER INTERRUPT REQUEST,
0676  6254          SINT                    /SKIP ON USER INTERRUPT FLIP-FLOP
0677  7410          SKP
0700  4454          ERROR                   /CINT FAILED TO CLEAR USER INT F/F
0701  7340          CLA CLL CMA
0702  6004          GTF
0703  7640          SZA     CLA
0704  4454          ERROR                   /INTERRUPT REQUEST FAILED TO CLEAR
0705  4455          LOOP                    /LOOP ON TEST IF SR = 1000

                /**********************************************************************************************
                /TEST6- CHECKS THAT RTF WILL RESET THE USER MODE AFTER A
                /USER INTERRUPT.
                /**********************************************************************************************

0706  4456  TEST6,  SCOPLP                  /SETUP SCOPE AND TEST LOOPING ADDRESS
0707  6007          CAF                     /CLEAR ALL FLAGS
0710  6001          ION                     /TURN THE INTERRUPT ON
0711  6274          SUF                     /SET USER BUFFER FLIP FLOP
0712  5313          JMP     .+1
0713  7402          HLT                     /HALT FAILED TO TRAP OR USER FIELD FAILED TO SET
0714  5314          JMP     .               /HALT FAILED TO TRAP
0715  6254          SINT                    /SKIP ON USER INTERRUPT F/F
0716  4454          ERROR                   /USER INTERRUPT FAILED TO SET
0717  6204          CINT                    /CLEAR USER INTERRUPT FLIP-FLOP
0720  6254          SINT
0721  7410          SKP
0722  4454          ERROR                   /CINT FAILED TO CLEAR USER INTERRUPT
0723  6234          RIB                     /READ THE INTERRUPT BUFFER
0724  1113          TAD     M100            /CHECK FOR USER FLAG
0725  7640          SZA     CLA
0726  4454          ERROR                   /USER FLAG NOT SET OR PICKED UP BITS
0727  7100          CLL
0730  1153          TAD     K4100           /SET AC0 +5 TO A 1 TO SET LINK + USER BUFFER
0731  6005          RTF                     /RESTORE THE FLAGS + SET USER BUFFER F/F
0732  7610          SKP     CLA
0733  5333          JMP     .               /RTF SKIPPED
0734  6224          RIF                     /READ THE INSTRUCTION FIELD
0735  7640          SZA     CLA             /IS IT NON ZERO
0736  5336          JMP     .               /RIF TRAPPED WITH OUT USER INT OR I.F, NON ZERO
0737  6214          RDF                     /READ THE DATA FIELD
0740  7640          SZA     CLA
0741  5341          JMP     .               /RDF TRAPPED WITH OUT USER INT OR D.F, IS NON-ZERO
0742  5343          JMP     .+1             /SET USER FIELD F/F, USER MODE, AND TURN INT ENA ON
0743  7402          HLT                     /RTF FAILED TO SET USER BUFFER F/F OR ION NOT SET
0744  5344          JMP     .               /HLT FAILED TO TRAP
0745  6254          SINT                    /SKIP ON USER INTERRUPT F/F
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0746  4454          ERROR                   /USER INTERRUPT NOT SET
0747  6004          GTF                     /GET THE FLAGS
0750  1133          TAD     M5100           /CHECK FOR LINK, INTERRUPT REQUEST AND USER FLAG
0751  7640          SZA     CLA
0752  4454          ERROR                   /THE LINK, OR INTERRUPT REQUEST OR USER FLAG NOT SET
0753  7100          CLL                     /CLEAR THE LINK BUT LEAVE INTERRUPT REQUEST UP
0754  6001          ION                     /TURN THE INTERRUPT ON
0755  5356          JMP     .+1             /SHOULD INTERRUPT AT TP4
0756  4454          ERROR                   /PROGRAM FAILED TO INTERRUPT WITH INT REQUEST SET
0757  6004          GTF                     /GET THE FLAGS
0760  1117          TAD     M1000           /CHECK FOR INTERRUPT REQUEST
0761  7640          SZA     CLA             /IS IT THE ONLY BIT SET
0762  4454          ERROR                   /NO, OTHER BITS SET BESIDES INT REQ OR INT REQ NOT SET
0763  6254          SINT                    /SKIP ON USER INTERRUPT F/F
0764  4454          ERROR                   /USER INTERRUPT NOT SET
0765  6204          CINT                    /CLEAR USER INTERRUPT F/F
0766  6254          SINT
0767  7610          SKP     CLA
0770  4454          ERROR                   /CINT FAILED TO CLEAR USER INTERRUPT F/F
0771  7340          CLA CLL CMA             /SET THE AC TO ALL ONES
0772  6004          GTF                     /GET THE FLAGS
0773  7640          SZA     CLA             /SHOULD BE ALL ZEROS
0774  4454          ERROR                   /THE SAVE FIELD OR STATUS IS NON-ZERO
0775  4455          LOOP                    /LOOP ON TEST IF SR = 1000

                /**********************************************************************************************
                /TEST7- CHECKS THAT RMF WILL RESET THE USER MODE AFTER A USER
                /INTERRUPT
                /**********************************************************************************************

0776  4456  TEST7,  SCOPLP                  /SETUP SCOPE AND TEST LOOPING ADDRESS
0777  7000          NOP                     ////////////////////////////////////
1000  6007          CAF                     /CLEAR ALL FLAGS
1001  6001          ION                     /TURN THE INTERRUPT ON
1002  6274          SUF                     /SET USER BUFFER FLIP-FLOP
1003  5204          JMP     .+1             /GO INTO USER MODE
1004  7402          HLT                     /HLT FAILED TO TRAP OR NOT IN USER MODE
1005  5205          JMP     .               /HLT FAILED TO TRAP
1006  6254          SINT                    /SKIP ON USER INTERRUPT
1007  4454          ERROR                   /SINT FAILED OR USER INTERRUPT NOT SET
1010  6204          CINT                    /CLEAR USER INTERRUPT FLIP-FLOP
1011  6254          SINT                    /SKIP ON USER INTERRUPT
1012  7410          SKP
1013  4454          ERROR                   /CINT FAILED TO CLEAR USER INTERRUPT
1014  6234          RIB                     /READ THE INTERRUPT BUFFER
1015  1113          TAD     M100
1016  7640          SZA     CLA
1017  4454          ERROR                   /USER FLAG NOT SET OR OTHER BITS SET
1020  6001          ION                     /TURN THE INTERRUPT ON
1021  6244          RMF                     /RESTORE IB, DF AND UB
1022  7610          SKP     CLA
1023  5223          JMP     .               /RMF SKIPPED
1024  5225          JMP     .+1             /ENTER USER MODE
1025  7402          HLT                     /RMF + JMP FAILED TO SET USER FIELD OR RMF FAILED
1026  5226          JMP     .               /HLT FAILED TO TRAP
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1027  6254          SINT                    /SKIP ON USER INTERRUPT
1030  4454          ERROR                   /USER INTERRUPT NOT SET
1031  7100          CLL
1032  6004          GTF                     /GET THE FLAGS
1033  1130          TAD     M1100           /CHECK FOR INTERUPT REQUEST AND USER FLAG
1034  7640          SZA     CLA             /WHERE THEY SET
1035  4454          ERROR                   /NO, INT REQUEST OR USER FLAG NOT SET OR RMF
                                            /SET OTHER BITS IN THE IF AND DF
1036  6001          ION                     /TURN THE INTERRUPT BACK ON
1037  5240          JMP     .+1             /INTERRUPT WITH INTERRUPT REQUEST SET
1040  4454          ERROR                   /PROGRAM FAILED TO INTERRUPT
1041  6234          RIB                     /READ THE INTERRUPT BUFFER
1042  7640          SZA     CLA
1043  4454          ERROR                   /USER FLAG NOT CLEARED ON INTERRUPT
1044  6254          SINT                    /CHECK USER INTERRUPT TO BE SET
1045  4454          ERROR                   /USER INTERRUPT GOT CLEARED
1046  6204          CINT                    /CLEAR USER INTERRUPT
1047  6254          SINT                    /SKIP ON USER INTERRUPT
1050  7410          SKP
1051  4454          ERROR                   /USER INTERRUPT SET
1052  4455          LOOP                    /LOOP ON TEST IF SR = 1000
```

```
/*****************************************************************************************************
/TEST 10- CHECKS THAT USER MODE AND LINK AND ION CAN BE SET BY THE AC AND
/THE RTF INSTRUCTION AND THAT IT CAN BE CLEAR BY RTF,
/*****************************************************************************************************
```

```
1053  4456  TEST10, SCOPLP                 /SETUP SCOPE AND TEST LOOPING ADDRESS
1054  6007          CAF                     /CLEAR ALL FLAGS
1055  1153          TAD     K4100           /SET THE LINK AND USER BIT INTO THE AC
1056  6005          RTF                     /RESTORE THE FLAGS
1057  7620          SNL     CLA             /CHECK THE LINK
1060  7402          HLT                     /LINK NOT SET BY RTF
1061  6000          SKON                    /SKIP IF INTERRUPT ON AND TURN OFF
1062  7402          HLT                     /RTF FAILED TO SET INTERRUPT ENABLE
1063  6000          SKON                    /SKIP IF INTERRUPT ON AND TURN OFF
1064  7410          SKP
1065  7402          HLT                     /SKON FAILED TO CLEAR INTERRUPT ENABLE
1066  6001          ION                     /TURN THE INTERRUPT ON
1067  5270          JMP     .+1             /ENTER USER MODE
1070  7402          HLT                     /RTF FAILED TO SET U,B OR JMP FAILED TO LOAD I,F,
1071  5271          JMP     .               /HLT FAILED TO TRAP
1072  6254          SINT                    /SKIP ON USER INTERRUPT
1073  4454          ERROR                   /USER INTERRUPT NOT SET
1074  6004          GTF                     /GET THE FLAGS
1075  1133          TAD     M5100           /CHECK LINK, INTERRUPT REQUEST AND USER FLAG
1076  7640          SZA     CLA
1077  4454          ERROR                   /LINK, INT REQ OR USER FLAG NOT SET
1100  7300          CLA     CLL             /LEAVE INTERRUPT REQUEST SET
1101  6005          RTF                     /RESTORE THE FLAGS TO 0
1102  5303          JMP     .+1             /SHOULD INTERRUPT
1103  4454          ERROR                   /FAILED TO INTERRUPT
1104  6254          SINT                    /SKIP ON USER INTERRUPT
1105  4454          ERROR                   /USER INTERRUPT GOT CLEARED
1106  6204          CINT                    /CLEAR USER INTERRUPT
```



```
1107  6234          RIB                     /READ THE INTERRUPT BUFFER
1110  7640          SZA     CLA
1111  4454          ERROR                   /THE SAVE FIELDS ARE NON ZERO
1112  6004          GTF                     /GET THE FLAGS
1113  7640          SZA     CLA
1114  4454          ERROR                   /THE SAVE FIELDS ARE NON ZERO
1115  4455          LOOP                    /LOOP ON TEST IF SR = 1000
```

```
/*****************************************************************************************************
/TEST 11 - USING THE USER INTERRUPT FLIP-FLOP AND INTERRUPT ENABLE
/THE IF REGISTER CAN BE INDIRECTLY CHECKED TO SET BY CHECKING THE
/SAVE FIELD REGISTER AFTER A INTERRUPT, THE I,F IS CHECKED NOT TO CHANGE
/UNTIL A JMP OR JMS IS ISSUED, THE INT INHIBIT F/F IS CHECKED NOT
/TO CLEAR BEFORE A JMP OR JMS IS ISSUED,
/*****************************************************************************************************
```

```
1116  4456  TEST11, SCOPLP                 /SETUP SCOPE AND TEST LOOPING ADDRESS
1117  6007          CAF                     /CLEAR ALL FLAGS
1120  6001          ION                     /TURN THE INTERRUPT ON
1121  6274          SUF                     /SET USER BUFFER F/F
1122  5323          JMP     .+1             /ENTER USER MODE
1123  7402          HLT                     /FAILED TO ENTER USER MODE
1124  5324          JMP     .               /HLT FAILED TO TRAP IN USER MODE
1125  6254          SINT                    /SKIP ON USER INTERRUPT
1126  4454          ERROR                   /USER INTERRUPT FLIP-FLOP NOT SET
1127  6004          GTF                     /GET THE FLAGS
1130  1130          TAD     M1100           /CHECK FOR INTERRUPT REQUEST AND USER FLAG
1131  7640          SZA CLA
1132  4454          ERROR                   /USER FLAG OR INT REQUEST NOT SET
1133  6234          RIB                     /READ THE INTERRUPT BUFFER
1134  1113          TAD     M100
1135  7640          SZA CLA
1136  4454          ERROR                   /USER FLAG GOT CLEARED
1137  6202  TST11A, CIF     00              /CHANGE INSTRUCTION FIELD TO FIELD 0
1140  7300          CLA CLL                 /CLEAR THE LINK
1141  6001          ION                     /TURN THE INTERRUPT ON
1142  6224          RIF                     /READ THE INSTRUCTION FIELD
1143  7440          SZA                     /IS IT ZERO
1144  7402          HLT                     /THE IF IS NON ZERO OR INTERRUPTED
1145  5346          JMP     .+1             /CLEAR INTERRUPT INHIBIT
1146  4454          ERROR                   /PROGRAM FAILED TO INTERRUPT
1147  6004          GTF                     /GET THE FLAGS
1150  1117          TAD     M1000           /CHECK FOR USER INTERRUPT REQUEST
1151  7640          SZA CLA
1152  4454          ERROR                   /INT REG NOT SET OR SAVE FIELD NON ZERO
1153  6234          RIB                     /READ THE INTERRUPT BUFFER
1154  7640          SZA CLA                 /IS THE SAVE FIELD 0?
1155  4454          ERROR                   /NO, SAVE FIELD OR USER FIELD NON ZERO
1156  7240  TST11B, CLA CMA                 /SET A LOCATION TO ALL ONE'S TO CHECK THAT
1157  3366          DCA     CJMS01          /THE JMS TO FIELD 7 DIDN'T JMS TO FIELD 0
1160  6272          CIF     70              /CHANGE INSTRUCTION FIELD TO FIELD 7
1161  6001          ION                     /SET INTERRUPT ENABLE
1162  6224          RIF                     /READ THE INSTRUCTION FIELD
1163  7440          SZA                     /IS IT STILL ZERO
1164  7402          HLT                     /THE IF IS NON ZERO OR IT INTERRUPTED
```

```
1165  4366            JMS     .+1             /CLEAR INTERRUPT INHIBIT
1166  7402  CJMS01,   HLT                     /THIS LOCATION PRESET TO 1'S SHOULDN'T CHANGE
1167  4454            ERROR                   /PROGRAM FAILED TO INTERRUPT
1170  7360            CLA CLL CML CMA         /SET AC AND LINK TO ALL ONES
1171  6004            GTF                     /GET THE FLAGS
1172  1132            TAD     M5000           /CHECK FOR LINK, USER INTERRUPT REQUEST,
1173  1111            TAD     M70             /AND SAVE FIELD REGISTER OF 70
1174  7640            SZA CLA
1175  4454            ERROR
1176  6234            RIB                     /GTF FAILED OR READ SOMETHING OTHER THAN ABOVE
1177  1111            TAD     M70             /READ THE INTERRUPT BUFFER
1200  7640            SZA CLA                 /IN THE SF SET TO I,S,F, 7 ONLY?
1201  4454            ERROR
1202  2777            ISZ     CJMS01          /SAVE FIELD IS NOT EQUAL TO FIELD 7
1203  4454            ERROR                   /CHECK THAT THE JMS DIDN'T GO TO FIELD 0
1204  7240  TST11D,  CLA CMA                 /THE JMS TO FIELD 7 WENT TO FIELD 0
1205  3216            DCA     CJMS02          /SET A LOCATION TO ALL ONE'S TO CHECK THAT A
1206  6254            SINT                    /JMS TO FIELD 5 DIDN'T CHANGE FIELD 0
1207  4454            ERROR                   /SKIP ON USER INTERRUPT REQUEST
1210  6252            CIF     50              /USER INTERRUPT F/F GOT CLEARED
1211  6001            ION                     /CHANGE TO INSTRUCTION FIELD 5
1212  6224            RIF                     /SET INTERRUPT ENABLE
1213  7440            SZA                     /READ THE INSTRUCTION FIELD
1214  7402            HLT                     /IS IT STILL ZERO
1215  4216            JMS     .+1             /THE IF IS NON ZERO OR IT INTERRUPTED
1216  7402  CJMS02,   HLT                     /CLEAR INTERRUPT INHIBIT AND INTERRUPT
1217  4454            ERROR                   /THIS LOCATION PRESET TO 1'S SHOULDN'T CHANGE
1220  7340            CLA CLL CMA             /PROGRAM FAILED TO INTERRUPT
1221  6004            GTF                     /SET THE AC TO ALL ONES
1222  1117            TAD     M1000           /GET THE FALGS
1223  1103            TAD     M50             /CHECK FOR USER INTERRUPT REQUEST AND SAVE
1224  7640            SZA CLA                 /FIELD REGISTER OF 50
1225  4454            ERROR
1226  6234            RIB                     /GTF FAILED OR READ SOMETHING OTHER THAN ABOVE
1227  1103            TAD     M50             /READ THE INTERRUPT BUFFER
1230  7640            SZA CLA                 /CHECK THE INTERRUPT BUFFER FOR ISF 50
1231  4454            ERROR
1232  2210            ISZ     CJMS02          /SAVE FIELD IS NOT EQUAL TO 1,F, 5
1233  4454            ERROR                   /CHECK THAT JMS DIDN'T GO TO FIELD 0
1234  7240  TST11D,  CLA CMA                 /THE JMS TO I,F,S, WENT TO FIELD 0
1235  3244            DCA     CJMS03          /SET A LOCATION TO ALL ONE'S TO CHECK THAT A JMS
1236  6222            CIF     20              /TO FIELD 2 DIDN'T CHANGE FIELD 0
1237  6001            ION                     /CHANGE INSTRUCTION FIELD TO FIELD 2
1240  6224            RIF                     /SET INTERRUPT ENABLE
1241  7440            SZA                     /READ THE INSTRUCTION FIELD
1242  7402            HLT                     /IS IT STILL EQUAL TO ZERO
1243  4244            JMS     .+1             /THE IF IS NON ZERO OR IT INTERRUPTED
1244  7402  CJMS03,   HLT                     /CLEAR INTERRUPT INHIBIT AND INTERRUPT
1245  4454            ERROR                   /THIS LOCATION PRESET TO 1'S SHOULDN'T CHANGE
1246  7360            CLA CLL CML CMA         /PROGRAM FAILED TO INTERRUPT
1247  6004            GTF                     /SET THE AC AND LINK TO 1'S
1250  1132            TAD     M5000           /GET THE FLAGS
1251  1072            TAD     M20             /CHECK FOR LINK AND USER INTERRUPT REQUEST
1252  7640            SZA CLA                 /AND SAVE FIELD REGISTER OF 20
1253  4454            ERROR
                                              /GTF FAILED OR READ SOMETHING OTHER THAN ABOVE
```



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1254  6234            RIB                     /READ THE INTERRUPT BUFFER
1255  1072            TAD     M20
1256  7640            SZA CLA                 /DOES THE INTERRUPT BUFFER CONTAIN 20
1257  4454            ERROR                   /NO, ERROR SAVE FIELD IS NOT EQUAL TO 20
1260  2244            ISZ     CJMS03          /CHECK THAT JMS DIDN'T GO TO FIELD 0
1261  4454            ERROR                   /THE JMS TO FIELD 2 WENT TO FIELD 0
1262  7240  TST11E,  CLA CMA                 /SET A LOCATION TO ALL ONE'S TO CHECK THAT THE
1263  3272            DCA     CJMS04          /JMS TO FIELD 1 DIDN'T JMS TO FIELD 0
1264  6212            CIF     10              /CHANGE INSTRUCTION FIELD TO FIELD 1,
1265  6001            ION                     /TURN THE INTERRUPT ON
1266  6224            RIF                     /READ THE INSTRUCTION FIELD
1267  7440            SZA                     /IS IT STILL ZERO
1270  7402            HLT                     /THE IF IS NON ZERO OR IT INTERRUPTED
1271  4272            JMS     .+1             /CLEAR INTERRUPT INHIBIT AND INTERRUPT
1272  7402  CJMS04,   HLT                     /THIS LOCATION PRESET TO ALL ONE'S SHOULDN'T CHANGE
1273  4454            ERROR                   /PROGRAM FAILED TO INTERRUPT
1274  7340            CLA CLL CMA             /SET THE AC TO ALL ONE'S
1275  6004            GTF                     /GET THE FLAGS
1276  1117            TAD     M1000           /CHECK FOR USER INTERRUPT REQUEST AND
1277  1067            TAD     M10             /SAVE FIELD OF 10
1300  7640            SZA CLA
1301  4454            ERROR                   /GTF FAILED OR READ SOMETHING OTHER THAN ABOVE
1302  6234            RIB                     /READ THE INTERRUPT BUFFER
1303  1067            TAD     M10
1304  7640            SZA CLA
1305  4454            ERROR
1306  2272            ISZ     CJMS04          /SAVE FIELD IS NOT EQUAL TO FIELD 10
1307  4454            ERROR                   /CHECK THAT THE JMS DIDN'T GO TO FIELD 0
1310  7240  TST11F,  CLA CMA                 /THE JMS TO FIELD 1 WENT TO FIELD 0
1311  3320            DCA     CJMS05          /SET A LOCATION TO ALL ONES TO CHECK THAT THE
1312  6262            CIF     60              /JMS TO FIELD 6 DIDN'T JMS TO FIELD 0
1313  6001            ION                     /CHANGE INSTRUCTION FIELD TO FIELD 6
1314  6224            RIF                     /TURN THE INTERRUPT ON
1315  7440            SZA                     /READ THE INSTRUCTION FIELD
1316  7402            HLT                     /IS IT STILL ZERO
1317  4320            JMS     .+1             /THE IF IS NON ZERO OR IT INTERRUPTED
1320  7402  CJMS05,   HLT                     /CLEAR INTERRUPT INHIBIT AND INTERRUPT
1321  4454            ERROR                   /THIS LOCATION SET TO ALL ONE'S, IT SHOULDN'T CHANGE
1322  7360            CLA CLL CML CMA         /PROGRAM FAILED TO INTERRUPT
1323  6004            GTF                     /SET THE AC AND LINK TO ALL ONE'S
1324  1132            TAD     M5000           /GET THE FLAG
1325  1106            TAD     M60             /CHECK FOR LINK, USER INTERRUPT REQUEST
1326  7640            SZA CLA                 /AND SAVE FIELD OF 60
1327  4454            ERROR
1330  6234            RIB                     /GTF FAILED OR READ SOMETHING OTHER THAN ABOVE
1331  1106            TAD     M60             /READ THE INTERRUPT BUFFER
1332  7640            SZA CLA
1333  4454            ERROR
1334  2320            ISZ     CJMS05          /SAVE FIELD IS NOT EQUAL TO FIELD 60
1335  4454            ERROR                   /CHECK THAT THE JMS DIDN'T GO TO FIELD 0
1336  7240  TST11G,  CLA CMA                 /THE JMS TO FIELD 6 WENT TO FIELD 0
1337  3346            DCA     CJMS06          /SET A LOCATION TO ALL 1'S TO CHECK THAT THE
1340  6232            CIF     30              /JMS TO FIELD 3 DIDN'T JMS TO FIELD 0
1341  6001            ION                     /CHANGE INSTRUCTION FIELD TO FIELD 3
1342  6224            RIF                     /TURN THE INTERRUPT ON
                                              /READ THE INSTRUCTION FIELD
```

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1343  7440            SZA                     /IS THE IF STILL ZERO
1344  7402            HLT                     /THE IF IS NON ZERO OR IT INTERRUPTED
1345  4340            JMS     .+1             /CLEAR INTERRUPT INHIBIT AND INTERRUPT
1346  7402    CJMS00, HLT                     /THIS LOCATION PRESET TO ALL ONES, IT SHOULDN'T CHANGE
1347  4454            ERROR                   /PROGRAM FAILED TO INTERRUPT
1350  7340            CLA CLL CMA             /SET THE AC TO ALL ONE'S
1351  6004            GTF                     /GET THE FLAGS
1352  1117            TAD     M1000           /CHECK FOR USER INTERRUPT REQUEST AND
1353  1075            TAD     M30             /SAVE FIELD OF 30
1354  7640            SZA CLA
1355  4454            ERROR                   /GTF FAILED OR READ SOMETHING OTHER THAN ABOVE
1356  6234            RIB                     /READ THE INTERRUPT BUFFER
1357  1075            TAD     M30
1360  7640            SZA CLA
1361  4454            ERROR                   /SAVE FIELD NOT EQUAL TO FIELD 3
1362  2346            ISZ     CJMS06
1363  4454            ERROR                   /JMS TO FIELD 3 WENT TO FIELD 0
1364  5776            JMP     TST11H          /GO TO NEXT SECTION

1376  1400
1377  1160
      1400            PAGE
1400  7240    TST11H, CLA CMA                 /SET A LOCATION TO ALL ONES TO CHECK
1401  3210            DCA     CJMS07          /THAT A JMS TO FIELD 4 DIDN'T JMS TO FIELD 0
1402  6242            CIF     40              /CHANGE INSTRUCTION FIELD TO FIELD 4
1403  6001            ION                     /SET INTERRUPT ENABLE
1404  6224            RIF                     /READ THE INSTRUCTION FIELD
1405  7440            SZA                     /IS THE IF STILL ZERO
1406  7402            HLT                     /THE IF IS NON ZERO OR IT INTERRUPTED
1407  4210            JMS     .+1
1410  7402    CJMS07, HLT                     /THIS LOCATION PRESET TO ALL ONE'S
1411  4454            ERROR                   /PROGRAM FAILED TO INTERRUPT
1412  7360            CLA CLL CML CMA         /SET THE AC AND LINK TO 1'S
1413  6004            GTF                     /GET THE FLAGS
1414  1132            TAD     M5000           /CHECK FOR USER INTERRUPT REQUEST AND LINK
1415  1100            TAD     M40             /AND SAVE FIELD OF 40
1416  7640            SZA CLA
1417  4454            ERROR                   /GTF FAILED OR READ SOMETHING OTHER THAN ABOVE
1420  6234            RIB                     /READ THE INTERRUPT BUFFER
1421  1100            TAD     M40
1422  7640            SZA CLA
1423  4454            ERROR                   /SAVE FIELD NOT EQUAL TO 40
1424  2210            ISZ     CJMS07
1425  4454            ERROR                   /JMS TO FIELD 4 WENT TO FIELD 0
1426  7340    TST111, CLA CLL CMA             /SETUP A LOCATION TO CHECK THAT A JMS TO
1427  3236            DCA     CJMS10          /FIELD 0 GETS EXECUTED
1430  6202            CIF     00              /CHANGE INSTRUCTION FIELD TO FIELD 00
1431  6001            ION                     /TURN THE INTERRUPT ON
1432  6224            RIF                     /READ THE INSTRUCTION FIELD
1433  7440            SZA                     /IS THE IF STILL ZERO
1434  7402            HLT                     /THE IF IS NON ZERO OR IT INTERRUPTED
1435  4236            JMS     .+1             /CLEAR INTERRUPT ENABLE AND INTERRUPT
1436  7402    CJMS10, HLT                     /THIS LOCATION PREVIOUSLY SET TO 1'S
1437  4454            ERROR                   /PROGRAM FAILED TO INTERRUPT
1440  6004            GTF                     /GET THE FLAGS
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1441  1117            TAD     M1000           /CHECK FOR INTERRUPT REQUEST AND
1442  7640            SZA CLA                 /SAVE FIELD OF 0
1443  4454            ERROR                   /GTF FAILED OR READ SOMETHING OTHER THAN ABOVE
1444  6234            RIB                     /READ THE INTERRUPT BUFFER
1445  7640            SZA CLA
1446  4454            ERROR                   /SAVE FIELD NON ZERO OR RIB FAILED
1447  2236            ISZ     CJMS10          /CHECK THAT THE JMS DID CHANGE LOCATION CJMS10
1450  7610            SKP     CLA
1451  4454            ERROR                   /JMS TO FIELD 0 FAILED TO STORE ITS PC IN CJMS10
1452  6007            CAF                     /CLEAR ALL FLAGS INCLUDING USER INTERRUPT
1453  6004            GTF                     /GET THE FLAGS
1454  7640            SZA CLA
1455  4454            ERROR                   /INIT FAILED TO CLEAR USER INTERRUPT F/F
1456  4455            LOOP                    /LOOP ON TEST IF SR = 1000
1457  5461            JMP  I  PASEND          /END OF 1ST 1K SEGMENT

      1600            PAGE


1600  0000    ACTLIN, 0
1601  1022            TAD     DP2SEL
1602  7700            SMA     CLA             /IS THE PROGRAM RUNNING ON ACT LINE?
1603  5600            JMP  I  ACTLIN          /NO, RETURN
1604  1037            TAD     FLDLIM          /GET THE FIELD LIMIT
1605  1111            TAD     M70
1606  7640            SZA     CLA             /IS THE FIELD LIMIT EQUAL TO FIELD 7?
1607  5600            JMP  I  ACTLIN          /NO, RETURN TO TEST
1610  1040            TAD     UPERLM          /GET THE UPPER ADDRESS LIMIT
1611  7001            IAC                     /ADD 1 TO IT
1612  7640            SZA     CLA             /WAS IT 7777
1613  5600            JMP  I  ACTLIN          /NO, RETURN
1614  7352            CLA CLL CMA RTR         /SET LAST ADDRESS = 5777
1615  3040            DCA     UPERLM          /SAVE IT
1616  5600            JMP  I  ACTLIN          /RETURN TO PROGRAM


1617  1022    ENDPAS, TAD     DP2SEL          /CHECK FOR ACT LINE
1620  7700            SMA     CLA             /IS THE PROGRAM RUNNING ON ACT LINE
1621  5230            JMP     ENDING          /NO GO CHECK FOR SR 3 TO HALT AT END OF A PASS
1622  2236            ISZ     PROPAS          /CHECK 1/2 SECOND COUNT
1623  5230            JMP     ENDING          /NOT 1/2 SECOND YET
1624  1377            TAD     (-144           /RESET THE COUNTER
1625  3236            DCA     PROPAS
1626  6272            CIF     70              /CHANGE INSTRUCTION FIELD TO 7
1627  4451            JMS  I  GOODPS          /SIGNAL THE PROM
1630  4335    ENDING, JMS     SWCHK           /CHECK SR 3 TO HALT ON A PROGRAM PASS
1631  7000            NOP
1632  7004            RAL
1633  7710            SPA     CLA
1634  7402            HLT                     /END OF A COMPLETE PROGRAM PASS
1635  5776            JMP     0200            /RESTART THE PROGRAM
```

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1036  7634    PRGPAS, -144


1037  7010    POWFAL, RAR
1040  3245            DCA     LINK
1041  1000            TAD     INTSER
1042  3246            DCA     PC
1043  6103            CAL                     /CLEAR AC LOW F/F
1044  4452            JMS  I  AUTRST          /RETURN TO THE PROGRAM

1045  0000    LINK,   0
1046  0000    PC,     0

1047  0000    PRGRST, 0
1050  6102            SPL                     /SKIP ON AC LOW AS A LEVEL
1051  7610            SKP     CLA
1052  5250            JMP     .+2
1053  5453            JMP  I  TEST            /RETURN TO TEST BEING EXECUTED AND START OVER

1054  0000    TESTAD, 0
1055  7340            CLA CLL CMA
1056  1254            TAD     TESTAD
1057  3053            DCA     TEST
1060  1375            TAD     (PRGRST
1061  3052            DCA     AUTRST
1062  5654            JMP  I  TESTAD

1063  1021    BATEMT, TAD     OP1SEL          /GET HARDWARE CONFIGURATION
1064  0143            AND     K200
1065  7650            SNA     CLA
1066  5273            JMP     DEAD            /MACHINE GOING DOWN - STOP EVERYTHING
1067  3367            DCA     ACNLOK
1070  2000            ISZ     INTSER
1071  2000            ISZ     INTSER
1072  5400            JMP  I  INTSER
1073  7402    DEAD,   HLT                     /ITS ALL OVER NOW - GOOD-BYE
1074  5453            JMP  I  TEST

1075  0000    GOODBD, 0
1076  1022            TAD     OP2SEL          /GET HARDWARE CONFIGURATION
1077  7700            SMA     CLA             /IS THE PROGRAM RUNNING ON ACT LINE
1100  5675            JMP  I  GOODBD          /NO RETURN TO PROGRAM
1101  6272            CIF     70              /CHANGE INSTRUCTION FIELD TO FIELD 7
1102  4451            JMS  I  GOODPS          /SIGNAL ACT LINE PROGRAM STILL RUNNING
1103  5675            JMP  I  GOODBD          /RETURN TO PROGRAM

1104  0000    ERRORX, 0                       /ERROR ROUTINE
1105  7300            CLA     CLL
1106  1022            TAD     OP2SEL          /CHECK FOR ACT LINE
1107  7700            SMA     CLA
1110  5322            JMP     CHKINH
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1111  1021            TAD     OP1SEL
1112  0143            AND     K200
1113  7640            SZA     CLA
1114  6160            CLRMOD
1115  6002            IOF                     /TURN THE INTERRUPT OFF
1116  7240            CLA     CMA
1117  1304            TAD     ERRORX
1120  6272            CIF     70
1121  5450            JMP  I  BADPAS          /GO TO ROM FOR ERROR
1122  4335    CHKINH, JMS     SWCHK           /CHECK FOR SR 0(1) TO INHIBIT ERROR HALT
1123  7710            SPA     CLA             /IS SR 0 SET TO A ONE
1124  5330            JMP     ERLPSW          /YES, GO CHECK SR 1 TO LOOP ON ERROR
1125  7340            CLA CLL CMA
1126  1304            TAD     ERRORX          /SUBTRACT ONE FROM JMS ERROR PC
1127  7402            HLT                     /AC CONTAINS THE ADDRESS WHERE THE ERROR
                                              /WAS DETECTED BY THE PROGRAM, REFER
                                              /TO THE PROGRAM LISTING FOR ERROR
                                              /EXPLANATION AND THE TEST DESCRIPTION,
1130  4335    ERLPSW, JMS     SWCHK           /CHECK THE SWITCH REGISTER TO LOOP ON ERROR
1131  7004            RAL
1132  7710            SPA     CLA             /IS SR 1 SET TO A ONE TO LOOP ON TEST
1133  5453            JMP  I  TEST            /YES GO LOOP ON THE TEST
1134  5704            JMP  I  ERRORX          /NO, RETURN TO THE PROGRAM

1135  0000    SWCHK,  0
1136  7300            CLA     CLL
1137  1021            TAD     OP1SEL          /GET THE HARDWARE STATUS WORD
1140  7700            SMA     CLA             /IS THE HARDWARE FRONT PANEL SELECTED
1141  5344            JMP     .+3             /NO, USE THE PSEUDO SWITCH REGISTER
1142  7604            LAS
1143  5735            JMP  I  SWCHK           /RETURN
1144  1020            TAD     SWITCH          /THE PSEUDO SWITCH REGISTER
1145  5735            JMP  I  SWCHK           /RETURN

1146  0000    TSTLOP, 0                       /ROUTINE TO CHECK SR 2 TO LOOP ON TEST
1147  4335            JMS     SWCHK           /GO GET THE SWITCH REGISTER
1150  7000            NTL
1151  7700            SMA     CLA
1152  5746            JMP  I  TSTLOP          /GO TO NEXT TEST
1153  5453            JMP  I  TEST            /LOOP ON SAME TEST


1154  0000    ACLBAT, 0
1155  1367            TAD     ACNLOK          /LOOK AT RETURN FOR AC LOW OR BATTERY EMPTY
1156  7640            SZA     CLA
1157  5362            JMP     .+3
1160  2000            ISZ     INTSER
1161  5400            JMP  I  INTSER
1162  3367            DCA     ACNLOK
1163  6101            SBE                     /SKIP ON BATTERY EMPTY
1164  5360            JMP     .+4
1165  2000            ISZ     INTSER
1166  5360            JMP     .+6
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          1767  0000    ACNLOK, 0

          1775  1647
          1776  0200
          1777  7634
                2000            PAGE

                0200            .200

                $
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0000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0100  11111111  11111111  11111111  11111111  11111111  1111?000  00000000  ?0?03000

0200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0300  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11103011

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  11111000  ?0?03011

1400  11111111  11111111  11111111  11111111  11111111  11111111  00000003  ?0?03000
1500  00000000  00000000  00000000  00000000  00000000  00000000  00000003  ?0?03000

1600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1700  11111111  11111111  11111111  11111111  11111111  11111111  11111111  ?0?03111


2000
2100

2200
2300

2400
2500

2600
2700


3000
3100

3200
3300

3400
3500

3600
3700
```

```
4000
4100

4200
4300

4400
4500

4600
4700


5000
5100

5200
5300

5400
5500

5600
5700


6000
6100

6200
6300

6400
6500

6600
6700


7000
7100

7200
7300

7400
7500

7600
7700
```



```
ACLBAT  1754        K4100   0153        M7      0066        TSTLOP  1746
ACNLOK  1767        K8201   0045        M70     0111        UPERLM  0040
ACTLIN  1600        K7      0134        M77     0112        WRKADD  0043
ADDCNT  0047        K73     0137        OP1SEL  0021        WRKFLD  0041
AUTHST  0052        K7877   0152        OP21K1  0000        XBAT    0060
BADPAS  0050        K77     0140        OP2SEL  0022        XPWRFL  0057
BATEMT  1663        K7707   0150        PASENV  0061
CAF     0007        K7757   0151        PC      1646
CAL     6103        K7774   0147        POWFAL  1637
CDF     6201        LINK    1645        PRGPAS  1636
CDFCHK  0033        LOOKG2  6152        PRGRST  1647
CHKCDF  0034        LOOKG3  6153        RDF     6214
CHKINH  1722        LOOP    4455        REDEMA  6195
CIF     6202        M1      0062        RIB     6234
CIFCDF  6203        M10     0067        RIF     6224
CINT    6204        M100    0113        RK8E    0023
CJMS01  1166        M1000   0117        RMF     6244
CJMS02  1210        M1007   0120        RTF     6005
CJMS03  1244        M1010   0121        SAVESZ  0036
CJMS04  1272        M1029   0122        SAVWFD  0046
CJMS05  1320        M1034   0123        SBE     6101
CJMS06  1346        M1043   0124        SCOPLP  4456
CJMS07  1410        M1052   0125        SINT    6254
CJMS10  1436        M1061   0126        SKON    6000
CLREMA  6154        M1076   0127        SKPEMA  6166
CLRMOD  6160        M11     0070        SPL     6102
CLRSIM  6150        M1100   0130        SUF     6274
CUF     6264        M125    0114        SWCHK   1735
DATPAT  0042        M192    0115        SWITCH  0020
DATREC  0035        M10     0071        TEST    0053
DEAD    1673        M2      0063        TEST1   0201
ENDING  1630        M20     0072        TEST10  1053
ENDPAS  1617        M22     0073        TEST11  1116
ERLPSW  1730        M25     0074        TEST2   0343
ERROR   4454        M30     0075        TEST3   0432
ERRORX  1704        M300    0116        TEST4   0474
EXECUT  6164        M33     0076        TEST5   0530
FLDLIM  0037        M34     0077        TEST6   0577
GOODBD  1675        M4      0064        TEST7   0647
GOODPS  0051        M40     0100        TEST8   0706
GTF     6004        M4100   0131        TEST9   0776
HGHLIM  0044        M43     0101        TESTAD  1054
HLT     7402        M44     0102        TST11A  1137
INTSER  0000        M5      0065        TST11B  1156
K10     0135        M50     0103        TST11C  1204
K125    0141        M5000   0132        TST11D  1234
K152    0142        M5100   0133        TST11E  1262
K1777   0145        M52     0104        TST11F  1310
K200    0143        M55     0105        TST11G  1336
K2000   0146        M60     0106        TST11H  1400
K37     0136        M61     0107        TST11I  1426
K400    0144        M66     0110        TST2CN  0402
```

```
ERRORS DETECTED: 0
LINKS GENERATED: 5
RUN-TIME:  18 SECONDS
3K CORE USED
```



```
                        /KM8-A OPTION TEST 2 MAINDEC-08-DJKMA-A-L 1K PART 2
                        /
                        /COPYRIGHT (C) 1974, DIGITAL EQUIPMENT CORPORATION
                        /
                        /PROGRAMMER: BRUCE HANSEN
                        /



                        ////////////////////////////////////////////////////////////////////////////////
                        /THE FOLLOWING LISTING WILL CORRESPOND TO THE PAPER TAPE LABELED MAINDEC-08-DJKMA-A-PM2,
                        /1K PART 2, THIS PAPER TAPE AND LISTING WILL BE THE SECOND OF FOUR 1K SEGMENTED
                        /PAPER TAPES AND LISTINGS FOR COMPUTERS WITH LESS THAN 4K OF MEMORY,
                        ////////////////////////////////////////////////////////////////////////////////
```

```
                        /KM8-A OPTION TEST 2 MAINDEC-08-DJKMA-A-L 1K PART 2
                        /
                        /COPYRIGHT 1974, DIGITAL EQUIPMENT CORP., MAYNARD, MASS., 01754
                        /
                        /POP-8A OPTION TEST 2 TESTS THE MEMORY EXTENTION/TIME SHARE CONTROL,
                        /POWER FAIL/AUTO RESTART, AND BOOTSTRAP LOADERS


0000                    SKON=0000
0007                    CAF=0007
7402                    HLT=7402

                        /SWITCH REGISTER SETTINGS

                        /SR0=1  INHIBIT ERROR HALT
                        /SR1=1  LOOP ON ERROR
                        /SR2=1  LOOP ON TEST
                        /SR3=1  HALT AT COMPLETION OF A PROGRAM PASS

                        /MEMORY EXTENTION/TIME SHARE INSTRUCTIONS

6004                    GTF=6004                /GET FLAGS,  READS THE FOLLOWING MACHINE STATES
                                                /INTO THE INDICATED BITS OF THE AC
                                                /AC0 LINE
                                                /AC2 INTERRUPT REQUEST
                                                /AC4 INTERRUPT ENABLE F/F
                                                /AC5 USER FLAG
                                                /AC6-11 SAVE FIELD REGISTER

6005                    RTF=6005                /RESTORE THE FLAGS,  RTF LOADS THE LINK FROM AC0,
                                                /LOADS THE USER BUFFER F/F, INSTRUCTION BUFFER AND
                                                /DATA FIELD WITH AC3, AC6-8, AC 9-11 AND INHIBITS
                                                /PROCESSOR INTERRUPTS UNTIL NEXT  JMP OR JMS INSTRUCTION,
                                                /AT THE END OF THE JMP OR JMS, THE CONTENTS OF THE U.B. & I.B.
                                                /ARE LOADED INTO USER FIELD F/F, AND THE I,F,,  INTERRUPT ENABLE
                                                /IS SET AND INTERRUPT INHIBIT AS CLEARED

6234                    RIB=6234                /READ THE INTERRUPT BUFFER

6244                    RMF=6244                /RESTORES MEMORY FLAGS

6204                    CINT=6204               /CLEAR USER INTERRUPT FLIP-FLOP

6254                    SINT=6254               /SKIP ON USER INTERRUPT FLIP-FLOP

6264                    CUF=6264                /CLEAR USER BUFFER FLIP-FLOP

6274                    SUF=6274                /SET USER BUFFER FLIP-FLOP (ENTER TIME SAME MODE)AND
                                                /INHIBITS PROCESSOR INTERRUPTS UNTIL THE NEXT JMP OR
                                                /JMS INSTRUCTION,  AT THE END OF THE JMP OR JMS
                                                /INSTRUCTION, THE USER BUFER IS LOADED INTO THE USER
                                                /FIELD F/F,

6201                    CDF=6201                /CHANGE DATA FIELD
```



```
6202                    CIF=6202                /CHANGE INSTRUCTION FIELD
6214                    RDF=6214                /READ THE DATA FIELD INTO AC BITS 6-8
6224                    RIF=6224                /READ THE INSTRUCTION FIELD INTO AC BITS 6-8
6203                    CIFCDF=6203             /PERFORMS THE CIF AND CDF FUNCTIONS

                        /POWER FAIL INSTRUCTIONS

6102                    SPL=6102                /SKIP ON AC LOW FLIP-FLOP

6103                    CAL=6103                /CLEAR AC LOW FLIP-FLOP

6101                    SBE=6101                /SKIP ON BATTERY EMPTY FLIP-FLOP

                        /OPTION BOARD 2 SIMULATOR IOT'S

6150                    CLRSIM=6150             /CLEAR CONTROL REGISTERS
6152                    LODMG2=6152             /LOAD CONTROL REGISTER 2
6153                    LODMG3=6153             /LOAD CONTROL REGISTER 3
6154                    CLREMA=6154             /CLEAR EMA CATCHER LOGIC
6155                    REDEMA=6155             /READ EMA CATCHER REGISTER
6160                    CLRMOD=6160             /CLEAR TEST MODULE LOGIC
6164                    EXECUT=6164             /EXECUT AND CONTROL WORD 3 BIT 7 =1 ISSUE A POWER ON PULSE
                                                /EXECUT AND CONTROL WORD 3 BIT 7 =0 ISSUE A SWITCH SW PULSE
6166                    SKPEMA=6166             /SKPEMA AND CONTROL WORD 3 BIT 3 =1 EMA INTERRUPT AND SKIP ENABLE
                                                /SKPEMA AND CONTROL WORD 3 BIT 3 =0 EMA INTERRUPT AND SKIP DISABLE

                        /OPTION BOARD2 SIMULATOR CONTROL WORD 2 BIT ASSIGNMENTS
                        /
                        /BITS 0 - 1     NOT USED
                        /BITS 2 - 8     BOOT STRAP PROGRAM SELECT
                        /BITS 9 - 11    AUTO-RESTART ADDRESS SELECT

                        /OPTION BOARD 2 SIMULATOR CONTROL WORD 3 BIT ASSIGNMENTS
                        /
                        /BIT 0          TIME SHARE 0=ENABLED  1=DISABLED
                        /BIT 1          AC LOW (L) 1=PULLED LOW  0=FREE STATE
                        /BIT 2          BATT EMPTY 1=BATT EMPTY PULLED LOW  2=FREE STATE
                        /BIT 3          1=EMA INTERRUPT/SKIP ENABLE  0=EMA INTERRUPT SKIP DISABLE
                        /BITS 4 - 6     NOT USED
                        /BIT 7          1=POWER ON PULSE WITH EXECUT 0=SWITCH SW PULSE WITH EXECUT
                        /BIT 8          1=DISABLES BOOTSTRAP WHILE RUNNING  2=ENABLES BOOTSTRAP WHILE RUNNING
                        /BIT 9 - 11     AUTO-RESTART/BOOT STRAP ENABLE CODE



        0000            *0

0000    0000    INTSEH, 0                       /JMS I AUTRST PLACED HERE FOR SIMULATOR AUTO RESTART
0001    3035            DCA     DATREC
0002    6102            SPL                     /SKIP ON AC LOW
0003    7410            SKP
0004    5457            JMP  I  XPWRFL          /POWER GOING DOWN
0005    6101            SBE                     /SKIP ON BATTERY EMPTY
```

```
0006  7410          SKP
0007  5460          JMP  I  XBAT          /GO HALT THE COMPUTER ,ITS ALL OVER
0010  6224          RIF                   /READ THE INSTRUCTION FIELD
0011  7640          SZA     CLA
0012  4454          ERROR                 /IF, IS NOT 0 AFTER A INTERRUPT
0013  6214          RDF                   /READ THE DATA FIELD
0014  7640          SZA     CLA
0015  4454          ERROR                 /DF, IS NOT 0 AFTER A INTERRUPT
0016  2000          ISZ     INTSER        /ADD 1 TO THE INTERRUPTED PC
0017  5400          JMP  I  INTSER        /RETURN TO THE PROGRAM

      0020    *20
0020  0000    SWITCH, 0                   /PSEUDO SWITCH REGISTER IF BIT 0=0 OF OP1SEL
0021  1000    OP1SEL, 1000

                                          /BIT 0=0 USE LOC 20 AS A PSEUDO S,R,
                                          /BIT 0=1 USE HARDWARE FRONT PANEL S,R,
                                          /BIT 1=1 HAS 8A OPTION 1
                                          /BIT 2=1 HAS 8A OPTION 2
                                          /BIT 3=1 HAS 8A CPU SIMULATOR
                                          /BIT 4=1 HAS 8A OPTION 1 + 2 TEST MODULE
                                          /BIT 5=1 PROGRAM ON 8A XOR
                                          /BIT 6=1 HAS PDP-8E TYPE CPU
                                          /BITS 7-11 MEMORY SIZE = 0'S = 1K, 37=32K,
                                          /MEMORY SIZE CAN BE INCREASED IN 1K INCREMENTS
                                          /BY ADDING A 1 TO THE NUMBER IN BITS 7-11,
0022  0000    OP2SEL, 0
                /RK8E BOOT STRAP WILL LOAD INTO THE FOLLOWING LOCATIONS

0023  7402    RK8E,   HLT                 /2000
0024  7402            HLT                 /0745
0025  7402            HLT                 /0023
0026  7402            HLT                 /7650
0027  7402            HLT                 /5024
0030  7402            HLT                 /6733
0031  7402            HLT                 /5031
0032  7402            HLT                 /TERMINATOR
0033  0000    CDFCHK, 0
0034  0033    CHKCDF, CDFCHK
0035  0000    DATREC, 0
0036  0000    SAVESE, 0
0037  0000    FLDLIM, 0
0040  0000    UPEMLM, 0
0041  0000    WRKFLD, 0
0042  0000    DATPAT, 0
0043  0000    WRKADD, 0
0044  0000    HGHLIM, 0
0045  6201    K6201,  6201
0046  0000    SAVMFU, 0
0047  0000    ADDCNT, 0
0050  6520    BADMAS, 6520
0051  6500    GOODPS, 6500
0052  1647    AUTHST, PRGMST
0053  0000    TEST,   0                   /SCOPE LOOP AND TEST LOOP ADDRESS
```



```
      4454    ERROR=  JMS  I  .
0054  1704                     ERRORX
      4455    LOOP=   JMS  I  .
0055  1740                     TSTLOP
      4456    SCOPLP= JMS  I  .
0056  1654                     TESTAD

0057  1637    XPWRFL, POWFAL
0060  1663    XBAT,   BATEMT
0061  1617    PASENU, ENDPAS

                /CONSTANTS USED BY THE PROGRAM

0062  7777    M1,     -1
0063  7776    M2,     -2
0064  7774    M4,     -4
0065  7773    M5,     -5
0066  7771    M7,     -7
0067  7770    M10,    -10
0070  7767    M11,    -11
0071  7762    M16,    -16
0072  7760    M20,    -20
0073  7756    M22,    -22
0074  7753    M25,    -25
0075  7750    M30,    -30
0076  7745    M33,    -33
0077  7744    M34,    -34
0100  7740    M40,    -40
0101  7735    M43,    -43
0102  7734    M44,    -44
0103  7730    M50,    -50
0104  7726    M52,    -52
0105  7723    M55,    -55
0106  7720    M60,    -60
0107  7717    M01,    -01
0110  7712    M06,    -06
0111  7710    M70,    -70
0112  7701    M77,    -77
0113  7700    M100,   -100
0114  7653    M125,   -125
0115  7626    M132,   -132
0116  7500    M300,   -300
0117  7000    M1000,  -1000
0120  6771    M1007,  -1007
0121  6762    M1016,  -1016
0122  6753    M1025,  -1025
0123  6744    M1034,  -1034
0124  6735    M1043,  -1043
0125  6726    M1052,  -1052
0126  6717    M1061,  -1061
0127  6710    M1070,  -1070
0130  6700    M1100,  -1100
0131  3700    M4100,  -4100
```

```
0132  3000    M5000,  .-5000
0133  2700    M5100,  .-5100

0134  0007    K7,     7
0135  0010    K10,    10
0136  0037    K37,    37
0137  0070    K70,    70
0140  0077    K77,    77
0141  0125    K125,   125
0142  0152    K152,   152
0143  0200    K200,   200
0144  0400    K400,   400
0145  1777    K1777,  1777
0146  2000    K2000,  2000
0147  7774    K7774,  7774
0150  7707    K7707,  7707
0151  7757    K7757,  7757
0152  7677    K7677,  7677
0153  4100    K4100,  4100

      0200    .200

/**********************************************************************************************************
/TEST 12 - CHECKS THAT A CIF AND CDF WILL LOAD THE APPROPIATE
/SAVE FIELD REGISTERS, A DCA INDIRECT IS CHECKED NOT TO CHANGE
/A LOCATION IN FIELD 0 WHEN THE DATA FIELD IS NON ZERO,  A
/JMS I IS CHECKED NOT TO CHANGE A LOCATION IN FIELD ZERO WHEN
/THE INSTRUCTION FIELD IS NON ZERO.
/**********************************************************************************************************

0200  4456    TEST12, SCOPLP                  /SETUP TEST AND SCOPE LOOPING ADDRESS
0201  6007            CAF                     /CLEAR ALL FLAGS
0202  6001            ION                     /TURN THE INTERRUPT ON
0203  6274            SUF                     /SET USER BUFFER FLIP-FLOP
0204  5205            JMP     .+1             /ENTER TIME SHARE MODE
0205  7402            HLT                     /PROGRAM FAILED TO ENTER USER MODE
0206  5206            JMP     .               /HLT FAILED TO TRAP
0207  6254            SINT                    /SKIP ON USER INTERRUPT
0210  4454            ERROR                   /SINT FAILED OR USER INTERRUPT NOT SET
0211  6004            GTF                     /GET THE FLAGS
0212  1130            TAD     M1100           /CHECK FOR USER INTERRUPT AND USER FLAG
0213  7640            SZA CLA
0214  4454            ERROR                   /GTF HEAD SOMETHING DIFFERENT THAN ABOVE
0215  7340    TST12A, CLA CLL CMA             /SET THE AC TO ALL ONES
0216  3033            DCA     CDFCHK          /STORE IT TO CHECK THAT THE DATA FIELD CHANGED
0217  7340            CLA CLL CMA             /SET THE AC TO ALL ONES
0220  3227            DCA     CKJMS1          /SAVE IT TO CHECK THE JMS TO ANOTHER FIELD
0221  6261            CDF     60              /CHANGE DATA FIELD TO FIELD 6
0222  6212            CIF     10              /CHANGE INSTRUCTION FIELD TO FIELD 1
0223  3434            DCA I   CHKCDF          /CHANGE EMA LINES TO CHECK THAT THE
                                              /DCA WENT TO ANOTHER FIELD THAN FIELD 0
0224  6001            ION                     /TURN THE INTERRUPT ON
0225  4620            JMS I   .+1             /CLEAR INTERRUPT INHIBIT AND INTERRUPT
0226  0227            CKJMS1
```



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0227  7402    CKJMS1, HLT                     /THIS LOCATION PRESET TO ONE'S TO CHECK JMS TO ANOTHER FIELD
0230  4454            ERROR                   /PROGRAM FAILED TO INTERRUPT
0231  6004            GTF                     /GET THE FLAGS
0232  1121            TAD     M1016           /CHECK FOR INT REQ, ISF OF 10 AND DSF OF 6
0233  7640            SZA CLA                 /IN SAVE FIELD REGISTER
0234  4454            ERROR                   /SAVE FIELD NOT EQUAL TO ABOVE
0235  6234            RIB                     /READ THE INTERRUPT BUFFER
0236  1071            TAD     M16             /CHECK FOR ISF OF 10 AND DSF OF 6
0237  7640            SZA CLA
0240  4454            ERROR                   /RIB FAILED OR SAVE FIELD NOT EQUAL TO 16
0241  2033            ISZ     CDFCHK          /CHECK THAT THE DCA I WENT TO ANOTHER FIELD
0242  4454            ERROR                   /DCA I WENT TO FIELD 0 INSTEAD OF FIELD 6
0243  2227            ISZ     CKJMS1          /CHECK THAT JMS I WENT TO ANOTHER FIELD
0244  4454            ERROR                   /JMS I WENT TO FIELD 0 INSTEAD OF FIELD 1
0245  7340    TST12B, CLA CLL CMA             /SET LOCATION CDFCHK AND CKJMS2 TO ONES
0246  3033            DCA     CDFCHK          /TO CHECK DCA I AND JMS I WENT TO
0247  7340            CLA CLL CMA             /ANOTHER FIELD THAN FIELD 0
0250  3257            DCA     CKJMS2
0251  6211            CDF     10              /CHANGE DATA FIELD TO FIELD 1
0252  6262            CIF     60              /CHANGE INSTRUCTION FIELD TO FIELD 6
0253  3434            DCA I   CHKCDF          /CHANGE EMA LINES TO FIELD 1
                                              /CDFCHK SHOULD NOT CHANGE IN FIELD 0
0254  6001            ION                     /TURN THE INTERRUPT ON
0255  4650            JMS I   .+1             /CLEAR INTERRUPT INHIBIT
0256  0257            CKJMS2                  /INDIRECT ADDRESS
0257  7402    CKJMS2, HLT                     /THIS LOCATION PRESET TO ONE'S TO CHECK JMS TO FIELD 6
0260  4454            ERROR                   /PROGRAM FAILED TO INTERRUPT
0261  7340            CLA CLL CMA             /SET THE AC TO ALL ONES
0262  6004            GTF                     /GET THE FLAGS
0263  1120            TAD     M1061           /CHECK FOR INT REQ, ISF OF 60 AND DSF OF 1
0264  7640            SZA CLA
0265  4454            ERROR                   /THE SAVE FIELD NOT EQUAL TO ABOVE
0266  6234            RIB                     /READ THE INTERRUPT BUFFER
0267  1107            TAD     M61             /CHECK FOR I,S,F, OF 6 AND I,D,F, OF 1
0270  7640            SZA CLA
0271  4454            ERROR                   /THE SAVE FIELD NOT EQUAL TO ABOVE
0272  2033            ISZ     CDFCHK          /CHECK THAT DCA I WENT TO ANOTHER FIELD
0273  4454            ERROR                   /DCA I WENT TO FIELD 0 INSTEAD OF FIELD 1
0274  2257            ISZ     CKJMS2          /CHECK THAT JMS I WENT TO ANNOTHER FIELD
0275  4454            ERROR                   /JMS I WENT TO FIELD 0 INSTEAD OF FIELD 16,
0276  7340    TST12C, CLA CLL CMA             /SET LOCATIONS CDFCHK AND CKJMS3 TO ONE'S
0277  3033            DCA     CDFCHK          /TO CHECK THAT DCA I AND JMS I WENT
0300  7340            CLA CLL CMA             /TO ANOTHER FIELD THAN FIELD 0
0301  3310            DCA     CKJMS3
0302  6232            CIF     30              /CHANGE INSTRUCTIN FIELD TO FIELD 3
0303  6241            CDF     40              /CHANGE DATA FIELD TO FIELD 4
0304  3434            DCA I   CHKCDF          /CHANGE EMA LINES TO FIELD 4
0305  6001            ION                     /TURN THE INTERRUPT ON
0306  4707            JMS I   .+1             /CLEAR INTERRUPT INHIBIT
0307  0310            CKJMS3                  /INDIRECT ADDRESS
0310  7402    CKJMS3, HLT                     /THIS LOCATION PRESET TO ONES TO CHECK JMS TO FIELD 3
0311  4454            ERROR                   /PROGRAM FAILED TO INTERRUPT
0312  7340            CLA CLL CMA             /SET THE AC TO ALL ONES
0313  6004            GTF                     /GET THE FLAGS
0314  1123            TAD     M1034           /CHECK FOR INT REQ, ISF OF 3 AND DSF OF 4
```

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0315  7640            SZA CLA
0316  4454            ERROR                   /THE SAVE FIELD REGISTER NOT EQUAL TO ABOVE
0317  6234            RIB                     /READ THE INTERRUPT BUFFER
0320  1077            TAD     M34             /CHECK FOR ISF OF 3 AND DSF OF 4
0321  7640            SZA CLA
0322  4454            ERROR                   /THE SAVE FIELD REGISTER NOT EQUAL TO ABOVE
0323  2033            ISZ     CDFCHK
0324  4454            ERROR                   /DCA I WENT TO FIELD 0 INSTEAD OF FIELD 4
0325  2310            ISZ     CKJMS3
0326  4454            ERROR                   /JMS I WENT TO FIELD 0 INSTEAD OF FIELD 3
0327  7340    TST12D, CLA CLL CMA             /SET LOCATIONS CDFCHK AND CKJMS4 TO ONES,
0330  3033            DCA     CDFCHK          /TO CHECK THAT DCA I OR JMS I TO ANOTHER
0331  7340            CLA CLL CMA             /FIELD DOESN'T GO TO FIELD 0
0332  3341            DCA     CKJMS4
0333  6252            CIF     50              /CHANGE INSTRUCTION FIELD TO FIELD 5
0334  6221            CDF     20              /CHANGE DATA FIELD TO FIELD 2
0335  3434            DCA I   CHKCDF          /CHANGE EMA LINES TO FIELD 2
0336  6001            ION                     /TURN THE INTERRUPT ON
0337  4740            JMS I   .+1             /CLEAR INTERRUPT INHIBIT
0340  0341            CKJMS4                  /INDIRECT ADDRESS
0341  7402    CKJMS4, HLT                     /THIS LOCATION PRESET TO ONES TO CHECK JMS TO FIELD 5
0342  4454            ERROR                   /PROGRAM FAILED TO INTERRUPT
0343  7340            CLA CLL CMA             /SET THE AC TO ALL ONES
0344  6004            GIF                     /GET THE FLAGS
0345  1125            TAD     M1052           /CHECK FOR INT, REQ,, ISF OF 5, AND DSF OF 2
0346  7640            SZA CLA
0347  4454            ERROR                   /THE SAVE FIELD REGISTER NOT EQUAL TO ABOVE
0350  6234            RIB                     /READ THE INTERRUPT BUFFER
0351  1104            TAD     M52             /CHECK FOR ISF OF 5 AND DSF OF 2
0352  7640            SZA CLA
0353  4454            ERROR                   /SAVE FIELD NOT EQUAL TO ABOVE
0354  2033            ISZ     CDFCHK
0355  4454            ERROR                   /DCA I TO FIELD 2 WENT TO FIELD 0
0356  2341            ISZ     CKJMS4
0357  4454            ERROR                   /JMS I TO FIELD 5 WENT TO FIELD 0
0360  5777'           JMP     TST12E

0377  0401
      0400            PAGE

0400  7000            NOP
0401  7340    TST12E, CLA CLL CMA             /SETUP LOCATIONS CDFCHK AND CKJMS5 TO ONES
0402  3033            DCA     CDFCHK          /TO CHECK THAT DCA I OR JMP I TO ANOTHER
0403  7240            CLA CMA                 /FIELD DOESN'T GO TO FIELD 0
0404  3213            DCA     CKJMS5
0405  6251            CDF     50              /CHANGE DATA FIELD TO FIELD 5
0406  6222            CIF     20              /CHANGE INSTRUCTION FIELD TO 2
0407  3434            DCA I   CHKCDF          /CHANGE EMA LINES TO 5 (DF ON)
0410  6001            ION                     /TURN INTERRUPT ENABLE ON
0411  4612            JMS I   .+1             /CLEAR INTERRUPT INHIBIT
0412  0413            CKJMS5                  /INDIRECT ADDRESS
0413  7402    CKJMS5, HLT                     /THIS LOCATION PRESET TO ONES TO CHECK JMS TO FIELD 2
0414  4454            ERROR                   /PROGRAM FAILED TO INTERRUPT
0415  7340            CLA CLL CMA             /SET THE AC TO ALL ONES
0416  6004            GIF                     /GET THE FLAGS
```



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0417  1122            TAD     M1025           /CHECK FOR INT, REQ,, ISF=2 AND DSF=5
0420  7640            SZA CLA
0421  4454            ERROR                   /THE SAVE FIELD REGISTER NOT EQUAL TO ABOVE
0422  6234            RIB                     /READ THE INTERRUPT BUFFER
0423  1074            TAD     M25             /CHECK FOR ISF OF 2 AND DSF=5
0424  7640            SZA CLA
0425  4454            ERROR                   /SAVE FIELD REGISTER NOT EQUAL TO ABOVE
0426  2033            ISZ     CDFCHK
0427  4454            ERROR                   /DCA I TO FIELD 5 WENT TO FIELD 0
0430  2213            ISZ     CKJMS5
0431  4454            ERROR                   /JMS I TO FIELD 2 WENT TO FIELD 0
0432  7340    TST12F, CLA CLL CMA             /SET LOCATIONS CDFCHK AND CKJMS6 TO
0433  3033            DCA     CDFCHK          /ONES TO CHECK THAT DCA I AND JMS I
0434  7240            CLA CMA                 /TO ANOTHER FIELD DOESN'T GO TO FIELD 0
0435  3244            DCA     CKJMS6
0436  6231            CDF     30              /CHANGE DATA FIELD TO FIELD 3
0437  6242            CIF     40              /CHANGE INSTRUCTION FIELD TO FIELD 4
0440  3434            DCA I   CHKCDF          /CHANGE EMA LINES TO 3
0441  6001            ION                     /TURN THE INTERRUPT ON
0442  4643            JMS I   .+1             /CLEAR INTERRUPT INHIBIT
0443  0444            CKJMS6                  /INDIRECT ADDRESS
0444  7402    CKJMS6, HLT                     /THIS LOCATION PRESET TO ONES TO CHECK JMS TO FIELD 4
0445  4454            ERROR                   /PROGRAM FAILED TO INTERRUPT
0446  7340            CLA CLL CMA             /SET THE AC TO ALL ONE'S
0447  6004            GIF                     /GET THE FLAGS
0450  1124            TAD     M1043           /CHECK FOR INT, REQ,, ISF OF 4 AND DSF OF 3,
0451  7640            SZA CLA
0452  4454            ERROR                   /SAVE FIELD NOT EQUAL TO ABOVE
0453  6234            RIB                     /READ THE INTERRUPT BUFFER
0454  1101            TAD     M43             /CHECK FOR ISF OF 4 AND DSF OF 3
0455  7640            SZA CLA
0456  4454            ERROR                   /SAVE FIELD NOT EQUAL TO ABOVE
0457  2033            ISZ     CDFCHK
0460  4454            ERROR                   /DCA I WENT TO FIELD 0 INSTEAD OF FIELD 3
0461  2244            ISZ     CKJMS6
0462  4454            ERROR                   /JMS I WENT TO FIELD 0 INSTEAD OF FIELD 4
0463  7340    TST12G, CLA CLL CMA             /SET CDFCHK AND CKJMS7 TO ONES TO
0464  3033            DCA     CDFCHK          /CHECK FOR DCA I TO ANOTHER FIELD AND A
0465  7240            CLA CMA                 /JMS I TO ANOTHER FIELD
0466  3275            DCA     CKJMS7
0467  6271            CDF     70              /CHANGE DATA FIELD TO FIELD 7
0470  6202            CIF     00              /CHANGE INSTRUCTION FIELD TO FIELD 0
0471  3434            DCA I   CHKCDF          /CHANGE EMA LINES TO 7
0472  6001            ION                     /TURNN INTERRUPT ON
0473  4674            JMS I   .+1             /CLEAR INTERRUPT INHIBIT
0474  0475            CKJMS7                  /INDIRECT ADDRESS
0475  7402    CKJMS7, HLT                     /THIS LOCATION WAS SET TO ONE'S BUT SHOULD CHANGE
0476  4454            ERROR                   /PROGRAM FAILED TO INTERRPT
0477  7340            CLA CLL CMA             /GET THE FLAGS
0500  6004            GIF
0501  1120            TAD     M1007           /CHECK FOR INT, REQ,, ISF=0, DSF=7
0502  7640            SZA CLA
0503  4454            ERROR                   /SAVE FIELD NOT EQUAL TO ABOVE
0504  6234            RIB                     /READ THE INTERRUPT BUFFER
0505  1066            TAD     M7              /CHECK FOR DSF OF 7
```

```
0506  7640          SZA CLA
0507  4454          ERROR                   /SAVE FIELD NOT EQUAL TO DSF OF 7
0510  2033          ISZ     CDFCHK
0511  4454          ERROR                   /DCA I WENT TO FIELD 0 INSTEAD OF FIELD 7
0512  2275          ISZ     CKJMS7
0513  7410          SKP
0514  4454          ERROR                   /JMS I TO FIELD 0 WENT TO ANOTHER FIELD
0515  7340  TST12H, CLA CLL CMA             /SET UP CDFCHK TO ONES TO CHECK THAT
0516  3033          DCA     CDFCHK          /DCA I TO FIELD 0 WILL CLEAR IT AND SET
0517  7340          CLA CLL CMA             /LOCATION CKJMS8 TO 1'S TO CHECK THAT
0520  3327          DCA     CKJMS8          /JMS I TO FIELD 7 WON'T CLEAR IT
0521  6201          CDF     00              /CHANGE DATA FIELD TO FIELD 0
0522  6272          CIF     70              /CHANGE INSTRUCTION FIELD TO FIELD 7
0523  3434          DCA I   CHKCDF          /CLEAR LOCATION CDFCHK IF EMA LINES WENT TO ZERO
0524  6001          ION                     /TURN THE INTERRUPT ON
0525  4726          JMS I   .+1             /CLEAR INTERRUPT INHIBIT
0526  0527          CKJMS8                  /INDIRECT ADDRESS
0527  7402  CKJMS8, HLT                     /THIS LOCATION PRESET TO 1'S, IT SHOULD NOT CHANGE
0530  4454          ERROR                   /PROGRAM FAILED TO INTERRUPT
0531  7340          CLA CLL CMA             /SET THE AC TO ALL ONES
0532  6004          GTF                     /GET THE FLAGS
0533  1127          TAD     M1070           /CHECK FOR INT. REQ,, ISF=7 AND DSF=0
0534  7640          SZA CLA
0535  4454          ERROR                   /SAVE FIELD REGISTER NOT EQUAL TO ABOVE
0536  6234          RIB                     /READ THE INTERRUPT BUFFER
0537  1111          TAD     M70             /CHECK SAVE FIELDS FOR ISF OF 7 AND DSF OF 0
0540  7640          SZA CLA
0541  4454          ERROR                   /SAVE FIELD NOT EQUAL TO ABOVE
0542  2033          ISZ     CDFCHK
0543  7410          SKP
0544  4454          ERROR                   /DCA I TO FIELD 0 WENT TO ANOTHER FIELD
0545  2327          ISZ     CKJMS8
0546  4454          ERROR                   /JMS I TO FIELD 7 WENT TO FIELD 0
0547  7240  TST121, CLA CMA                 /SETUP CDFCHK AND CKJMS9 TO ONES TO
0550  3033          DCA     CDFCHK          /CHECK THAT DCA I AND JMS I TO FIELD 0
0551  7340          CLA CLL CMA             /WILL CHANGE THESE LOCATIONS
0552  3361          DCA     CKJMS9
0553  6201          CDF     00              /CHANGE DATA FIELD TO FIELD 0
0554  6202          CIF     00              /CHANGE INSTRUCTION FIELD TO FIELD 0
0555  3434          DCA I   CHKCDF          /CLEAR LOCATION CDFCHK
0556  6001          ION                     /SET INTERRUPT ENABLE
0557  4760          JMS I   .+1             /CLEAR INTERRUPT INHIBIT
0560  0561          CKJMS9                  /INDIRECT ADDRESS
0561  7402  CKJMS9, HLT                     /THIS LOCATION PRESET TO ONES, SHOULD CHANGE
0562  4454          ERROR                   /PROGRAM FAILED TO INTERRUPT
0563  7340          CLA CLL CMA             /SET THE AC TO ALL ONE'S
0564  6004          GTF                     /GET THE FLAGS
0565  1117          TAD     M1000           /CHECK FOR INTERRUPT REQUEST
0566  7640          SZA CLA
0567  4454          ERROR                   /SAVE FIELD NOT EQUAL TO ABOVE
0570  6234          RIB                     /READ THE INTERRUPT BUFFER
0571  7640          SZA CLA                 /IS THE SAVE FIELD EQUAL TO 0
0572  4454          ERROR                   /SAVE FIELD NOT EQUAL TO ZERO
0573  2033          ISZ     CDFCHK
0574  7410          SKP
```



```
0575  4454          ERROR                   /DCA I TO FIELD 0 DID NOT GO TO FIELD 0
0576  2361          ISZ     CKJMS9
0577  7410          SKP
0600  4454          ERROR                   /JMS I TO FIELD 0 DID NOT GO TO FIELD 0
0601  1150          TAD     K7707           /CHECK THE INCLUSIVE OR OF RIF WITH AC
0602  6224          RIF
0603  1137          TAD     K70
0604  7040          CMA
0605  7640          SZA CLA
0606  4454          ERROR                   /THE INCLUSIVE OR OF IF WITH AC FAILED
0607  6254          SINT                    /SKIP ON USER INTERRUPT
0610  4454          ERROR                   /USER INTERRUPT FLIP-FLOP GOT CLEARED
0611  6007          CAF                     /CLEAR ALL FLAGS
0612  6254          SINT                    /SKIP ON USER INTERRUPT
0613  7410          SKP
0614  4454          ERROR                   /INIT FAILED TO CLEAR USER INTERRUPT F/F
0615  4455          LOOP                    /LOOP ON TEST IF SR = 1000
```

```
/*****************************************************************************************
/TEST 13 = CHECKS THE MICRO PROGRAM INSTRUCTIONS CDF CIF (62X3).  A DCA I
/AND JMS ARE ALSO ISSUED TO CHECK THAT THESE INSTRUCTIONS DO NOT DESTROY
/LOCATIONS IN FIELD 0.  THE USER INTERRUPT F/F IS USED TO CAUSE INTERRUPTS.
/*****************************************************************************************
```

```
0616  4456  TEST13, SCOPLP                 /SETUP TEST AND SCOPLE LOOPING ADDRESS
0617  6007          CAF                     /CLEAR ALL FLAGS
0620  6202          CIF     00              /INITIALIZE THE IF AND DF TO FIELD 0
0621  6201          CDF     00              /
0622  5223          JMP     .+1             /LOAD THE IF BY A JMP
0623  6001          ION                     /TURN THE INTERRUPT ON
0624  6274          SUF                     /SET THE USER BUFFER F/F
0625  5226          JMP     .+1             /ENTER USER MODE
0626  7402          HLT                     /PROGRAM FAILED TO TRAP
0627  5227          JMP     .               /HALT FAILED TO TRAP
0630  6254          SINT                    /SKIP ON USER INTERRUPT FLIP-FLOP
0631  4454          ERROR                   /USER INTERRUPT FLIP-FLOP NOT SET
0632  6234          RIB                     /READ THE INTERRUPT BUFFER
0633  1113          TAD     M100
0634  7640          SZA CLA
0635  4454          ERROR                   /USER FLAG NOT SET OR SAVE FIELD NON ZERO
0636  7240  TST13A, CLA CMA                 /SETUP TWO LOCATIONS TO CHECK THAT A CIF,CDF
0637  3033          DCA     CDFCHK          /WENT TO ANOTHER FIELD BY DOING A DCA I AND JMS
0640  7240          CLA CMA
0641  3246          DCA     JMSCK1
0642  6273          CIFCDF  70              /CHANGE IF AND DF TO FIELD 7
0643  3434          DCA I   CHKCDF          /TRY TO CLEAR CDFCHK IN FIELD 7
0644  6001          ION                     /SET INTERRUPT ENABLE
0645  4246          JMS     JMSCK1          /CLEAR INTERRUPT INHIBIT AND INTERRUPT
0646  7402  JMSCK1, HLT                     /THIS LOCATION PRESET TO 7777
0647  4454          ERROR                   /PROGRAM FAILED TO INTERRUPT
0650  6234          RIB                     /READ THE INTERRUPT BUFFER
0651  1112          TAD     M77             /CHECK SAVE FIELD FOR ISF OF 7 AND DSF OF 7
0652  7640          SZA CLA
0653  4454          ERROR                   /CIFCDF TO FIELD 7 FAILED OR SAVE FIELD NOT=TO 77
0654  2033          ISZ     CDFCHK
```

```
0055  4454                ERROR
0056  2246                ISZ     JMSCK1
0057  4454                ERROR
0060  6254                SINT
0061  4454                ERROR
0062  7240    TST13B,     CLA CMA
0063  3033                DCA     CDFCHK
0064  7240                CLA CMA
0065  3272                DCA     JMSCK2
0066  6223                CIFCDF  20
0067  3434                DCA I   CHKCDF
0070  6001                ION
0071  4272                JMS     JMSCK2
0072  7402    JMSCK2,     HLT
0073  4454                ERROR
0074  6234                RIB
0075  1073                TAD     M22
0076  7640                SZA CLA
0077  4454                ERROR
0100  2033                ISZ     CDFCHK
0101  4454                ERROR
0102  2272                ISZ     JMSCK2
0103  4454                ERROR
0104  7240    TST13C,     CLA CMA
0105  3033                DCA     CDFCHK
0106  7240                CLA CMA
0107  3314                DCA     JMSCK3
0110  6253                CIFCDF  50
0111  3434                DCA I   CHKCDF
0112  6001                ION
0113  4314                JMS     JMSCK3
0114  7402    JMSCK3,     HLT
0115  4454                ERROR
0116  6234                RIB
0117  1105                TAD     M55
0120  7640                SZA CLA
0121  4454                ERROR
0122  2033                ISZ     CDFCHK
0123  4454                ERROR
0124  2314                ISZ     JMSCK3
0125  4454                ERROR
0126  6254                SINT
0127  4454                ERROR
0130  7240    TST13D,     CLA CMA
0131  3033                DCA     CDFCHK
0132  7240                CLA CMA
0133  3340                DCA     JMSCK4
0134  6243                CIFCDF  40
0135  3434                DCA I   CHKCDF
0136  6001                ION
0137  4340                JMS     JMSCK4
0140  7402    JMSCK4,     HLT
0141  4454                ERROR
0142  6234                RIB
0143  1102                TAD     M44
```



```
0144  7640                SZA CLA
0145  4454                ERROR
0146  2033                ISZ     CDFCHK
0147  4454                ERROR
0150  2340                ISZ     JMSCK4
0151  4454                ERROR
0152  6254                SINT
0153  4454                ERROR
0154  7340    TST13E,     CLA CLL CMA
0155  3033                DCA     CDFCHK
0156  7240                CLA CMA
0157  3364                DCA     JMSCK5
0160  6233                CIFCDF  30
0161  3434                DCA I   CHKCDF
0162  6001                ION
0163  4364                JMS     JMSCK5
0164  7402    JMSCK5,     HLT
0165  4454                ERROR
0166  6234                RIB
0167  1076                TAD     M33
0170  7640                SZA CLA
0171  4454                ERROR
0172  2033                ISZ     CDFCHK
0173  4454                ERROR
0174  2364                ISZ     JMSCK5
0175  4454                ERROR
0176  6254                SINT
0177  4454                ERROR
1000  7240    TST13F,     CLA CMA
1001  3033                DCA     CDFCHK
1002  7240                CLA CMA
1003  3210                DCA     JMSCK6
1004  6263                CIFCDF  60
1005  3434                DCA I   CHKCDF
1006  6001                ION
1007  4210                JMS     JMSCK6
1010  7402    JMSCK6,     HLT
1011  4454                ERROR
1012  6234                RIB
1013  1110                TAD     M66
1014  7640                SZA CLA
1015  4454                ERROR
1016  2033                ISZ     CDFCHK
1017  4454                ERROR
1020  2210                ISZ     JMSCK6
1021  4454                ERROR
1022  6254                SINT
1023  4454                ERROR
1024  7240    TST13G,     CLA CMA
1025  3033                DCA     CDFCHK
1026  7240                CLA CMA
1027  3234                DCA     JMSCK7
1030  6213                CIFCDF  10
1031  3434                DCA I   CHKCDF
1032  6001                ION
```

```
1033  4234            JMS     JMSCK7          /CLEAR INTERRUPT INHIBIT AND INTERRUPT
1034  7402  JMSCK7,   HLT                     /THIS LOCATION PRESET TO ONES
1035  4454            ERROR                   /PROGRAM FAILED TO INTERRUPT
1036  6234            RIB                     /READ THE INTERRUPT BUFFER
1037  1070            TAD     M11             /CHECK FOR ISF OF 1 AND DSF OF 1
1040  7640            SZA CLA
1041  4454            ERROR                   /SAVE FIELD NOT EQUAL ABOVE OR CIFCDF 10 FAILED
1042  2033            ISZ     CDFCHK
1043  4454            ERROR                   /DCA I TO FIELD 1 WENT TO FIELD 0
1044  2234            ISZ     JMSCK7
1045  4454            ERROR                   /JMS TO FIELD 1 WENT TO FIELD 0
1046  6254            SINT                    /SKIP ON USER INTERRUPT F/F
1047  4454            ERROR                   /USER INTERRUPT F/F GOT CLEARED
1050  7240  TST13H,   CLA CMA                 /SET UP 2 LOCATIONS TO CHECK THAT
1051  3033            DCA     CDFCHK          /CIFCDF 00 WENT TO FIELD 0 INSTEAD
1052  7240            CLA CMA                 /OF ANOTHER FIELD
1053  3260            DCA     JMSCK8
1054  6203            CIFCDF  00              /CHANGE INSTRUCTION AND DATA FIELD TO 0
1055  3434            DCA I   CHKCDF          /CLEAR CDFCHK IN FIELD 0
1056  6001            ION                     /SET INTERRUPT ENABLE
1057  4260            JMS     JMSCK8          /CLEAR INTERRUPT INHIBIT AND INTERRUPT
1060  7402  JMSCK8,   HLT                     /THIS LOCATIONS PRESET TO ONES
1061  4454            ERROR                   /PROGRAM FAILED TO INTERRUPT
1062  6234            RIB                     /READ THE INTERRUPT BUFFER
1063  7640            SZA CLA
1064  4454            ERROR                   /SAVE FIELD IS NOT EQUAL TO 0
1065  2033            ISZ     CDFCHK
1066  7410            SKP
1067  4454            ERROR                   /DCA I FAILED TO CLEAR CDFCHK IN FIELD 0
1070  2260            ISZ     JMSCK8
1071  7410            SKP
1072  4454            ERROR                   /JMS FAILED TO CHANGE JMSCK8 IN FIELD 0
1073  6204            CINT                    /CLEAR USER INTERRUPT F/F
1074  6254            SINT                    /SKIP ON USER INTERRUPT F/F
1075  7410            SKP
1076  4454            ERROR                   /CINT FAILED TO CLEAR USER INTERRUPT F/F
1077  4455            LOOP                    /LOOP ON TEST IF SR 2 = 1000

                /**********************************************************************************************
                /TEST 14 - CHECKS THAT RTF CAN LOAD THE IF AND DF AND THAT RMF CAN
                /RELOAD IT.
                /**********************************************************************************************

1100  4456  TEST14,   SCOPLP                  /SETUP SCOPE AND TEST LOOPING ADDRESS
1101  6007            CAF                     /CLEAR ALL FLAGS
1102  6001            ION                     /SET INTERRUPT ENABLE
1103  6274            SUF                     /SET USER BUFFER
1104  5305            JMP     .+1             /LOAD THE UB INTO THE IF
1105  7402            HLT                     /HALT SHOULD TRAP
1106  5306            JMP     .               /HLT FAILED TO TRAP
1107  6254            SINT                    /SKIP ON USER INTERRUPT
1110  4454            ERROR                   /USER INTERRUPT NOT SET
1111  6234            RIB                     /READ THE INTERRUPT BUFFER
1112  1113            TAD     M100            /CHECK FOR USER FLAG
1113  7640            SZA     CLA
```



```
1114  4454            ERROR                   /USER FLAG OR INT REQ NOT SET
1115  1141  TST14A,   TAD     K125
1116  6005            RTF                     /LOAD THE UB, IB, + DF WITH USER FLAG, IF OF 2 + DF OF 5
1117  7300            CLA CLL                 /AND SET INTERRUPT ENABLE
1120  6214            RDF                     /READ THE DATA FIELD TO CHECK THAT FIELD 5 GOT LOADED
1121  1103            TAD     M50
1122  7640            SZA CLA
1123  7402            HLT                     /RTF FAILED TO LOAD DATA FIELD TO 5
1124  5325            JMP     .+1             /ENTER USER MODE,CLEAR INT INHIBIT,AND INTERRUPT
1125  4454            ERROR                   /FAILED TO INTERRUPT , RTF OR JMP FAILED
1126  6254            SINT                    /SKIP ON USER INTERRUPT F/F
1127  4454            ERROR                   /SINT FAILED OR USER INTERRUPT F/F CLEARED
1130  6234            RIB                     /CHECK FOR USER FLAG, ISF OF 2 AND DSF OF 5
1131  1114            TAD     M125
1132  7640            SZA CLA
1133  4454            ERROR                   /SAVE FIELD NOT EQUAL TO ABOVE
1134  6244            RMF                     /LOAD THE UB, IB, + DF FROM THE SAVE FIELD
1135  6214            RDF                     /READ THE DATA FIELD
1136  1103            TAD     M50             /CHECK THAT RMF LOADED THE DF
1137  7640            SZA CLA
1140  4454            ERROR                   /RMF FAILED TO LOAD DF TO FIELD 5
1141  6001            ION                     /SET INTERRUPT ENABLE
1142  5343            JMP     .+1             /LOAD THE IF, CLEAR INTERRUPT INHIBIT, ENTER USER MODE
1143  4454            ERROR                   /FAILED TO INTERRUPT OR RMF JMP FAILED
1144  6254            SINT                    /SKIP ON USER INTERRUPT FLIP-FLOP
1145  4454            ERROR                   /USER INTERRUPT FLIP-FLOP NOT SET
1146  6234            RIB                     /READ THE INTERRUPT BUFFER
1147  1114            TAD     M125            /CHECK FOR USER FLAG, ISF OF 2 AND DSF OF 5
1150  7640            SZA CLA
1151  4454            ERROR                   /RMF FAILED TO LOAD THE ABOVE
1152  1142  TST14B,   TAD     K152
1153  6005            RTF                     /LOAD THE UB, IB, + DF WITH UF, ISF OF 5 AND DSF OF 2
1154  7300            CLA CLL                 /AND SET INTERRUPT ENABLE
1155  6214            RDF                     /READ THE DATA FIELD
1156  1072            TAD     M20             /CHECK FOR A DF SET TO FIELD 2
1157  7640            SZA CLA
1160  7402            HLT                     /RTF FAILED TO LOAD DF WITH 2
1161  5362            JMP     .+1             /ENTER USER MODE CLEAR INTERRUPT INHIBIT
1162  4454            ERROR                   /FAILED TO INTERRUPT
1163  6254            SINT                    /SKIP ON USER INTERRUPT
1164  4454            ERROR                   /USER INTERRUPT NOT SET
1165  6234            RIB                     /READ THE INTERRUPT BUFFER
1166  1115            TAD     M152            /CHECK FOR USER FLAG, ISF OF 5 AND DSF OF 2
1167  7640            SZA CLA
1170  4454            ERROR                   /SAVE FIELD NOT EQUAL TO ABOVE
1171  6244            RMF                     /RESTORE MEMORY FIELDS
1172  6214            RDF                     /READ THE DATA FIELD
1173  1072            TAD     M20             /CHECK THAT RMF LOADED DF TO FIELD 2
1174  7640            SZA CLA
1175  4454            ERROR                   /RMF FAILED TO LOAD DF TO FIELD 2
1176  7000            NOP
1177  6001            ION                     /SET INTERRUPT ENABLE
1200  5201            JMP     .+1             /CLEAR INTERRUPT INHIBIT, LOAD IF, ENTER USER MODE
1201  4454            ERROR                   /FAILED TO INTERRUPT
1202  6254            SINT                    /SKIP ON USER INTERRUPT
```

```
1203  4454          ERROR                   /USER INTERRUPT NOT SET
1204  6234          RIB                     /READ THE INTERRUPT BUFFER
1205  1115          TAD     M152            /CHECK SF FOR USER FLAG, ISF OF 5 AND DSF OF 2
1206  7640          SZA CLA
1207  4454          ERROR                   /RMF FAILED TO LOAD THE ABOVE
1210  6254  TST14Q, SINT                    /SKIP ON USER INTERRUPT FLIP=FLOP
1211  4454          ERROR                   /USER INTERRUPT FLIP=FLOP GOT CLEARED,
1212  1140          TAD     K77             /LOAD DATA FIELD AND IB TO FIELD 7
1213  6005          RTF                     /RESTORE THE FLAGS AND SET INTERRUPT ENABLE
1214  7300          CLA CLL
1215  6214          RDF                     /READ THE DATA FIELD
1216  1111          TAD     M70             /CHECK FOR DATA FIELD SET TO FIELD 7
1217  7640          SZA CLA
1220  7402          HLT                     /RTF FAILED TO SET DF TO FIELD 7
1221  5222          JMP     .+1             /CLEAR INTERRUPT INHIBIT AND INTERRUPT
1222  4454          ERROR                   /PROGRAM FAILED TO INTERRUPT ON USER INTERRUPT
1223  6234          RIB                     /READ THE INTERRUPT BUFFER
1224  1112          TAD     M77             /CHECK FOR UF=0, ISF=7 AND DSF=7
1225  7640          SZA CLA
1226  4454          ERROR                   /SAVE FIELD NOT EQUAL TO ABOVE
1227  6254          SINT                    /SKIP ON USER INTERRUPT
1230  4454          ERROR                   /USER INTERRUPT GOT CLEARED
1231  6244          RMF                     /RESTORE MEMORY FIELDS
1232  6214          RDF                     /CHECK THAT RMF RESTORED THE DF
1233  1111          TAD     M70
1234  7640          SZA CLA
1235  4454          ERROR                   /RMF FAILED TO LOAD DF TO 7
1236  6224          RIF                     /CHECK INSTRUCTION FIELD TO BE SET 0
1237  7640          SZA CLA
1240  4454          ERROR                   /IF IS NON ZERO AFTER A RMF
1241  6001          ION                     /SET INTERRUPT ENABLE
1242  5243          JMP     .+1             /CLEAR INTERRUPT INHIBIT AND INTERRUPT
1243  4454          ERROR                   /PROGRAM FAILED TO INTERRUPT;
1244  6234          RIB                     /READ THE INTERRUPT BUFFER
1245  1112          TAD     M77             /CHECK FOR ISF AND DSF = TO 7
1246  7640          SZA CLA
1247  4454          ERROR                   /RMF FAILED TO RESTORE IF AND DF TO 7
1250  6254  TST14U, SINT                    /SKIP ON USER INTERRUPT FLIP=FLOP
1251  4454          ERROR                   /USER INTERRUPT CLEARED
1252  6005          RTF                     /RESTORE THE FLAGS, SET IB=DF TO ZERO
1253  5254          JMP     .+1             /CLEAR INTERRUPPT INHIBIT AND INTERRUPT
1254  4454          ERROR                   /PROGRAM FAILED TO INTERRUPT
1255  6234          RIB                     /READ THE INTERRUPT BUFFER
1256  7640          SZA CLA
1257  4454          ERROR                   /THE ISF OR DSF IS NON ZERO
1260  6244          RMF                     /RESTORE MEMORY FIELDS
1261  6001          ION                     /SET INTERRUPT ENABLE
1262  5263          JMP     .+1             /CLEAR INTERRUPT INHIBIT AND INTERRUPT
1263  4454          ERROR                   /PROGRAM FAILED TO INTERRUPT
1264  6234          RIB                     /READ THE INTERRUPT BUFFER
1265  7640          SZA CLA
1266  4454          ERROR                   /RMF FAILED TO RELOAD IF AND DF TO ZERO
1267  6204          CINT                    /CLEAR USER INTERRUPT FLIP=FLOP
1270  6254          SINT                    /SKIP ON USER INTERRUPT FLIP=FLOP
1271  7610          SKP     CLA
```



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1272  4454          ERROR                   /CINT FAILED TO CLEAR USER INTERRUPT
1273  4455          LOOP                    /LOOP ON TEST IF SR = 1000

              /**********************************************************************************************
              /TEST 13 = SETS THE UB TO A 1, THE IF AND DF TO FIELD 6, THE PROGRAM
              /THEN ISSUES ANU, TAD, ISZ, AND DCA INDIRECTS TO CHECK THAT THE
              /PROGRAM DOESN'T INTERRUPT UNTIL A JUMP INSTRUCTION IS ISSUED,
              /**********************************************************************************************

1274  4456  TEST13, SCOPLP                  /SETUP SCOPE AND TEST LOOPING ADDRESS
1275  6007          CAF                     /CLEAR ALL FLAGS
1276  6203          CIFCDF                  /CHANGE DATA AND INSTRUCTION FIELD TO 0
1277  5300          JMP     .+1             /CLEAR INTERRUPT INHIBIT
1300  6264          CUF                     /CLEAR USER FLAG
1301  6204          CINT                    /CLEAR USER INTERRUPT FLIP=FLOP
1302  6001          ION                     /SET INTERRUPT ENABLE
1303  6274          SUF                     /SET USER BUFFER FLIP=FLOP
1304  5305          JMP     .+1             /CLEAR INTERRUPT INHIBIT
1305  7402          HLT                     /FAILED TO ENTER USER MODE
1306  5306          JMP     .               /HLT FAILED TO TRAP
1307  6254          SINT                    /SKIP ON USER INTERRUPT FLIP=FLOP
1310  4454          ERROR                   /USER INTERRUPT FLIP=FLOP NOT SET
1311  6234          RIB                     /READ THE INTERRUPT BUFFER
1312  1113          TAD     M100            /CHECK FOR USER FLAG
1313  7640          SZA CLA
1314  4454          ERROR                   /USER FLAG NOT SET
1315  6263          CIFCDF  60              /CHANGE IB AND DF TO FIELD 6 AND SET INTERRUPT INHIBIT
1316  6001          ION                     /SET INTERRUPT ENABLE, THE PROGRAM
                                            /SHOULDN'T INTERRUPT UNTIL A JMP OR JMS IS ISSUED,
1317  7000          NOP                     /CHECK THAT PROGRAM DOESN'T INTERRUPT
1320  7410          SKP
1321  7402          HLT                     /PROGRAM INTERRUPTED BEFORE A JMP WAS ISSUED
1322  3723          DCA I   .+1             /DO A DCA I TO NEXT LOCATIONS
1323  7410          SKP
1324  7402          HLT                     /PROGRAM INTERRUPTED BEFORE A JMP WAS ISSUED
1325  1726          TAD I   .+1             /DO A TAD I TO NEXT LOCATION
1326  7410          SKP
1327  7402          HLT                     /PROGRAM INTERRUPTED BEFORE A JMP WAS ISSUED
1330  0731          AND I   .+1             /DO A AND I TO THE NEXT LOCATION
1331  7410          SKP
1332  7402          HLT                     /PROGRAM INTERRUPTED BEFORE A JMP WAS ISSUED
1333  2734          ISZ I   .+1             /DO A ISZ I TO THE NEXT LOCATION
1334  7410          SKP
1335  7402          HLT                     /PROGRAM INTERRUPTED BEFORE A JMP WAS ISSUED
1336  5337          JMP     .+1             /CLEAR INTERRUPT INHIBIT AND INTERRUPT
1337  4454          ERROR                   /PROGRAM FAILED TO INTERRUPT
1340  6234          RIB                     /READ THE INTERRUPT BUFFER
1341  1110          TAD     M66             /CHECK FOR ISF AND DSF OF 6
1342  7640          SZA CLA
1343  4454          ERROR                   /SAVE FIELD NOT EQUAL TO 66
1344  6254          SINT                    /SKIP ON USER INTERRUPT F/F
1345  4454          ERROR                   /USER INTERRUPT F/F NOT SET
1346  7300          CLA CLL                 /CLEAR AC AND LINK
1347  6203          CIFCDF                  /SET IB AND DF TO 0
1350  6001          ION                     /SET INTERRUPT ENABLE
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1351  5352            JMP     .-1             /CLEAR INTERRUPT INHIBIT
1352  4454            ERROR                   /PROGRAM FAILED TO INTERRUPT
1353  6254            SINT                    /SKIP ON USER INTERRUPT
1354  4454            ERROR                   /USER INTERRUPT NOT SET
1355  6204            CINT                    /CLEAR USER INTERRUPT
1356  7340            CLA CLL CMA             /SET THE AC TO ONES AND LINK TO 0
1357  6004            GTF                     /GET THE FLAGS
1360  7640            SZA CLA
1361  4454            ERROR                   /THE LINK, INT REQ, OR SAVE FIELD NON ZERO
1362  4455            LOOP                    /LOOP ON TEST IF SR = 1000

                /**********************************************************************************************
                /TEST 19 - 13 A DATA TEST TO CHECK THAT DATA CAN BE DEPOSITED INTO EACH
                /SELECTED EXTENDED FIELD, DATA IS DEPOSITED INTO THE LAST ADDRESS OF
                /EACH 1K MEMORY SEGMENT IN THE EXTENDED MEMORY FIELD, THE USER INTERRUPT
                /IS SET FOR THIS TEST, THE PROGRAM CHANGES THE DATA FIELD TO THE NEW FIELD
                /CHECKS, IT THEN TURNS THE INTERRUPT ON AND AND DOES A DCA I TO THE LAST
                /ADDRESS IN A 1K MEMORY SEGMENT OF THAT FIELD, THE PROGRAM THEN DOES THE
                /SAME AS ABOVE, ONLY DOING A TAD I TO THE LAST ADDRESS OF A 1K MEMORY
                /SEGMENT, THE DATA THAT IS PUT INTO THE LAST ADDRESS OF EACH EXTENDED
                /1K MEMORY SEGMENT CONTAINS THE FIELD IN BITS 6-8 AND THE 1K SEGMENT IN
                /BITS 9-11,
                /**********************************************************************************************

1363  4456    TEST19, SCOPLP                  /SETUP TEST AND SCOPE LOOPING ADDRESS
1364  6007            CAF                     /CLEAR ALL FLAGS
1365  6001            ION                     /TURN THE INTERRUPT ON
1366  1021            TAD     DP1SEL          /GET MEMORY SIZE FROM LOCATION 21
1367  0136            AND     K37             /MASK OFF THE MEMORY BITS
1370  7104            CLL     RAL             /ROTATE BITS LEFT ONCE TO SETUP FOR FIELD
1371  3036            DCA     SAVES2          /LIMIT AND LAST ADDRESS IN LAST FIELD
1372  1036            TAD     SAVES2          /GET THE NUMBER
1373  0137            AND     K70             /MASK OFF BITS 6-8 FOR FIELD LIMIT
1374  3037            DCA     FLDLIM          /SAVE THE NUMBER AS THE LAST SELECTED FIELD
1375  1036            TAD     SAVES2          /GET THE ROTATED NUMBER
1376  0134            AND     K7              /MASK OFF ADDRESS BITS
1377  7112            CLL     RTR             /ROTATE THE NUMBER 4 PLACES TO THE RIGHT
1400  7012            RTR
1401  1145            TAD     K1777           /ADD 1K TO THE NUMBER
1402  3040            DCA     UPERLM          /SAVE THIS NUMBER AS THE LAST ADDRESS IN LAST FIELD
1403  1037            TAD     FLDLIM          /GET THE FIELD LIMIT
1404  7650            SNA     CLA             /IS THE LAST FIELD = TO FIELD 0
1405  5461            JMP  I  PASEND          /END OF 2ND 1K SEGMENT
1406  4777'           JMS     ACTLIN          /CHECK FOR ACT LINE AND 32K OF MEMORY
1407  6001            ION                     /TURN THE INTERRUPT ON
1410  6274            SUF
1411  5212            JMP     .-1             /SET USER BUFFER F/F
1412  7402            HLT                     /SHOULD TRAP HERE
1413  5213            JMP     .               /HALT FAILED TO TRAP
1414  6254            SINT                    /SKIP ON USER INTERRUPT
1415  4454            ERROR                   /USER INTERRUPT NOT SET
1416  7340            CLA CLL CMA             /SET THE AC TO ALL ONES
1417  6004            GTF                     /GET THE FLAGS
1420  1130            TAD     M1100           /CHECK FOR USER FLAG AND INT REQ
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1421  7640            SZA     CLA
1422  4454            ERROR                   /SAVE FIELD NOT EQUAL TO ABOVE
1423  3041            DCA     WRKFLD          /CLEAR WORKING FIELD
1424  3042            DCA     DATPAT          /CLEAR DATA PATTERN
1425  1145    BEGT19, TAD     K1777           /GET UPPER ADDRESS OF 1K FIELD
1426  3043            DCA     WRKADD          /SET FIRST ADDRESS EQUAL TO 1777
1427  1041            TAD     WRKFLD          /GET THE WORKING FIELD
1430  1135            TAD     K10             /ADD A FIELD TO IT
1431  3041            DCA     WRKFLD
1432  1041            TAD     WRKFLD          /GET THE WORKING FIELD
1433  7041            CIA                     /NEGATE IT
1434  1037            TAD     FLDLIM          /COMPARE IT TO THE FIELD LIMIT
1435  7510            SPA                     /IS THE NEW FIELD GREATER THAN FIELD LIMIT
1436  5344            JMP     ENDTST          /YES END OF TEST
1437  7640            SZA     CLA             /IS NEW FIELD EQUAL TO LAST FIELD
1440  7240            CLA     CMA             /NO, THE LAST ADDRESS IN THIS FIELD WILL BE 7777
1441  7450            SNA                     /YES, THE LAST ADDRESS WILL BE EQUAL TO UPERLM
1442  1040            TAD     UPERLM
1443  3044            DCA     HGHLIM          /SAVE THE LAST ADDRESS IN THIS FIELD
1444  1044            TAD     HGHLIM          /GET THE HIGH LIMIT
1445  7040            CMA                     /COMPLEMENT IT
1446  7100            CLL     RTL             /ROTATE 3 PLACES TO THE RIGHT
1447  7004            RAL                     /
1450  1147            TAD     K7774           /ADD IN 4K ADDRESS CONSTANT
1451  3047            DCA     ADDCNT          /SAVE IT
1452  1041            TAD     WRKFLD          /GET THE NEW FIELD
1453  7001            IAC                     /ADD 1 TO IT
1454  3042            DCA     DATPAT          /SAVE THE WORD AS THE DATA PATTERN
1455  6254    T16LOU, SINT                    /SKIP ON USER INTERRUPT
1456  4454            ERROR                   /USER INTERRUPT GOT CLEARED
1457  1041            TAD     WRKFLD          /GET THE NEW FIELD
1460  1045            TAD     K6201           /GET THE CDF INSTRUCTION
1461  3262            DCA     .+1             /PUT CDF TO NEW FIELD IN NEXT ADDRESS

1462  7402    CDFNEW, HLT/CDF                 /CHANGE DATA FIELD TO NEW FIELD
1463  6214            RDF                     /READ THE DATA FIELD
1464  7041            CIA                     /NEGATE IT
1465  1041            TAD     WRKFLD          /GET THE NEW FIELD
1466  7640            SZA     CLA
1467  4454            ERROR                   /CDF TO NEW FIELD FAILED
1470  1042            TAD     DATPAT          /GET THE DATA PATTERN
1471  6001            ION                     /TURN THE INTERRUPT ON
1472  3443            DCA  I  WRKADD          /PUT THE WORD UP IN NEW FIELD AND INTERRUPT
1473  4454            ERROR                   /PROGRAM FAILED TO INTERRUPT
1474  1041            TAD     WRKFLD
1475  7112            CLL     RTR
1476  7010            RAR
1477  3040            DCA     SAVWFD          /SAVE THE WORKING FIELD IN BITS 9-11
1500  6234            RIB                     /READ THE INTERRUPT BUFFER
1501  7041            CIA                     /NEGATE IT
1502  1040            TAD     SAVWFD          /GET THE EXPECTED WORKING SAVE FIELD
1503  7640            SZA     CLA
1504  4454            ERROR                   /SAVE FIELD NOT EQUAL TO EXPECTED FIELD
1505  6254            SINT                    /SKIP ON USER INTERRUPT F/F
1506  4454            ERROR                   /USER INTERRUPT GOT CLEARED
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1507  1262          TAD     CDFNEW          /GET THE CDF INSTRUCTION TO THE NEW FIELD
1510  3311          DCA     .+1             /PUT IT IN THE NEXT LOCATION
1511  7402          HLT/CDF                 /CDF TO NEW FIELD
1512  6214          RDF                     /READ THE DATA FIELD
1513  7041          CIA                     /NEGATE IT
1514  1041          TAD     WRKFLD          /GET THE WORKING FIELD
1515  7640          SZA     CLA
1516  4454          ERROR                   /CDF TO NEW FIELD FAILED
1517  6001          ION                     /TURN THE INTERRUPT ON
1520  1443          TAD  I  WRKADD          /GET DATA PATTERN FROM NEW FIELD
1521  4454          ERROR                   /PROGRAM FAILED TO INTERRUPT
1522  6234          RIB                     /READ THE INTERRUPT BUFFER
1523  7041          CIA                     /NEGATE IT
1524  1046          TAD     SAVWFD          /GET THE EXPECTED SAVE FIELD
1525  7640          SZA     CLA             /ARE THEY EQUAL
1526  4454          ERROR                   /NO,EXPECTED SAVE FIELD NOT EQUAL TO FIELD READ
1527  1042          TAD     DATPAT          /GET THE DATA PATTERN
1530  7041          CIA                     /NEGATE IT
1531  1035          TAD     DATREC          /GET THE WORD RECEIVED
1532  7640          SZA     CLA             /ARE THEY EQUAL?
1533  4454          ERROR                   /NO, DATA ERROR IN WRKFLD
1534  2047          ISZ     ADDCNT          /GET NEXT ADDRESS IN THIS FIELD?
1535  7610          SKP     CLA             /YES
1536  5225          JMP     BEGT16          /NO,GO GET NEXT FIELD IF ANY LEFT
1537  1043          TAD     WRKADD          /GET THE WORKING ADDRESS
1540  1146          TAD     K2000           /ADD 1K TO IT
1541  3043          DCA     WRKADD          /SAVE NEW 1K UPPER ADDRESS BOUNDRY
1542  2042          ISZ     DATPAT          /ADD ANOTHER 1K TO DATA WORD
1543  5255          JMP     T16LCD          /GO LOAD AND COMPARE THIS ADDRESS
1544  6204  ENDIST, CINT                    /CLEAR USER INTERRUPT
1545  6254          SINT                    /SKIP ON USER INTERRUPT
1546  7610          SKP     CLA
1547  4454          ERROR                   /CINT FAILED TO CLEAR USER INTERRUPT
1550  4455          LOOP                    /LOOP ON TEST IF SR = 1000
1551  5461          JMP  I  PASEND

1577  1600
      1600          PAGE


1600  0000  ACTLIN, 0
1601  1022          TAD     DP2SEL
1602  7700          SMA     CLA             /IS THE PROGRAM RUNNING ON ACT LINE?
1603  5600          JMP  I  ACTLIN          /NO, RETURN
1604  1037          TAD     FLDLIM          /GET THE FIELD LIMIT
1605  1111          TAD     M70
1606  7640          SZA     CLA             /IS THE FIELD LIMIT EQUAL TO FIELD 7?
1607  5600          JMP  I  ACTLIN          /NO, RETURN TO TEST
1610  1040          TAD     UPERLM          /GET THE UPPER ADDRESS LIMIT
1611  7001          IAC                     /ADD 1 TO IT
1612  7640          SZA     CLA             /WAS IT 7777
1613  5600          JMP  I  ACTLIN          /NO, RETURN
1614  7352          CLA CLL CMA RTR         /SET LAST ADDRESS = 5777
1615  3040          DCA     UPERLM          /SAVE IT
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1616  5600          JMP  I  ACTLIN          /RETURN TO PROGRAM


1617  1022  ENDPAS, TAD     DP2SEL          /CHECK FOR ACT LINE
1620  7700          SMA     CLA             /IS THE PROGRAM RUNNING ON ACT LINE
1621  5230          JMP     ENDING          /NO GO CHECK FOR SR 3 TO HALT AT END OF A PASS
1622  2236          ISZ     PRGPAS          /CHECK 1/2 SECOND COUNT
1623  5230          JMP     ENDING          /NOT 1/2 SECOND YET
1624  1377          TAD     (-144           /RESET THE COUNTER
1625  3236          DCA     PRGPAS
1626  6272          CIF     70              /CHANGE INSTRUCTION FIELD TO 7
1627  4451          JMS  I  GOODPS          /SIGNAL THE PROM
1630  4335  ENDING, JMS     SWCHK           /CHECK SR 3 TO HALT ON A PROGRAM PASS
1631  7006          RTL
1632  7004          RAL
1633  7710          SPA     CLA
1634  7402          HLT                     /END OF A COMPLETE PROGRAM PASS
1635  5776          JMP     0200


1636  7634  PRGPAS, -144


1637  7010  POWFAL, RAR
1640  3245          DCA     LINK
1641  1000          TAD     INTSER
1642  3246          DCA     PC
1643  6103          CAL                     /CLEAR AC LOW F/F
1644  4452          JMS  I  AUTRST          /RETURN TO THE PROGRAM

1645  0000  LINK,   0
1646  0000  PC,     0

1647  0000  PRGRST, 0
1650  6102          SPL                     /SKIP ON AC LOW AS A LEVEL
1651  7610          SKP     CLA
1652  5250          JMP     .+2
1653  5453          JMP  I  TEST            /RETURN TO TEST BEING EXECUTED AND START OVER

1654  0000  TESTAD, 0
1655  7340          CLA CLL CMA
1656  1254          TAD     TESTAD
1657  3053          DCA     TEST
1660  1375          TAD     (PRGRST
1661  3052          DCA     AUTRST
1662  5654          JMP  I  TESTAD


1663  1021  RATEMT, TAD     DP1SEL          /GET HARDWARE CONFIGURATION
1664  0143          AND     K200
1665  7650          SNA     CLA
1666  5273          JMP     DEAD            /MACHINE GOING DOWN - STOP EVERYTHING
1667  3367          DCA     ACNLOK
1670  2000          ISZ     INTSER
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1671  2000            ISZ     INTSER
1672  5400            JMP  I  INTSER
1673  7402    DEAD,   HLT                     /ITS ALL OVER NOW - GOOD-BYE
1674  5453            JMP  I  TEST


1675  0000    GOODBD, 0
1676  1022            TAD     OP2SEL          /GET HARDWARE CONFIGURATION
1677  7700            SMA     CLA             /IS THE PROGRAM RUNNING ON ACT LINE
1700  5675            JMP  I  GOODBD          /NO RETURN TO PROGRAM
1701  6272            CIF     70              /CHANGE INSTRUCTION FIELD TO FIELD 7
1702  4451            JMS  I  GOODPS          /SIGNAL ACT LINE PROGRAM STILL RUNNING
1703  5675            JMP  I  GOODBD          /RETURN TO PROGRAM


1704  0000    ERRORX, 0                       /ERROR ROUTINE
1705  7300            CLA     CLL
1706  1022            TAD     OP2SEL          /CHECK FOR ACT LINE
1707  7700            SMA     CLA
1710  5322            JMP     CHKINH
1711  1021            TAD     OP1SEL
1712  0143            AND     K200
1713  7640            SZA     CLA
1714  6160            CLRMOD
1715  6002            IOF                     /TURN THE INTERRUPT OFF
1716  7240            CLA     CMA
1717  1304            TAD     ERRORX
1720  6272            CIF     70
1721  5450            JMP  I  BADPAS          /GO TO HOM FOR ERROR
1722  4335    CHKINH, JMS     SWCHK           /CHECK FOR SR 0(1) TO INHIBIT ERROR HALT
1723  7710            SPA     CLA             /IS SR 0 SET TO A ONE
1724  5330            JMP     ERLPSW          /YES, GO CHECK SR 1 TO LOOP ON ERROR
1725  7340            CLA CLL CMA
1726  1304            TAD     ERRORX          /SUBTRACT ONE FROM JMS ERROR PC
1727  7402            HLT                     /AC CONTAINS THE ADDRESS WHERE THE ERROR
                                              /WAS DETECTED BY THE PROGRAM, REFER
                                              /TO THE PROGRAM LISTING FOR ERROR
                                              /EXPLANATION AND THE TEST DESCRIPTION,
1730  4335    ERLPSW, JMS     SWCHK           /CHECK THE SWITCH REGISTER TO LOOP ON ERROR
1731  7004            RAL
1732  7710            SPA     CLA             /IS SR 1 SET TO A ONE TO LOOP ON TEST
1733  5453            JMP  I  TEST            /YES GO LOOP ON THE TEST
1734  5704            JMP  I  ERRORX          /NO, RETURN TO THE PROGRAM

1735  0000    SWCHK,  0
1736  7300            CLA     CLL
1737  1021            TAD     OP1SEL          /GET THE HARDWARE STATUS WORD
1740  7700            SMA     CLA             /IS THE HARDWARE FRONT PANEL SELECTED
1741  5344            JMP     .+3             /NO, USE THE PSEUDO SWITCH REGISTER
1742  7604            LAS
1743  5735            JMP  I  SWCHK           /RETURN
1744  1020            TAD     SWITCH          /THE PSEUDO SWITCH REGISTER
1745  5735            JMP  I  SWCHK           /RETURN
```



```
1746  0000    TSTLOP, 0                       /ROUTINE TO CHECK SR 2 TO LOOP ON TEST
1747  4335            JMS     SWCHK           /GO GET THE SWITCH REGISTER
1750  7006            RTL
1751  7700            SMA     CLA
1752  5746            JMP  I  TSTLOP          /GO TO NEXT TEST
1753  5453            JMP  I  TEST            /LOOP ON SAME TEST


1754  0000    ACLBAT, 0
1755  1367            TAD     ACNLOK          /LOOK AT RETURN FOR AC LOW OR BATTERY EMPTY
1756  7640            SZA     CLA
1757  5362            JMP     .+3
1760  2000            ISZ     INTSER
1761  5400            JMP  I  INTSER
1762  3367            DCA     ACNLOK
1763  6101            SBE                     /SKIP ON BATTERY EMPTY
1764  5360            JMP     .+4
1765  2000            ISZ     INTSER
1766  5360            JMP     .+6
1767  0000    ACNLOK, 0

1770  1647
1771  0200
1772  7634
      2000            PAGE

      0200            *200
```

```
0000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0100  11111111  11111111  11111111  11111111  11111111  1111P000  00M0M070  70707000

0200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0300  11111111  11111111  11111111  11111111  11111111  11111111  10M00070  30000001

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  11M00000  00000070  20700001

1600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1700  11111111  11111111  11111111  11111111  11111111  11111111  11111111  70007111

2000
2100

2200
2300

2400
2500

2600
2700

3000
3100

3200
3300

3400
3500

3600
3700
```



```
4000
4100

4200
4300

4400
4500

4600
4700

5000
5100

5200
5300

5400
5500

5600
5700

6000
6100

6200
6300

6400
6500

6600
6700

7000
7100

7200
7300

7400
7500

7600
7700
```

```
ACLBAT  1754    JMSCK5  0764    M4100  0131    TST12D  0327
ACNLOK  1767    JMSCK6  1010    M43    0101    TST12E  0401
ACTLIN  1600    JMSCK7  1034    M44    0102    TST12F  0432
ADDCNT  0047    JMSCK8  1060    M5     0005    TST12G  0463
AUTRST  0052    K10     0135    M50    0103    TST12H  0515
BADPAS  0050    K125    0141    M5000  0132    TST12I  0547
BATEMT  1663    K192    0142    M5100  0133    TST13A  0636
BEGT16  1425    K1777   0145    M52    0104    TST13B  0662
CAF     6007    K200    0143    M55    0105    TST13C  0704
CAL     6103    K2000   0146    M60    0106    TST13D  0733
CDF     6201    K37     0136    M61    0107    TST13E  0754
CDFCHK  0033    K400    0144    M66    0110    TST13F  1000
CDFNEW  1462    K4100   0153    M7     0006    TST13G  1024
CHKCDF  0034    K6201   0045    M70    0111    TST13H  1050
CHKINH  1722    K7      0134    M77    0112    TST14A  1115
CIF     6202    K70     0137    OP1SEL  0021   TST14B  1152
CIFCDF  6203    K7877   0152    OP2K2  0000    TST14C  1210
CINT    6204    K77     0140    OP2SEL  0022   TST14D  1250
CKJMS1  0227    K7707   0150    PASENU  0061   TSTLOP  1746
CKJMS2  0257    K7757   0151    PC     1646    UPERLM  0040
CKJMS3  0310    K7774   0147    POWFAL  1637   WRKADD  0043
CKJMS4  0341    LINK    1645    PRGPAS  1636   WRKFLD  0041
CKJMS5  0413    LOOPG2  6152    PRGRST  1647   XBAT    0060
CKJMS6  0444    LOOPG3  6153    RDF    6214    XPWRFL  0057
CKJMS7  0475    LOOP    4455    REDEMA  6155
CKJMS8  0527    M1      0002    RIB    6234
CKJMS9  0561    M10     0007    RIF    6224
CLREMA  6154    M100    0113    RKBE   0023
CLRMOD  6160    M1000   0117    RMF    6244
CLRSIM  6150    M1007   0120    RTF    6005
CUF     6264    M1010   0121    SAVES4  0036
DATPAT  0042    M1025   0122    SAVWFU  0046
DATREC  0035    M1034   0123    SBE    6101
DEAD    1673    M1043   0124    SCOPLP  4456
ENDING  1630    M1052   0125    SINT   6254
ENDPAS  1617    M1061   0126    SKON   6000
ENDTST  1544    M1070   0127    SKPEMA  6166
ERLPSW  1730    M11     0070    SPL    6102
ERROR   4454    M1100   0130    SUF    6274
ERRORX  1704    M125    0114    SWCHK  1735
EXECUT  6164    M192    0115    SWITCH  0020
FLDLIM  0037    M19     0071    T16LCU  1455
GOODBD  1675    M2      0063    TEST   0053
GOODPS  0051    M20     0072    TEST12  0200
GTF     6004    M22     0073    TEST13  0616
HGHLIM  0044    M23     0074    TEST14  1100
HLT     7402    M30     0075    TEST15  1274
INTSER  0000    M300    0116    TEST16  1363
JMSCK1  0646    M33     0076    TESTAD  1654
JMSCK2  0672    M34     0077    TST12A  0215
JMSCK3  0714    M4      0064    TST12B  0245
JMSCK4  0740    M40     0100    TST12C  0276
```



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ERRORS DETECTED: 0

LINKS GENERATED: 3

RUN-TIME:  18 SECONDS

3K CORE USED
```

```
                        /KM8-A OPTION TEST 2 MAINDEC-08-DJKMA-A-L 1K PART 3
                        /
                        /COPYRIGHT (C) 1974, DIGITAL EQUIPMENT CORPORATION
                        /
                        /PROGRAMMER: BRUCE HANSEN
                        /
```

```
                        ////////////////////////////////////////////////////////////////////////////////
                        /THE FOLLOWING LISTING WILL CORRESPOND TO THE PAPER TAPE LABELED MAINDEC-08-DJKMA-A-PM3,
                        /1K PART 3, THIS PAPER TAPE AND LISTING WILL BE THE THIRD OF FOUR 1K SEGMENTED
                        /PAPER TAPES AND LISTINGS FOR COMPUTERS WITH LESS THAN 4K OF MEMORY.
                        ////////////////////////////////////////////////////////////////////////////////
```



```
                        /KM8-A OPTION TEST 2 MAINDEC-08-DJKMA-A-L 1K PART 3
                        /
                        /COPYRIGHT 1974, DIGITAL EQUIPMENT CORP., MAYNARD, MASS., 01754
                        /
                        /POP-8A OPTION TEST 2 TESTS THE MEMORY EXTENTION/TIME SHARE CONTROL,
                        /POWER FAIL/AUTO RESTART, AND BOOTSTRAP LOADERS


0000    SKON=0000
0007    CAF=0007
7402    HLT=7402

        /SWITCH REGISTER SETTINGS

        /SR0=1  INHIBIT ERROR HALT
        /SR1=1  LOOP ON ERROR
        /SR2=1  LOOP ON TEST
        /SR3=1  HALT AT COMPLETION OF A PROGRAM PASS

        /MEMORY EXTENTION/TIME SHARE INSTRUCTIONS

6004    GTF=6004                        /GET FLAGS,  READS THE FOLLOWING MACHINE STATES
                                        /INTO THE INDICATED BITS OF THE AC:
                                        /AC0 LINE
                                        /AC2 INTERRUPT REQUEST
                                        /AC4 INTERRUPT ENABLE F/F
                                        /AC5 USER FLAG
                                        /AC6-11 SAVE FIELD REGISTER

6005    RTF=6005                        /RESTORE THE FLAGS,  RTF LOADS THE LINK FROM AC0,
                                        /LOADS THE USER BUFFER F/F, INSTRUCTION BUFFER AND
                                        /DATA FIELD WITH AC3, AC6-8, AC 9-11 AND INHIBITS
                                        /PROCESSOR INTERRUPTS UNTIL NEXT  JMP OR JMS INSTRUCTION,
                                        /AT THE END OF THE JMP OR JMS, THE CONTENTS OF THE U.B. + I.B.
                                        /ARE LOADED INTO USER FIELD F/F, AND THE I.F.,  INTERRUPT ENABLE
                                        /IS SET AND INTERRUPT INHIBIT AS CLEARED

6234    RIB=6234                        /READ THE INTERRUPT BUFFER

6244    RMF=6244                        /RESTORES MEMORY FLAGS

6204    CINT=6204                       /CLEAR USER INTERRUPT FLIP-FLOP

6254    SINT=6254                       /SKIP ON USER INTERRUPT FLIP-FLOP

6264    CUF=6264                        /CLEAR USER BUFFER FLIP-FLOP

6274    SUF=6274                        /SET USER BUFFER FLIP-FLOP (ENTER TIME SAME MODE)AND
                                        /INHIBITS PROCESSOR INTERRUPTS UNTIL THE NEXT JMP OR
                                        /JMS INSTRUCTION,  AT THE END OF THE JMP OR JMS
                                        /INSTRUCTION, THE USER BUFER IS LOADED INTO THE USER
                                        /FIELD F/F,

6201    CDF=6201                        /CHANGE DATA FIELD
```

```
                6202    CIF=6202                        /CHANGE INSTRUCTION FIELD
                6214    RDF=6214                        /READ THE DATA FIELD INTO AC BITS 6-8
                6224    RIF=6224                        /READ THE INSTRUCTION FIELD INTO AC BITS 6-8
                6203    CIFCDF=6203                     /PERFORMS THE CIF AND CDF FUNCTIONS

                        /POWER FAIL INSTRUCTIONS

                6102    SPL=6102                        /SKIP ON AC LOW FLIP-FLOP

                6103    CAL=6103                        /CLEAR AC LOW FLIP-FLOP

                6101    SBE=6101                        /SKIP ON BATTERY EMPTY FLIP-FLOP


                        /OPTION BOARD 2 SIMULATOR IOT'S

                6150    CLRSIM=6150                     /CLEAR CONTROL REGISTERS
                6152    LODMG2=6152                     /LOAD CONTROL REGISTER 2
                6153    LODMG3=6153                     /LOAD CONTROL REGISTER 3
                6154    CLREMA=6154                     /CLEAR EMA CATCHER LOGIC
                6155    REDEMA=6155                     /READ EMA CATCHER REGISTER
                6160    CLRMOD=6160                     /CLEAR TEST MODULE LOGIC
                6164    EXECUT=6164                     /EXECUT AND CONTROL WORD 3 BIT 7 =1 ISSUE A POWER ON PULSE
                                                        /EXECUT AND CONTROL WORD 3 BIT 7 =0 ISSUE A SWITCH SW PULSE
                6166    SKPEMA=6166                     /SKPEMA AND CONTROL WORD 3 BIT 3 =1 EMA INTERRUPT AND SKIP ENABLE
                                                        /SKPEMA AND CONTROL WORD 3 BIT 3 =0 EMA INTERRUPT AND SKIP DISABLE

                        /OPTION BOARD2 SIMULATOR CONTROL WORD 2 BIT ASSIGNMENTS
                        /
                        /BITS 0 - 1     NOT USED
                        /BITS 2 - 8     BOOT STRAP PROGRAM SELECT
                        /BITS 9 - 11    AUTO-RESTART ADDRESS SELECT

                        /OPTION BOARD 2 SIMULATOR CONTROL WORD 3 BIT ASSIGNMENTS
                        /
                        /BIT 0          TIME SHARE 0=ENABLED  1=DISABLED
                        /BIT 1          AC LOW (L) 1=PULLED LOW  0=FREE STATE
                        /BIT 2          BATT EMPTY 1=BATT EMPTY PULLED LOW  0=FREE STATE
                        /BIT 3          1=EMA INTERRUPT/SKIP ENABLE  0=EMA INTERRUPT SKIP DISABLE
                        /BITS 4 - 6     NOT USED
                        /BIT 7          1=POWER ON PULSE WITH EXECUT 0=SWITCH SW PULSE WITH EXECUT
                        /BIT 8          1=DISABLES BOOTSTRAP WHILE RUNNING  0=ENABLES BOOTSTRAP WHILE RUNNING
                        /BIT 9 - 11     AUTO-RESTART/BOOT STRAP ENABLE CODE



                0000    *0
0003  0000    INTSEN, 0                               /JMS I AUTRST PLACED HERE FOR SIMULATOR AUTO RESTART
0001  3035            DCA     DATREG
0002  6102            SPL                             /SKIP ON AC LOW
0003  7410            SKP
0004  5457            JMP  I  XPWRFL                  /POWER GOING DOWN
0005  6101            SBE                             /SKIP ON BATTERY EMPTY
```



```
0006  7410            SKP
0007  5460            JMP  I  XBAT                   /GO HALT THE COMPUTER ,ITS ALL OVER
0010  6224            RIF                             /READ THE INSTRUCTION FIELD
0011  7640            SZA     CLA
0012  4454            ERROR                           /IF, IS NOT 0 AFTER A INTERRUPT
0013  6214            RDF                             /READ THE DATA FIELD
0014  7640            SZA     CLA
0015  4454            ERROR                           /DF, IS NOT 0 AFTER A INTERRUPT
0016  2000            ISZ     INTSER                  /ADD 1 TO THE INTERRUPTED PC
0017  5400            JMP  I  INTSER                  /RETURN TO THE PROGRAM


                0020    *20
0020  0000    SWITCH, 0                               /PSEUDO SWITCH REGISTER IF BIT 0=0 OF OP1SEL
0021  1000    OP1SEL, 1000
                                                      /BIT 0=0 USE LOC 20 AS A PSEUDO S,R,
                                                      /BIT 0=1 USE HARDWARE FRONT PANEL S,R,
                                                      /BIT 1=1 HAS 8A OPTION 1
                                                      /BIT 2=1 HAS 8A OPTION 2
                                                      /BIT 3=1 HAS 8A CPU SIMULATOR
                                                      /BIT 4=1 HAS 8A OPTION 1 + 2 TEST MODULE
                                                      /BIT 5=1 PROGRAM ON 8A XOR
                                                      /BIT 6=1 HAS PDP-8E TYPE CPU
                                                      /BITS 7-11 MEMORY SIZE = 0'S = 1K, 37=32K,
                                                      /MEMORY SIZE CAN BE INCREASED IN 1K INCREMENTS
                                                      /BY ADDING A 1 TO THE NUMBER IN BITS 7-11,
0022  0000    OP2SEL, 0
                /RK8E BOOT STRAP WILL LOAD INTO THE FOLLOWING LOCATIONS

0023  7402    RK8E,   HLT                             /2000
0024  7402            HLT                             /6745
0025  7402            HLT                             /0023
0026  7402            HLT                             /7650
0027  7402            HLT                             /5024
0030  7402            HLT                             /6733
0031  7402            HLT                             /5031
0032  7402            HLT                             /TERMINATOR
0033  0000    CDFCHK, 0
0034  0033    CHKCDF, CDFCHK
0035  0000    DATREG, 0
0036  0000    SAVESZ, 0
0037  0000    FLDLIM, 0
0040  0000    UPFLIM, 0
0041  0000    WRKFLD, 0
0042  0000    DATPAT, 0
0043  0000    WRKADD, 0
0044  0000    HGHLIM, 0
0045  6201    K6201,  6201
0046  0000    SAVWFD, 0
0047  0000    ADDCNT, 0
0050  6520    BADPAS, 6520
0051  6500    GOODPS, 6500
0052  1653    AUTRST, PRGRST
0053  0000    TEST,   0                               /SCOPE LOOP AND TEST LOOP ADDRESS
```

```
                4454    ERROR=  JMS  I  .
0054  1710                             ERRORX
                4455    LOOP=   JMS  I  .
0055  1752                             TSTLOP
                4456    SCOPLP= JMS  I  .
0056  1660                             TESTAD

0057  1643    XPWRFL, POWFAL
0060  1667    XBAT,   BATEMT
0061  1617    PASENU, ENDPAS

                /CONSTANTS USED BY THE PROGRAM

0062  7777    M1,     -1
0063  7776    M2,     -2
0064  7774    M4,     -4
0065  7773    M5,     -5
0066  7771    M7,     -7
0067  7770    M10,    -10
0070  7767    M11,    -11
0071  7762    M16,    -16
0072  7760    M20,    -20
0073  7756    M22,    -22
0074  7753    M25,    -25
0075  7750    M30,    -30
0076  7745    M33,    -33
0077  7744    M34,    -34
0100  7740    M40,    -40
0101  7735    M43,    -43
0102  7734    M44,    -44
0103  7730    M50,    -50
0104  7726    M52,    -52
0105  7723    M55,    -55
0106  7720    M60,    -60
0107  7717    M61,    -61
0110  7712    M66,    -66
0111  7710    M70,    -70
0112  7701    M77,    -77
0113  7700    M100,   -100
0114  7653    M125,   -125
0115  7626    M152,   -152
0116  7500    M300,   -300
0117  7000    M1000,  -1000
0120  6771    M1007,  -1007
0121  6762    M1016,  -1016
0122  6753    M1025,  -1025
0123  6744    M1034,  -1034
0124  6735    M1043,  -1043
0125  6726    M1052,  -1052
0126  6717    M1061,  -1061
0127  6710    M1070,  -1070
0130  6700    M1100,  -1100
0131  3700    M4100,  -4100
```



```
0132  3000    M5000,  -5000
0133  2700    M5100,  -5100

0134  0007    K7,     7
0135  0010    K10,    10
0136  0037    K37,    37
0137  0070    K70,    70
0140  0077    K77,    77
0141  0125    K125,   125
0142  0152    K152,   152
0143  0200    K200,   200
0144  0400    K400,   400
0145  1777    K1777,  1777
0146  2000    K2000,  2000
0147  7774    K7774,  7774
0150  7707    K7707,  7707
0151  7757    K7757,  7757
0152  7677    K7677,  7677
0153  4100    K4100,  4100

      0200    .200


                /**********************************************************************************************
                /TEST 18 - IS ONLY EXECUTED WHEN THE SIMULATOR IS SELECTED (BIT 4 OF LOCATION 21 SET TO A 1).
                /TEST 18 CHECKS THAT THE EMA IS LOADED ONTO THE BUS DURING A DCA I FOLLOWING
                /A CDF 10) CDF 20) CDF 40,  THE SIMULATOR IS USED TO CAUSE A INTERRUPT
                /FOLLOWING A EMA CHANGE ON THE BUS, THE SIMULATOR STORES THE EMA INTO A
                /EMA CATCHER REGISTER AND THEN THE PROGRAM READS AND COMPARES IT.
                /**********************************************************************************************

0200  7000              NOP/JMS I AUTRST        /THIS LOCATION USED FOR AUTO-RESTARTS
0201  4456    TEST18, SCOPLP                  /SETUP TEST AND SCOPE LOOPING ADDRESS
0202  6007              CAF                   /CLEAR ALL FLAGS
0203  1021              TAD     OPISEL        /CHECK BIT 4 OF LOCATION 21 FOR SIMULATOR SELECT
0204  0143              AND     K200          /
0205  7650              SNA     CLA           /WAS THE SIMULATOR SELECTED ?
0206  5461              JMP  I  PASEND        /NO, END OF ONE PROGRAM PASS
0207  4211              JMS     EMACLR        /LOAD CONTROL WORD AND CLEAR EMA REGISTER
0210  5225              JMP     TST18A        /GO TO FIRST TEST
0211  0000    EMACLR, 0                       /ROUTINE TO LOAD CONTROL WORD AND CLEAR EMA CATCHER REGISTER
0212  1144              TAD     K400
0213  6153              LODMG3                /LOAD CONTROL REGISTER 3 FOR INT AND SKIP ENABLE
0214  6154              CLREMA                /CLEAR EMA CATCHER REGISTER
0215  6166              SKPEMA                /SKIP ON EMA CATCHER REGISTER SET
0216  7610              SKP     CLA
0217  4454              ERROR                 /CLREMA FAILED TO CLEAR CATCHER F/F
0220  6155              RDEMA                 /READ THE EMA CATCHER REGISTER
0221  1066              TAD     M7            /CLEARING THE REGISTER SET IT TO 7
0222  7640              SZA     CLA           /IS THE REGISTER SET TO 7 ?
0223  4454              ERROR                 /NO, CLREMA FAILED TO SET REGISTER TO 7
0224  5611              JMP  I  EMACLR
0225  6211    TST18A, CDF     10              /CHANGE DATA FIELD TO FIELD 10
0226  6001              ION                   /TURN THE INTERRUPT ON
```

```
0227  3630            DCA  I  .+1          /CHANGE THE EMA LINES TO 1 AND INTERRUPT
0230  7402            HLT                  /SIMULATOR FAILED TO INT, OR EMA DIDN'T CHANGE
0231  6166            SKPEMA               /SKIP ON EMA REGISTER SET
0232  4454            ERROR                /SIMULATOR EMA CATCHER REGISTER NOT SET
0233  6234            RIB                  /READ THE INTERRUPT BUFFER
0234  1062            TAD     M1
0235  7640            SZA     CLA          /IS THE SAVE FIELD EQUAL TO 1 ?
0236  4454            ERROR                /NO,SAVE FIELD NOT EQUAL TO 1
0237  6155            REDEMA               /READ THE SIMULATOR EMA CATCHER REGISTER
0240  1062            TAD     M1
0241  7640            SZA     CLA          /IS THE EMA CATCHER REGISTER = 1 ?
0242  4454            ERROR                /NO,EMA LINES OTHER THAN EMA2 MUST HAVE BEEN SET
0243  4211            JMS     EMACLR       /LOAD CONTROL WORD AND CLEAR EMA CARCHER REGISTTER
0244  6221  TST18B,   CDF     20           /CHANGE DATA FIELD TO FIELD 2
0245  6001            ION                  /TURN THE INTERRUPT ON
0246  3647            DCA  I  .+1          /CHANGE THE EMA LINES TO 2 AND INTERRUPT
0247  7402            HLT                  /PROGRAM FAILED TO INTERRUPT OR EMA DID NOT CHANGE
0250  6166            SKPEMA               /SKIP ON EMA REGISTER SET
0251  4454            ERROR                /EMA CATCHER REGISTER NOT SET
0252  6155            REDEMA               /READ THE EMA CATCHER REGISTER
0253  1063            TAD     M2
0254  7640            SZA     CLA          /DID THE DF SET EMA1 ON TO THE BUS
0255  4454            ERROR                /NO, EMA REGISTER NOT EQUAL TO 2
0256  4211            JMS     EMACLR       /LOAD CONTROL WORD CLEAR EMA REGISTER
0257  6241  TST18C,   CDF     40           /CHANGE DATA FIELD TO FIELD 4
0260  6001            ION                  /TURN THE INTERRUPT ON
0261  3662            DCA  I  .+1          /CHANGE EMA LINES TO 4 AND INTERRUPT
0262  7402            HLT                  /PROGRAM FAILED TO INTERRUPT OR EMA DID NOT CHANGE
0263  6166            SKPEMA               /SKIP ON EMA CATCHER REGISTER SET
0264  4454            ERROR                /EMA CATCHER F/F NOT SET
0265  6155            REDEMA               /READ THE EMA CATCHER REGISTER
0266  1064            TAD     M4
0267  7640            SZA     CLA          /DID THE DF SET EMA0 ONTO THE BUS
0270  4454            ERROR                /NO,EMA CATCHER REGISTER NOT EQUAL TO 4
0271  4672            JMS  I  .+1          /LOAD CONTROL WORD AND CLEAR EMA CATCHER REGISTER
0272  0211            EMACLR
0273  6150            CLRSIM               /CLEAR SIMULATOR CONTROL WORD
0274  4455            LOOP                 /LOOP ON TEST IF SR = 1000
```

```
/*****************************************************************************************************
/TEST 19 - IS A CONTINUATION OF TEST 18 ONLY TESTING THAT THE CIF
/INSTRUCTION LOADS THE APPROPRIATE EMA LINE, THE TEST WILL BE FOR CIF 10;
/CIF 20; AND CIF 40, THE SIMULATOR IS USED FOR INTERRUPTS AND TO READ
/THE EMA LINES;
/*****************************************************************************************************
```

```
0275  4456  TEST19, SCOPLP              /SETUP TEST AND SCOPE LOOPING ADDRESS
0276  6007            CAF                /CLEAR ALL FLAGS
0277  6160            CLRMOD             /CLEAR SIMULATOR MODULE
0300  6211            CDF     10         /CHANGE DATA FIELD TO FIELD 1
0301  3761            DCA  I  EMA1       /CLEAR THE FIRST TEST LOCATION
0302  6221            CDF     20         /CHANGE DATA FILED TO FIELD 2
0303  3762            DCA  I  EMA2
0304  6241            CDF     40         /CHANGE DATA FIELD TO FIELD 4
0305  3763            DCA  I  EMA3       /CLEAR A LOCATION IN FIELD 4
```



```
0306  6201            CDF     00         /CHANGE DATA FIELD BACK TO FIELD 0
0307  4760            JMS  I  CLRERG     /LOAD CONTROL WORD AND CLEAR EMA CATCHER REGISTER
0310  6212  TST19A,   CIF     10         /CHANGE INSTRUCTION FIELD TO 1
0311  6001            ION                /TURN THE INTERRUPT ON
0312  5312  EMA1F1,   JMP     .          /CLEAR  INT INHIBIT AND INTERRUPT
0313  7402            HLT                /PROGRAM FAILED TO INTERRUPT
0314  6166            SKPEMA             /SKIP ON EMA CATCHER F/F SET
0315  4454            ERROR              /EMA CATCHER F/F NOT SET
0316  6234            RIB                /READ THE INTERRUPT BUFFER
0317  1067            TAD     M10
0320  7640            SZA     CLA        /IS THE SAVE FIELD EQUAL TO IF OF 1
0321  4454            ERROR              /SAVE FIELD NOT EQUAL TO IF OF 1
0322  6155            REDEMA             /READ THE EMA CATCHER REGISTER
0323  1062            TAD     M1
0324  7640            SZA     CLA        /IS THE EMA CATCHER REGISTER EQUAL TO 1
0325  4454            ERROR              /NO,EMA CATCHER GEGISTER NOT EQUAL TO 1
0326  4760  TST19B,   JMS  I  CLRERG     /LOAD CONTROL WORD, CLEAR EMA CATCHER REGISTER
0327  6222            CIF     20         /CHANGE INSTRUCTION FIELD TO FIELD 2
0330  6001            ION                /TURN THE INTERRUPT ON
0331  5331  EMA1F2,   JMP     .          /CLEAR INT INHIBIT AND INTERRUPT
0332  7402            HLT                /PROGRAM FAILED TO INTERRUPT OR EMA DID NOT CHANGE
0333  6166            SKPEMA             /SKIP ON EMA CATCHER F/F SET
0334  4454            ERROR              /EMA CATCHER REGISTER NOT SET
0335  6155            REDEMA             /READ THE EMA CATCHER REGISTER
0336  1063            TAD     M2
0337  7640            SZA     CLA        /IS THE EMA CATCHER REGISTER EQUAL TO 2
0340  4454            ERROR              /NO, EMA WASN'T SET TO 2
0341  4760  TST19C,   JMS  I  CLRERG     /LOAD CONTROL WORD, CLEAR EMA REGISTER
0342  6242            CIF     40         /CHANGE INSTRUCTION FIELD TO FIELD 4
0343  6001            ION                /TURN THE INTERRUPT ON
0344  5344  EMA1F3,   JMP     .          /CLEAR INTERRUPT INHIBIT AND INTERRUPT
0345  7402            HLT                /PROGRAM FAILED TO INTERRUPT
0346  6166            SKPEMA             /SKIP ON EMA CATCHER F/F SET
0347  4454            ERROR              /EMA CATCHER REGISTER NOT SET
0350  6155            REDEMA             /READ THE EMA CATCHER REGISTER
0351  1064            TAD     M4
0352  7640            SZA     CLA        /IS THE EMA CATCHER REGISTER SET TO 4
0353  4454            ERROR              /NO, EMA WASN'T SET TO 4
0354  4760            JMS  I  CLRERG     /LOAD CONTROL WORD CLEAR CATCHER F/F'S
0355  6150            CLRSIM             /CLEAR SIMULATOR CONTROL WORDS
0356  4455            LOOP               /LOOP ON TEST IF SR = 1000
0357  5777'           JMP     TEST20     /GO TO THE NEXT TEST

0360  0211  CLRERG,   EMACLR
0361  0312  EMA1,     EMA1F1
0362  0331  EMA2,     EMA1F2
0363  0344  EMA3,     EMA1F3

0377  0402
      0400            PAGE
0400  5601            JMP  I  .+1        /SIMULATOR COMES HERE AFTER A BOOTSTRAP
0401  0642            BOTH1
```

```
/*****************************************************************************************************
```

```
                    /TEST 20 = IS EXECUTED WHEN THE SIMULATOR IS SELECTED, TEST 22 CHECKS
                    /THAT THE TIME SHARE LOGIC CAN BE DISABLED, THIS IS DONE WITH THE
                    /SIMULATOR BY PULLING KMTS TIME SHARE DISA, L LOW, THE PROGRAM THEN
                    /TRIES TO LOAD THE USER BUFFER AND THEN DOES A IOT, LAS, OSR AND CHECKS
                    /THAT THE PROGRAM DIDN'T INTERRUPT;
                    /*****************************************************************************************************

0402  4456    TEST20, SCOPLP                  /SETUP TEST AND SCOPE LOOPING ADDRESS
0403  6007            CAF                     /CLEAR ALL FLAGS
0404  6160            CLRMOD                  /CLEAR SIMULATOR LOGIC
0405  7330            CLA CLL CML RAR         /SET BIT 0 TO A ONE
0406  6153            LODKG3                  /LOAD CONTROL REGISTER 3 WITH TIME SHARE DISABLE
0407  7300            CLA     CLL
0410  6001            ION                     /TURN THE INTERRUPT ON
0411  6274            SUF                     /TRY TO SET USER BUFFER
0412  5213            JMP     .+1             /TRY TO ENTER TIME SHARE MODE
0413  7404            OSR                     /SHOULD TRAP HERE IF TIME SHARE NOT DISABLED
0414  7410            SKP
0415  4454            ERROR                   /TIME SHARE NOT DISABLED=PROGRAM INTERRUPTED
0416  7604            LAS                     /SHOULD TRAP HERE IF TIME SHARE NOT DISABLED
0417  7410            SKP
0420  4454            ERROR                   /LAS TRAPPED WITHOUT TIME SHARE ENABLED
0421  6001            ION                     /ISSUE A IOT
0422  7610            SKP     CLA
0423  4454            ERROR                   /IOT TRAPPED WITHOUT TIME SHARE ENABLED
0424  6007            CAF                     /CLEAR ALL FLAGS
0425  7610            SKP     CLA
0426  4454            ERROR                   /CAF TRAPPED
0427  6150            CLRSIM                  /CLEAR THE SIMULATOR CONTROL REGISTERS
0430  6001            ION                     /TURN INTERRUPT ENABLE ON
0431  6274            SUF                     /SET THE USER BUFFER F/F
0432  5233            JMP     .+1             /ENTER TIME SHARE MODE
0433  7402            HLT                     /SHOULD TRAP HERE
0434  5234            JMP     .               /HALT FAILED TO TRAP IN USER MODE
0435  6254            SINT                    /SKIP ON USER INTERRUPT F/F SET
0436  4454            ERROR                   /USER INTERRUPT F/F NOT SET
0437  6007            CAF                     /CLEAR USER INTERRUPT F/F
0440  4455            LOOP                    /LOOP ON TEST IF SR = 1000
0441  5642            JMP  I  .+1
0442  0600            TEST21


                    /THE FOLLOWING LOCATIONS CONTAIN THE CONTENTS OF THE TABE CASSETTE BOOTSTRAP

0443  4000    TABADD, 4000                    /BOOTSTRAP WILL START LOADING INTO THIS ADDRESS
0444  7740            TABCMP=TABEND-1
0445  1237    TABCMP, 1237
0446  1206            1206
0447  6706            6706
0450  6706            6706
0451  6703            6703
0452  5204            5204
0453  7254            7254
0454  6702            6702
```



```
0455  7610            7610
0456  3211            3211
0457  3636            3636
0460  1205            1205
0461  6704            6704
0462  6706            6706
0463  6701            6701
0464  5216            5216
0465  7002            7002
0466  7430            7430
0467  1636            1636
0470  7022            7022
0471  3636            3636
0472  7420            7420
0473  2236            2236
0474  2235            2235
0475  5215            5215
0476  7346            7346
0477  7002            7002
0500  3235            3235
0501  5201            5201
0502  7737            7737
0503  3557            3557
0504  7730    TABEND, 7730
0505  0000            0000                    /TERMINATOR

0506  1301    BOOTTB, PTPADD
0507  1343            TCBADD
0510  1363            DSKADD
0511  0443            TABADD
0512  0514            RKBADD
0513  0000            0


                    /THE FOLLOWING LOCATIONS CONTAIN THE CONTENTS OF THE RK8E BOOTSTRAP

0514  0023    RKBADD, 0023                    /BOOTSTRAP WILL LOAD INTO THIS ADDRESS
0515  7771            RKBCMP=RKBEND-1         /NUMBER OF LOCATIONS TO COMPARE
0516  2000    RKBCMP, 2000
0517  6745            6745
0520  0023            0023
0521  7650            7650
0522  5024            5024
0523  6743            6743
0524  5031    RKBEND, 5031
0525  0000            0000                    /TERMINATOR
      0600            PAGE
```

```
                    /**********************************************************************************************
                    /THE FOLLOWING TEST CHECKS THE BOOTSTRAP TO LOAD AND TO COMPARE CORRECTLY
                    /**********************************************************************************************

0000  4456    TEST21, SCOPLP                  /SETUP TEST COUNT AND SCOPE LOOPING ADDRESS
0001  1377            TAD     (JMS I AUTRST   /SETUP LOCATIONS 0 AND 200
0002  3000            DCA     INTSER
0003  1377            TAD     (JMS I AUTRST
0004  3776'           DCA     TEST18-1
0005  1375            TAD     (NOBOOT         /SET UP A LOCATION IN CASE LOGIC DID A AUTO RESTART
0006  3852            DCA     AUTRST          /SAVE IT
0007  5212            JMP     .+3
0010  0000    NOBOOT, 0
0011  4454            ERROR                   /PROGRAM DID A AUTO-RESTART INSTEAD OF A BOOT
0012  6160            CLRMOD                  /CLEAR SIMULATOR TEST LOGIC
0013  4774'           JMS     SETUP           /GO SETUP FOR BOOTSTRAPS
0014  1373    NXTBOT, TAD     (BOTSEL         /GET THE ADDRESS OF THE BOOT SELECT TABLE
0015  1320            TAD     SIMBOT          /GET THE BOOTSTRAP TO BE EXECUTED
0016  3322            DCA     CONTW2          /SAVE THE ADDRESS OF BOOTSTRAP SELECT
0017  1372            TAD     (BOTENA         /GET THE ADDRESS OF THE BOOTSTRAP ENABLE BITS
0020  3323            DCA     CONTW3          /SAVE THE ADDRESS OF BOOT ENABLE CODE
0021  7346            CLA CLL CMA RTL         /SETUP TO DO 3 BOOTSTRAP COMBINATIONS
0022  3325            DCA     BTSUBT          /SAVE SUB-TEST COUNT
0023  6160    BTTST1, CLRMOD                  /CLEAR SIMULATOR MODULE
0024  4771'           JMS     CLEARB          /CLEAR BOOTSTRAP LOCATIONS IN MEMORY
0025  1022            TAD     DP2SEL          /CHECK FOR THE ACT LINE
0026  7710            SPA     CLA             /IS PROGRAM RUNNING ON ACT LINE?
0027  6305            6305                    /YES,DISABLE ACT UNTIL BOOTSTRAP IS COMPLETED
0030  1722            TAD  I  CONTW2          /GET THE BOOTSTRAP SELECT ADDRESS
0031  6152            LODMG2                  /LOAD SIMULATOR CONTROL REGISTER 2
0032  7300            CLA     CLL
0033  1326            TAD     BOOTR1          /GET BOOT STRAP RETURN ADDRESS FOR BOOT RETURN
0034  3724            DCA  I  AUD401          /PUT IT INTO LOCATION 401
0035  1723            TAD  I  CONTW3          /GET BOOTSTRAP ENABLING CODE
0036  6153            LODMG3                  /LOAD SIMULATOR CONTROL REGISTER 3
0037  7300            CLA     CLL
0040  6164            EXECUT                  /LOAD THE BOOTSTRAP
0041  5241            JMP     .                       /PROGRAM FAILED TO BOOTSTRAP ON 1 OF THE FOLLOWING CONDITIONS
                                                /0001 SW-SW ENABLE BOOT WHEN RUNNING
                                                /0003 SW-SW ENABLE BOOT WHEN RUNNING
                                                /0005 SW-SW ENABLE BOOT WHEN RUNNING
0042  6160    BOTRT1, CLRMOD                  /CLEAR SIMULATOR LOGIC
0043  7301            CLA CLL IAC             /BOOTSTRAP SHOULD RETURN HERE VIA SIMULATOR
0044  1022            TAD     DP2SEL          /CHECK FOR THE ACT LINE
0045  7510            SPA                     /IS THE PROGRAM ON THE ACT LINE
0046  6305            6305                    /YES, ENABLE THE ACT LINE
0047  7300            CLA     CLL
0050  1320            TAD     SIMBOT          /GET THE BOOT BEING EXECUTED
0051  4770'           JMS     BOTCMP+2        /GO COMPARE THE BOOT THAT WAS LOADED
0052  2323            ISZ     CONTW3          /ADD 1 TO THE BOOTSTRAP ENABLE ADDRESS
0053  2325            ISZ     BTSUBT          /DONE WITH THIS SUB TEST?
0054  5223            JMP     BTTST1          /NO,DO NEXT ENABLING CONDITION
0055  4767'           JMS     GOODBD          /SIGNAL ACT LINE IF SELECTED
0056  1065            TAD     M5              /SETUP TO DO NEXT SUB TEST 5 TIMES
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0057  3325            DCA     BTSUBT          /SAVE SUB-TEST COUNT
0060  6160    BTTST2, CLRMOD                  /CLEAR SIMULATOR MODULE
0061  4771'           JMS     CLEARB          /CLEAR BOOTSTRAP LOCATIONS IN MEMORY
0062  1022            TAD     DP2SEL          /CHECK FOR THE ACT LINE
0063  7710            SPA     CLA             /IS IT ON THE ACT LINE
0064  6305            6305                    /YES, DISABLE ACT LINE UNTIL BOOT IS DONE
0065  1722            TAD  I  CONTW2          /GET THE BOOTSTRAP SELECT ADDRESS
0066  6152            LODMG2                  /LOAD CONTROL REGISTER 2
0067  7300            CLA     CLL
0070  1327            TAD     BOOTR2          /GET BOOT RETURN ADDRESS FOR BOOT RETURN
0071  3724            DCA  I  AUD401          /PUT IT IN LOCATION 401
0072  1723            TAD  I  CONTW3          /GET BOOT STRAP ENABLE CODE
0073  6153            LODMG3                  /LOAD CONTROL REGISTER 3
0074  7300            CLA     CLL
0075  6164            EXECUT                  /LOAD THE BOOTSTRAP
0076  7602            HLT     CLA             /IF PROGRAM HALTED IT FAILED TO DO 1 OF FOLLOWING
                                                /0011 SW-SW DISABLE BOOT WHEN RUNNING
                                                /0002 POWER ON DISABLE BOOT WHEN RUNNING
                                                /0013 SW-SW DISABLE BOOT WHEN RUNNING
                                                /0003 POWER ON DISABLE BOOT WHEN RUNNING
                                                /0015 SW-SW DISABLE BOOT WHEN RUNNING
0077  6160    BOTRT2, CLRMOD                  /CLEAR SIMULATOR LOGIC
0700  7301            CLA CLL IAC
0701  1022            TAD     DP2SEL
0702  7510            SPA
0703  6305            6305
0704  7300            CLA     CLL
0705  1320            TAD     SIMBOT          /GET THE BOOTSTRAP BEING EXECUTED
0706  4770'           JMS     BOTCMP+2        /GO COMPARE THE BOOTSTRAP THAT WAS LOADED
0707  2323            ISZ     CONTW3          /ADD 1 TO BOOTSTRAP ENABLE ADDRESS
0710  2325            ISZ     BTSUBT          /DONE WITH THE SUB-TEST ?
0711  5260            JMP     BTTST2          /NO, DO NEXT ENABLING CODE
0712  4767'           JMS     GOODBD          /SIGNAL ACT LINE IF SELECTED
0713  2320            ISZ     SIMBOT          /ADD 1 TO THE BOOTSTRAP SELECT
0714  2321            ISZ     CNTBOT          /DONE ALL 5 BOOTSTRAPS?
0715  5214            JMP     NXTBOT          /NO,GO DO NEXT BOOTSTRAP
0716  4455            LOOP                    /LOOP ON TEST IF SR = 1000
0717  5766'           JMP     TEST22          /GO TO THE NEXT TEST

0720  0000    SIMBOT, 0
0721  0000    CNTBOT, 0
0722  0000    CONTW2, 0
0723  0000    CONTW3, 0
0724  0401    AUD401, 0401
0725  0000    BTSUBT, 0

                    /BOOTSTRAP RETURN ADDRESSES

0726  0642    BOOTR1, BOTRT1
0727  0677    BOOTR2, BOTRT2

0766  1041
0767  1701
0770  1402
0771  1463
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0772  1155
0773  1150
0774  1517
0775  0610
0776  0200
0777  4452
      1000          PAGE


                    /THE CAPS8 CASSETTE BOOT STRAP WILL LOAD INTO THE FOLLOWING LOCATIONS,

1000  7402  CAPS8,  HLT                   /1237
1001  7402          HLT                   /1206
1002  7402          HLT                   /0704
1003  7402          HLT                   /0706
1004  7402          HLT                   /0703
1005  7402          HLT                   /5204
1006  7402          HLT                   /7264
1007  7402          HLT                   /0702
1010  7402          HLT                   /7610
1011  7402          HLT                   /3211
1012  7402          HLT                   /3636
1013  7402          HLT                   /1205
1014  7402          HLT                   /0704
1015  7402          HLT                   /0706
1016  7402          HLT                   /0701
1017  7402          HLT                   /5216
1020  7402          HLT                   /7002
1021  7402          HLT                   /7430
1022  7402          HLT                   /1636
1023  7402          HLT                   /7022
1024  7402          HLT                   /3636
1025  7402          HLT                   /7420
1026  7402          HLT                   /2236
1027  7402          HLT                   /2235
1030  7402          HLT                   /5215
1031  7402          HLT                   /7346
1032  7402          HLT                   /7002
1033  7402          HLT                   /3235
1034  7402          HLT                   /5201
1035  7402          HLT                   /7737
1036  7402          HLT                   /3557
1037  7402          HLT                   /7730
1040  7402          HLT                   /TERMINATOR


                    /**********************************************************************************************************
                    /TEST 22 CHECKS THAT THE AUTO RESTART OCCURS AT THE APPROPRIATE ADDRESS, THIS
                    /TEST USES THE SIMULATOR TO SELECT AND CAUSE A AUTO RESTART.
                    /**********************************************************************************************************

1041  4456  TEST22, SCOPLP              /SETUP TEST AND SCOPE LOOP ADDRESS
1042  1377          TAD     (JMS I AUTRST   /SETUP LOCATIONS 0 AND 200
```



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1043  3000          DCA     INTSER          /
1044  1377          TAD     (JMS I AUTRST   /
1045  3776'         DCA     TEST18-1
1046  1375          TAD     (RSTAUT         /GET THE AUTO RESTART ADDRESS
1047  3052          DCA     AUTRST          /SAVE IT
1050  1374          TAD     (NOAUTO         /GET BOOT STRAP ADDRESS
1051  3653          DCA  I  ,+2
1052  5255          JMP     ,+3
1053  0401          0401
1054  4454  NOAUTO, ERROR                   /LOGIC DID A BOOT INSTEAD OF A AUTO RESTART
1055  4773'         JMS     SETUP           /GO SETUP FOR TEST
1056  6160  AUTIST, CLRMOD          /CLEAR SIMULATOR MODULE
1057  1372          TAD     (RESADD         /GET THE ADDRESS OF AUTO RESTART TABLE
1060  1334          TAD     AUTSEL          /GET THE PROGRAM AUTO - RESTART TO BE EXECUTED
1061  3335          DCA     ADDRES          /SAVE THE TABLE ADDRESS
1062  1371          TAD     (SELAUT         /GET THE CONTROL WORD 2 TABLE ADDRESS
1063  1334          TAD     AUTSEL          /ADD IN THE RESTART TO BE EXECUTED
1064  3336          DCA     CONW2           /SAVE THIS ADDRESS TO GET THE CONTROL WORD
1065  1022          TAD     OP2SEL          /CHECK TO SEE IF PROGRAM IS ON ACT LINE
1066  7710          SPA     CLA
1067  6305          6305                    /DISABLE ACT LINE UNTIL AUTO RESTART IS DONE
1070  1736          TAD  I  CONW2           /GET THE CONTROL WORD
1071  6152          LOADW2                  /LOAD CONTROL REGISTER 2
1072  7300          CLA     CLL
1073  1347          TAD     AUTENA          /GET THE ENABLE CONTROL WORD
1074  6153          LOADW3                  /LOAD CONTROL REGISTER 3
1075  7300          CLA     CLL
1076  6164          EXECUT                  /EXECUTE A AUTO RESTART
1077  7602          HLT     CLA             /SHOULD DO A AUTO RESTART HERE-PRESS CONT FOR RETRY
1100  5256          JMP     AUTTST          /RETRY
1101  0000  RSTAUT, 0                      /A AUTO RESTART SHOULD COME HERE
1102  6160          CLRMOD                  /CLEAR SIMULATOR LOGIC
1103  7301          CLA CLL IAC             /SET BIT 11 TO A ONE
1104  1022          TAD     OP2SEL          /CHECK FOR THE ACT LINE
1105  7510          SPA                     /IS IT RUNNING ON ACT LINE
1106  6305          6305                    /YES, ENABLE ACT LINE
1107  7340          CLA CLL CMA             /SET THE AC TO MINUS 1
1110  1301          TAD     RSTAUT          /GET THE PC FROM THE AUTO RESTART
1111  7041          CIA                     /NEGATE IT
1112  1735          TAD  I  ADDRES          /GET THE EXPECTED AUTO RESTART PC
1113  7650          SNA     CLA             /ARE THEY EQUAL?
1114  5325          JMP     GODAUT          /YES GO DO NEXT ADDRESS
1115  4454          ERROR                   /EXPECTED AUTO RESTART ADDRESS NOT EQUAL TO
                                            /RETURN ADDRESS, PRESS CONT TO GET EXP AND ACT ADDRESS
1116  1735          TAD  I  ADDRES          /
1117  7402          HLT                     /AC EQUALS EXPECTED AUTO RESTART ADDRESS
1120  7340          CLA CLL CMA
1121  1301          TAD     RSTAUT          /
1122  7402          HLT                     /AC EQUALS ACTUAL AUTO RESTART ADDRESS
1123  7200          CLA                     /
1124  5256          JMP     AUTTST          /DO SAME RESTART OVER AGAIN
1125  2334  GODAUT, ISZ     AUTSEL          /ADD 1 TO PROGRAM SELECT RESTART
1126  2333          ISZ     AUTCNT          /DONE ALL FOUR AUTO RESTARTS?
1127  5256          JMP     AUTTST          /NO,GO DO NEXT ONE
1130  4770'         JMS     GOODBD          /SIGNAL ACT LINE OF A GOOD PASS IF ON IT
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1131  4455          LOOP                    /LOOP ON TEST IF SR = 1000
1132  5767          JMP       TEST23

1133  0000    AUTCNT, 0
1134  0000    AUTSEL, 0
1135  0000    ADDRES, 0
1136  0000    CONW2,  0

1137  4200    RESADD, 4200
1140  2000            2000
1141  0200            0200
1142  0000            0000

1143  1676    SELAUT, 1676                  /AUTO RESTART AT 4200
1144  1674            1674                  /AUTO RESTART AT 2000
1145  1672            1672                  /AUTO RESTART AT 200
1146  1670            1670                  /AUTO RESTART AT 0000

1147  0037    AUTENA, 0037                  /POWER ON TRIGGERED AUTO RESTART

                /CONTROL WORD 2 BOOTSTRAP SELECT

1150  1672    BOTSEL, 1672                  /HI-LOW PAPER TAPE SELECT
1151  1132            1132                  /TC08 BOOTSTRAP SELECT
1152  0742            0742                  /RF08/DF32D BOOTSTRAP SELECT

1153  0642            0642                  /TAPE CASSETTE BOOTSTRAP SELECT
1154  1252            1252                  /RK8-E BOOTSTRAP SELECT

                /CONTROL WORD 3 BOOTSTRAP ENABLES (POWER ON OR SWITCH SW)

1155  0001    BOTENA, 0001                  /SW-SW ENABLE BOOT WHEN RUNNING
1156  0003            0003                  /SW-SW ENABLE BOOT WHEN RUNNING
1157  0007            0007                  /SW-SW ENABLE BOOT WHEN RUNNING
1160  0011            0011                  /SW-SW DISABLE BOOT WHEN RUNNING
1161  0032            0032                  /POWER ON DISABLE BOOT WHEN RUNNING
1162  0013            0013                  /SW-SW DISABLE BOOT WHEN RUNNING
1163  0033            0033                  /POWER ON DISABLE BOOT WHEN RUNNING
1164  0017            0017                  /SW-SW DISABLE BOOT WHEN RUNNING


1167  1201
1170  1701
1171  1143
1172  1137
1173  1517
1174  1054
1175  1101
1176  0200
1177  4452
      1200          PAGE

                /*****************************************************************************************
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                /TEST 23- USES THE SIMULATOR TO CHECK THAT AC LOW AND BATTERY EMPTY F/F'S
                /CAN SKIP AND INTERRUPT AND THAT THEY CAN BE CLEARED.
                /*****************************************************************************************
1200  4452          JMS  I  AUTRST          /AUTO RESTART HANDLER
1201  4456    TEST23, SCOPLP                /SETUP TEST AND SCOPE LOOP ADDRESS
1202  1377          TAD       (ACLBAT
1203  3052          DCA       AUTRST
1204  6007          CAF                     /CLEAR ALL FLAGS
1205  6160          CLSMOD                  /CLEAR SIMULATOR MODULE
1206  3776          DCA       ACNLOK
1207  6101          SBE                     /SKIP ON BATTERY EMPTY
1210  7410          SKP
1211  4454          ERROR                   /BATTERY EMPTY IS SET
1212  6102          SPL                     /SKIP ON AC LOW
1213  7410          SKP
1214  4454          ERROR                   /AC LOW F/F IS SET
1215  1253          TAD       K3000         /SET BITS 2 + 3 TO A 1
1216  6153          LODMG3                  /LOAD REGISTER 3 TO PULL AC LOW AND BATTERY EMPTY LOW
1217  7300          CLA       CLL
1220  6001          ION                     /TURN THE INTERRUPT ON
1221  5222          JMP       .+1
1222  4454          ERROR                   /AC LOW NOT SET OR FAILED TO INTERRUPT
1223  7610          SKP       CLA
1224  4454          ERROR                   /AC LOW NOT SET BUT BATTERY EMPTY IS
1225  6102          SPL                     /SKIP ON AC LOW AS A LEVEL
1226  4454          ERROR                   /AC LOW AS A LEVEL DID NOT SKIP
1227  6101          SBE                     /SKIP ON BATTERY EMPTY
1230  4454          ERROR                   /BATTERY EMPTY NOT SET WITH BATTERY EMPTY HELD LOW
1231  1254          TAD       K1000         /SET CONTROL BIT 3 HIGH
1232  6153          LODMG3                  /LOAD THE CONTROL REGISTER
1233  7340          CLA CLL CMA
1234  3776          DCA       ACNLOK        /
1235  6001          ION                     /TURN THE INTERRUPT ON
1236  5237          JMP       .+1
1237  4454          ERROR                   /BATTERY EMPTY NOT SET OR FAILED TO INT
1240  4454          ERROR                   /AC LOW SET BUT BATTERY EMPTY ISN'T
1241  6153          LODMG3                  /OK, BATTERY EMPTY SET,LET AC LOW GO HIGH
1242  6101          SBE                     /SKIP ON BATTERY EMPTY
1243  7410          SKP
1244  4454          ERROR                   /AC LOW FAILED TO CLEAR BATTERY EMPTY
1245  6102          SPL                     /SKIP ON AC LOW
1246  7410          SKP
1247  4454          ERROR                   /AC LOW AS A LEVEL STILL SKIPPED
1250  6160          CLSMOD                  /CLEAR SIMULATOR TEST MODULE
1251  4455          LOOP                    /LOOP ON TEST IF SR = 1000
1252  5461          JMP  I  PASEND          /END OF PROGRAM

1253  3000    K3000,  3000
1254  1000    K1000,  1000


                /*****************************************************************************************
                /TIMDIS - IS AN OPERATOR INTERVENTION TEST, THE OPERATOR MUST SET THE
                /TIME SHARE ENABLE SWITCH TO THE TIME SHARE DISABLE POSITION, THE PROGRAM
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                    /TRIES TO SET THE USER FLAG AND CHECKS THAT LAS, OSR, IOT, AND HALT
                    /DO NOT TRAP AND THAT HLT HALTS,
                    /*****************************************************************************************

1255  4456          TIMDIS, SCOPLP                  /SETUP TEST AND SCOPE LOOPING ADDRESS
1256  6007                  CAF                     /CLEAR ALL FLAGS
1257  6264                  CUF                     /CLEAR USER BUFFER F/F
1260  6204                  CINT                    /CLEAR USER INTERRUPT F/F
1261  6001                  ION                     /TURN THE INTERRUPT ON
1262  6274                  SUF                     /TRY TO SET THE USER BUFFER F/F
1263  5264                  JMP     .+1             /TRY TO ENTER TIME SHARE MODE
1264  7404                  OSR                     /SHOULD TRAP HERE IF TIME SHARE NOT DISABLED
1265  7610                  SKP     CLA
1266  4454                  ERROR                   /TIME SHARE NOT DISABLED-PROGRAM INTERRUPTED
1267  7604                  LAS                     /SHOULD TRAP HERE IF TIME SHARE NOT DISABLED
1270  7610                  SKP     CLA
1271  4454                  ERROR                   /LAS TRAPPED WITHOUT TIME SHARE ENABLED
1272  6254                  SINT                    /SKIP ON USER INTERRUPT
1273  7610                  SKP     CLA
1274  4454                  ERROR                   /IOT TRAPPED OR USER INTERRUPT SET
1275  7402                  HLT                     /PROGRAM SHOULD HALT HERE FOR COMPLETION
                                                    /OF TIME SHARE DISABLE TEST
1276  7610                  SKP     CLA
1277  4454                  ERROR                   /HLT TRAPPED
1300  5255                  JMP     TIMDIS          /RETRY THE TEST

                    /THE FOLLOWING LOCATIONS CONTAINS THE CONTENTS OF THE HI-LOW PAPER TAPE
                    /BOOTSTRAP


1301  7737          PTPADD, 7737                    /BOOTSTRAP WILL START LOADING INTO THIS ADDRESS
1302  7741                  PTPCMP=PTPEND-1         /NUMBER OF LOCATIONS TO COMPARE
1303  6014          PTPCMP, 6014
1304  3776                  3776
1305  7326                  7326
1306  1337                  1337
1307  2376                  2376
1310  5340                  5340
1311  6011                  6011
1312  5356                  5356
1313  3361                  3361
1314  1361                  1361
1315  3371                  3371
1316  1345                  1345
1317  3357                  3357
1320  1345                  1345
1321  3367                  3367
1322  6032                  6032
1323  6031                  6031
1324  5357                  5357
1325  6036                  6036
1326  7106                  7106
1327  7006                  7006
1330  7510                  7510
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1331  5374                  5374
1332  7006                  7006
1333  6031                  6031
1334  5367                  5367
1335  6034                  6034
1336  7420                  7420
1337  3776                  3776
1340  3376                  3376
1341  5356          PTPEND, 5356
1342  0000                  0000                    /TERMINATOR


                    /THE FOLLOWING LOCATIONS CONTAIN THE CONTENTS OF THE TC08 BOOTSTRAP

1343  7613          TC8ADD, 7613                    /BOOTSTRAP WILL START LOADING INTO THIS ADDRESS
1344  7767                  TC8CMP=TC8END-1
1345  6774          TC8CMP, 6774
1346  1222                  1222
1347  6766                  6766
1350  6771                  6771
1351  5216                  5216
1352  1223                  1223
1353  5215                  5215
1354  0600                  0600
1355  0220          TC8END, 0220
1356  7754                  7754                    /BOOTSTRAP WILL ALSO LOAD INTO 7754 + 7755
1357  7776                  -2                      /NUMBER OF LOCATIONS TO COMPARE
1360  7577                  7577
1361  7577                  7577
1362  0000                  0                       /TERMINATOR

                    /THE FOLLOWING LOCATIONS CONTAINS THE CONTENTS OF THE RF08/DF32D BOOTSTRAP

1363  7750          DSKADD, 7750                    /BOOTSTRAP WILL START LOADING INTO THIS ADDRESS
1364  7773                  RFDFCP=RFDFED-1         /NUMBER OF LOCATIONS TO COMPARE
1365  7600          RFDFCP, 7600
1366  6603                  6603
1367  6622                  6622
1370  5352                  5352
1371  5752          RFDFED, 5752
1372  0000                  0000                    /TERMINATOR

1376  1773
1377  1760
      1400                  PAGE

                    /*****************************************************************************************
                    /TO RUN THE OPERATOR INTERVENTION BOOT STRAP COMPARE TEST,DO THE FOLLOWING!
                    /1,     RUN CLRBOT TO CLEAR THE BOOTSTRAP LOCATIONS IN MEMORY
                    /2,     DISABLE ALL OPTIONS ASSOCIATED WITH THE BOOTSTRAP
                    /3,     SET THE APPROPRIATE SELECT AND ENABLE SWITCHES FOR THE BOOTSTRAP
                    /4,     SET THE HALT KEY
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                    /5,     TOGGLE THE BOOT KEY OR SWITCH
                    /6,     START THE BOOT COMPARE TEST (BOTCMP)
                    /7,     THE PROGRAM WILL HALT
                    /8,     SET THE APPROPRIATE SWITCH REGISTER OR PSEUDO SWITCH REGISTER
                    /       TO THE BOOTSTRAP TO COMPARE AND PRESS CONTINUE,
                    /       SR=0000=HI-LOW PAPER TAPE READER BOOTSTRAP
                    /       SR=0001=TC08 BOOTSTRAP
                    /       SR=0002=RF08/DF32D BOOTSTRAP
                    /       SR=0003=TA8E CASSETTE BOOTSTRAP
                    /       SR=0004=RK8E BOOTSTRAP
                    /9,     THE PROGRAM SHOULD HALT AT ADDRESS BOOTOK IF NO ERRORS
                    /*************************************************************************************

1400  7402  BOTCMP, HLT                     /SET THE SR FOR THE APPROPRIATE BOOTSTRAP COMPARE
1401  5204        JMP     .+3
1402  0000        0                         /SIMULATOR BOOTSTRAP CHECK ENTERS HERE
1403  5213        JMP     .+10
1404  1021        TAD     OPISEL            /GET THE HARDWARE OPTIONS
1405  7700        SMA     CLA               /IS THE HARDWARE SR BIT SET
1406  5211        JMP     .+3               /NO,USE THE PSEUDO SWITCH REGISTER
1407  7604        LAS                       /USE THE HARDWARE SWITCH REGISTER
1410  7410        SKP
1411  1020        TAD     SWITCH            /GET THE PSEUDO SWITCH REGISTER
1412  0134        AND     K7                /MASK OFF BITS 9-11
1413  1377        TAD     (BOOTTB           /ADD IT TO THE BOOTSTRAP TABLE ADDRESS
1414  3366        DCA     SAVSTR            /SAVE IT
1415  1766        TAD  I  SAVSTR            /GET THE ADDRESS FROM THE TABLE
1416  3367        DCA     BOTADD            /SAVE IT
1417  1767        TAD  I  BOTADD            /GET THE BOOTSTRAP STARTING ADDRESS
1420  3370        DCA     BOTSAD            /THIS IS THE BOOTSTRAP STARTING ADDRESS
1421  2367        ISZ     BOTADD
1422  1767        TAD  I  BOTADD            /GET THE WORD COUNT
1423  3371        DCA     BOTCNT            /SAVE IT
1424  2367        ISZ     BOTADD            /BOTADD IS THE STARTING ADDRESS OF BOOT COMPARE
1425  1770  COMPAR, TAD  I  BOTSAD         /GET THE CONTENTS THAT BOOTSTRAP LOADED
1426  7041        CIA                       /NEGATE IT
1427  1767        TAD  I  BOTADD            /GET THE EXPECTED BOOTSTRAP CONTENTS
1430  7650        SNA     CLA               /ARE THEY EQUAL
1431  5243        JMP     GOODCP            /YES, GO GET NEXT WORD
1432  4454        ERROR                     /BOOTSTRAP COMPARE ERROR, PRESS "CONT" TO
                                            /GET BAD PC, GOOD CONTENTS, AND BAD CONTENTS
1433  1370        TAD     BOTSAD            /GET BOOTSTRAP ADDRESS THAT WAS BAD
1434  7402        HLT                       /AC=THE ADDRESS THAT DIDN'T COMPARE
1435  7200        CLA
1436  1767        TAD  I  BOTADD
1437  7402        HLT                       /AC=EXPECTED CONTENTS OF BOOTSTRAP
1440  7200        CLA
1441  1770        TAD  I  BOTSAD
1442  7402        HLT                       /AC=ACTUAL CONTENTS OF BOOTSTRAP
1443  7300  GOODCP, CLA     CLL
1444  2370        ISZ     BOTSAD
1445  7000        NOP
1446  2367        ISZ     BOTADD
1447  7000        NOP
1450  2371        ISZ     BOTCNT            /END OF COMPARE
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1451  5225        JMP     COMPAR            /NO,GO GET NEXT WORD
1452  1767        TAD  I  BOTADD            /CONTINUE FOR TC08
1453  7440        SZA
1454  5220        JMP     COMPAR+5
1455  1021        TAD     OPISEL            /GET HARDWARE OPTIONS
1456  0143        AND     K200
1457  7640        SZA     CLA               /WAS THE SIMULATOR BEING USED
1460  5602        JMP  I  BOTCMP+2          /YES, RETURN TO SIMULATOR BOOTSTRAP CHECK
1461  7402  BOOTOK, HLT                     /BOOT STRAP COMPARED OK
1462  5200        JMP     BOTCMP            /DO AGAIN

                    /*************************************************************************************
                    /THE FOLLOWING SECTIONS WILL CLEAR THE LOCATIONS THAT THE BOOT STRAP WILL LOAD INTO,
                    /THIS SHOULD BE DONE BEFORE EACH BOOTSTRAP IS ATTEMPTED,
                    /*************************************************************************************

1463  0000  CLEARB, 0                       /SIMULATOR ENTERS WERE
1464  7610        SKP     CLA
1465  4317  CLRBOT, JMS     SETUP           /GET MEMORY SIZE TO SEE WHAT BOOTS TO CLEAR
1466  1365        TAD     BOTCLR            /GET THE NUMBER TO START CLEARING BOOT
1467  1377        TAD     (BOOTTB           /GET THE ADDRESS OF BOOT STRAP TABLE
1470  3366        DCA     SAVSTR            /SAVE IT
1471  1766        TAD  I  SAVSTR            /GET THE ADDRESS FROM TABLE
1472  7450        SNA
1473  5311        JMP     BOTEND            /END OF CLEARING BOOTSTRAP LOCATIONS
1474  3367        DCA     BOTADD            /SAVE IT
1475  1767        TAD  I  BOTADD            /GET THE BOOTSTRAP STARTING ADDRESS
1476  3370        DCA     BOTSAD            /SAVE IT
1477  2367        ISZ     BOTADD
1500  1767        TAD  I  BOTADD            /GET THE WORD COUNT
1501  3371        DCA     BOTCNT            /SAVE IT
1502  3770        DCA  I  BOTSAD
1503  2370        ISZ     BOTSAD
1504  7000        NOP
1505  2371        ISZ     BOTCNT
1506  5302        JMP     .-4
1507  2366        ISZ     SAVSTR
1510  5271        JMP     CLRBOT+4
1511  1021  BOTEND, TAD    OPISEL
1512  0143        AND     K200
1513  7640        SZA     CLA
1514  5663        JMP  I  CLEARB            /RETURN TO SIMULATOR BOOTSTRAP TEST
1515  7402        HLT                       /END OF CLEARING BOOTSTRAPS
1516  5265        JMP     CLRBOT            /DO IT AGAIN


1517  0000  SETUP,  0
1520  3776'       DCA     AUTSEL
1521  3775'       DCA     SIMBOT
1522  1021        TAD     OPISEL            /GET THE HARDWARE CONFIGURATION
1523  7104        CLL     RAL               /MOVE FIELD BITS INTO BITS 6-8
1524  0137        AND     K70               /MASK OUT FIELD BITS
1525  7650        SNA     CLA               /IS MEMORY SIZE GREATER THAN 4K
```

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1526  5341            JMP     SETUP2          /NO, GO GET THE MEMORY SIZE
1527  3775  SETUP1,   DCA     SIMBOT          /YES THAN DO ALL BOOT'S
1530  1775            TAD     SIMBOT          /GET BOOTSTRAP SELECT
1531  1065            TAD     M5              /SUBTRACT 5
1532  3774            DCA     CNTBOT          /SAVE IT
1533  1775            TAD     SIMBOT          /GET BOOT NUMBER
1534  3365            DCA     BOTCLR          /SAVE IT
1535  1776            TAD     AUTSEL          /GET AUTO RESTART SELECT
1536  1064            TAD     M4
1537  3773            DCA     AUTCNT          /SAVE THE NUMBER OF AUTO'S TO DO
1540  5717            JMP  I  SETUP           /RETURN TO DO BOOT OR AUTO-RESTART
1541  1021  SETUP2,   TAD     OP1SEL          /GET THE HARDWARE CONFIGURATION
1542  0372            AND     KK3             /MASK OFF FIELD 7 MEMORY SIZE
1543  7450            SNA
1544  5354            JMP     SET1K           /IS IT 1K OF MEMORY
1545  1062            TAD     M1              /YES,SETUP TO DO 1 BOOT OR 2 AUTO-RESTART
1546  7450            SNA                     /SUBTRACT 1
1547  5360            JMP     SET2K           /IS IT 2K OF MEMORY
1550  1062            TAD     M1              /YES,DO ONE BOOT AND 3 AUTO'S
1551  7650            SNA     CLA             /SUBTRACT 1
1552  5363            JMP     SET3K           /IS IT 4K OF MEMORY
1553  5327            JMP     SETUP1          /YES, SETUP TO DO 2 BOOTS AND 4 AUTO'S
1554  7305  SET1K,    CLA CLL IAC RAL         /MUST BE 4K OF MEMORY-DO ALL
1555  3776            DCA     AUTSEL
1556  7307            CLA CLL IAC RTL
1557  5327            JMP     SETUP1
1560  7301  SET2K,    CLA CLL IAC
1561  3776            DCA     AUTSEL
1562  5356            JMP     .+4
1563  7325  SET3K,    CLA CLL CML IAC RAL
1564  5327            JMP     SETUP1

1565  0000  BOTCLR,   0

1566  0000  SAVSTH,   0
1567  0000  BOTADD,   0
1570  0000  BOTSAD,   0
1571  0000  BOTCNT,   0
1572  0003  KK3,      3

1573  1133
1574  0721
1575  0720
1576  1134
1577  0506
      1600            PAGE


1600  0000  ACTLIN,   0
1601  1022            TAD     OP2SEL
1602  7700            SMA     CLA             /IS THE PROGRAM RUNNING ON ACT LINE?
1603  5600            JMP  I  ACTLIN          /NO, RETURN
1604  1037            TAD     FLDLIM          /GET THE FIELD LIMIT
1605  1111            TAD     M70
```



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1606  7640            SZA     CLA             /IS THE FIELD LIMIT EQUAL TO FIELD 7?
1607  5600            JMP  I  ACTLIN          /NO, RETURN TO TEST
1610  1040            TAD     UPERLM          /GET THE UPPER ADDRESS LIMIT
1611  7001            IAC                     /ADD 1 TO IT
1612  7640            SZA     CLA             /WAS IT 7777
1613  5600            JMP  I  ACTLIN          /NO, RETURN
1614  7352            CLA CLL CMA RTR         /SET LAST ADDRESS = 5777
1615  3040            DCA     UPERLM          /SAVE IT
1616  5600            JMP  I  ACTLIN          /RETURN TO PROGRAM


1617  1022  ENDPAS,   TAD     OP2SEL          /CHECK FOR ACT LINE
1620  7700            SMA     CLA             /IS THE PROGRAM RUNNING ON ACT LINE
1621  5234            JMP     ENDING          /NO GO CHECK FOR SR 3 TO HALT AT END OF A PASS
1622  1021            TAD     OP1SEL          /GET THE HARDWARE CONFIGURATION
1623  0143            AND     K200            /CHECK FOR THE SIMULATOR
1624  7640            SZA     CLA             /WAS THE SIMULATOR SELECTED
1625  5234            JMP     ENDING          /YES, ALREADY NOTIFIED PROM OF GOOD PAS
1626  2242            ISZ     PRGPAS          /CHECK 1/2 SECOND COUNT
1627  5234            JMP     ENDING          /NOT 1/2 SECOND YET
1630  1377            TAD     (-144           /RESET THE COUNTER
1631  3242            DCA     PRGPAS
1632  6272            CIF     70              /CHANGE INSTRUCTION FIELD TO 7
1633  4451            JMS  I  GOODPS          /SIGNAL THE PROM
1634  4341  ENDING,   JMS     SWCHK           /CHECK SR 3 TO HALT ON A PROGRAM PASS
1635  7006            RTL
1636  7004            RAL
1637  7710            SPA     CLA
1640  7402            HLT                     /END OF A COMPLETE PROGRAM PASS
1641  5776            JMP     0201            /RESTART THE PROGRAM

1642  7634  PRGPAS,   -144


1643  7010  POWFAL,   RAR
1644  3251            DCA     LINK
1645  1000            TAD     INTSER
1646  3252            DCA     PC
1647  6103            CAL
1650  4452            JMS  I  AUTRST          /CLEAR AC LOW F/F
                                              /RETURN TO THE PROGRAM
1651  0000  LINK,     0
1652  0000  PC,       0

1653  0000  PRGRST,   0
1654  6102            SPL                     /SKIP ON AC LOW AS A LEVEL
1655  7610            SKP     CLA
1656  5254            JMP     .+2
1657  5453            JMP  I  TEST            /RETURN TO TEST BEING EXECUTED AND START OVER

1660  0000  TESTAD,   0
1661  7340            CLA CLL CMA
1662  1260            TAD     TESTAD
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1663  3053            DCA     TEST
1664  1375            TAD     (PRGRST
1665  3052            DCA     AUTRST
1666  5660            JMP  I  TESTAD


1667  1021  BATEMT,   TAD     OP1SEL          /GET HARDWARE CONFIGURATION
1670  0143            AND     K200
1671  7650            SNA     CLA
1672  5277            JMP     DEAD            /MACHINE GOING DOWN - STOP EVERYTHING
1673  3373            DCA     ACNLOK
1674  2000            ISZ     INTSER
1675  2000            ISZ     INTSER
1676  5400            JMP  I  INTSER
1677  7402  DEAD,     HLT
1700  5453            JMP  I  TEST


1701  0000  GOODBD,   0
1702  1022            TAD     OP2SEL          /GET HARDWARE CONFIGURATION
1703  7700            SMA     CLA             /IS THE PROGRAM RUNNING ON ACT LINE
1704  5701            JMP  I  GOODBD          /NO RETURN TO PROGRAM
1705  6272            CIF     70              /CHANGE INSTRUCTION FIELD TO FIELD 7
1706  4451            JMS  I  GOODPS          /SIGNAL ACT LINE PROGRAM STILL RUNNING
1707  5701            JMP  I  GOODBD          /RETURN TO PROGRAM


1710  0000  ERRORX,   0                       /ERROR ROUTINE
1711  7300            CLA     CLL
1712  1022            TAD     OP2SEL          /CHECK FOR ACT LINE
1713  7700            SMA     CLA
1714  5326            JMP     CHKINH
1715  1021            TAD     OP1SEL
1716  0143            AND     K200
1717  7640            SZA     CLA
1720  6160            CLA<MOD
1721  6002            IOF                     /TURN THE INTERRUPT OFF
1722  7240            CLA     CMA
1723  1310            TAD     ERRORX
1724  6272            CIF     70
1725  5450            JMP  I  BADPAS          /GO TO MOM FOR ERROR
1726  4341  CHKINH,   JMS     SWCHK           /CHECK FOR SR 0(1) TO INHIBIT ERROR HALT
1727  7710            SPA     CLA             /IS SR 0 SET TO A ONE
1730  5334            JMP     ERLPSW          /YES, GO CHECK SR 1 TO LOOP ON ERROR
1731  7340            CLA CLL CMA
1732  1310            TAD     ERRORX          /SUBTRACT ONE FROM JMS ERROR PC
1733  7402            HLT                     /AC CONTAINS THE ADDRESS WHERE THE ERROR
                                              /WAS DETECTED BY THE PROGRAM, REFER
                                              /TO THE PROGRAM LISTING FOR ERROR
                                              /EXPLANATION AND THE TEST DESCRIPTION,
1734  4341  ERLPSW,  JMS     SWCHK           /CHECK THE SWITCH REGISTER TO LOOP ON ERROR
1735  7004            RAL
1736  7710            SPA     CLA             /IS SR 1 SET TO A ONE TO LOOP ON TEST
1737  5453            JMP  I  TEST            /YES GO LOOP ON THE TEST
1740  5710            JMP  I  ERRORX          /NO, RETURN TO THE PROGRAM
```



```
1741  0000  SWCHK,   0
1742  7300            CLA     CLL
1743  1021            TAD     OP1SEL          /GET THE HARDWARE STATUS WORD
1744  7700            SMA     CLA             /IS THE HARDWARE FRONT PANEL SELECTED
1745  5350            JMP     .+3             /NO, USE THE PSEUDO SWITCH REGISTER
1746  7604            LAS
1747  5741            JMP  I  SWCHK           /RETURN
1750  1020            TAD     SWITCH          /THE PSEUDO SWITCH REGISTER
1751  5741            JMP  I  SWCHK           /RETURN


1752  0000  TSTLOP,   0                       /ROUTINE TO CHECK SR 2 TO LOOP ON TEST
1753  4341            JMS     SWCHK           /GO GET THE SWITCH REGISTER
1754  7006            RTL
1755  7700            SMA     CLA
1756  5752            JMP  I  TSTLOP          /GO TO NEXT TEST
1757  5453            JMP  I  TEST            /LOOP ON SAME TEST


1760  0000  ACLBAT,   0
1761  1373            TAD     ACNLOK          /LOOK AT RETURN FOR AC LOW OR BATTERY EMPTY
1762  7640            SZA     CLA
1763  5366            JMP     .+3
1764  2000            ISZ     INTSER
1765  5400            JMP  I  INTSER
1766  3373            DCA     ACNLOK
1767  6101            SBE                     /SKIP ON BATTERY EMPTY
1770  5364            JMP     .+4
1771  2000            ISZ     INTSER
1772  5364            JMP     .+6
1773  0000  ACNLOK,   0

1774  1653
1776  0201
1777  7634
      2000            PAGE

      0200            *200
```

```
0000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0100  11111111  11111111  11111111  11111111  11111111  11110000  00000070  70000000

0200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0300  11111111  11111111  11111111  11111111  11111111  11111111  11110070  70000001

0400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0500  11111111  11111111  11111170  00000000  00000000  00000000  00000070  70000000

0600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0700  11111111  11111111  11111111  00000000  00000000  00000000  00000011  11111111


1000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1100  11111111  11111111  11111111  11111111  11111111  11111111  11111071  11111111

1200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1300  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11107011

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  11111111  11111111  11113111

2000
2100

2200
2300

2400
2500

2600
2700


3000
3100

3200
3300

3400
3500

3600
3700
```



```
4000
4100

4200
4300

4400
4500

4600
4700


5000
5100

5200
5300

5400
5500

5600
5700


6000
6100

6200
6300

6400
6500

6600
6700


7000
7100

7200
7300

7400
7500

7600
7700
```

```
ACLBAT  1760        DATPAT  0042        M100    0113        PTPCMP  1303
ACNLOK  1773        DATREC  0035        M1007   0117        PTPEND  1341
ACTLIN  1600        DEAD    1677        M1007   0120        RDF     6214
ADD401  0724        DS<ADD  1363        M1016   0121        REDEMA  6155
ADDCNT  0047        EMA1    0361        M1025   0122        RESADD  1137
ADDRES  1135        EMA2    0362        M1034   0123        RFDFCP  1365
AUTCNT  1133        EMA3    0363        M1043   0124        RFDFED  1371
AUTENA  1147        EMACLR  0211        M1052   0125        RIB     6234
AUTHST  0052        EMAIF1  0312        M1061   0126        RIF     6224
AUTSEL  1134        EMAIF2  0331        M1070   0127        RK8ADD  0514
AUTTST  1056        EMAIF3  0344        M11     0070        RK8CMP  0516
BADPAS  0050        ENDING  1034        M1100   0130        RK8E    0023
BATEMT  1667        ENDMAS  1017        M125    0114        RK8END  0524
BOOTOK  1461        ERLPSW  1734        M152    0115        RMF     6244
BOOTR1  0720        ERROR   4454        M16     0071        RSTAUT  1101
BOOTR2  0727        ERRORX  1710        M2      0063        RTF     6005
BOOTTB  0506        EXECUT  0164        M20     0072        SAVESZ  0036
BOTADD  1567        FLDLIM  0037        M22     0073        SAVSTR  1566
BOTCLR  1565        GODAUT  1125        M25     0074        SAVWFD  0046
BOTCMP  1400        GODBRD  1701        M30     0075        SBE     6101
BOTCNT  1571        GODUCP  1443        M300    0116        SCOPLP  4456
BOTENA  1155        GODUPS  0051        M33     0076        SELAUT  1143
BOTEND  1511        GTF     0004        M34     0077        SET1K   1554
BOTRT1  0642        HGHLIM  0044        M4      0064        SET2K   1560
BOTRT2  0677        HLT     7402        M40     0100        SET3K   1563
BOTSAD  1570        INTSER  0000        M4100   0131        SETUP   1517
BOTSEL  1150        K10     0135        M43     0101        SETUP1  1527
BTSURT  0725        K1000   1254        M44     0102        SETUP2  1541
BTTST1  0623        K12D    0141        M5      0065        SIMBOT  0720
BTTST2  0660        K192    0142        M50     0103        SINT    6254
CAF     6007        K1777   0145        M5000   0132        SKON    6000
CAL     6103        K200    0143        M5100   0133        SKPEMA  6166
CAPSR   1000        K2000   0146        M52     0104        SPL     6102
CDF     6201        K3000   1253        M55     0105        SUF     6274
CDFCHK  0033        K37     0136        M60     0106        SWCHK   1741
CHKCDF  0034        K400    0144        M61     0107        SWITCH  0020
CHKINH  1726        K4100   0153        M66     0110        TABADD  0443
CIF     6202        K8201   0045        M7      0066        TABCMP  0445
CIFCDF  6203        K7      0134        M70     0111        TABEND  0524
CINT    6204        K70     0137        M77     0112        TC8ADD  1343
CLEARB  1465        K7877   0152        NOAUTO  1054        TC8CMP  1345
CLRBOT  1465        K77     0140        NORBOT  0610        TC8END  1355
CLREMA  6154        K7707   0150        NXTBOT  0614        TEST    0053
CLRERG  0360        K7757   0151        OP1SEL  0021        TEST18  0201
CLRMOD  6160        K7774   0147        OP21KJ  0000        TEST19  0275
CLRSIM  6150        KKJ     1572        OP2SEL  0022        TEST20  0402
CNTBOT  1721        LINK    1651        PASLNU  0061        TEST21  0602
COMPAR  1425        LOOKG2  6152        PC      1652        TEST22  1041
CONTW2  1722        LOOKG3  6153        POWFAL  1643        TEST23  1201
CONTW3  0725        LOOP    4455        PRGMAS  1642        TESTAD  1660
CONW2   1136        M1      0062        PRGRST  1653        TIMDIS  1255
CUF     6264        M10     0067        PTPADD  1301        TST1RA  0225
```



```
TST18B  0244
TST18C  0257
TST19A  0310
TST19B  0326
TST19C  0341
TSTLOP  1752
UPERLM  0040
WRKADD  0043
WRKFLD  0041
XBAT    0060
XPWRFL  0057


ERRORS DETECTED: 0

LINKS GENERATED: 27

RUN-TIME:  18 SECONDS

3K CORE USED
```

```
                        /KM8-A OPTION TEST 2 MAINDEC-08-DJKMA-A-L 1K PART 4
                        /
                        /COPYRIGHT (C) 1974, DIGITAL EQUIPMENT CORPORATION
                        /
                        /PROGRAMMER: BRUCE HANSEN
                        /
```

```
                        ////////////////////////////////////////////////////////////////////////////////
                        /THE FOLLOWING LISTING WILL CORRESPOND TO THE PAPER TAPE LABELED MAINDEC-08-DJKMA-A-PM4,
                        /1K PART 4. THIS PAPER TAPE AND LISTING WILL BE THE LAST OF FOUR 1K SEGMENTED
                        /PAPER TAPES AND LISTINGS FOR COMPUTERS WITH LESS THAN 4K OF MEMORY.
                        ////////////////////////////////////////////////////////////////////////////////
```



```
                        /KM8-A OPTION TEST2 MAINDEC-08-DJKMA-A-L 1K PART 4
                        /
                        /COPYRIGHT 1974, DIGITAL EQUIPMENT CORP.,, MAYNARD, MASS.,, 01754
                        /
                        /POP-8A OPTION TEST 2 TESTS THE MEMORY EXTENTION/TIME SHARE CONTROL,
                        /POWER FAIL/AUTO RESTART, AND BOOTSTRAP LOADERS


        6000    SKON=6000
        6007    CAF=6007
        7402    HLT=7402

                /SWITCH REGISTER SETTINGS

                /SR0=1  INHIBIT ERROR HALT
                /SR1=1  LOOP ON ERROR
                /SR2=1  LOOP ON TEST
                /SR3=1  HALT AT COMPLETION OF A PROGRAM PASS

                /MEMORY EXTENTION/TIME SHARE INSTRUCTIONS

        6004    GTF=6004                /GET FLAGS,  READS THE FOLLOWING MACHINE STATES
                                        /INTO THE INDICATED BITS OF THE AC:
                                        /AC0 LINE
                                        /AC2 INTERRUPT REQUEST
                                        /AC4 INTERRUPT ENABLE F/F
                                        /AC5 USER FLAG
                                        /AC6-11 SAVE FIELD REGISTER

        6005    RTF=6005                /RESTORE THE FLAGS,  RTF LOADS THE LINK FROM AC0,
                                        /LOADS THE USER BUFFER F/F, INSTRUCTION BUFFER AND
                                        /DATA FIELD WITH AC3, AC6-8, AC 9-11 AND INHIBITS
                                        /PROCESSOR INTERRUPTS UNTIL NEXT  JMP OR JMS INSTRUCTION,
                                        /AT THE END OF THE JMP OR JMS, THE CONTENTS OF THE U.B, + I.B,
                                        /ARE LOADED INTO USER FIELD F/F, AND THE I.F,,  INTERRUPT ENABLE
                                        /IS SET AND INTERRUPT INHIBIT AS CLEARED

        6234    RIB=6234                /READ THE INTERRUPT BUFFER

        6244    RMF=6244                /RESTORES MEMORY FLAGS

        6204    CINT=6204               /CLEAR USER INTERRUPT FLIP-FLOP

        6254    SINT=6254               /SKIP ON USER INTERRUPT FLIP-FLOP

        6264    CUF=6264                /CLEAR USER BUFFER FLIP-FLOP

        6274    SUF=6274                /SET USER BUFFER FLIP-FLOP (ENTER TIME SAME MODE)AND
                                        /INHIBITS PROCESSOR INTERRUPTS UNTIL THE NEXT JMP OR
                                        /JMS INSTRUCTION,  AT THE END OF THE JMP OR JMS
                                        /INSTRUCTION, THE USER BUFER IS LOADED INTO THE USER
                                        /FIELD F/F,

        6201    CDF=6201                /CHANGE DATA FIELD
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                6202    CIF=6202                        /CHANGE INSTRUCTION FIELD
                6214    RDF=6214                        /READ THE DATA FIELD INTO AC BITS 6-8
                6224    RIF=6224                        /READ THE INSTRUCTION FIELD INTO AC BITS 6-8
                6203    CIFCDF=6203                     /PERFORMS THE CIF AND CDF FUNCTIONS

                        /POWER FAIL INSTRUCTIONS

                6102    SPL=6102                        /SKIP ON AC LOW FLIP-FLOP

                6105    CAL=6105                        /CLEAR AC LOW FLIP-FLOP

                6101    SBE=6101                        /SKIP ON BATTERY EMPTY FLIP-FLOP


                        /OPTION BOARD 2 SIMULATOR IOT'S

                6150    CLRSIM=6150                     /CLEAR CONTROL REGISTERS
                6152    LODMG2=6152                     /LOAD CONTROL REGISTER 2
                6153    LODMG3=6153                     /LOAD CONTROL REGISTER 3
                6154    CLREMA=6154                     /CLEAR EMA CATCHER LOGIC
                6155    REDEMA=6155                     /READ EMA CATCHER REGISTER
                6160    CLRMOD=6160                     /CLEAR TEST MODULE LOGIC
                6164    EXECUT=6164                     /EXECUT AND CONTROL WORD 3 BIT 7 =1 ISSUE A POWER ON PULSE
                                                        /EXECUT AND CONTROL WORD 3 BIT 7 =0 ISSUE A SWITCH SW PULSE
                6166    SKPEMA=6166                     /SKPEMA AND CONTROL WORD 3 BIT 3 =1 EMA INTERRUPT AND SKIP ENABLE
                                                        /SKPEMA AND CONTROL WORD 3 BIT 3 =0 EMA INTERRUPT AND SKIP DISABLE

                        /OPTION BOARD2 SIMULATOR CONTROL WORD 2 BIT ASSIGNMENTS
                        /
                        /BITS 0 - 1     NOT USED
                        /BITS 2 - 5     BOOT STRAP PROGRAM SELECT
                        /BITS 9 - 11    AUTO-RESTART ADDRESS SELECT

                        /OPTION BOARD 2 SIMULATOR CONTROL WORD 3 BIT ASSIGNMENTS
                        /
                        /BIT 0          TIME SHARE 0=ENABLED  1=DISABLED
                        /BIT 1          AC LOW (L) 1=PULLED LOW  0=FREE STATE
                        /BIT 2          BATT EMPTY 1=BATT EMPTY PULLED LOW  0=FREE STATE
                        /BIT 3          1=EMA INTERRUPT/SKIP ENABLE  0=EMA INTERRUPT SKIP DISABLE
                        /BITS 4 - 6     NOT USED
                        /BIT 7          1=POWER ON PULSE WITH EXECUT 0=SWITCH SW PULSE WITH EXECUT
                        /BIT 8          1=DISABLES BOOTSTRAP WHILE RUNNING  0=ENABLES BOOTSTRAP WHILE RUNNING
                        /BIT 9 - 11     AUTO-RESTART/BOOT STRAP ENABLE CODE



                0000    *0

0000    0000    INTSEN, 0                               /JMS I AUTRST PLACED HERE FOR SIMULATOR AUTO RESTART
0001    3035            DCA     DATREC
0002    6102            SPL                             /SKIP ON AC LOW
0003    7410            SKP
0004    5457            JMP  I  XPWRFL                  /POWER GOING DOWN
0005    6101            SBE                             /SKIP ON BATTERY EMPTY
```



```
0006    7410            SKP
0007    5460            JMP  I  XBAT                   /GO HALT THE COMPUTER ,ITS ALL OVER
0010    6224            RIF                             /READ THE INSTRUCTION FIELD
0011    7640            SZA     CLA
0012    4454            ERROR                           /I,F, IS NOT 0 AFTER A INTERRUPT
0013    6214            RDF                             /READ THE DATA FIELD
0014    7640            SZA     CLA
0015    4454            ERROR                           /D,F, IS NOT 0 AFTER A INTERRUPT
0016    2000            ISZ     INTSER                  /ADD 1 TO THE INTERRUPTED PC
0017    5400            JMP  I  INTSER                  /RETURN TO THE PROGRAM


                0020    *20
0020    0000    SWITCH, 0                               /PSEUDO SWITCH REGISTER IF BIT 0=0 OF OPISEL
0021    1000    OPISEL, 1000
                                                        /BIT 0=0 USE LOC 20 AS A PSEUDO S,R,
                                                        /BIT 0=1 USE HARDWARE FRONT PANEL S,R,
                                                        /BIT 1=1 HAS 8A OPTION 1
                                                        /BIT 2=1 HAS 8A OPTION 2
                                                        /BIT 3=1 HAS 8A CPU SIMULATOR
                                                        /BIT 4=1 HAS 8A OPTION 1 & 2 TEST MODULE
                                                        /BIT 5=1 PROGRAM ON AA XOR
                                                        /BIT 6=1 HAS PDP-8E TYPE CPU
                                                        /BITS 7-11 MEMORY SIZE = 0'S + 1K, 37=32K,
                                                        /MEMORY SIZE CAN BE INCREASED IN 1K INCREMENTS
                                                        /BY ADDING A 1 TO THE NUMBER IN BITS 7-11,
0022    0000    OPISEL, 0
                /RK8E BOOT STRAP WILL LOAD INTO THE FOLLOWING LOCATIONS

0023    7402    RK8E,   HLT                             /2000
0024    7402            HLT                             /6745
0025    7402            HLT                             /0023
0026    7402            HLT                             /7650
0027    7402            HLT                             /5024
0030    7402            HLT                             /6733
0031    7402            HLT                             /5031
0032    7402            HLT                             /TERMINATOR
0033    0000    CDFCHK, 0
0034    0033    CHKCDF, CDFCHK
0035    0000    DATREC, 0
0036    0000    SAVESE, 0
0037    0000    FLDLIM, 0
0040    0000    UPERLM, 0
0041    0000    WRKFLD, 0
0042    0000    DATPAT, 0
0043    0000    WRKADD, 0
0044    0000    HGHLIM, 0
0045    6201    K6201,  6201
0046    0000    SAVWFD, 0
0047    0000    ADDCNT, 0
0050    6520    BADPAS, 6520
0051    6500    GOODPS, 6500
0052    0453    AUTRST, PRGRST
0053    0000    TEST,   0                               /SCOPE LOOP AND TEST LOOP ADDRESS
```

```
          4454    ERROR=  JMS  I  ,
0054      0510                    ERRORX
          4455    LOOP=   JMS  I  ,
0055      0552                    TSTLOP
          4456    SCOPLP= JMS  I  ,
0056      0460                    TESTAD

0057      0443    XPWRFL, PO-FAL
0060      0467    XBAT,   BATENT
0061      0417    PASENU, ENDPAS

                  /CONSTANTS USED BY THE PROGRAM

0062      7777    M1,     -1
0063      7776    M2,     -2
0064      7774    M4,     -4
0065      7773    M5,     -5
0066      7771    M7,     -7
0067      7770    M10,    -10
0070      7767    M11,    -11
0071      7762    M16,    -16
0072      7760    M20,    -20
0073      7756    M22,    -22
0074      7753    M25,    -25
0075      7750    M30,    -30
0076      7745    M33,    -33
0077      7744    M34,    -34
0100      7740    M40,    -40
0101      7735    M43,    -43
0102      7734    M44,    -44
0103      7730    M50,    -50
0104      7726    M52,    -52
0105      7723    M55,    -55
0106      7720    M60,    -60
0107      7717    M61,    -61
0110      7712    M66,    -66
0111      7710    M70,    -70
0112      7701    M77,    -77
0113      7700    M100,   -100
0114      7653    M125,   -125
0115      7626    M152,   -152
0116      7500    M300,   -300
0117      7000    M1000,  -1000
0120      6771    M1007,  -1007
0121      6762    M1016,  -1016
0122      6753    M1025,  -1025
0123      6744    M1034,  -1034
0124      6735    M1043,  -1043
0125      6726    M1052,  -1052
0126      6717    M1061,  -1061
0127      6710    M1070,  -1070
0130      6700    M1100,  -1100
0131      5700    M4100,  -4100
```



```
0132      3000    M5000,  -5000
0133      2700    M5100,  -5100

0134      0007    K7,     7
0135      0010    K10,    10
0136      0037    K37,    37
0137      0070    K70,    70
0140      0077    K77,    77
0141      0125    K125,   125
0142      0152    K152,   152
0143      0200    K200,   200
0144      0400    K400,   400
0145      1777    K1777,  1777
0146      2000    K2000,  2000
0147      7774    K7774,  7774
0150      7707    K7707,  7707
0151      7757    K7757,  7757
0152      7677    K7677,  7677
0153      4100    K4100,  4100

          0200    .=200
```

```
                  /**********************************************************************************************
                  /AUTO - IS AN OPERATOR INTERVENTION TEST TO CHECK POWER-FAIL/AUTO-RESTART,
                  /WHEN THE PROGRAM IS STARTED, IT FILLS LOCATIONS 5200 TO 7777 (4K) OR 5200 TO 5777 (3K) WITH A
                  /COMPLEMENTING DATA PATTERN (5252 - 2525), AND THEN HALTS, THE OPERATOR
                  /AT THIS TIME MUST SET THE APPROPRIATE AUTO RESTART SWITCHES ON THE
                  /MODULE, HE THEN MUST SIGNIFY TO THE PROGRAM VIA FRONT PANEL SWITCH
                  /REGISTER OR THE PSEUDO SWITCH REGISTER, WHICHEVER IS SELECTED, THE
                  /AUTO RESTART TO BE TESTED (0000=RESTART AT 4200; 2071=RESTART AT 2200;
                  /0002=RESTART AT 0200; 0003=RESTART AT 0000), THE OPERATOR THEN PRESSES
                  /"CONTINUE",THE PROGRAM THEN STARTS COMPARING DATA ,WAITING FOR THE
                  /OPERATOR TO PULL THE LINE CORD, WHEN THE AC LINE CORD IS PULLED, THE
                  /PROGRAM SHOULD HALT AT LOCATION ACDOWN, THE OPERATOR SHOULD THEN PLUG
                  /THE LINE CORD BACK IN, AT THIS TIME THE PROGRAM SHOULD DO A AUTO RESTART
                  /TO THE ADDRESS SELECTED, THE PROGRAM THEN CHECKS FOR THE CORRECT
                  /AUTO RESTART AND THEN GOES BACK TO COMPARING DATA, THE ABOVE SEQUENCE
                  /OF UNPLUGGING AND PLUGGING LINE CORD SHOULD BE DONE SEVERAL TIMES FOR EACH
                  /AUTO RESTART,
                  ///WARNING-THE BATTERY SUPPLY SHOULD BE FULLY CHARGED////////
                  /**********************************************************************************************

0200      7000            NOP/JMS  I  AUTRST
0201      4456    AUTO,   SCOPLP                  /SETUP TEST AND SCOPE LOOP ADDRESS
0202      6007            CAF                     /CLEAR ALL FLAGS
0203      1021            TAD     OP1SEL          /GET THE HARDWARE CONFIGURATION
0204      0143            AND     K200
0205      7640            SZA     CLA
0206      6160            CLRMOD                  /SIMULATOR SELECTED CLEAR TEST MODULE
```

```
0207  1377            TAD     (OPRINT         /GET THE ADDRESS FOR THE INTERRUPT ROUTINE
0210  3052            DCA     AUTRST          /SAVE IT
0211  1376            TAD     (BUFFER         /GET THE ADDRESS OF TEST BUFFER
0212  3302            DCA     FILLIT          /SAVE IT
0213  1303            TAD     BUFCNT          /GET THE NUMBER OF WORDS TO FILL THE BUFFER
0214  3304            DCA     CNTBUF          /SAVE IT
0215  1306            TAD     K5252           /THE FIRST WORD IN THE BUFFER WILL BE 5252
0216  3305            DCA     BUFPAT          /SAVE THE WORD
0217  1305            TAD     BUFPAT          /GET THE WORD
0220  3702            DCA  I  FILLIT          /PUT IT IN THE BUFFER
0221  1305            TAD     BUFPAT          /GET THE WORD
0222  7040            CMA                     /COMPLEMENT IT
0223  3305            DCA     BUFPAT
0224  2302            ISZ     FILLIT          /INCREMENT BUFFER ADDRESS
0225  2304            ISZ     CNTBUF          /DONE?
0226  5217            JMP     .-7             /NO KEEP FILLING THE BUFFER
0227  7402            HLT                     /SET THE SWITCH REGISTER OR PSEUDO S,R
                                              /TO THE AUTO-RESTART TO BE EXECUTED
0230  1021            TAD     OP1SEL          /GET THE HARDWARE CONFIGURATION
0231  7500            SMA                     /IS THE HARDWARE S,R, BEING USED
0232  5235            JMP     .+3             /NO USE THE PSEUDO SWITCH REGISTER
0233  7604            LAS
0234  7410            SKP
0235  1020            TAD     SWITCH
0236  0307            AND     K3              /MASK OFF BITS 10 AND 11
0237  1375            TAD     (RESADD         /ADD THE AUTO RESTART TABLE ADDRESS TO IT
0240  3310            DCA     MANRST          /SAVE IT
0241  1710            TAD  I  MANRST          /GET THE AUTO RESTART TO BE EXECUTED
0242  3310            DCA     MANRST          /SAVE IT FOR COMPARISON AFTER RESTART
0243  1376    STRCMP, TAD     (BUFFER         /GET THE BUFFER ADDRESS
0244  3302            DCA     FILLIT          /SAVE IT
0245  1303            TAD     BUFCNT          /GET THE BUFFER SIZE
0246  3304            DCA     CNTBUF          /SAVE IT
0247  1306            TAD     K5252
0250  3305            DCA     BUFPAT          /SETUP INITIAL PATTERN
0251  6001    CMPBUF, ION                     /TURN THE INTERRUPT ON
0252  1702            TAD  I  FILLIT          /GET THE WORD FROM BUFFER
0253  7041            CIA                     /NEGATE IT
0254  1305            TAD     BUFPAT          /GET THE WORD EXPECTED
0255  7650            SNA     CLA             /WORD COMPARED GO INCREMENT COUNTER
0256  5272            JMP     BUFGOD          /DATA WORDS DIDNT COMPARE- PRESS
0257  4454            ERROR                   /"CONT" FOR ADDRESS AND GOOD AND BAD DATA
                                              /
0260  1302            TAD     FILLIT          /AC=BUFFER ADDRESS WHERE ERROR WAS DETECTED
0261  7402            HLT
0262  7300            CLA     CLL
0263  1305            TAD     BUFPAT
0264  7402            HLT                     /AC = GOOD DATA WORD
0265  7300            CLA     CLL
0266  1702            TAD  I  FILLIT
0267  7402            HLT                     /AC = BAD DATA WORD - PRESS "CONT" TO
0270  7300            CLA     CLL             /RETRY THE COMPLETE TEST
0271  5453            JMP  I  TEST            /DO THE TEST OVER
0272  1305    BUFGOD, TAD     BUFPAT          /GET THE DATA PATTERN
0273  7040            CMA                     /NEGATE IT
```



```
0274  3305            DCA     BUFPAT          /SAVE IT FOR NEXT COMPARE
0275  2302            ISZ     FILLIT          /INCREMENT ADDRESS TO COMPARE
0276  7000            NOP                     /THIS IS NEEDED FOR ISZ OVERFLOW
0277  2304            ISZ     CNTBUF          /DONE COMPLETE BUFFER?
0300  5251            JMP     CMPBUF          /NO CONTINUE
0301  5243            JMP     STRCMP          /RE-INITIALIZE COMPARE LOOP AND COMPARE

0302  0000    FILLIT, 0
0303  6600    BUFCNT, -1200
0304  0000    CNTBUF, 0
0305  0000    BUFPAT, 0
0306  5252    K5252,  5252
0307  0003    K3,     3
0310  0000    MANRST, 0

0311  0000    OPRRET, 0                       /PROGRAM COMES HERE FROM AN AUTO RESTART
0312  7340            CLA CLL CMA
0313  1311            TAD     OPRRET          /GET THE ADDRESS FROM AUTO RESTART
0314  7041            CIA                     /NEGATE IT
0315  1310            TAD     MANRST          /GET EXPECTED RESTART
0316  7650            SNA     CLA             /ARE THEY EQUAL?
0317  5320            JMP     RESET           /YES RESET AC AND LINK AND RETURN TO COMPARE
0320  4454            ERROR                   /THE AUTO RESTART ADDRESS SELECTED BY
                                              /OPERATOR DOES NOT COMPARE WITH AUTO
                                              /AUTO RESTART THAT RETURNED, PRESS "CONT"
                                              /FOR EXPECTED AND ACTUAL RETURN ADDRESS
0321  1310            TAD     MANRST          /GET THE EXPECTED AUTO RESTART ADDRESS
0322  7402            HLT                     /AC = EXPECTED AUTO RESTART ADDRESS
0323  7340            CLA  CLL CMA
0324  1311            TAD     OPRRET          /GET ACTUAL
0325  7402            HLT                     /AC = ADDRESS RETURNED FROM AUTO RESTART
0326  7300    RESET,  CLA     CLL
0327  1377            TAD     (OPRINT         /SETUP RETURN ADDRESS FOR POWER FAIL
0330  3052            DCA     AUTRST          /SAVE IT
0331  1774            TAD     PC
0332  3340            DCA     RETPRG
0333  1773            TAD     LINK            /GET THE LINK
0334  7004            RAL                     /PUT IT IN THE LINK
0335  1035            TAD     DATREG          /GET THE AC
0336  6001            ION                     /TURN THE INTERRUPT ON
0337  5740            JMP  I  RETPRG

0340  0000    RETPRG, 0

0341  0034    K34,    34
0342  0001    K1,     1


0343  0000    OPRINT, 0                       /OPERATOR INTERVENTION AUTO RESTART
0344  1372            TAD     (JMS I AUTRST
0345  3000            DCA     INTSER
0346  1372            TAD     (JMS I AUTRST
0347  3200            DCA     AUTO-1
0350  1371            TAD     (OPRRET         /SETUP FOR A AUTO RESTART
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0351  3052            DCA     AUTRST
0352  7402  ACDOWN,   HLT
0353  5453            JMP  I  TEST          /WAIT FOR LINE CORD TO BE PLUGGED IN
                                            /RETRY TEST

0354  4200  RESADD,   4200
0355  2000            2000
0356  0200            0200
0357  0000            0000



0371  0311
0372  4452
0373  0451
0374  0452
0375  0354
0376  0600
0377  0343
      0400            PAGE


0400  0000  ACTLIN,   0
0401  1022            TAD     OP2SEL
0402  7700            SMA     CLA           /IS THE PROGRAM RUNNING ON ACT LINE?
0403  5600            JMP  I  ACTLIN        /NO, RETURN
0404  1037            TAD     FLDLIM        /GET THE FIELD LIMIT
0405  1111            TAD     M70
0406  7640            SZA     CLA           /IS THE FIELD LIMIT EQUAL TO FIELD 7?
0407  5600            JMP  I  ACTLIN        /NO, RETURN TO TEST
0410  1040            TAD     UPERLM        /GET THE UPPER ADDRESS LIMIT
0411  7001            IAC                   /ADD 1 TO IT
0412  7640            SZA     CLA           /WAS IT 7777
0413  5600            JMP  I  ACTLIN        /NO, RETURN
0414  7352            CLA CLL CMA RTR       /SET LAST ADDRESS = 5777
0415  3040            DCA     UPERLM        /SAVE IT
0416  5600            JMP  I  ACTLIN        /RETURN TO PROGRAM

0417  1022  ENDPAS,   TAD     OP2SEL        /CHECK FOR ACT LINE
0420  7700            SMA     CLA           /IS THE PROGRAM RUNNING ON ACT LINE
0421  5234            JMP     ENDING        /NO GO CHECK FOR SR 3 TO HALT AT END OF A PASS
0422  1021            TAD     OP1SEL        /GET THE HARDWARE CONFIGURATION
0423  0143            AND     K200          /CHECK FOR THE SIMULATOR
0424  7640            SZA     CLA           /WAS THE SIMULATOR SELECTED
0425  5234            JMP     ENDING        /YES, ALREADY NOTIFIED PROM OF GOOD PAS
0426  2242            ISZ     PRGPAS        /CHECK 1/2 SECOND COUNT
0427  5234            JMP     ENDING        /NOT 1/2 SECOND YET
0430  1377            TAD     (-144         /RESET THE COUNTER
0431  3242            DCA     PRGPAS
0432  6272            CIF     70            /CHANGE INSTRUCTION FIELD TO 7
0433  4451            JMS  I  GOODPS        /SIGNAL THE PROM
0434  4341  ENDING,   JMS     SWCHK         /CHECK SR 3 TO HALT ON A PROGRAM PASS
0435  7006            RTL
```



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0436  7004            RAL
0437  7710            SPA     CLA
0440  7402            HLT                   /END OF A COMPLETE PROGRAM PASS
0441  5776            JMP     0201          /RESTART THE PROGRAM

0442  7634  PRGPAS,   -144


0443  7010  POWFAL,   RAR
0444  3251            DCA     LINK
0445  1000            TAD     INTSER
0446  3252            DCA     PC
0447  6103            CAL                   /CLEAR AC LOW F/F
0450  4452            JMS  I  AUTRST        /RETURN TO THE PROGRAM

0451  0000  LINK,     0
0452  0000  PC,       0

0453  0000  PRGRST,   0
0454  6102            SPL                   /SKIP ON AC LOW AS A LEVEL
0455  7610            SKP     CLA
0456  5254            JMP     .+2
0457  5453            JMP  I  TEST          /RETURN TO TEST BEING EXECUTED AND START OVER

0460  0000  TESTAD,   0
0461  7340            CLA CLL CMA
0462  1260            TAD     TESTAD
0463  3053            DCA     TEST
0464  1375            TAD     (PRGRST
0465  3052            DCA     AUTRST
0466  5660            JMP  I  TESTAD

0467  1021  RATEMT,   TAD     OP1SEL        /GET HARDWARE CONFIGURATION
0470  0143            AND     K200
0471  7650            SNA     CLA
0472  5277            JMP     DEAD          /MACHINE GOING DOWN - STOP EVERYTHING
0473  3373            DCA     ACNLOK
0474  2000            ISZ     INTSER
0475  2000            ISZ     INTSER
0476  5400            JMP  I  INTSER
0477  7402  DEAD,     HLT                   /IT'S ALL OVER NOW - GOOD-BYE
0500  5453            JMP  I  TEST

0501  0000  GOODBD,   0
0502  1022            TAD     OP2SEL        /GET HARDWARE CONFIGURATION
0503  7700            SMA     CLA           /IS THE PROGRAM RUNNING ON ACT LINE
0504  5701            JMP  I  GOODBD        /NO RETURN TO PROGRAM
0505  6272            CIF     70            /CHANGE INSTRUCTION FIELD TO FIELD 7
0506  4451            JMS  I  GOODPS        /SIGNAL ACT LINE PROGRAM STILL RUNNING
0507  5701            JMP  I  GOODBD        /RETURN TO PROGRAM
```

```
0510  0000  ERRORX, 0                      /ERROR ROUTINE
0511  7300        CLA     CLL
0512  1022        TAD     OP2SEL          /CHECK FOR ACT LINE
0513  7700        SMA     CLA
0514  5326        JMP     CHKINH
0515  1021        TAD     OP1SEL
0516  0143        AND     K200
0517  7640        SZA     CLA
0520  6160        CLRMOD
0521  6002        IOF                     /TURN THE INTERRUPT OFF
0522  7240        CLA     CMA
0523  1310        TAD     ERRORX
0524  6272        CIF     70
0525  5450        JMP   I BADPAS          /GO TO MOM FOR ERROR
0526  4341  CHKINH, JMS     SWCHK         /CHECK FOR SR 0(1) TO INHIBIT ERROR HALT
0527  7710        SPA     CLA             /IS SH 0 SET TO A ONE
0530  5334        JMP     ERLPSW          /YES, GO CHECK SR 1 TO LOOP ON ERROR
0531  7340        CLA CLL CMA
0532  1310        TAD     ERRORX          /SUBTRACT ONE FROM JMS ERROR PC
0533  7402        HLT                     /AC CONTAINS THE ADDRESS WHERE THE ERROR
                                          /WAS DETECTED BY THE PROGRAM, REFER
                                          /TO THE PROGRAM LISTING FOR ERROR
                                          /EXPLANATION AND THE TEST DESCRIPTION,
0534  4341  ERLPSW, JMS     SWCHK         /CHECK THE SWITCH REGISTER TO LOOP ON ERROR
0535  7004        RAL
0536  7710        SPA     CLA             /IS SH 1 SET TO A ONE TO LOOP ON TEST
0537  5453        JMP   I TEST            /YES GO LOOP ON THE TEST
0540  5710        JMP   I ERRORX          /NO, RETURN TO THE PROGRAM

0541  0000  SWCHK,  0
0542  7300        CLA     CLL
0543  1021        TAD     OP1SEL          /GET THE HARDWARE STATUS WORD
0544  7700        SMA     CLA             /IS THE HARDWARE FRONT PANEL SELECTED
0545  5350        JMP     .+3             /NO, USE THE PSEUDO SWITCH REGISTER
0546  7604        LAS
0547  5741        JMP   I SWCHK           /RETURN
0550  1020        TAD     SWITCH          /THE PSEUDO SWITCH REGISTER
0551  5741        JMP   I SWCHK           /RETURN

0552  0000  TSTLOP, 0                     /ROUTINE TO CHECK SH 2 TO LOOP ON TEST
0553  4341        JMS     SWCHK           /GO GET THE SWITCH REGISTER
0554  7006        RTL
0555  7700        SMA     CLA
0556  5752        JMP   I TSTLOP          /GO TO NEXT TEST
0557  5453        JMP   I TEST            /LOOP ON SAME TEST


0560  0000  ACLBAT, 0
0561  1373        TAD     ACNLOK          /LOOK AT RETURN FOR AC LOW OR BATTERY EMPTY
0562  7640        SZA     CLA
0563  5366        JMP     .+3
0564  2000        ISZ     INTSER
```



```
0565  5400        JMP   I INTSER
0566  3373        DCA     ACNLOK
0567  6101        SBE                     /SKIP ON BATTERY EMPTY
0570  5364        JMP     .+4
0571  2000        ISZ     INTSER
0572  5364        JMP     .+6
0573  0000  ACNLOK, 0

0575  0453
0576  0201
0577  7634
      0600        PAGE


0600  0000  BUFFER, 0                     /BUFFER IS FROM 600 TO 1777

      0200        .200
```

```
0200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0100  11111111  11111111  11111111  11111111  11111111  1111?000  00000070  70700000

0200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0300  11111111  11111111  11111111  11111111  11111111  11111111  00000070  71111111

0400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0500  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11117111

0600  10000000  70000070  00000070  00000000  00000000  00000000  00000070  70700000
0700  00000000  00000000  00000000  00000070  00000000  00000000  00000070  70700000

1000
1100

1200
1300

1400
1500

1600
1700


2000
2100

2200
2300

2400
2500

2600
2700


3000
3100

3200
3300

3400
3500

3600
3700
```



```
4000
4100

4200
4300

4400
4500

4600
4700


5000
5100

5200
5300

5400
5500

5600
5700


6000
6100

6200
6300

6400
6500

6600
6700


7000
7100

7200
7300

7400
7500

7600
7700
```

```
ACDOWN  0352        K3      0307        M52     0104
ACLBAT  0560        K34     0341        M55     0105
ACNLOK  0573        K37     0136        M60     0106
ACTLIN  0400        K400    0144        M61     0107
ADDCNT  0047        K4100   0153        M66     0110
AUTO    0201        K5252   0306        M7      0066
AUTHST  0052        K6201   0045        M70     0111
BADPAS  0050        K7      0134        M77     0112
BATEMT  0467        K70     0137        MANHST  0310
BUFCNT  0303        K7577   0152        OP1SEL  0021
BUFFER  0600        K77     0140        OP21K4  0000
BUFGOD  0272        K7707   0150        OP2SEL  0022
BUFPAT  0305        K7757   0151        OPRINT  0343
CAF     6007        K7774   0147        OPRRET  0311
CAL     6103        LINK    0451        PASEND  0001
CDF     6201        LODMG2  6152        PC      0452
CDFCHK  0033        LODMG3  6153        POWFAL  0443
CHKCDF  0034        LOOP    4455        PRGPAS  0442
CHKINH  0526        M1      0062        PRGRST  0453
CIF     6202        M10     0067        RUF     6214
CIFCDF  6203        M100    0113        REDEMA  6155
CINT    6204        M1000   0117        RESADD  0354
CLKEMA  6154        M1007   0120        RESET   0326
CLKMOD  6160        M1016   0121        RETPRG  0340
CLRSIM  6150        M1029   0122        RIB     6234
CMPBUF  0251        M1034   0123        RIF     6224
CNTBUF  0304        M1043   0124        RKBE    0023
CUF     6264        M1052   0125        RMF     6244
DATPAT  0042        M1061   0126        RTF     6005
DATREC  0035        M1070   0127        SAVESE  0036
DEAD    0477        M11     0070        SAVWFD  0046
ENDING  0434        M1100   0130        SBE     6101
ENDPAS  0417        M125    0114        SCOPLP  4456
ERLPSW  0534        M132    0115        SINT    6254
ERROR   4454        M16     0071        SKON    6000
ERRORX  0510        M2      0063        SKPEMA  6166
EXECUT  6164        M20     0072        SPL     6102
FILLIT  0302        M22     0073        STRCMP  0243
FLDLIM  0037        M25     0074        SUF     6274
GOODRD  0501        M30     0075        SWCHK   0541
GOODPS  0051        M300    0116        SWITCH  0020
GTF     6004        M33     0076        TEST    0053
HGHLIM  0044        M34     0077        TESTAD  0400
HLT     7402        M4      0064        TSTLOP  0552
INTSER  0000        M40     0100        UPERLM  0040
K1      0342        M4100   0131        WRKADD  0043
K10     0135        M43     0101        WRKFLD  0041
K125    0141        M44     0102        XBAT    0060
K152    0142        M5      0065        XPWRFL  0037
K1777   0145        M50     0103
K200    0143        M5000   0132
K2000   0146        M5100   0133
```



```
ERRORS DETECTED: 0

LINKS GENERATED: 3

RUN-TIME:  17 SECONDS

3K CORE USED
```