

IDENTIFICATION

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PRODUCT NAME: DKC8-AA OPTION TEST #1
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MAINTAINER: DIAGNOSTIC ENGINEERING
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SUPERCEDES: MAINDEC-08-DJDKA-A

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1.0

ABSTRACT

THE DKCB-AA OPTION TEST #1 PROGRAM IS DESIGNED TO TEST ALL THE LOGIC ON THE PDP-8A OPTION BOARD #1 MODULE (M8316) THAT IS TESTABLE BY PROGRAM INSTRUCTIONS. THE DEVICES TESTED BY THE PROGRAM ARE THE REAL TIME CLOCK, THE 12 BIT PARALLEL I/O, AND THE SERIAL LINE UNIT. THE 12 BIT PARALLEL I/O AND THE SERIAL LINE UNIT ARE TESTED IN LOOP BACK MODE BY CONNECTING THE 12 BIT PARALLEL I/O OUT TO 12 BIT PARALLEL I/O IN, EIA OUT TO EIA IN, OR 20MA CURRENT OUT TO 20MA CURRENT IN FOR THE SERIAL LINE UNIT. A OPERATOR INTERVENTION TEST HAS BEEN PROVIDED IN THE DOCUMENT TO TEST THE FRONT PANEL LOGIC. IF A FRONT PANEL IS CONNECTED TO THE PDP-8A OPTION BOARD #1, THIS PROGRAM WILL RUN IN ANY FIELD.

THE PROGRAM WILL RUN WITH THE PDP-8A OPTION 1 & 2 TEST MODULE (G5041) IF AVAILABLE. THE PROGRAM USES THE OPTION 1 & 2 TEST MODULE TO TEST LOGIC THAT THE PROGRAM NORMALLY CAN NOT TEST USING PROGRAM INSTRUCTIONS. ALSO THE PROGRAM USES THE OPTION 1 & 2 TEST MODULE TO PERFORM TIMING TESTS ON THE REAL TIME CLOCK AND THE SERIAL LINE UNIT, AND TO ALLEVIATE OPERATOR INTERVENTION.

THE 4K VERSION OF THE PROGRAM ONLY, IS STRUCTURED SO THAT IT MAY BE RUN ON THE PDP-8A XOR TESTER. TO RUN THE PROGRAM ON THE PDP-8A XOR TESTER, A OPTION 1 & 2 TEST MODULE IS REQUIRED FOR THE "KGM" AND THE "MUT" SIDE.

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

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

PROCESSOR:

PDP-8A

MEMORY:

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

OPTIONS:

IF OPTION BOARD #1 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 #1 (M8316)
2. ONE BC08R-01 CABLE
3. ONE EIA BERG CONNECTOR
4. THREE TERM-POINT JUMBERS
5. ONE QUAD EXTENDER,

SPECIAL

A. THE FOLLOWING HARDWARE IS REQUIRED TO RUN THE PROGRAM WITH THE OPTION 1 & 2 TEST MODULE:

1. PDP-8A OPTION BOARD #1 (M8316)
2. OPTION 1 & 2 TEST MODULE (G5041)
3. ONE BERG INTERFACE CABLE (PN-7010274)
4. ONE IC SOCKET CONNECTOR CABLE (PN-7008612)
5. ONE QUAD EXTENDER

B. THE FOLLOWING HARDWARE IS REQUIRED TO RUN THE PROGRAM ON THE PDP-8A XOR TESTER,

1. TWO PDP-8A OPTION BOARD #1/S (ONE MODIFIED FOR "KGM" SIDE)
2. TWO OPTION 1 & 2 TEST MODULES (G5041/S)
3. TWO BERG INTERFACE CABLES (PN-7010274)
4. THREE IC SOCKET CONNECTOR CABLES (PN-7008612)

2.2

STORAGE

THE 4K VERSION OF DKC8-AA OPTION TEST 1 CAN BE LOADED INTO ANY FIELD. THE PROGRAM OCCUPIES LOCATIONS 0000 TO 5777 IN THE FIELD THAT IT WAS LOADED INTO AND ADDRESSES 0000 TO 0012 IN FIELD 0.

THE 1K SEGMENTS OF THE 4K PROGRAM CAN BE LOADED INTO ANY FIELD. THE PROGRAM OCCUPIES LOCATIONS 0000 TO 1777 IN THE FIELD THAT IT WAS LOADED INTO AND LOCATIONS 0000 TO 0012 IN FIELD 0.

2.3

PREREQUISITE SOFTWARE

PDP-8A CPU TEST

PDP-8A MEMORY TESTS

IF 1K OF MEMORY - 1K TO 32K RANDOM MEMORY REFERENCE INSTRUCTION EXERCISER

IF 2K OF MEMORY - 2K TO 32K PDP-8A PROCESSOR EXERCISER

3.0

RESTRICTIONS

1. DO NOT LOAD THE PROGRAM UNTIL PARAGRAPH 4.0 (STANDARD TEST PROCEDURE) IS FOLLOWED EXPLICITLY.
2. IF THE OPTION 1 & 2 TEST MODULE IS TO BE USED, SET ALL SWITCHES ON THE M8316 (OPTION BOARD #1) TO OFF.
3. THE 4K VERSION OF THE PROGRAM IS THE ONLY VERSION OF THE PROGRAM THAT WILL RUN ON THE PDP-8A XOR TESTER.
4. TO RUN THE PROGRAM ON THE PDP-8A XOR TESTER, A OPTION 1 & 2 TEST MODULE IS REQUIRED FOR THE "KGM" AND "MUT" SIDES OF THE TESTER, AND THE PROGRAM MUST BE "INITIALIZED" CORRECTLY.

4.0

STANDARD TEST PROCEDURE

IF A FRONT PANEL IS CONNECTED TO THE M8316 MODULE, DO THE OPERATOR INTERVENTION FRONT PANEL TEST, PARAGRAPH 4.1.

IF THE PROGRAM IS TO BE RUN ON THE PDP-8A XOR TESTER, GO TO PARAGRAPH 4.8 (PDP-8A XOR TESTING) FOR LOADING AND INITIALIZING THE PROGRAM AND FOR THE TEST SETUP.

THE FOLLOWING PARAGRAPHS MUST BE FOLLOWED EXPLICITLY TO SETUP THE HARDWARE, LOAD THE PROGRAM, SETUP THE MODULE FOR TEST, AND TO INITIALIZE THE PROGRAM.

- 4.2 LOADING THE PROGRAM
- 4.2.1 LOADING THE PROGRAM VIA HIGH SPEED READER OR TELETYPE
- 4.3 SETTING THE M8316 MODULE UP FOR TEST
- 4.3.1 SETTING THE M8316 UP FOR TEST WITHOUT OPTION 1 + 2 TEST MODULE
- 4.3.2 SETTING THE M8316 UP FOR TEST WITH OPTION 1 + 2 TEST MODULE
- 4.4 PROGRAM INITIALIZATION

THE PROGRAM IS DIVIDED INTO THREE 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 DKC8-AA OPTION TEST 1 (4.5) WHICH WILL INCLUDE THE REAL TIME CLOCK AND SERIAL LINE UNIT TIMING TEST. IF THE OPTION 1 + 2 TEST MODULE IS NOT USED DO THE FOLLOWING TEST:

RUN DKC8-AA OPTION TEST 1 PARAGRAPH 4.5
RUN REAL TIME CLOCK TIMING TEST PARAGRAPH 4.6
RUN SERIAL LINE UNIT TIMING TEST PARAGRAPH 4.7

OPERATOR INTERVENTION FRONT PANEL TEST -----

ANY ERRORS DURING THIS TEST, REFER TO THE CIRCUIT SCHEMATICS OF THE M9316 MODULE (OPTION BOARD #1) OR TO THE CIRCUIT SCHEMATICS OF THE FRONT PANEL;

1. TURN THE COMPUTER OFF AND THEN ON
2. CHECK FOR A NUMBER LIT IN EACH DIGIT OF THE ADDRESS AND CONTENT REGISTER,
3. PRESS THE NUMBER 0,
4. CHECK CONTENT REGISTER TO BE 0 AND THE AC, MQ, BUS, STATUS, SR, RUN, STATE, AND MD LIGHTS TO BE OFF,
5. PRESS DISP AND CHECK THAT THE AC LIGHT IS THE ONLY LIGHT THAT IS LIT,
6. PRESS THE NUMBER 1
7. CHECK CONTENT TO BE 0001 AND ALL OTHER LIGHTS TO BE OFF
8. PRESS DISP AND CHECK MQ LIGHT TO BE THE ONLY LIGHT LIT
9. PRESS THE NUMBER 2
10. CHECK THAT CONTENT EQUALS 0002 AND ALL OTHER LIGHTS ARE OFF
11. PRESS DISP AND CHECK BUS TO BE THE ONLY LIGHT ON,
12. PRESS THE NUMBER 3
13. CHECK THAT CONTENT EQUALS 0003 AND ALL OTHER LIGHTS ARE OFF
14. PRESS DISP AND CHECK STATUS TO BE THE ONLY LIGHT ON,
15. PRESS THE NUMBER 4
16. CHECK THAT CONTENT EQUALS 0004 AND ALL OTHER LIGHTS ARE OFF
17. PRESS DISP AND CHECK SR TO BE THE ONLY LIGHT ON
18. PRESS THE NUMBER 5
19. CHECK THAT CONTENT EQUALS 0005 AND ALL OTHER LIGHTS ARE OFF
20. PRESS DISP AND CHECK STATE TO BE THE ONLY LIGHT ON
21. PRESS THE NUMBER 6
22. CHECK THAT CONTENT EQUALS 0006 AND ALL OTHER LIGHTS ARE OFF
23. PRESS DISP AND CHECK MD TO BE THE ONLY LIGHT ON,
24. PRESS THE NUMBER 7
25. CHECK THAT CONTENT EQUALS 0007 AND ALL OTHER LIGHTS ARE OFF
26. PRESS DISP AND CHECK CONTENT TO BE 7777 AND ALL THE OTHER LIGHTS TO BE OFF
27. TURN THE COMPUTER OFF AND THEN ON
28. PRESS THE NUMBER 4 AND THEN DISP
29. CHECK CONTENT TO BE 0 AND SR TO BE ONLY LIGHT ON
30. PRESS THE NUMBER 5 AND CHECK CONTENT TO BE 0005 AND THAT NO LIGHTS ARE ON
31. PRESS THE NUMBER 2 AND CHECK CONTENT TO BE 0052
32. PRESS THE NUMBER 5 AND CHECK CONTENT TO BE 0525
33. PRESS THE NUMBER 2 AND CHECK CONTENT TO BE 5252
34. PRESS LA - CHECK THAT CONTENT 5252 WENT TO ADDRESS AS 05252 AND CONTENT WENT TO ZERO AND CHECK THAT SR IS THE ONLY LIGHT ON;
35. PRESS THE NUMBERS 2525 CONSECUTIVELY AND CHECK CONTENT TO CONTAIN 2525, AND THAT NO LIGHTS ARE ON
36. PRESS LA - CHECK ADDRESS TO BE 02525, CONTENT TO BE 0000, AND SR TO BE ONLY LIGHT ON
37. LOAD ADDRESS TO 0200
38. PRESS THE NUMBER 6 AND THEN DISP
39. CHECK THE MD LIGHT TO BE THE ONLY LIGHT ON
40. PRESS THE NUMBERS 7402 AND CHECK CONTENT TO EQUAL THIS NUMBER
41. PRESS D THIS
42. CHECK ADDRESS EQUAL 0200 AND CONTENT EQUAL 7402
43. PRESS THE NUMBERS 7604 - CHECK CONTENT TO EQUAL THIS NUMBER

- 44: PRESS D NEXT
- 45: CHECK ADDRESS EQUAL 0201 AND CONTENT EQUAL 7604
- 46: PRESS THE NUMBERS 7421 AND CHECK CONTENT TO EQUAL 7421
- 47: PRESS D NEXT
- 48: CHECK ADDRESS TO EQUAL 0202 AND CONTENT EQUAL 7421
- 49: PRESS THE NUMBERS 1201 AND CHECK CONTENT TO EQUAL 1201
- 50: PRESS D NEXT
- 51: CHECK ADDRESS TO EQUAL 0203 AND CONTENT EQUAL TO 1201
- 52: PRESS NUMBERS 7402 AND CHECK CONTENT TO EQUAL 7402
- 53: PRESS D NEXT
- 54: CHECK ADDRESS TO EQUAL 0204 AND CONTENT TO EQUAL 7402
- 55: PRESS NUMBERS 7001 AND CHECK CONTENT TO EQUAL THIS NUMBER
- 56: PRESS D NEXT
- 57: CHECK ADDRESS TO EQUAL 0205 AND CONTENT TO EQUAL 7001
- 58: PRESS NUMBERS 5204 AND CHECK CONTENT TO EQUAL THIS NUMBER
- 59: PRESS D NEXT
- 60: CHECK ADDRESS TO EQUAL 0206 AND CONTENT TO EQUAL 5204
- 61: LOAD ADDRESS TO 0200
- 62: PRESS E THIS
- 63: CHECK ADDRESS EQUAL TO 0200 AND CONTENT EQUAL 7604
- 64: PRESS E NEXT
- 65: CHECK ADDRESS EQUAL TO 0201 AND CONTENT EQUAL 7604
- 66: PRESS E NEXT
- 67: CHECK ADDRESS EQUAL TO 0202 AND CONTENT EQUAL TO 7421
- 68: PRESS E NEXT
- 69: CHECK ADDRESS EQUAL TO 0203 AND CONTENT EQUAL TO 1201
- 70: PRESS E NEXT
- 71: CHECK ADDRESS EQUAL TO 0204 AND CONTENT EQUAL TO 7402
- 72: PRESS E NEXT
- 73: CHECK ADDRESS TO EQUAL 0205 AND CONTENT TO EQUAL 7001
- 74: PRESS E NEXT
- 75: CHECK ADDRESS TO EQUAL 0206 AND CONTENT TO EQUAL 5204
- 76: PRESS NUMBERS 5252
- 77: CHECK ADDRESS TO EQUAL 0206, CONTENT TO EQUAL 5252 AND
NO LIGHTS ON
- 78: PRESS LSR
- 79: CHECK ADDRESS TO EQUAL 0206, CONTENT TO EQUAL 5204 AND
MD LIGHT TO BE ONLY LIGHT LIT
- 80: PRESS THE NUMBER 4 AND DISPLAY
- 81: CHECK ADDRESS TO BE 206 AND CONTENT TO BE 5252 AND
THE SR LIGHT TO BE ONLY LIGHT LIT
- 82: LOAD ADDRESS TO 0200 & PRESS INIT AND THEN RUN
- 83: CHECK THAT MA EQUALS 0204, CONTENT EQUALS 5252 AND
SR LIGHT TO BE ONLY LIGHT LIT
- 84: PRESS THE NUMBER 6 AND THEN DISP
- 85: CHECK ADDRESS TO BE 0204 AND CONTENT TO BE 7402 AND
THAT THE MD LIGHT IS THE ONLY LIGHT LIT
- 86: PRESS THE NUMBER 1 AND THEN DISP
- 87: CHECK ADDRESS TO BE 0204 AND CONTENT TO BE 5252 AND
THAT THE MD LIGHT IS THE ONLY LIGHT LIT
- 88: PRESS THE NUMBER 0 AND THEN DISP
- 89: CHECK ADDRESS TO BE 0204, CONTENT TO BE 7421 AND
AC LIGHT TO BE ONLY LIGHT LIT
- 90: PRESS INIT
- 91: CHECK ADDRESS TO BE 0204, CONTENT TO BE 0 AND AC
LIGHT TO BE ONLY LIGHT LIT
- 92: PRESS HLT/SS
- 93: CHECK ADDRESS TO BE 0205, CHECK CONTENT TO EQUAL 1
AND AC LIGHT TO BE ONLY LIGHT LIT
- 94: PRESS HLT/SS

95, CHECK ADDRESS TO BE 0204, CONTENT TO BE 0001 AND AC
 LIGHT TO BE ONLY LIGHT LIT;
 96, PRESS RUN
 97, CHECK RUN AND AC LIGHTS TO BE ONLY LIGHT LIT
 98, PRESS HLT/SS
 99, CHECK RUN LIGHT TO GO OUT AND AC LIGHT TO BE ONLY
 LIGHT ON
 100, PRESS RUN
 101, CHECK RUN LIGHT AND AC LIGHT TO BE ON;
 102, SET PANEL LOCK SWITCH TO PANEL LOCK POSITION
 103, PRESS E THIS, E NEXT, D THIS, D NEXT, BOOT, DISP, LSR
 LA, LXA, INIT, RUN, AND HLT/SS
 104, CHECK THAT RUN LIGHT AND AC LIGHT REMAIN ON
 105, SET PANEL LOCK SWITCH TO OFF AND THEN PRESS HLT/SS
 106, CHECK THAT RUN LIGHT GOES OFF AND THAT AC LIGHT
 IS THE ONLY LIGHT LIT
 107, PRESS THE NUMBER 6 AND THEN DISP
 108, CHECK THAT THE MD LIGHT IS LIT
 109, LOAD ADDRESS TO 0400 AND DEPOSIT THE FOLLOWING
 NUMBER INTO 400 TO 412 BY PRESSING D NEXT AFTER
 EACH NUMBER: 7000, 3000, 1000, 0000, 2000, 4206, 0000,
 5210, 6002, 3603, 5200
 110, LOAD ADDRESS TO 0400 AND CHECK THAT THOSE NUMBERS WERE
 DEPOSITED CORRECTLY BY PRESSING E NEXT,
 111, LOAD ADDRESS TO 0400
 112, PRESS THE NUMBER 5 AND DISP
 113, CHECK THAT THE STATUS LIGHT IS THE ONLY LIGHT ON
 114, PRESS HLT/SS
 115, CHECK ADDRESS TO BE 0401 AND CONTENT TO BE 4740
 IF THE NUMBER IS 4750 PRESS THE BOOT SWITCH ONCE
 116, PRESS HLT/SS
 117, CHECK ADDRESS TO BE 0000 AND CONTENT TO BE 1340
 118, PRESS HLT/SS
 119, CHECK ADDRESS TO BE 0402 AND CONTENT TO BE 4300
 120, PRESS HLT/SS
 121, CHECK ADDRESS TO BE 0000 AND CONTENT TO BE 1140
 122, PRESS HLT/SS
 123, CHECK ADDRESS TO BE 0403 AND CONTENT TO BE 4100
 124, PRESS HLT/SS
 125, CHECK ADDRESS TO BE 0000 AND CONTENT TO BE 1040
 126, PRESS HLT/SS
 127, CHECK ADDRESS TO BE 0404 AND CONTENT TO BE 4000
 130, PRESS HLT/SS
 131, CHECK ADDRESS TO BE 0000 AND CONTENT TO BE 1240
 132, PRESS HLT/SS
 133, CHECK ADDRESS TO BE 0405 AND CONTENT TO BE 4200
 134, PRESS HLT/SS
 135, CHECK ADDRESS TO BE 0406 AND CONTENT TO BE 1440
 136, PRESS HLT/SS
 137, CHECK ADDRESS TO BE 0407 AND CONTENT TO BE 4400
 138, PRESS HLT/SS
 139, CHECK ADDRESS TO BE 0410 AND CONTENT TO BE 4540
 140, PRESS HLT/SS
 141, CHECK ADDRESS TO BE 0411 AND CONTENT TO BE 4640
 142, PRESS HLT/SS
 143, CHECK ADDRESS TO BE 0403 AND CONTENT TO BE 2340
 144, PRESS HLT/SS
 145, CHECK ADDRESS TO BE 0000 AND CONTENT TO BE 1300
 146, PRESS HLT/SS
 147, CHECK ADDRESS TO BE 0412 AND CONTENT TO BE 4300

150. PRESS HLT/SS
151. CHECK ADDRESS TO BE 0400 AND CONTENT TO BE 4340
152. PRESS HLT/SS
153. CHECK ADDRESS TO BE 0401 AND CONTENT TO BE 4740
154. PRESS BOOT SWITCH
155. CHECK ADDRESS TO BE 0401 AND CONTENT TO BE 4750
156. PRESS BOOT SWITCH
157. CHECK ADDRESS TO BE 0401 AND CONTENT TO BE 4740
158. LOAD ADDRESS TO 0200 AND DEPOSIT IN TO 0200 TO
0206 THE FOLLOWING NUMBERS USING THE D NEXT FUNCTION:
6007, 7020, 6001, 7100, 6002, 5200
159. LOAD ADDRESS TO 0200 AND CHECK THAT THE NUMBERS
WERE DEPOSITED CORRECTLY USING THE E NEXT FUNCTION,
160. LOAD ADDRESS TO 0200
161. PRESS NUMBER 3 AND THEN DISP
162. PRESS HLT/SS
163. CHECK ADDRESS TO BE 0201 AND CONTENTS TO BE 0000
164. PRESS HLT/SS
165. CHECK ADDRESS TO BE 0202 AND CONTENTS TO BE 4000
166. PRESS HLT/SS
167. CHECK ADDRESS TO BE 0203 AND CONTENTS TO BE 4200
168. PRESS HLT/SS
169. CHECK ADDRESS TO BE 0204 AND CONTENTS TO BE 0200
170. PRESS HLT/SS
171. CHECK ADDRESS TO BE 0205 AND CONTENTS TO BE 0000
172. LOAD ADDRESS TO 0200 AND DEPOSIT INTO 200 AND 201
USING THE D NEXT FUNCTION THE NUMBER 7604
AND 5200
173. LOAD ADDRESS TO 0200 PRESS INIT THEN RUN
174. PRESS NUMBER 0 AND DISP
175. PRESS NUMBER 5252 AND THEN LSR
176. CHECK CONTENT TO BE 5252
177. PRESS NUMBER 2525 AND THEN LSR
178. CHECK CONTENT TO BE 2525
179. DONE GO TO PARAGRAPH 4.2

4.2 LOADING THE PROGRAM

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

- A. POWER THE COMPUTER DOWN
- B. UNPLUG THE M8316 MODULE FROM THE COMPUTER
- C. PLUG THE QUAD EXTENDER INTO THE SLOT THE M8316 OCCUPIED
- D. PLUG THE M8316 MODULE INTO THE QUAD EXTENDER,
- E. IF THE OPTION 1 + 2 TEST MODULE IS TO BE USED DO THE FOLLOWING, IF NOT GO TO STEP F:
 1. PLUG ONE END OF THE IC SOCKET CONNECTOR CABLE (PN-7008612) INTO TS-3, 1ST SOCKET ABOVE E63, ON THE G5041 MODULE,
 2. TAKE THE END OF THE BERG CONNECTOR CABLE (PN-7010274) WHICH HAS ONLY ONE BERG CONNECTOR ON IT AND PLUG IT INTO BERG SOCKET J1 ON THE G5041 MODULE,
 3. PLUG THE TEST MODULE (G5041) INTO THE COMPUTER,
- F. POWER THE COMPUTER BACK UP
- G. TO LOAD THE PROGRAM VIA HIGH SPEED READER OR TELETYPE, GO TO PARAGRAPH 4.2.1.

4.2.1 LOADING THE PROGRAM VIA HIGH SPEED READER OR TELETYPE

- A. IF THE PROGRAM IS TO BE LOADED VIA HIGH SPEED READER GO TO STEP B, OTHERWISE DO THE FOLLOWING THREE STEPS TO SETUP THE M8316 MODULE TO LOAD THE PROGRAM VIA TELETYPE,
 1. WITH POWER ON, SET THE FOLLOWING SWITCHES ON THE M8316 MODULE TO THE OFF POSITION: S1-1, S1-2, S1-3, AND S1-7,
 2. WITH POWER ON, SET THE FOLLOWING SWITCHES ON THE M8316 MODULE TO THE ON POSITION: S1-5, S1-6, AND S1-8,
 3. PLUG THE TELETYPE CABLE INTO THE J3 BERG CONNECTOR ON THE M8316 MODULE, THE MODULE IS NOW READY TO LOAD THE PROGRAM, GO TO STEP B,
- B. IF THE COMPUTER CONTAINS 4K OF MEMORY OR MORE, DO STEP C IN THIS SECTION, OTHERWISE DO STEP D FOR THOSE COMPUTERS WITH LESS THAN 4K OF MEMORY,
- C. LOAD THE BINARY TAPE, MAINDEC-08-DJDKA-B-PB1, USING THE STANDARD BINARY LOADER TECHNIQUE, AFTER TAPE HAS BEEN SUCCESSFULLY LOADED, GO TO PARAGRAPH 4.3, SETTING THE M8316 MODULE UP FOR TEST,
- D. COMPUTERS WITH LESS THAN 4K OF MEMORY ARE SUPPLIED WITH FOUR 1K SEGMENTS OF DKC8-AA OPTION TEST 1, THESE 1K SEGMENTS ARE IN RIM FORMAT AND EACH TAPE SHOULD BE RUN CONSECUTIVELY, THE TAPES ARE LABELED AS MAINDEC-08-DJDKA-B-PM1, -PM2, -PM3 AND -PM4, TO LOAD THESE PROGRAMS, DEPOSIT INTO LOCATIONS LISTED BELOW THE APPROPRIATE RIM LOADER FOR THE LOADING DEVICE TO BE USED,

HIGH SPEED READER

ADDRESS	CONTENT
-----	-----
0156	6014
0157	6011
0160	5357
0161	6016
0162	7106
0163	7006
0164	7510
0165	5374
0166	7006
0167	6011
0170	5367
0171	6016
0172	7420
0173	3776
0174	3376
0175	5357

LOW SPEED READER

ADDRESS	CONTENT
-----	-----
0156	6032
0157	6031
0160	5357
0161	6036
0162	7106
0163	7006
0164	7510
0165	5357
0166	7006
0167	6031
0170	5367
0171	6034
0172	7420
0173	3776
0174	3376
0175	5356

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

WHEN THE TAPE HAS BEEN LOADED, STOP THE COMPUTER, GO
TO PARAGRAPH 4.3, SETTING THE M8316 MODULE UP FOR TEST;

4.3 SETTING THE M8316 MODULE UP FOR TEST

DO NOT TURN THE COMPUTER OFF IF RAM MEMORY IS BEING USED.

UNPLUG THE TELETYPE CABLE FROM THE J3 BERG SOCKET
ON THE M8316 MODULE IF CONNECTED. IF OPTION 1 + 2 TEST
MODULE IS TO BE USED, GO TO PARAGRAPH 4.3.2.

4.3.1 SETTING THE M8316 MODULE UP FOR TEST WITHOUT OPTION 1 + 2 TEST MODULE

A. SET THE SWITCHES ON THE M8316 MODULE TO THE
DESIRED BAUD RATE LISTED BELOW

S1-1	S1-2	S1-3	BAUD RATE
----	----	----	-----
OFF	OFF	OFF	110 BAUD
OFF	OFF	ON	150 BAUD
OFF	ON	OFF	300 BAUD
OFF	ON	ON	600 BAUD
ON	OFF	OFF	1200 BAUD
ON	OFF	ON	2400 BAUD
ON	ON	OFF	4800 BAUD
ON	ON	ON	9600 BAUD

- B. SET SWITCHES S1-5 AND S1-6 TO THE ON POSITION TO ENABLE THE REAL TIME CLOCK AND THE TEST SWITCH;
- C. SET SWITCH S1-7 TO ONE OF THE FOLLOWING POSITIONS:
 S1-7 IN THE ON POSITION = ONE STOP BIT ON THE SERIAL LINE UNIT
 S1-7 IN THE OFF POSITION = TWO STOP BITS ON THE SERIAL LINE UNIT
- D. SET SWITCH S1-8 TO THE ON POSITION IF THE MODULE IS SETUP FOR 110 BAUD, OTHERWISE, ALWAYS SET THE SWITCH TO THE OFF POSITION.
- E. CONNECT BERG SOCKETS J4 AND J5 ON THE M8316 MODULE IN PARALLEL USING THE BC08R-01 CABLE. THIS CONNECTS THE 12 BIT PARALLEL I/O OUTPUTS TO ITS INPUTS. BE SURE THAT THE CABLE IS INSTALLED CORRECTLY, I.E., ONE END OF THE CABLE HAS TO BE PLUGGED IN WITH THE LETTERING FACING DOWNWARDS (UPSIDE DOWN).
- F. DO STEP 1 BELOW TO CONNECT THE SERIAL LINE UNIT UP FOR EIA LOOP BACK OR DO STEP 2 BELOW FOR 20MA LOOP BACK.
 - 1. USING THE TERMI-POINT JUMPERS, CONNECT PIN F TO PIN J AND PIN E TO PIN M ON THE J3 BERG SOCKET ON THE M8316 MODULE OR PLUG THE EIA TEST BERG INTO THE J3 BERG SOCKET. GO TO PARAGRAPH 4.4, PROGRAM INITIALIZATION.
 - 2. USING THE TERMI-POINT JUMPERS, CONNECT PIN E TO PIN H, PIN K TO PIN KK, AND PIN S TO PIN AA ON THE J3 BERG SOCKET ON THE M8316 MODULE. GO TO PARAGRAPH 4.4, PROGRAM INITIALIZATION.

4.3.2 SETTING THE M8316 MODULE UP FOR TEST WITH THE OPTION 1 + 2 TEST MODULE

- A. SET ALL THE SWITCHES ON THE M8316 MODULE TO THE OFF POSITION.
- B. PLUG THE OTHER END OF THE IC SOCKET CONNECTOR CABLE, WHICH WAS PLUGGED IN, IN PARAGRAPH 4.2 STEP E, INTO THE TEST SOCKET ON THE M8316 MODULE (PIN 1 TO PIN 1).
- C. NOW TAKE THE OTHER END OF THE BERG CONNECTOR CABLE, AND PLUG THE BERG CONNECTORS INTO J3, J4, AND J5 BERG SOCKETS ON THE M8316 MODULE.

4.4

PROGRAM INITIALIZATION

THE PROGRAM WHEN LOADED IS INITIALIZED TO RUN WITHOUT THE HARDWARE FRONT PANEL SWITCH REGISTER, WITHOUT THE OPTION 1 + 2 TEST MODULE, WITHOUT XOR TESTING, 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 FROM THE BITS LISTED BELOW,

- 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 1 = 1 HAS A M8316 OPTION 1 MODULE - N/A TO THE PROGRAM
 - BIT 4 = 0 THE PROGRAM WILL NOT USE THE OPTION 1 + 2 TEST MODULE TO TEST THE M8316
 - BIT 4 = 1 THE PROGRAM WILL USE THE OPTION 1 + 2 TEST MODULE TO TEST THE M8316
 - BIT 5 = 0 NOT RUNNING ON THE PDP-8A XOR TESTER
 - BIT 5 = 1 RUNNING ON THE PDP-8A XOR TESTER - BIT 4 MUST BE SET AND THE OPTION 1 & 2 TEST MODULES MUST BE USED,
 - BITS 7 = 11 SPECIFIES THE PDP-8A'S MEMORY SIZE; ALL ZEROES INDICATES 1K OF MEMORY, AN ADDITION OF 1 TO THE NUMBER OF BITS IN 7 = 11 INCREASES MEMORY SIZE BY 1K.
- GO TO PARAGRAPH 4.5, DKCB-AA OPTION TEST 1

4.5

RUN DKCB-AA OPTION TEST 1

- A. IF THE COMPUTER CONTAINS 4K OF MEMORY, THE MAIN TAPE (DJOKA-B-PB1) IS USED FOR THIS SECTION, OTHERWISE, EACH ONE OF THE FOUR 1K SEGMENTED TAPES SHOULD BE LOADED AND RUN. THEY SHOULD BE LOADED AND RUN IN THE FOLLOWING ORDER, 1K PART 1, 1K PART 2, 1K PART 3, AND 1K PART 4.
- B. TO THOROUGHLY CHECKOUT THE SERIAL LINE UNIT WITHOUT THE OPTION 1 + 2 TEST MODULE, THE MAIN PROGRAM, OR THE 1K VERSIONS PART 2, PART 3 AND PART 4 SHOULD BE RUN 3 TIMES WITH THE FOLLOWING CONFIGURATIONS.
 - 1. 110 BAUD -2 STOP BITS- 20 MA LOOP BACK
 - 2. 150 BAUD -1 STOP BIT- EIA LOOP BACK
 - 3. 9600 BAUD -1 STOP BIT- EIA LOOP BACK

REFER TO PARAGRAPH 4.3.1 FOR SETTING UP SWITCHES ON THE M8316 MODULE AND FOR EIA OR 20 MA LOOP BACK CONNECTIONS.

- C. THE 4K PROGRAM AND ALL THE 1K SEGMENTED VERSIONS OF THE PROGRAM START AT ADDRESS 0200.
- D. TO RUN THE PROGRAM, LOAD ADDRESS TO 0200, SET THE SWITCH REGISTER TO 0000, PRESS "INIT" AND THEN "RUN".
- E. SETTING THE SWITCH REGISTER TO 0400, OR IF THE PSEUDO SWITCH REGISTER WAS SET TO 0400 DEPENDING ON WHICH ONE WAS SELECTED BY THE OPERATOR, THE COMPUTER WILL HALT AT THE COMPLETION OF A PROGRAM PASS.
- F. THE PROGRAM WILL NOW RUN UNTIL AN ERROR IS ENCOUNTERED OR THE PROGRAM IS STOPPED BY THE OPERATOR OR SR3=1.

4.6 RUN REAL TIME CLOCK TIMING TEST

- A. THE TEST IS A 30 SECOND STOP WATCH TIMING TEST
- B. LOAD ADDRESS TO 4000 FOR TAPE MAINDEC-08-DJDKA-B-PB1 OR TO 1200 FOR TAPE MAINDEC-08-DJDKA-B-PM4, 1K VERSION PART 4, AND THEN PRESS "INIT".
- C. CHECK STOP WATCH AND PRESS "RUN".
- D. THE PROGRAM SHOULD HALT IN APPROXIMATELY 30 SECONDS AT LOCATION 4021 FOR TAPE MAINDEC-08-DJDKA-B-PB1 OR 1221 FOR TAPE MAINDEC-08-DJDKA-B-PM4.

4.7 RUN SERIAL LINE UNIT TIMING TEST

THIS TEST SHOULD BE RUN FOR THE FOLLOWING CONDITIONS:
 1) 110 BAUD-2 STOP BITS, AND 2) 150 BAUD-1 STOP BIT.
 REFER TO PARAGRAPH 4.3.1 FOR BAUD RATE AND STOP BIT SWITCH SETTINGS.

- A. THIS TEST IS A 30 SECOND STOP WATCH TIMING TEST.
- B. LOAD ADDRESS TO 4023 FOR TAPE MAINDEC-08-DJDKA-B-PB1 OR TO 1223 FOR TAPE MAINDEC-08-DJDKA-B-PM4, PRESS "INIT" AND THEN "RUN".
- C. THE COMPUTER WILL HALT AT ADDRESS 4026 OR 1226 FOR TAPES LISTED IN STEP B ABOVE.

- D. SET BITS 8-11 FROM THE TABLE LISTED BELOW IN THE SWITCH REGISTER OR PSEUDO SWITCH REGISTER DEPENDING ON WHICH ONE WAS SELECTED BY OPERATOR, TO THE CONFIGURATION OF THE M8316 MODULE,

SR8 ---	SR9 ---	SR10 ----	SR11 ----	
0	0	0	0	110 BAUD = 1 STOP BIT
1	0	0	0	110 BAUD = 2 STOP BITS
0	0	0	1	150 BAUD = 1 STOP BIT
1	0	0	1	150 BAUD = 2 STOP BITS
0	0	1	0	300 BAUD = 1 STOP BIT
1	0	1	0	300 BAUD = 2 STOP BITS
0	0	1	1	600 BAUD = 1 STOP BIT
1	0	1	1	600 BAUD = 2 STOP BITS
0	1	0	0	1200 BAUD = 1 STOP BIT
1	1	0	0	1200 BAUD = 2 STOP BITS
0	1	0	1	2400 BAUD = 1 STOP BIT
1	1	0	1	2400 BAUD = 2 STOP BITS
0	1	1	0	4800 BAUD = 1 STOP BIT
1	1	1	0	4800 BAUD = 2 STOP BITS
0	1	1	1	9600 BAUD = 1 STOP BIT
1	1	1	1	9600 BAUD = 2 STOP BITS

- E. CHECK STOP WATCH AND PRESS "INIT" AND THEN "RUN".
- F. THE PROGRAM SHOULD HALT IN APPROXIMATELY 30 SECONDS AT LOCATION 4102 FOR TAPE MAINDEC=08=DJDKA=B-PB1, OR AT LOCATION 1302 FOR TAPE MAINDEC=08=DJDKA=B-PM4,

4.8 PDP-8A XOR TESTING

DO THE FOLLOWING STEPS TO LOAD AND INITIALIZE THE PROGRAM, TO SETUP THE HARDWARE, AND TO START THE XOR TEST,

- A. LOAD THE BINARY PAPER TAPE, MAINDEC=08=DJDKA=B-PB1, USING THE STANDARD BINARY LOADER TECHNIQUE,
- B. POWER THE PDP-8A XOR DOWN AND DO THE FOLLOWING:
1. UNPLUG ANY TELETYPE MODULE THAT MAY BE PLUGGED INTO THE XOR TESTER,
 2. PLUG A PDP-8A OPTION 1 & 2 TEST MODULE INTO THE "KGM" AND "MUT" SIDES OF THE XOR TESTER,
 3. PLUG A BUSS LOADS MODULE UNDER EACH OPTION 1 & 2 TEST MODULE,
 4. TAKE ONE OF THE I.C. SOCKET CONNECTOR CABLES AND PLUG IT INTO TS-3, 1ST SOCKET ABOVE E63, ON THE OPTION 1 & 2 TEST MODULE ON THE "KGM" SIDE, AND THEN

DO THE SAME ON THE "MUT" SIDE.

5. TAKE THE END OF THE BERG CONNECTOR CABLE WHICH HAS ONLY ONE BERG CONNECTOR ON IT, AND PLUG IT INTO THE BERG SOCKET ON THE TEST MODULE ON THE "KGM" SIDE, NOW DO THE SAME FOR THE "MUT" SIDE.
6. NOW TAKE THE OTHER I.C. SOCKET CONNECTOR CABLE AND PLUG IT INTO TS-4, 1ST SOCKET ABOVE E2, ON THE OPTION TEST MODULE ON THE "KGM" SIDE, NOW PLUG THE OTHER END OF THIS I.C. SOCKET CABLE INTO TS-5, 1ST SOCKET ABOVE E69, ON THE OPTION TEST MODULE ON THE "MUT" SIDE.
7. NOW USING THE MODIFIED PDP-8A OPTION BOARD #1, PLUG THE THREE BERG CONNECTORS FROM THE TEST MODULE ON THE "KGM" SIDE INTO BERG SOCKETS J3, J4, AND J5 ON THE PDP-8A OPTION BOARD #1, NOW PLUG THIS MODULE INTO THE "KGM" SIDE OF THE XOR ABOVE THE OPTION 1 & 2 TEST MODULE.
8. MAKE THE SAME CONNECTIONS AS IN STEP 7 ABOVE ON THE MODULE TO BE TESTED AND PLUG IT INTO THE "MUT" SIDE, ABOVE THE OPTION 1 & 2 TEST MODULE.
9. NOW PLUG THE OTHER END OF THE I.C. SOCKET CONNECTOR CABLE FROM EACH TEST MODULE INTO THE TEST SOCKET ON EACH OF THE PDP-8A OPTION BOARD #1'S.
10. SET ALL SWITCHES ON EACH OF THE PDP-8A OPTION BOARD #1'S TO THE OFF POSITION, AND POWER THE XOR BACK UP.
12. LOAD ADDRESS TO 0021 IN FIELD 0 AND DEPOSIT 6303 INTO THIS LOCATION.
13. SET THE TIME OUT SWITCH ON THE PDP-8A XOR TESTER TO THE SECOND POSITION, SET THE DEVICE CODE SWITCHES ON THE XOR TESTER TO 88 WHEN RUNNING THIS TEST, SET BOARD SELECT TO OTHERS.
14. LOAD ADDRESS TO 0200 AND PRESS "CLEAR" AND THEN "CONTINUE".

- C. THE PROGRAM SHOULD NOW RUN UNTIL AN XOR ERROR IS ENCOUNTERED, AT WHICH TIME THE PROGRAM WILL HANG IN A SCOPE LOOP, LOOPING ON THE TEST THE ERROR WAS ENCOUNTERED IN.
- D. THE AREAS OF LOGIC WHICH THE PROGRAM CAN NOT TEST ARE THE BAUD RATE MULTIPLEXER SECTION AND FRONT PANEL SECTION, IF THE BAUD RATE ON THE "MUT" SIDE IS A LOT HIGHER THAN ON THE "KGM" SIDE, A ERROR WILL NOT BE DETECTED, IF THE BAUD RATE ON THE "MUT" SIDE IS SLOWER THEN ON THE "KGM" SIDE A ERROR WILL BE DETECTED.

5.0 ERRORS

5.1 DKCB-AA OPTION TEST 1 ERRORS

ALL ERRORS DETECTED BY THE PROGRAM WILL RESULT IN AN ERROR HALT, REFER TO THE APPROPRIATE PROGRAM LISTING FOR THE CAUSE OF THE ERROR.

5.1.1 DKC8-AA OPTION TEST 1 ERROR RECOVERY

SET SWITCH REGISTER 0, 1 AND 2 TO A 1 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.

5.2 REAL TIME CLOCK AND SERIAL LINE UNIT TIMING TEST ERRORS

THE OPERATOR MUST DETECT ANY ERRORS IN THE REAL TIME CLOCK
TIMING TEST OR THE SERIAL LINE UNIT TIMING TEST, ONCE
THE PROGRAM IS STARTED, IT SHOULD HALT IN APPROXIMATELY
30 SECONDS, ANY DEVIATIONS OF MORE THAN A 1/2 SECOND
IS AN ERROR,

5.2.1 REAL TIME CLOCK AND SERIAL LINE UNIT TIMING TEST ERROR RECOVERY

AFTER CHECKING THE MODULE TO BE SETUP CORRECTLY, PRESS
"RUN" OR RESTART THE TEST, IF THE ERROR STILL EXISTS,
CHECK THE REAL TIME CLOCK FREQUENCY OR THE SERIAL LINE
UNITS FREQUENCY, DEPENDING ON THE TEST BEING
RUN, WITH A SCOPE,

6.0 SWITCH REGISTER SETTINGS

6.1 NORMAL OPERATING SWITCHES

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

6.2 ERROR SWITCHES

SR0 = 1 (4000) INHIBIT ERROR HALT
SR1 = 1 (2000) LOOP ON ERROR
SR2 = 1 (1000) LOOP ON TEST SUCH AS TEST 1, TEST 2, ETC.,

7.0 REVISIONS

SUPERCEDES MAINDEC-08-DJDKA-A

8.0 PROGRAM DESCRIPTION

8.1 DKC8-AA OPTION TEST 1

*****THIS IS THE BEGINNING OF THE FIRST SEGMENTED 1K VERSION
OF THE PROGRAM IF MEMORY SIZE IS LESS THAN 4K,

TEST 1 - CHECKS THAT INITIALIZE WILL CLEAR ALL FLAGS, ANY ERROR MAYBE DUE TO A FLAG STUCK ON OR THE IOT SKIPPED, THE 12 BIT PARALLEL I/O BUFFER IS CHECKED TO CONTAIN ZEROES, HOWEVER, THE READ COMMAND (DBRD) MAY NOT WORK, THE TESTS WAITS FOR THE RTC FLAG TO SET AND CHECKS THE FLAG TO SKIP, NO INTERRUPTS SHOULD OCCUR,

TEST 2 - IS THE FIRST SECTION OF THE REAL TIME CLOCK DIAGNOSTIC, THIS TEST CHECKS THAT THE REAL TIME CLOCK (RTC) FLAG WILL SET AND THAT CAF WILL CLEAR IT, PROGRAM IS CHECKED NOT TO INTERRUPT,

TEST 3 - CHECKS THE RTC FLAG TO SET AND THAT IT CAN BE CLEARED BY CLCL, THE RTC FLAG IS CHECKED NOT TO CAUSE AN INTERRUPT,

TEST 4 - CHECKS THAT RTC CLOCK INTERRUPT ENABLE CAN BE SET AND CLEARED BY DATA BIT 11 AND CLLE USING THE RTC FLAG TO INTERRUPT ON,

TEST 5 - CHECKS THAT RTC CLOCK INTERRUPT ENABLE CAN BE SET AND THAT CAF WILL CLEAR IT USING THE RTC FLAG TO INTERRUPT ON,

TEST 6 - CHECKS THAT THE THREE RTC IOT'S, CLLE, CLCL, AND CLSK DON'T EFFECT THE AC,

TEST 7 - IS THE FIRST SECTION OF THE 12 BIT PARALLEL I/O, THIS TEST CHECKS THAT DATA ACCEPTED AND DATA READY F/F'S TO BE ZERO FOLLOWING A CAF, THE PROGRAM ISSUES THE IOT DBCF TO CLEAR THE DATA READY FLAG AND TO SET THE DATA ACCEPTED F/F, THE IOT DBST IS THEN ISSUED TO CHECK THAT IT WILL SKIP ON DATA ACCEPTED F/F AND THEN REISSUED TO CHECK THAT THE FIRST DBST CLEARED DATA ACCEPTED,

TEST 8 - CHECKS THAT THE DATA READY FLAG CAN BE SET AND CLEARED, TO SET THE DATA READY FLAG, THE PROGRAM ISSUES THE IOT DBTD TO TRANSMIT AND SET DATA AVAILABLE F/F, THE SETTING OF DATA AVAILABLE F/F IN LOOP BACK MODE SETS THE DATA READY F/F, THE IOT DBSK IS THEN ISSUED TO CHECK THAT THE FLAG IS SET AND THAT THE IOT WILL SKIP, THE PROGRAM THEN CLEARS THE DATA READY FLAG WITH DBCF WHICH ALSO SETS DATA ACCEPTED F/F, THE DATA READY FLAG IS CHECKED TO BE CLEARED BY ISSUING A DBSK AND DATA ACCEPTED F/F IS CHECKED TO BE SET BY ISSUING A DBST, THE DATA ACCEPTED F/F IS CHECKED AGAIN TO BE CLEARED BY ISSUING ANOTHER DBST

TEST 9 - CHECKS THAT CAF WILL CLEAR THE DATA READY FLAG AND THE DATA ACCEPTED FLAG

TEST 10 - CHECKS THAT PARALLEL I/O INTERRUPT ENABLE CAN BE SET AND CLEARED BY DBSE AND DBCE USING THE DATA READY FLAG TO SKIP AND INTERRUPT ON,

TEST 11 - CHECKS THAT INITIALIZE WILL CLEAR THE PARALLEL I/O INTERRUPT ENABLE F/F USING THE DATA READY FLAG TO SKIP AND INTERRUPT ON,

TEST 12 - CHECKS THAT DATA ACCEPTED CAN CAUSE A INTERRUPT, USING

DBOF TO SET DATA ACCEPTED, AND DBSE TO SET INTERRUPT ENABLE,

TEST 13 - CHECKS THE EFFECT OF THE 12 BIT PARALLEL I/O IOT'S ON THE AC. DBRD SHOULD BE THE ONLY IOT TO CHANGE THE AC;

TEST 14 - CHECKS THAT ALL ONE'S CAN BE TRANSMITTED AND READ BACK ON THE 12 BIT PARALLEL I/O. IT ALSO CHECKS THAT CAF WILL CLEAR THE XMIT BUFFERS. INTERRUPTS ARE ALSO CHECKED;

TEST 15 - CHECKS FOR A COMPLEMENTING DATA PATTERN OF ONE'S AND ZEROES ON THE 12 BIT PARALLEL I/O AND THAT CAF WILL CLEAR THE DATA BUFFERS. THE PROGRAM IS CHECKED TO INTERRUPT;

TEST 16 - CHECKS FOR A COMPLEMENTING DATA PATTERN OF 5252 - 2525 AND CHECKS THAT CAF WILL CLEAR THE DATA BUFFERS. THE PROGRAM IS CHECKED TO INTERRUPT;

*****THIS IS THE BEGINNING OF THE SECOND 1K VERSION OF THE PROGRAM IF MEMORY SIZE IS LESS THAN 4K;

TEST 17 - CHECKS FOR AN INCREMENTING DATA PATTERN ON THE 12 BIT PARALLEL I/O WITH INTERRUPT ENABLE ENABLED;

TEST 18 - CHECKS FOR AN INCREMENTING DATA PATTERN ON THE 12 BIT PARALLEL I/O WITH INTERRUPT ENABLE DISABLED. THIS ALLOWS FOR FASTER TRANSMITTING AND READING DUE TO THE ABSENCE OF A SKIP CHAIN;

TEST 19 - IS TESTED ONLY IF A OPTION 1 + 2 TEST MODULE IS BEING USED WITH THE PROGRAM. IF NO OPTION 1 + 2 TEST MODULE IS USED, GO TO TEST 23. TEST 19 CHECKS THAT THE STROBE F/F CAN BE SET BY DBSS AND TP3 AND THAT TIME STATE 1 CAN CLEAR IT.

TEST 20 - USES THE OPTION 1 + 2 TEST MODULE TO CHECK THAT DATA AVAILABLE CAN BE SET BY DBTD AND CLEARED BY CAF.

TEST 21 - USES THE OPTION 1 + 2 TEST MODULE TO CHECK THAT DBTD WILL SET DATA AVAILABLE AND THAT DBST WILL CLEAR IT.

TEST 22 - USES THE OPTION 1 + 2 TEST MODULE TO CHECK THAT DATA AVAILABLE CAN BE SET BY DBTD AND CLEARED BY "TS1".

TEST 23 - IS THE FIRST SECTION OF THE SERIAL LINE UNIT (SLU) DIAGNOSTIC. THIS TEST TRIES TO CLEAR THE SLU INTERRUPT ENABLE BY ISSUING A KIE COMMAND. THE PROGRAM THEN TESTS THE SLU XMIT FLAG TO SET BY TFL AND CLEAR BY TCF. THE FLAG IS CHECKED WITH TSF AND SPI. IF AN INTERRUPT OCCURED, IT MAY BE DUE TO SLU INTERRUPT ENABLE NOT BEING CLEARED BY KIE AND DATA BIT 11 EQUAL TO 0.

TEST 24 - CHECKS THAT CAF WILL CLEAR THE SLU XMIT FLAG. THE PROGRAM CHECKS THAT NO INTERRUPTS OCCURED.

TEST 25 - CHECKS THAT CAF WILL SET SLU INT ENABLE AND THAT KIE AND DATA 11 ON A 0 WILL CLEAR IT USING THE SLU XMIT FLAG TO INTERRUPT ON. SPI IS CHECKED TO SKIP AND NOT TO SKIP.

TEST 26 - CHECKS THAT SLU INTERRUPT ENABLE CAN BE SET AND CLEARED BY KIE AND DATA BIT 11 USING THE XMIT FLAG TO INTERRUPT ON,

TEST 27 - CHECKS THAT TLS WILL CLEAR SLU XMIT FLAG AND THEN SET IT WITH XMIT BUFF MT H; THE PROGRAM THEN CLEARS THE XMIT FLAG AND WAITS FOR RCV DATA AVAILABLE H TO SET RECEIVE FLAG; THE RECEIVE FLAG IS CHECKED TO SKIP AND INTERRUPT AND THEN TO CLEAR BY KCF,

TEST 28 - CHECKS THAT TPC WILL NOT CLEAR SLU XMIT FLAG AND THAT IT WILL RESET IT, THIS TEST ALSO CHECKS THAT THE SLU RECEIVE FLAG WILL SET AND THAT IT CAN BE CLEARED BY KCC;

*****THIS IS THE BEGINNING OF THE THIRD 1K VERSION OF THE PROGRAM IF MEMORY SIZE IS LESS THAN 4K;

TEST 29 - CHECKS THAT KRB WILL CLEAR THE SLU RECEIVE FLAG, THE RECEIVE FLAG IS SET BY ISSUING A TLS,

TEST 30 - CHECKS THAT CAF WILL CLEAR THE SLU RECEIVE FLAG,

TEST 31 - CHECKS THE EFFECT OF THE SERIAL LINE UNITS IOT'S UPON THE AC,

TEST 32 - CHECKS THAT ALL ZEROES CAN BE TRANSMITTED AND READ BACK ON THE SERIAL LINE UNIT,

TEST 33 - CHECKS THAT ALL ONES CAN BE TRANSMITTED OR READ BACK ON THE SERIAL LINE UNIT,

TEST 34 - CHECKS THAT A COMPLEMENTING DATA PATTERN (000-377) CAN BE TRANSMITTED AND READ BACK IN THE SERIAL LINE UNIT,

TEST 35 - CHECKS THAT A COMPLEMENTING DATA PATTERN (252-125) CAN BE TRANSMITTED AND READ BACK ON THE SERIAL LINE UNIT,

TEST 36 - CHECK FOR LOADING AND READING A BINARY COUNT PATTERN ON THE SERIAL LINE UNIT WITH INTERRUPT ENABLE ENABLED,

TEST 37 - CHECKS FOR LOADING AND READING A BINARY COUNT PATTERN WITHOUT SLU INTERRUPT ENABLE SET TO SAVE TIME IN SKIP-CHAIN SO THAT THE WORD CAN BE READ FASTER,

IF NO OPTION 1 + 2 MODULE, GO TO TEST 42

TEST 38 - USES THE SIMULATOR TO CHECK THAT READER RUN CAN BE SET BY KCC AND KRB AND CLEARED BY INITIALIZE,

TEST 39 - USES THE SIMULATOR TO CHECK THAT READER RUN WILL CLEAR AFTER A WORD HAS BEEN TRANSMITTED AND LOOPS BACK INTO THE RECEIVE BUFFERS USING THE 20 MA CURRENT LOOP FOR 110 BAUD TO 9600 BAUD,

*****THIS IS THE BEGINNING OF THE FOURTH AND LAST SEGMENTED 1K VERSION OF THE PROGRAM IF MEMORY SIZE IS LESS THAN 4K;

IF THE OPTION 1 + 2 TEST MODULE IS NOT USED, GO TO TEST 42;

TEST 40 - USES THE OPTION 1 + 2 TEST MODULE TO TEST
THE REAL TIME CLOCK FREQUENCY, NOT APPLICABLE FOR XOR TESTING

TEST 41 - USES THE OPTION 1 + 2 TEST MODULE TO TEST
THE SERIAL LINE UNITS FREQUENCY FOR BOTH 20 MA
AND EIA LOOP BACKS FROM 110 BAUD TO 9600 BAUD; NOT APPLICABLE FOR XOR TESTING,

TEST 42 - IS AN INTERACTION TEST, THE TEST CHECKS THAT
THE REAL TIME CLOCK, THE SERIAL LINE UNIT AND THE
12 BIT PARALLEL I/O CAN RUN TOGETHER, THE AC AND LINK
ARE LOADED WITH SOME RANDOM DATA BEFORE THE INTERRUPT
IS TURNED ON, THE PROGRAM CHECKS THAT AC AND LINK
DON'T CHANGE AND THAT THE DATA CAN BE TRANSMITTED
AND READ BACK CORRECTLY, NOT APPLICABLE FOR XOR TESTING,

8.2 REAL TIME CLOCK TIMING TEST

IF THE COMPUTER CONSISTS OF LESS THAN 4K OF MEMORY, THIS
TEST (RTCTIM) IS LOCATED IN 1K SEGMENTED VERSION PART 4,

REAL TIME CLOCK TIMING TEST IS A STOP WATCH TIMING TEST, ONCE
THIS TEST HAS BEEN STARTED, THE PROGRAM TURNS THE INTERRUPT ON, AND
COUNTS A CALCULATED NUMBER OF CLOCK FLAGS, WHEN THE PROGRAM
HAS RECEIVED THE CALCULATED NUMBER OF CLOCK FLAGS IT HALTS
THE COMPUTER, THE TIME FROM START TO FINISH SHOULD BE 30 SECONDS +/- HALF A SECOND,

8.3 SERIAL LINE UNIT TIMING TEST

IF THE COMPUTER CONSISTS OF LESS THAN 4K OF MEMORY, THIS TEST
(SLUTIM) IS LOCATED IN 1K SEGMENTED VERSION PART 4,

SERIAL LINE UNIT TIMING TEST IS ALSO A STOP WATCH TIMING TEST;
ONCE THIS TEST HAS BEEN STARTED, THE PROGRAM TURNS THE INTERRUPT
ON AND TRANSMITS A CALCULATED NUMBER OF CHARACTERS (DETERMINED
FROM THE BAUD RATE AND NUMBER OF STOP BITS), THE PROGRAM
SHOUL HALT IN 30 SECONDS +/- HALF A SECOND,

9.0 FLOW CHARTS

NOT APPLICABLE

10.0 PROGRAM LISTINGS

ATTACHED

/DKC8-AA OPTION TEST 1 MAINDEC-08-DJDKA-B-L 4K PAL10 V142A 16JUN75 8158 PAGE 1

/DKC8-AA OPTION TEST 1 MAINDEC-08-DJDKA-B-L 4K
/
/COPYRIGHT (C) 1974, 1975 DIGITAL EQUIPMENT CORPORATION
/
/PROGRAMMER: BRUCE HANSEN
/

////////////////////////////////////
/THE FOLLOWING LISTING WILL CORRESPOND TO THE PAPER TAPE LABELED
/MAINDEC-08-DJDKA-B-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,
////////////////////////////////////

/DNCS-AA OPTION TEST 1 MAINDEC=08=DJOKA-B=L 4K
 /COPYRIGHT (C) 1974, 1975 DIGITAL EQUIPMENT CORPORATION
 /PROGRAMMER: BRUCE HANSEN
 /

/PROCESSOR INSTRUCTIONS
 6007 CAF=6007 /CLEAR ALL FLAGS
 6102 SPL=6102 /SKIP ON AC LOW FLIP=FL0P
 6103 CAL=6103 /CLEAR AC LOW FLIP=FL0P
 6101 SBE=6101 /SKIP ON BATTERY EMPTY
 7402 HLT=7402
 6244 RMF=6244 /RESTORE MEMORY FIELD
 6005 RTF=6005
 6004 GTF=6004
 /OPTION BOARD NUMBER 1 IOT/S
 //SERIAL LINE UNIT
 /RECEIVER IOTS
 6030 KCF=6030 /CLEAR RECEIVE FLAG, DON'T SET READER RUN
 6031 KSF=6031 /SKIP ON RECEIVE FLAG
 6032 KCC=6032 /CLEAR RECEIVE FLAG AND AC, SET READER RUN
 6034 KRS=6034 /READ RECEIVE BUFFER
 6035 KIE=6035 /AC 11=1 SET INTERRUPT ENABLE
 /AC 11=0 CLEAR INTERRUPT ENABLE
 6036 KRB=6036 /CLEAR RECEIVE FLAG AND AC, SET READER RUN AND READ
 /RECEIVE BUFFER
 /TRANSMIT IOTS
 6040 TFL=6040 /SET TRANSMIT FLAG
 6041 TSP=6041 /SKIP ON TRANSMIT FLAG
 6042 TCF=6042 /CLEAR THE TRANSMIT FLAG
 6044 TPC=6044 /LOAD TRANSMIT BUFFER AND TRANSMIT
 6045 SPI=6045 /SKIP IF TRANSMIT OR RECEIVE FLAG SET AND INT ENA SET TO A 1
 6046 TLS=6046 /LOAD TRANSMIT BUFFER, TRANSMIT AND CLEAR TRANSMIT FLAG
 /REAL TIME CRYSTAL CLOCK
 6135 CLLE=6135 /AC 11=1 SET INTERRUPT ENABLE
 /AC 11=0 CLEAR INTERRUPT ENABLE
 6136 CLCL=6136 /CLEAR CLOCK FLAG
 6137 CLSK=6137 /SKIP ON CLOCK FLAG
 /12 BIT PARALLEL I/O
 6570 DBST=6570 /SKIP ON DATA ACCEPTED, CLEAR DATA ACCEPTED AND DATA AVAILABLE
 6571 DBSK=6571 /SKIP ON DATA READY FLAG
 6572 DBRU=6572 /READ DATA INTO AC 0=11
 6573 DBCF=6573 /CLEAR DATA READY FLAG, ISSUE DATA ACCEPTED OUT
 6574 DBTU=6574 /LOAD AC 0=11 INTO BUFFER AND TRANSMIT DATA OUT
 6575 DBSE=6575 /SET INTERRUPT ENABLE TO A 1
 6576 DBCE=6576 /SET INTERRUPT ENABLE TO A 0

6577 DBSS=6577 /ISSUE A STROBE PULSE
 /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
 /OPTION BOARD 1 SIMULATOR IOT/S
 6150 CLRSIM=6150 /CLEAR SIMULATOR CONTROL REGISTERS
 6151 LOADSH=6151 /LOAD SIMULATOR CONTROL WORD 1
 6156 CLROET=6156 /CLEAR READER RUN, STROBE, AND DATA AVAILABLE CATCHER F/F'S
 6157 SKPROR=6157 /SKIP ON READER RUN CATCHER F/F SET
 6160 SINCLR=6160 /CLEAR CONTROL REGISTERS AND MOST OF LOGIC ON SIMULATOR
 6161 STFRQ=6161 /START FREQUENCY CHECK (SLU OR RTC)
 6162 SKPFRQ=6162 /SKIP ON FREQUENCY CHECK IN PROGRESS
 6163 LODFRQ=6163 /READ FREQUENCY COUNT INTO AC
 6165 SKPDIV=6165 /SKIP ON DATA AVAILABLE CATCHER F/F SET
 6167 SKPSTR=6167 /SKIP ON STROBE CATCHER F/F SET
 /OPTION BOARD 1 SIMULATOR CONTROL WORD BIT ASSIGNMENTS
 /BIT 0 COUNTER RESET 1=ACTIVATE
 / 0=NO ACTION
 /BIT 1 PARALLEL I/O CLEAR DATA 1=TS1
 / AVAILABLE SELECT 0=DATA ACCEPTED IN
 /BIT 2 NOT USED
 /BIT 3 NOT USED
 /BIT 4 NOT USED
 /BIT 5 RTC FREQUENCY OR 1=RTC
 / SLU FREQUENCY CHECK 0=SLU BAUD RATES
 /BIT 6 REAL TIME CLOCK 1=OFF
 / 0=ON
 /BIT 7 SLU EIA/20MA SELECT 1=EIA RECEIVE DATA
 / 0=20 MA RECEIVE DATA
 /BIT 8 STOP BIT SELECT 1=1 STOP BITS
 / 0=2 STOP BIT
 /BIT 9 BAUD RATE SELECT BIT 9, 10, 11 ALL 0'S
 /BIT 10 BAUD RATE SELECT EQUALS 110 BAUD, EACH
 /BIT 11 BAUD RATE SELECT INCREASING BIT SELECTS
 / NEXT HIGHEST BAUD RATE;

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6170 XRON=6170
6171 SKXR=6171 /SKIP IF ERROR 1 FLOP SET
6172 XRCI=6172 /CLEAR INTERRUPT ENABLE
6173 STIP=6173 /SKIP IF MUT POWER AND 1ST XRON
6174 XRSI=6174 /SET INT ENABLE
6175 SXRC=6175 /SKIP IF ERROR 2 AND CLEAR IT
6176 XRT0=6176 /SET TIME OUT

0000 *0
0002 0302 302 /PROGRAM REVISION LETTER=MAINDEC=08=DJOKA=B
0001 6244 RMF /RESTORE MEMORY FIELDS
0002 5403 JMP I 3 /RETURN TO INTERRUPT SERVICE ROUTINE
0003 3244 SIMINT/SKPCHN/SIMCHK/RTICNT/SLUINT /INTERRUPT SERVICE ROUTINES

0020 *20
0020 0000 SWITCH, 0
0021 2003 OP1SEL, 2003
/Bit 0=0 USE LOCATION 20 AS A PSEUDO SWITCH REGISTER
/Bit 0=1 USE HARDWARE FRONT PANEL SWITCH REGISTER
/Bit 1=1 HAS OPTION 1
/Bit 2=1 HAS OPTION 2
/Bit 3=1 HAS 8A CPU SIMULATOR
/Bit 4=1 HAS 8A OPTION 1+2 SIMULATOR
/Bit 5=1 PROGRAM ON POP=8A XOR(REQUIRES BIT 4 SET ALSO)
/Bit 6=1 HAS POP=8E TYPE CPU
/Bit 7=11 MEMORY SIZE = 8*8=1K, 37=32K; MEMORY
/Size CAN BE INCREASED IN 1K INCREMENTS BY ADDING
/ONE TO THE NUMBER IN BITS 7 = 11
/Bit 0 IS SET FOR THE ACT LINE

0022 0000 OP2SEL, 0
4423 LOOPPC=JMS I, PCLOOP
0023 3200 DONLOP=JMS I, LOPDON
4424 3221 CLKWT=JMS I, WTCCLK
0024 3221 CLKWT=JMS I, WTCCLK
4425 3352 P10DAT=JMS I, DATPIO
0025 3352 P10DAT=JMS I, DATPIO
4426 3600 ERROR=JMS I, AERROR
0026 3600 ERROR=JMS I, AERROR
4427 3475 P10DER=JMS I, DERPIO
0027 3475 P10DER=JMS I, DERPIO
4430 3711 TSFWAT=JMS I, WATTSF
0030 3711 TSFWAT=JMS I, WATTSF
4431 3327 KSFAT=JMS I, WATKSF
0031 3327 KSFAT=JMS I, WATKSF
4432 3341 SLUDAT=JMS I, DATSLU
0032 3341 SLUDAT=JMS I, DATSLU
4433 3653 SLUDER=JMS I, DERSLU
0033 3653 SLUDER=JMS I, DERSLU
4434 3734 SWCHK=JMS I, CHKSWH
0034 3734 SWCHK=JMS I, CHKSWH
4435 3407
0035 3407

```

```

4436 SIMCHK=JMS I, CHKSIM
0036 3761 LODSIM=JMS I, SIMLOD
4437 3214 RTICNA=JMS ENARTC
0037 3214 RTICNA=JMS ENARTC
4446

5440 PRGEN0=JMP I, ENDPAS
0040 3400

/LOCATIONS USED BY THE PROGRAM

0041 0000 INTFLG, 0
0042 0000 CLKFLG, 0
0043 0000 CNT, 0
0044 0000 CNT1, 0
0045 0000 TEST, 0
0046 0000 TSTLOP, 0
0047 0000 TSTCNT, 0
0050 0000 SAVCNT, 0
0051 0000 P10XMT, 0
0052 0000 P10REC, 0
0053 0000 SLUXMT, 0
0054 0000 SLUREC, 0
0055 0000 CNTW0, 0
0056 0377 K377, 377
0057 0200 K200, 200
0060 0252 K252, 252
0061 0125 K125, 125
0062 5252 K5252, 5252
0063 2525 K2525, 2525
0064 0007 K7, 7
0065 7774 M4, -4
0066 7770 M10, -10
0067 0000 SIMCNT, 0

0070 4160 DELAYR, DELAY
0071 0000 EXPACD, 0
0072 0000 LINK, 0
0073 0000 XMTFLG, 0
0074 0000 RECFLG, 0
0075 0000 RTCFLG, 0
0076 0000 PPOINT, 0
0077 0000 INACTV, 0
0100 6520 BADPAS, 6520 /ACT LINE ERROR RETURN TO FIELD 7
0101 6500 GOODPS, 6500 /ACT LINE GOOD RETURN TO FIELD 7
0102 7634 ACTCNT, -144
0103 7634 M144, -144

```

/ROUTINE TO SETUP FIELD 0 TO HANDLE INTERRUPTS FROM ANOTHER FIELD

```

0104 0000 PATCH, 0
0105 1504 TAD I PATCH /GET THE INTERRUPT SERVICE ADDRESS

```



```

0186 3124 DCA SAVADD /SAVE INTERRUPT ADDRESS
0187 6201 CDF /CHANGE DATA FIELD TO FIELD 8
0110 1131 TAD /GET THE INSTRUCTION RMP
0111 3525 DCA I K1 /PUT IT IN LOCATION 1 OF FIELD 8
0112 1130 TAD /GET THE INSTRUCTION JMP I 3
0113 3526 DCA I K2 /PUT IT IN LOCATION 2 OF FIELD 8
0114 1124 TAD SAVADD /GET THE INTERRUPT SERVICE ADDRESS
0115 3527 DCA I K3 /PUT IT IN LOCATION 3 IF FIELD 8
0116 6224 RIF /GET THE PROGRAM FIELD INTO THE AC
0117 1132 TAD /AND IT TO THE CDF INSTRUCTION
0120 3121 DCA /PUT IT IN THE NEXT LOCATION
0121 7402 HLT/CDF /EXECUTE IT
0122 2104 ISZ /ADD 1 TO THE ENTRANCE
0123 5504 JMP I PATCH /RETURN

0124 2000 SAVADD, 0
0125 2001 K1, 1
0126 2002 K2, 2
0127 2003 K3, 3
0130 5403 KJMP, JMP I 3
0131 6244 KRMP, 6244
0132 6201 KCDF, CDF
0133 6005 KRTF, RTF
0134 2000 ACTFLG, 0
0135 2000 CLKSNG, 0

```

/THIS ROUTINE USED WHEN RUNNING ON THE ACT LINE TO SIGNIFY THAT NO
/ERRORS HAVE BEEN ENCOUNTERED

```

0136 2000 TSTGOD, 0
0137 1022 TAD /GET THE HARDWARE FLAG
0140 7700 SMA CLA /ARE WE ON THE ACT LINE?
0141 5536 JMP I TSTGOD /NO, RETURN TO THE PROGRAM
0142 6002 IOF /TURN THE INTERRUPT OFF
0143 6272 CIF 70 /CHANGE THE INSTRUCTION TO FIELD 7
0144 4501 JMS I GOODPS /GO TO PROM
0145 5536 JMP I TSTGOD /RETURN TO THE PROGRAM

```

```

0146 2000 ENARTC, 0
0147 1022 TAD /CHECK TO SEE IF ON ACT LINE
0150 7710 K7710, SPA CLA /IF NOT CLEAR RTC INT ENA
0151 7301 CLA CLL IAC /SET AC BIT 11
0152 6135 CLLE /LOAD BIT 11 INTO CLOCK INT ENA
0153 7200 CLA
0154 5546 JMP I ENARTC

```

0200 *200

/*****
/INITIALIZATION TEST
/TEST 1 = CHECKS THAT INITIALIZE WILL CLEAR ALL FLAGS, ANY ERROR MAYBE DUE TO A

/FLAG STUCK ON OR THE IOT SKIPPED, THE PARALLEL I/O BUFFER IS CHECKED TO CONTAIN
/ZEROS, HOWEVER, THE READ COMMAND (6372) MAY NOT WORK; THE TEST WAITS FOR THE
/RTC FLAG TO SET AND CHECKS THE FLAG TO SKIP, NO INTERRUPTS SHOULD OCCUR,
/NOTE! INITIALIZE SETS THE SERIAL LINE UNIT'S INTERRUPT ENABLE;
/*****

```

0200 6160 TEST1, SIMCLR
0201 4104 JMS PATCH /SETUP INTERRUPT SERVICE
0202 3244 SIMINT
0203 4423 LOOPPC /STORE THE LOOPING PC AND SETUP TEST COUNT
0204 7777 =1 /SETUP SIMULATOR ITERATION COUNTER
0205 4436 SIMCHK /CHECK FOR SIMULATOR
0206 4000 4000 /CONTROL WORD FOR SIMULATOR
0207 4437 LODSIM /LOAD SIMULATOR-TEST LOOP USING SIMULATOR
0210 3041 DCA INTFLG /CLEAR PROGRAM INTERRUPT FLAG
0211 6007 CAF /INITIALIZE THE MODULE = CAF SETS INT ENA ON SLU
0212 6001 ION /TURN THE INTERRUPT ON
0213 6031 KSF /SKIP ON RECEIVE FLAG
0214 7410 SKP
0215 4427 ERROR /RECEIVE FLAG SET OR KSF SKIPPED
0216 6041 TSF /SKIP ON TRANSMIT FLAG
0217 7410 SKP
0220 4427 ERROR /TRANSMIT FLAG SET OR TSF SKIPPED
0221 6045 SPI /SKIP ON XMIT/RECEIVE + INT ENA
0222 7410 SKP
0223 4427 ERROR /0 SIDE OF XMIT/RECEIVE WELD LOW OR SPI SKIPPED
0224 6571 DBSK /SKIP ON DATA READY FLAG
0225 7410 SKP
0226 4427 ERROR /DATA READY FLAG SET OR DBSK SKIPPED
0227 6570 DBST /SKIP ON DATA ACCEPTED 0 IT AND DATA AVAILABLE
0230 7410 SKP
0231 4427 ERROR /DBST SKIPPED OR DATA ACCEPTED SET
0232 7240 CLA CMA /SET THE AC TO ALL ONES
0233 6572 DBRD /READ THE 12 BIT PARALLEL I/O BUFFER
0234 7410 SKP
0235 4427 ERROR /DBRD SKIPPED
0236 7640 SZA CLA
0237 4427 ERROR /CAF FAILED TO CLEAR XMIT BUFFER OR DBRD FAILED;
0240 4425 CLSKWT /WAIT FOR REAL TIME CLOCK FLAG TO SET
0241 4427 ERROR /CLOCK FLAG FAILED TO SET WITHIN A 192 LOOP
0242 1041 TAD INTFLG /DID THE PROGRAM INTERRUPT
0243 7640 SZA CLA
0244 4427 ERROR /PROGRAM INTERRUPTED = ALL FLAGS ZERO EXCEPT CLK FLG
0245 4424 DONLOP /CHECK TO SEE IF DONE, OR LOOP ON TEST IF SR2=1

```

/*****
//FIRST SECTION OF THE REAL TIME CLOCK DIAGNOSTIC
/TEST 2 = CHECKS THAT KLKL TICK WILL SET CLK FLAG AND THAT CAF WILL CLEAR IT, THE
/PROGRAM IS CHECKED NOT TO TO INTERRUPT;
/*****

```

0246 4104 TEST2, JMS PATCH /SETUP INTERRUPT SERVICE
0247 3232 SKPCHN
0250 7240 CLA CMA
0251 3042 DCA CLKFLG /SET INTERRUPT CHAIN TO ACKNOWLEDGE CLOCK INTERRUPTS,

```

```

0252 4423      LOOPPC      /SETUP TEST COUNT AND SCOPE LOOPING ADDRESS
0253 7777      =1          /SIMULATOR ITERATION COUNTER
0254 4436      SIMCHK      /CHECK TO SEE IF SIMULATOR IS SELECTED
0255 4888      4888        /CONTROL WORD FOR THE SIMULATOR
0256 4437      LODSIM      /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
                        /LOOP = THIS ADDRESS IF SIMULATOR SELECTED
                        /OTHERWISE SCOPE LOOP IS THIS ADDRESS +1
0257 7344      CLA CLL CMA RAL /SETUP A PROGRAM LOOP TO LOOK AT 2 CLOCK FLAGS
0260 3139      DCA CLKSNC    /TO SYNC THE REAL TIME CLOCK
0261 3841      DCA INTFLG    /CLEAR PROGRAM INTERRUPT FLAG
0262 6887      CAF          /CLEAR ALL FLAGS BUT SET INT ENA ON SLU
0263 6881      ION          /TURN THE INTERRUPT ON
0264 4425      CLSKWT       /WAIT FOR THE CLOCK FLAG TO SET
0265 4427      ERROR        /CLK FLAG FAILED TO SET OR NO KLKL TICK PULSE
0266 1841      TAD INTFLG    /GET THE PROGRAM INTERRUPT FLAG
0267 7648      SZA CLA       /DID IT INTERRUPT?
0270 4427      ERROR        /PROGRAM INTERRUPTED WITHOUT CLK INT ENA
0271 2139      ISE CLKSNC    /2ND FLAG SET?
0272 9261      JMP ,=11      /NO, GO AND TRY TO CLEAR CLK FLAG WITH CAF
0273 6887      CAF          /CLEAR ALL FLAGS BUT SET SLU'S INT ENA
0274 6881      ION          /TURN THE INTERRUPT BACK ON
0275 6137      CLSK         /SKIP ON THE CLOCK FLAG
0276 7618      SKP CLA       /CAF FAILED TO CLEAR CLK FLAG OR CLSK SKIPPED,
0277 4427      ERROR        /GET THE PROGRAM INTERRUPT FLAG
0300 1841      TAD INTFLG    /GET THE PROGRAM INTERRUPT FLAG
0301 7648      SZA CLA       /PROGRAM INTERRUPTED WITHOUT CLK INT ENA + CLK FLAG
0302 4427      ERROR        /REPEAT TEST IF NOT DONE OR LOOP ON TEST IF SR2=1
0303 4424      DONLOP

```

/*****
 /TEST 3 = CHECKS THAT KLKL TICK WILL SET CLK FLAG AND THAT IT CAN BE CLEARED BY CLCL.
 /THE CLK FLAG IS CHECKED NOT TO CAUSE AN INTERRUPT;
 /*****

```

0304 4423      TEST3, LOOPPC /SETUP TEST COUNT AND SCOPE LOOPING ADDRESS
0305 7777      =1          /SIMULATOR ITERATION COUNTER
0306 4436      SIMCHK      /CHECK TO SEE IF SIMULATOR IS SELECTED
0307 4888      4888        /CONTROL WORD FOR THE SIMULATOR
0310 4437      LODSIM      /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
                        /LOOP = THIS ADDRESS IF SIMULATOR SELECTED
                        /OTHERWISE SCOPE LOOP IS THIS ADDRESS +1
0311 7344      CLA CLL CMA RAL /SETUP A PROGRAM LOOP TO LOOK AT 2 CLK FLAGS TO
0312 3139      DCA CLKSNC    /SYNC THE REAL TIME CLOCK
0313 3841      DCA INTFLG    /CLEAR PROGRAM INTERRUPT FLAG
0314 6887      CAF          /CLEAR ALL FLAGS BUT SET INT ENA ON SLU
0315 6881      ION          /TURN INTERRUPT ON
0316 4425      CLSKWT       /WAIT FOR CLK FLAG
0317 4427      ERROR        /CLOCK FLAG FAILED TO SET
0320 1841      TAD INTFLG    /GET THE PROGRAM INTERRUPT FLAG
0321 7648      SZA CLA       /DID IT INTERRUPT
0322 4427      ERROR        /PROGRAM INTERRUPTED WITH CLK INT ENA,
0323 2139      ISE CLKSNC    /2ND FLAG SET?
0324 9313      JMP ,=11      /NO, GO CLEAR THE FLAG WITH CAF AND WAIT FOR NEXT ONE
0325 6136      CLCL         /CLEAR THE CLK FLAG
0326 7618      SKP CLA

```

```

0327 4427      ERROR        /CLCL SKIPPED
0330 6137      CLSK         /SKIP ON CLOCK FLAG
0331 7618      SKP CLA       /CLCL FAILED TO CLEAR CLK FLAG
0332 4427      ERROR        /GET THE PROGRAM INTERRUPT FLAG
0333 1841      TAD INTFLG    /GET THE PROGRAM INTERRUPT?
0334 7648      SZA CLA       /PROGRAM INTERRUPTED, COULD BE CLCL SHORTED TO CLLE
0335 4427      ERROR        /REPEAT TEST IF NOT DONE OR LOOP ON TEST IF SR2=1
0336 4424      DONLOP

```

/*****
 /TEST 4 = CHECK THAT CLK INT ENA CAN BE SET AND CLEARED BY DATA BIT 11
 /AND CLLE USING THE CLK FLAG TO INTERRUPT ON
 /*****

```

0337 4423      TEST4, LOOPPC /SETUP TEST COUNT AND SCOPE LOOPING ADDRESS
0340 7777      =1          /SIMULATOR ITERATION COUNTER
0341 4436      SIMCHK      /CHECK TO SEE IF SIMULATOR IS SELECTED
0342 4888      4888        /CONTROL WORD FOR THE SIMULATOR
0343 4437      LODSIM      /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
                        /LOOP = THIS ADDRESS IF SIMULATOR SELECTED
                        /OTHERWISE SCOPE LOOP IS THIS ADDRESS +1
0344 7344      CLA CLL CMA RAL /SETUP A PROGRAM LOOP TO LOOK AT 2 CLK FLAGS
0345 3139      DCA CLKSNC    /TO SYNC UP THE REAL TIME CLOCK
0346 3841      DCA INTFLG    /CLEAR PROGRAM INTERRUPT FLAG
0347 6887      CAF          /CLEAR ALL FLAGS BUT SET INT ENA ON SLU
0350 6881      ION          /TURN THE INTERRUPT ON
0351 4425      CLSKWT       /WAIT FOR THE CLK FLAG
0352 4427      ERROR        /CLK FLAG FAILED TO SET
0353 1841      TAD INTFLG    /GET THE PROGRAM INTERRUPT FLAG
0354 7648      SZA CLA       /DID THE PROGRAM INTERRUPT?
0355 4427      ERROR        /FLAG INTERRUPTED WITHOUT CLK INT ENA
0356 2139      ISE CLKSNC    /2ND FLAG SET?
0357 9346      JMP ,=11      /NO, GO CLEAR FLAG WITH CAF AND WAIT FOR NEXT FLAG
0360 6136      CLCL         /CLEAR THE CLOCK FLAG
0361 6137      CLSK         /SKIP ON CLOCK FLAG
0362 7618      SKP CLA       /CLCL FAILED TO CLEAR CLK FLAG
0363 4427      ERROR        /SET DATA BIT 11 TO A ONE
0364 7301      CLA CLL IAC    /TRY AND SET CLK INT ENA
0365 6135      CLLE         /CLLE SKIPPED,
0366 7618      SKP CLA       /GET THE PROGRAM INTERRUPT FLAG
0367 4427      ERROR        /PROGRAM INTERRUPTED WITHOUT CLK FLAG SET
0370 1841      TAD INTFLG    /WAIT FOR NEXT CLK FLAG
0371 7648      SZA CLA       /CLK FLAG FAILED TO SET
0372 4427      ERROR        /DID THE PROGRAM INTERRUPT
0373 4425      CLSKWT       /CLLE FAILED TO SET CLK INT ENA OR FAILED TO INT
0374 4427      XORENA, ERROR /CLEAR THE PROGRAM INTERRUPT FLAG
0375 2841      ISE INTFLG    /CLEAR CLK INT ENA
0376 4427      ERROR        /TURN THE INTERRUPT ON
0377 3841      DCA INTFLG    /
0380 6135      CLLE         /GET THE PROGRAM INTERRUPT FLAG
0381 6881      ION          /DID IT INTERRUPT?
0382 7300      CLA CLL       /YES, CLLE FAILED TO CLEAR CLK INT ENA
0383 1841      TAD INTFLG
0384 7648      SZA CLA
0385 4427      ERROR

```

```

0406 6136      CLCL      /CLEAR THE CLOCK FLAG
0407 6137      CLSK      /SKIP ON CLOCK FLAG
0410 7610      SKP CLA
0411 4427      ERROR      /ERROR CLCL FAILED TO CLEAR CLOCK FLAG
0412 4424      DONLOP     /REPEAT TEST IF NOT DONE OR LOOP ON TEST IF SR2=1

```

```

/*****
/TEST 5 - CHECKS THAT CLK INT ENA CAN BE SET AND THAT CAF WILL CLEAR IT
/USING THE CLK FLAG TO INTERRUPT ON,
/*****

```

```

0413 4423      TEST5, LOOPPC /SETUP TEST COUNT AND SCOPE LOOPING ADDRESS
0414 7777      =1          /SIMULATOR ITERATION COUNTER
0415 4436      SIMCHK      /CHECK TO SEE IF SIMULATOR IS SELECTED
0416 4000      4000        /CONTROL WORD FOR THE SIMULATOR
0417 4437      LODSIM      /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
                        /LOOP = THIS ADDRESS IF SIMULATOR SELECTED
                        /OTHERWISE SCOPE LOOP IS THIS ADDRESS +1
0420 7344      CLA CLL CMA RAL /SETUP A PROGRAM LOOP TO LOOK AT 2 CLOCK FLAGS
0421 3135      DCA CLKSNC     /TO SYNC UP THE REAL TIME CLOCK
0422 3041      DCA INTFLG     /CLEAR PROGRAM INTERRUPT FLAG
0423 6007      CAF          /CLEAR ALL FLAGS AND SET INT ENA ON SLU
0424 6001      ION          /TURN THE INTERRUPT ON
0425 4425      CLSKWT       /WAIT FOR THE CLOCK FLAG
0426 4427      ERROR        /CLK FLAG FAILED TO SET
0427 1041      TAD INTFLG     /GET THE PROGRAM INTERRUPT FLAG
0430 7640      SZA CLA
0431 4427      ERROR        /PROGRAM INTERRUPTED WITHOUT CLK INT ENA
0432 2135      ISE CLKSNC     /2ND FLAG SET?
0433 9222      JMP ,=11       /NO, GO CLEAR FLAG AND WAIT FOR NEXT
0434 7301      CLA CLL IAC
0435 6135      CLLE          /SET INTERRUPT INABLE TO A ONE
0436 7300      CLA CLL       /SHOULD INTERRUPT HERE
0437 2041      ISE INTFLG     /DID THE PROGRAM INTERRUPT
0440 4427      ERROR        /PROGRAM FAILED TO INTERRUPT WITH CLK FLAG + CLK INT ENA
0441 6007      CAF          /CLEAR ALL FLAGS
0442 6001      ION
0443 4425      CLSKWT       /WAIT FOR CLK FLAG
0444 4427      ERROR        /CLK FLAG FAILED TO RESET
0445 1041      TAD INTFLG     /GET THE PROGRAM INTERRUPT FLAG
0446 7640      SZA CLA
0447 4427      ERROR        /DID IT INTERRUPT
0448 4427      ERROR        /CAF FAILED TO CLEAR CLK INT ENA
0450 6136      CLCL         /CLEAR THE CLOCK FLAG
0451 4424      DONLOP     /REPEAT TEST IF NOT DONE OR LOOP ON TEST IF SR2=1

```

```

/*****
/TEST 6 - CHECKS THAT THE THREE RTC IOT'S DON'T EFFECT THE AC
/*****

```

```

0452 4423      TEST6, LOOPPC /STORE THE TEST LOOPING PC
0453 7777      =1          /SIMULATOR ITERATION COUNTER
0454 4436      SIMCHK      /CHECK TO SEE IF SIMULATOR IS SELECTED
0455 4000      4000        /CONTROL WORD FOR THE SIMULATOR
0456 4437      LODSIM      /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE

```

```

/LOOP = THIS ADDRESS IF SIMULATOR SELECTED
/OTHERWISE SCOPE LOOP IS THIS ADDRESS +1
0457 6007      CAF
0460 6001      ION
0461 7344      CLA CLL CMA RAL
0462 6135      CLLE          /CLEAR CLK INT ENABLE
0463 1126      TAD K2
0464 7640      SZA CLA
0465 4427      ERROR        /CLIE CHANGED THE AC
0466 7240      CLA CMA
0467 6136      CLCL         /CLEAR CLOCK FLAG
0470 7001      IAC
0471 7640      SZA CLA
0472 4427      ERROR        /CLCL CHANGED THE AC
0473 7240      CLA CMA
0474 6137      CLSK         /SKIP ON CLOCK FLAG
0475 7000      NOP
0476 7001      IAC
0477 7640      SZA CLA
0500 4427      ERROR        /CLSK CHANGED THE AC
0501 4424      DONLOP     /CHECK TO SEE IF DONE OR LOOP ON TEST,
0502 4136      JMS TSTG00    /GO CHECK FOR THE ACT LINE

```

```

/*****
/FIRST SECTION OF THE 12 BIT PARALLEL I/O DIAGNOSTIC TESTS
/THE PARALLEL I/O MUST BE CONNECTED IN LOOP BACK MODE (12 BIT DATA OUT
/TO 12 BIT DATA IN, DATA AVAILABLE TO SET DATA READY, AND DATA ACCEPTED
/OUT TO DATA ACCEPTED IN), THE SWITCH FOR TS1 TO CLEAR DATA AVAILABLE SHOULD
/BE LEFT OFF TO RUN THIS SECTION OF THE PROGRAM,
/*****

```

```

/*****
/TEST 7 - CHECKS THE DATA ACCEPTED AND THE DATA READY FLIP=FLOPS TO BE
/ZERO FOLLOWING A CAF, THE PROGRAM ISSUES THE IOT DBCF TO CLEAR THE DATA
/READY FLAG AND TO SET THE DATA ACCEPTED F/F, THE IOT DBST IS THEN
/ISSUED TO CHECK THAT IT WILL SKIP ON DATA ACCEPTED F/F AND THEN RE-
/ISSUED TO CHECK THAT THE FIRST DBST CLEARED DATA ACCEPTED,
/*****

```

```

0503 4104      TEST7, JMS PATCH
0504 3252      SKPOHN
0507 4423      LOOPPC      /SETUP TEST COUNT AND TEST LOOPING ADDRESS
0508 7777      =1          /SIMULATOR ITERATION COUNTER
0509 4436      SIMCHK      /CHECK TO SEE IF SIMULATOR IS SELECTED
0510 4000      4000        /SIMULATOR CONTROL WORD
0511 4437      LODSIM      /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE LOOP
                        /EQUAL THIS ADDRESS IF SELECTED OTHERWISE
                        /SET IT TO THE NEXT ADDRESS
0512 6007      CAF          /CLEAR ALL FLAGS
0513 4146      RTCENA        /SET REAL TIME CLOCK INT ENA
0514 3041      DCA INTFLG     /CLEAR PROGRAM INTERRUPT FLAG
0515 3042      DCA CLKFLG     /SET INTERRUPT SERVICE TO IGNORE CLOCK FLAG
0516 6001      ION          /TURN THE INTERRUPT ON
0517 6571      DBSK         /SKIP ON THE DATA READY FLAG
0520 7640      SZA CLA       /CHECK THAT DBSK DIDN'T READ ANYTHING INTO AC

```

```

0521 4427      ERROR      /INIT FAILED TO 8 DATA READY,DBSK SKIPPED OR
0522 6570      DBST              /READ SOMETHING INTO THE AC
0523 7640      SEA              /SKIP ON DATA ACCEPTED, 8 DATA ACCEPTED AND DATA AVAILABLE
0524 4427      ERROR      /INIT FAILED TO 8 DATA ACCEPTED, DBST SKIPPED OR
                                /DBST READ SOMETHING INTO THE AC
0525 1841      TAD              /GET THE PROGRAM INTERRUPT FLAG
0526 7640      SEA              /PROGRAM INTERRUPTED WITHOUT INT ENA AND FLAG SET
0527 4427      ERROR      /CLEAR DATA READY SET DATA ACCEPTED
0530 6573      DBCF              /DBCF SKIPPED ON READ SOMETHING INTO AC
0531 7640      SEA              /SKIP ON DATA READY
0532 4427      ERROR      /DATA READY FLAG GOT SET BY DBST OR DBCF
0533 6571      DBSK              /SKIP ON DATA ACCEPTED AND CLEAR IT
0534 7610      SKP              /DATA ACCEPTED NOT SET OR DBST FAILED TO SKIP
0535 4427      ERROR      /SKIP ON DATA ACCEPTED TO CHECK THAT IT CLEARED
0536 6570      DBST              /DBST AND TP4 FAILED TO CLEAR DATA ACCEPTED F/F
0537 4427      ERROR      /GET THE PROGRAM INTERRUPT FLAG
0540 6570      DBST              /GET THE PROGRAM INTERRUPT FLAG
0541 7610      SKP              /PROGRAM INTERRUPTED WITHOUT INT ENA SET
0542 4427      ERROR      /REPEAT TEST IF SR EQUAL TO 1888
0543 1841      TAD              /TEST 8 - CHECKS THAT THE DATA READY FLAG CAN BE SET AND CLEARED. TO
0544 7640      SEA              /SET THE DATA READY FLAG, THE PROGRAM ISSUES THE 101 DBST TO TRANSMIT
0545 4427      ERROR      /AND SET DATA AVAILABLE F/F, THE SETTING OF DATA AVAILABLE F/F IN LOOP
                                /BACK MODE SETS THE DATA READY F/F, THE 101 DBSK IS THEN ISSUED TO
                                /CHECK THAT THE FLAG IS SET AND THAT THE 101 WILL SKIP, THE PROGRAM
                                /THEN CLEARS THE DATA READY FLAG WITH DBCF WHICH ALSO SETS DATA ACCEPTED,
                                /THE DATA READY FLAG IS CHECKED TO BE CLEARED BY ISSUING A DBSK AND
                                /DATA ACCEPTED F/F IS CHECKED TO BE SET BY ISSUING A DBST, THE DATA
                                /ACCEPT F/F IS CHECKED AGAIN TO BE CLEARED BY ISSUING ANOTHER DBST,
                                /*****
0546 4424      DONLOP

```

```

0547 4423      TEST8, LOOPPC      /SETUP TEST COUNT AND TEST LOOPING ADDRESS
0548 7777      -1                /SIMULATOR ITERATION COUNTER
0551 4436      SIMCHK            /CHECK TO SEE IF THE SIMULATOR IS SELECTED
0552 4080      4080              /SIMULATOR CONTROL WORD
0553 4437      LODSIM            /LOAD SIMULATOR IF SELECTED, ALSO SET SCOPE
                                /LOOP = THIS ADDRESS IF SELECTED OTHERWISE
                                /SCOPE LOOP WILL BE NEXT ADDRESS;
0554 6007      CAF              /CLEAR ALL FLAGS
0555 4146      RTCENA            /SET REAL TIME CLOCK INT ENA
0556 3041      DCA              /CLEAR PROGRAM INTERRUPT FLAG
0557 6001      ION              /TURN THE INTERRUPT ON
0560 6571      DBSK              /SKIP ON DATA READY FLAG
0561 7610      SKP              /DATA READY FLAG SET OR DBSK SKIPPED
0562 4427      ERROR      /SKIP ON DATA ACCEPTED, 8 DATA ACCEPTED AND DATA AVAILABLE
0563 6570      DBST              /DATA ACCEPTED SET OR DBST SKIPPED
0564 7610      SKP              /TRANSMIT AND SET DATA AVAILABLE AND DATA READY
0565 4427      ERROR
0566 6574      DBTD

```

```

0567 7640      SEA              /CHECK THAT DBTD DIDN'T READ ANYTHING INTO AC
0570 4427      ERROR      /DBTD SKIPPED
0571 6571      DBSK              /SKIP ON DATA READY FLAG
0572 4427      ERROR      /DBTD FAILED TO SET DATA READY FLAG
0573 6570      DBST              /SKIP ON DATA ACCEPTED, 8 DATA AVAILABLE AND DATA ACCEPTED
0574 7610      SKP              /DATA ACCEPTED SET BEFORE DBCF WAS ISSUED
0575 4427      ERROR      /SKIP ON DATA READY
0576 6571      DBSK              /DATA READY FLAG CLEARED
0577 4427      ERROR      /GET THE PROGRAM INTERRUPT FLAG
0600 1841      TAD              /PROGRAM INTERRUPTED WITHOUT SETTING INT ENA
0601 7640      SEA              /CLEAR DATA READY SET DATA ACCEPTED
0602 4427      ERROR      /SKIP ON DATA READY
0603 6573      DBCF              /DBCF FAILED TO CLEAR DATA READY
0604 6571      DBSK              /SKIP ON DATA ACCEPTED AND CLEAR IT AND DATA AVAIL.
0605 7410      SKP              /DBCF FAILED TO SET DATA ACCEPTED OR DBST FAILED TO SKIP
0606 4427      ERROR      /SKIP ON DATA ACCEPTED
0607 6570      DBST              /THE FIRST DBST FAILED TO CLEAR DATA ACCEPTED
0610 4427      ERROR      /GET THE PROGRAM INTERRUPT FLAG
0611 6570      DBST              /PROGRAM INTERRUPTED WITHOUT INT ENA SET
0612 7410      SKP              /REPEAT TEST IF SR = 1888
0613 4427      ERROR
0614 1841      TAD              /TEST 9 - CHECKS THAT CAF WILL CLEAR THE DATA READY FLAG AND THE
0615 7640      SEA              /DATA ACCEPTED FLAG,
0616 4427      ERROR
0617 4424      DONLOP

```

```

0620 4423      TEST9, LOOPPC      /SETUP TEST COUNT AND TEST LOOPING ADDRESS
0621 7777      -1                /SIMULATOR ITERATION COUNTER
0622 4436      SIMCHK            /CHECK TO SEE IF SIMULATOR IS SELECTED
0623 4080      4080              /SIMULATOR CONTROL WORD
0624 4437      LODSIM            /LOAD SIMULATOR IF SELECTED, ALSO SET SCOPE
                                /LOOP EQUAL THIS ADDRESS IF SIMULATOR SELECTED
                                /OTHERWISE SCOPE LOOP WILL BE NEXT ADDRES
0625 6007      CAF              /CLEAR ALL FLAGS
0626 4146      RTCENA            /SET REAL TIME CLOCK INT ENA
0627 3041      DCA              /CLEAR PROGRAM INTERRUPT FLAG
0630 6001      ION              /TURN THE INTERRUPT ON
0631 6574      DBTD              /TRANSMIT AND SET DATA READY FLAG
0632 6571      DBSK              /SKIP ON DATA READY FLAG
0633 4427      ERROR      /DBTD FAILED TO SET DATA READY
0634 6570      DBST              /SKIP ON DATA ACCEPTED AND CLEAR IT
0635 7410      SKP              /DATA ACCEPTED GOT SET BEFORE A DBCF WAS ISSUED
0637 1841      TAD              /GET THE PROGRAM INTERRUPT FLAG
0640 7640      SEA              /PROGRAM INTERRUPTED WITHOUT INT ENA SET
0641 4427      ERROR      /CLEAR DATA READY FLAG
0642 6007      CAF              /SET REAL TIME CLOCK INT ENA
0643 4146      RTCENA            /SKIP ON DATA READY FLAG
0644 6571      DBSK              /SKIP ON DATA READY FLAG
0645 7610      SKP

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```

0646 4427 ERROR /INIT FAILED TO CLEAR DATA READY FLAG
0647 6001 ION /TURN THE INTERRUPT BACK ON
0650 6573 DBCF /CLEAR DATA READY SET DATA ACCEPTED
/*****
0651 6007 CAF /THE PROGRAM ASSUMES THAT DBCF SET DATA ACCEPTED
0652 4146 RTGENA /CLEAR DATA ACCEPTED
0653 6001 ION /SET REAL TIME CLOCK INT ENA
0654 6570 DBST /TURN THE INTERRUPT ON
0655 7640 SZA /SKIP ON DATA ACCEPTED
0656 4427 ERROR CLA /INIT FAILED TO CLEAR DATA ACCEPTED
0657 1041 TAD INTFLG /GET THE PROGRAM INTERRUPT FLAG
0660 7640 SZA CLA /PROGRAM INTERRUPTED WITHOUT INT ENA SET
0661 4427 ERROR /REPEAT TEST IF SR = 1000
0662 4424 DONLOP

```

 /TEST 10 = CHECKS THAT INT ENA CAN BE SET AND CLEARED USING THE
 /DATA READY FLAG TO SKIP AND INTERRUPT ON,

```

0663 4423 TEST10: LOOPPC /SETUP TEST COUNT AND TEST LOOPING ADDRESS
0664 7777 =1 /SIMULATOR ITERATION COUNTER
0665 4436 SIMCHK /CHECK TO SEE IF SIMULATOR SELECTED
0666 4000 /SIMULATOR CONTROL WORD
0667 4437 LODSIM /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
/LOOP = THIS ADDRESS IF SIMULATOR SELECTED
/OTHERWISE SCOPE LOOP IS NEXT ADDRESS
0670 6007 CAF /CLEAR ALL FLAGS
0671 4146 RTGENA /SET REAL TIME CLOCK INT ENA
0672 3041 DCA INTFLG /CLEAR PROGRAM INTERRUPT FLAG
0673 6001 ION /TURN THE INTERRUPT ON
0674 6571 DBSK /SKIP ON DATA READY FLAG
0675 7610 SKP CLA
0676 4427 ERROR /DATA READY FLAGS SET FOLLOWING INIT
0677 6570 DBST /SKIP ON DATA ACCEPTED
0700 7610 SKP CLA
0701 4427 ERROR /DATA ACCEPTED SET FOLLOWING INIT
0702 1041 TAD INTFLG /CHECK THAT THE PROGRAM DID NOT INTERRUPT
0703 7640 SZA CLA
0704 4427 ERROR /PROGRAM INTERRUPTED WITHOUT FLAGS AND INT ENA SET
0705 6575 DBSE /SET INTERRUPT ENABLE TO A 1
0706 7640 SZA CLA /CHECK THAT DBSE DIDN'T CHANGE THE AC
0707 4427 ERROR /DBSE SKIPPED OR READ SOMETHING INTO AC
0710 1041 TAD INTFLG /GET THE PROGRAM INTERRUPT FLAG
0711 7640 SZA CLA
0712 4427 ERROR /PROGRAM INTERRUPTED WITHOUT FLAG SET
0713 6574 DBTD /TRANSMIT AND SET DATA READY
0714 6571 DBSK /SKIP ON DATA READY FLAG
0715 4427 ERROR /DBTD FAILED TO SET DATA READY
0716 2041 ISE INTFLG /DID THE PROGRAM INTERRUPT?
0717 4427 ERROR /PROGRAM FAILED TO INTERRUPT OR INT ENA NOT SET
0720 6576 DBCE /CLEAR INTERRUPT ENABLE
0721 7640 SZA CLA /CHECK THAT DBCE DIDN'T CHANGE THE AC
0722 4427 ERROR /DBCE SKIPPED OR CHANGED THE AC
0723 6001 ION /TURN THE INTERRUPT ON

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0724 6571 DBSK /SKIP ON DATA READY
0725 4427 ERROR /DATA READY FLAG GOT CLEARED
0726 1041 TAD INTFLG /GET THE PROGRAM INTERRUPT FLAG
0727 7640 SZA CLA
0730 4427 ERROR /PROGRAM INTERRUPTED, DBCE FAILED TO 0 INT ENA
0731 6007 CAF /CLEAR ALL FLAGS
0732 4424 DONLOP /REPEAT TEST IF SR = 1000

```

 /TEST 11 = CHECKS THAT INITIALIZE WILL CLEAR INT ENA F/F USING THE
 /DATA READY FLAG TO SKIP AND INTERRUPT ON,

```

0733 4423 TEST11: LOOPPC /SETUP TEST COUNT AND TEST LOOPING ADDRESS
0734 7777 =1 /SIMULATOR ITERATION COUNTER
0735 4436 SIMCHK /CHECK TO SEE IF SIMULATOR SELECTED
0736 4000 /SIMULATOR CONTROL WORD
0737 4437 LODSIM /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
/LOOP = THIS ADDRESS IF SIMULATOR SELECTED
/OTHERWISE SCOPE LOOP IS NEXT ADDRESS
0740 6007 CAF /CLEAR ALL FLAGS
0741 4146 RTGENA /SET REAL TIME CLOCK INT ENA
0742 3041 DCA INTFLG /CLEAR PROGRAM INTERRUPT FLAG
0743 6001 ION /TURN THE INTERRUPT ON
0744 6574 DBTD /TRANSMIT AND SET DATA READY
0745 6571 DBSK /SKIP ON DATA READY FLAG
0746 4427 ERROR /DBTD FAILED TO SET DATA READY
0747 6575 DBSE /SET INTERRUPT ENABLE
0750 7000 NOP /PROGRAM SHOULD INTERRUPT HERE
0751 2041 ISE INTFLG /DID THE PROGRAM INTERRUPT?
0752 4427 ERROR /NO, PROGRAM FAILED TO INTERRUPT
0753 6007 CAF /CLEAR ALL FLAGS
0754 4146 RTGENA /SET REAL TIME CLOCK INT ENA
0755 6001 ION /TURN THE INTERRUPT BACK ON
0756 6571 DBSK /SKIP ON DATA READY FLAG
0757 7410 SKP
0760 4427 ERROR /INIT FAILED TO CLEAR DATA READY
0761 6574 DBTD /TRANSMIT AND SET DATA READY
0762 6571 DBSK /SKIP ON DATA READY FLAG
0763 4427 ERROR /DBTD FAILED TO SET DATA READY FLAG
0764 1041 TAD INTFLG /GET THE PROGRAM INTERRUPT FLAG
0765 7640 SZA CLA
0766 4427 ERROR /PROGRAM INTERRUPTED, INIT FAILED TO
/CLEAR INTERRUPT ENABLE F/F
0767 6007 CAF /CLEAR DATA READY FLAG
0770 6571 DBSK /SKIP ON DATA READY FLAG
0771 7410 SKP
0772 4427 ERROR /INIT FAILED TO CLEAR DATA READY
0773 4424 DONLOP /REPEAT TEST IF SR = 1000

```

 /TEST 12 = CHECKS THAT DATA ACCEPTED CAN CAUSE A INTERRUPT,

```

0774 4423 TEST12, LOOPPC /SETUP TEST COUNT AND TEST LOOPING ADDRESS
0775 7777 =1 /SIMULATOR ITERATION COUNTER
0776 4436 SIMCHK /CHECK TO SEE IF SIMULATOR IS SELECTED
0777 4000 /SIMULATOR CONTROL WORD
1000 4437 LODSIM /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
/LOOP = THIS ADDRESS IF SIMULATOR SELECTED
/OTHERWISE SCOPE LOOP IS NEXT ADDRESS

1001 6007 CAP /CLEAR ALL FLAGS
1002 4146 RTCENA /SET REAL TIME CLOCK INT ENA
1003 3041 DCA INTFLG /CLEAR PROGRAM INTERRUPT FLAG
1004 6001 ION /TURN THE INTERRUPT ON
1005 6373 DBCF /CLEAR DATA READY SET DATA ACCEPTED
1006 7000 NOP /SHOULDN'T INTERRUPT HERE
1007 1041 TAD INTFLG /GET THE PROGRAM INTERRUPT FLAG
1010 7040 SEA CLA
1011 4427 ERROR /PROGRAM INTERRUPTED WITHOUT INT ENA SET
1012 6373 DBSE /SET INTERRUPT ENABLE
1013 7000 NOP /SHOULD INTERRUPT HERE WITH INT ENA AND FLAG SET
1014 2041 ISE INTFLG /DID THE PROGRAM INTERRUPT
1015 4427 ERROR /NO, FAILED TO INTERRUPT WITH INT ENA AND DATA ACCEPTED SET
1016 6001 ION /TURN THE INTERRUPT BACK ON
1017 6370 DBST /CHECK THAT DATA ACCEPTED GOT CLEARED BY 1ST DBST IN SKIP CHAIN
1020 7010 SKP CLA
1021 4427 ERROR /DATA ACCEPTED DIDN'T CLEAR IN INTERRUPT SKIP CHAIN
1022 1041 TAD INTFLG /GET THE PROGRAM INTERRUPT FLAG
1023 7040 SEA CLA
1024 4427 ERROR /PROGRAM INTERRUPTED WITH DATA ACCEPTED CLEARED
1025 6376 DBCE /CLEAR INTERRUPT ENABLE
1026 4424 DONLOP /REPEAT TEST IF SR = 1000

```

/*****
 /TEST 13 = CHECKS THE EFFECT OF THE IOT ON THE AC, DBRD SHOULD BE THE ONLY
 /IOT TO CHANGE THE AC
 /*****

```

1027 4423 TEST13, LOOPPC /STORE THE TEST LOOPING ADDRESS AND SETUP TEST COUNT
1030 7777 =1 /SIMULATOR ITERATION COUNTER
1031 4436 SIMCHK /CHECK TO SEE IF SIMULATOR IS SELECTED
1032 4000 /CONTROL WORD FOR THE SIMULATOR
1033 4437 LODSIM /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
/LOOP = THIS ADDRESS IF SIMULATOR SELECTED
/OTHERWISE SCOPE LOOP IS THIS ADDRESS +1

1034 3041 DCA INTFLG /CLEAR PROGRAM INTERRUPT FLAG
1035 6007 CAP /CLEAR ALL FLAGS
1036 4146 RTCENA /SET REAL TIME CLOCK INT ENA
1037 6001 ION /TURN INTERRUPT ON
1040 7240 CLA CMA /SET THE AC TO ALL ONES
1041 6374 DBTD /TRANSMIT DATA
1042 7001 IAC
1043 7040 SEA CLA
1044 4427 ERROR /DBTD CHANGED THE AC
1045 6007 CAP /CLEAR ALL
1046 4146 RTCENA /SET REAL TIME CLOCK INT ENA
1047 6001 ION /TURN INTERRUPT BACK ON
1050 7240 CLA CMA /SET THE AC TO ALL ONES

```

```

1051 6372 DBRD /READ THE 12 BIT PARALLEL I/O
1052 7040 SEA CLA
1053 4427 ERROR /DBRD FAILED TO READ OR CAP FAILED TO CLEAR XMIT BUFFERS
1054 7240 CLA CMA /SET AC TO ALL ONES
1055 6371 DBSK /SKIP ON DATA READY
1056 7001 IAC
1057 7040 SEA CLA
1058 4427 ERROR /DBSK CHANGED THE AC
1061 6002 IOP
1062 7240 CLA CMA /SET THE AC TO ALL ONES
1063 6373 DBCF /CLEAR DATA READY FLAG SET DATA ACCEPT FLAG
1064 7001 IAC
1065 7040 SEA CLA
1066 4427 ERROR /DBCF CHANGED THE AC
1067 6007 CAP /CLEAR ALL FLAGS
1070 4146 RTCENA /SET REAL TIME CLOCK INT ENA
1071 6001 ION /SET INTERRUPT ENABLE
1072 7240 CLA CMA
1073 6370 DBST /SKIP AND CLEAR DATA ACCEPTED AND DATA AVAILABLE
1074 7001 IAC
1075 7040 SEA CLA
1076 4427 ERROR /DBST SKIPPED OR CHANGED THE AC
1077 7240 CLA CMA
1080 7240 DBSE /SET PARALLEL INTERRUPT ENABLE
1101 7001 IAC
1102 7040 SEA CLA
1103 4427 ERROR /DBSE CHANGED THE AC
1104 7240 CLA CMA
1105 6376 DBCE /CLEAR INTERRUPT ENABLE
1106 7001 IAC
1107 7040 SEA CLA
1110 4427 ERROR /DBCE CHANGED THE AC
1111 7240 CLA CMA /SET THE AC TO ALL ONES
1112 6377 DBSS /ISSUE A STROBE PULSE
1113 7410 SKP
1114 4427 ERROR /DBSS SKIPPED
1115 7001 IAC
1116 7040 SEA CLA
1117 4427 ERROR /DBSS CHANGED THE AC
1120 1041 TAD INTFLG /DID THE PROGRAM INTERRUPT
1121 7040 SEA CLA
1122 4427 ERROR /PROGRAM INTERRUPTED
1123 4424 DONLOP /CHECK TO SEE IF DONE OR LOOP ON TEST

```

/*****
 /TEST 14 = CHECKS THAT ALL ONES CAN BE TRANSMITTED AND READ BACK, IT ALSO CHECKS THAT
 /CAP CAN CLEAR THE XMIT BUFFERS, INTERRUPTS ARE ALSO CHECKED
 /*****

```

1124 4423 TEST14, LOOPPC /SETUP SCOPE LOOP ADDRESS AND SETUP TEST COUNT;
1125 7777 =1 /SIMULATOR ITERATION COUNTER
1126 4436 SIMCHK /CHECK TO SEE IF SIMULATOR IS SELECTED
1127 4000 /CONTROL WORD FOR THE SIMULATOR
1130 4437 LODSIM /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
/LOOP = THIS ADDRESS IF SIMULATOR SELECTED

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1131 3041      DCA INTFLG      /OTHERWISE SCOPE LOOP IS THIS ADDRESS +1
1132 7240      /CLEAR PROGRAM INTERRUPT FLAG
1133 3051      CLA CMA
1134 4426      DCA P10XMT      /SET THE WORD TO BE TRANSMITTED TO ALL ONES
1135 4430      P10DAT          /GO TRANSMIT AND COMPARE THE WORD
1136 4424      P10DER          /DATA ERROR = WORD DIDN'T COMPARE IN ROUTINE P10DAT
                        /REPEAT TEST IF NOT DONE OR LOOP ON TEST IF SR2=1

/*****
/TEST 15 = CHECKS FOR A COMPLEMENTING DATA PATTERN OF 7777 THEN 0000 AND CHECKS THAT CAF
/WILL CLEAR THE DATA BUFFER, THE PROGRAM IS CHECKED TO INTERRUPT
/*****/

1137 4423      TEST15, LOOPPC      /SETUP TEST SCOPE LOOP AND TEST COUNT
1138 7777      -1                  /SIMULATOR ITERATION COUNTER
1139 4436      SIMCHK              /CHECK TO SEE IF SIMULATOR IS SELECTED
1140 4000      4000              /CONTROL WORD FOR THE SIMULATOR
1141 4437      LODSIM              /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
                        /LOOP = THIS ADDRESS IF SIMULATOR SELECTED
                        /OTHERWISE SCOPE LOOP IS THIS ADDRESS +1
1144 3041      DCA INTFLG      /CLEAR PROGRAM INTERRUPT FLAG
1145 7240      CLA CMA          /SET THE FIRST WORD TO ALL ONES
1146 3051      DCA P10XMT      /SAVE IT
1147 4426      P10DAT          /GO TRANSMIT AND COMPARE THE WORD
1148 4430      P10DER          /DATA ERROR = WORD DIDN'T COMPARE IN ROUTINE P10DAT
1149 3051      DCA P10XMT      /SET THE WORD TO 0
1150 4426      P10DAT          /GO TRANSMIT AND COMPARE THE WORD
1151 4430      P10DER          /DATA ERROR= FAILED TO READ ZEROES BACK
1152 4424      DONLOP          /REPEAT TEST IF NOT DONE OR LOOP ON TEST IF SR2=1

/*****
/TEST 16 = CHECKS FOR A COMPLEMENTING DATA PATTERN OF 5252 = 2925 AND CHECKS
/THAT CAF WILL CLEAR THE XMIT BUFFERS, THE PROGRAM IS CHECKED TO INTERRUPT
/*****/

1155 4423      TEST16, LOOPPC      /SETUP TEST LOOP AND TEST COUNT
1156 7777      -1                  /SIMULATOR ITERATION COUNTER
1157 4436      SIMCHK              /CHECK TO SEE IF SIMULATOR IS SELECTED
1158 4000      4000              /CONTROL WORD FOR THE SIMULATOR
1159 4437      LODSIM              /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
                        /LOOP = THIS ADDRESS IF SIMULATOR SELECTED
                        /OTHERWISE SCOPE LOOP IS THIS ADDRESS +1
1162 3041      DCA INTFLG      /CLEAR PROGRAM INTERRUPT FLAG
1163 1062      TAD K5252
1164 3051      DCA P10XMT      /SET THE FIRST WORD TO TRANSMIT=5252
1165 4426      P10DAT          /GO TRANSMIT AND COMPARE THE DATA WORD
1166 4430      P10DER          /DATA ERROR = WORD DIDN'T COMPARE
1167 1063      TAD K2525
1168 3051      DCA P10XMT      /SET THE SECOND WORD TO TRANSMIT = 2925
1169 4426      P10DAT          /GO TRANSMIT AND COMPARE THE WORD
1170 4430      P10DER          /DATA ERROR=THE WORD DIDN'T COMPARE
1171 4424      DONLOP          /REPEAT THE TEST IF NOT DONE OR LOOP ON TEST IF SR2=1

1174 5777      JMP TEST17 /GO NEXT TEST
1177 1200

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1200      IFDEF OP13K <PAGE>

/*****
/TEST 17 = CHECKS FOR AN INCREMENTING DATA PATTERN;
/*****/

1200 4423      TEST17, LOOPPC      /SET UP TEST LOOPING ADDRESS
1201 7777      -1                  /SIMULATOR ITERATION COUNTER
1202 4104      JMS PATCH          /GO SET UP FOR INTERRUPT RETURN
1203 3252      SKPCHN
1204 3042      DCA CLKFLG      /SET INTERRUPT TO IGNORE RTC FLAGS
1205 7300      CLA CLL
1206 3050      DCA SAVCNT
1207 3047      DCA TSTCNT
1208 4436      SIMCHK          /CLEAR PROGRAM TEST COUNTER
1209 4000      4000          /CHECK FOR SIMULATOR
1210 4437      LODSIM          /SIMULATOR CONTROL WORD
1211 3041      DCA INTFLG      /LOAD THE SIMULATOR IF SELECTED
1212 1047      TAD TSTCNT      /CLEAR PROGRAM INTERRUPT FLAG
1213 3051      DCA P10XMT      /GET TEST COUNTER
1214 4426      P10DAT          /SET THE WORD TO BE TRANSMITTED = TO 17
1215 4430      P10DER          /GO TRANSMIT AND COMPARE THE WORD
1216 4424      DONLOP          /DATA ERROR
                        /DONE OR LOOP ON TEST IF SR2=1

/*****
/TEST 18 = CHECKS FOR AN INCREMENTING DATA PATTERN WITH THE INTERRUPT
/ENABLE DISABLED WHICH ALLOWS FOR PASTER READING BECAUSE OF NO SKIP CHAIN
/*****/

1221 4423      TEST18, LOOPPC      /SETUP TEST COUNT AND TEST LOOP ADDRESS
1222 7777      -1                  /SIMULATOR ITERATION COUNTER
1223 7300      CLA CLL
1224 3050      DCA SAVCNT
1225 3047      DCA TSTCNT
1226 4436      SIMCHK          /CHECK FOR THE SIMULATOR
1227 4000      4000          /SIMULATOR CONTROL WORD
1228 4437      LODSIM          /LOAD SIMULATOR IF SELECTED
1229 6007      CAF            /CLEAR ALL FLAGS
1230 4146      RTCEA          /SET REAL TIME CLOCK INT ENA
1231 6001      ION            /TURN THE INTERRUPT ON
1232 3041      DCA INTFLG      /CLEAR PROGRAM INTERRUPT FLAG
1233 1047      TAD TSTCNT      /GET THE TEST COUNTER
1234 3051      DCA P10XMT      /PUT IT IN THE WORD TO TRANSMIT
1235 1051      TAD P10XMT      /GET THE WORD
1236 6574      DBTD            /TRANSMIT IT
1237 6571      DBSK            /SKIP ON DATA READY
1238 4427      ERROR          /DATA READY FLAG FAILED TO SET
1239 7240      CLA CMA          /SET THE AC TO ALL ONE'S
1240 6572      DBRD            /READ THE DATA BUFFER
1241 3052      DCA P10REC      /SAVE THE WORD READ
1242 6573      DBCF            /CLEAR THE DATA READY FLAG
1243 6570      DBST            /SKIP AND CLEAR DATA ACCEPTED AND DATA AVAIL
1244 4427      ERROR          /DBSF FAILED TO SET DATA ACCEPTED
1245 6570      DBST            /CHECK THAT DATA ACCEPTED CLEARED

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1252 7410 SKP
1253 4427 ERROR /DATA ACCEPTED STILL SET
1254 1054 TAD P10XMT /COMPARE THE WORD TRANSMITTED WITH THE WORD READ
1255 7041 CIA
1256 1052 TAD P10REC
1257 7640 SZA CLA
1260 4430 P10DER /PARALLEL I/O DATA ERROR
1261 0007 CAF /CLEAR ALL INCLUDING THE TRANSMIT BUFFER
1262 4146 RTCEA /SET REAL TIME CLOCK INT ENA
1263 0001 ION /TURN THE INTERRUPT BACK ON
1264 0572 DBRD /READ THE BUFFER
1265 7640 SZA CLA /DID INIT CLEAR THE BUFFER?
1266 4427 ERROR /NO, INIT FAILED TO CLEAR BUFFER
1267 1041 TAD INTFLG /GET THE PROGRAM INTERRUPT FLAG
1270 7640 SZA CLA
1271 4427 ERROR /PROGRAM INTERRUPTED WITHOUT INT ENA SET
1272 4424 DONLOP /DONE OR REPEAT TEST IF SR=1

```

```

/*****
/TEST 19 = IS ONLY TESTED WHEN THE SIMULATOR IS SELECTED, THE TEST
/CHECKS THAT STROBE CAN BE SET BY DBSS AND TP3 AND THAT TIME STATE 1
/CAN CLEAR IT,
/*****

```

```

1273 4423 TEST19, LOOPPC /SETUP TEST COUNT AND TEST LOOP ADDRESS
1274 7777 =1 /SIMULATOR ITERATION COUNTER
1275 4436 SIMCHK /CHECK TO SEE IF SIMULATOR IS SELECTED
1276 4000 4000 /SIMULATOR CONTROL WORD
1277 4437 LODSIM /LOAD THE CONTROL WORD
1300 1021 TAD OPASEL /RECHECK THE SIMULATOR BIT
1301 0057 AND K200 /MASK OUT FOR SIMULATOR BIT
1302 7640 SZA CLA /IS IT SET
1303 5306 JMP ,+3 /YES GO CHECK THAT STROBE SETS AND CLEARS
1304 3709 JMP ,+1 /GO TO NEXT TEST
1305 1527 TEST23 /ADDRESS OF THE NEXT TEST
1306 0007 CAF /CLEAR ALL FLAGS
1307 4146 RTCEA /SET REAL TIME CLOCK INT ENA
1310 3041 DCA INTFLG /CLEAR THE PROGRAM INTERRUPT FLAG
1311 0001 ION /TURN THE INTERRUPT ON
1312 6156 CLRDET /CLEAR SIMULATOR DETECTOR F/F/S
1313 6167 SKPSTR /SKIP ON STROBE DETECTOR F/F SET
1314 7610 SKP CLA
1315 4427 ERROR /STROBE IS SET TO A ONE
1316 0577 DBSS /ISSUE A STROBE PULSE
1317 7440 SZA
1320 4427 ERROR /DBSS SKIPPED OR READ SOMETHING INTO THE AC
1321 6167 SKPSTR /SKIP ON STROBE DETECTOR F/F SET
1322 4427 ERROR /DBSS FAILED TO SET STROBE OR SIMULATOR DETECTOR F/F
1323 6156 CLRDET /CLEAR READER RUN AND STROBE DETECTOR F/F
1324 6167 SKPSTR /SKIP ON STROBE DETECTOR F/F SET
1325 7410 SKP
1326 4427 ERROR /STROBE STILL SET OR DETECTOR F/F DIDN'T CLEAR
1327 0577 DBSS /ISSUE ANOTHER STROBE PULSE
1330 6167 SKPSTR /SKIP ON STROBE DETECTOR F/F SET

```

```

1331 4427 ERROR /DBSS FAILED TO SET STROBE OR DETECTOR F/F
1332 6156 CLRDET /CLEAR READER RUN AND STROBE DETECTOR F/F
1333 6167 SKPSTR /SKIP ON STROBE DETECTOR F/F SET
1334 7410 SKP
1335 4427 ERROR /STROBE STILL SET OR DETECTOR F/F DIDN'T 0
1336 1041 TAD INTFLG /CHECK THAT THE PROGRAM DIDN'T INTERRUPT
1337 7640 SZA CLA
1340 4427 ERROR /PROGRAM INTERRUPTED
1341 0002 IOF /TURN THE INTERRUPT OFF
1342 4424 DONLOP /REPEAT TEST IF SR = 1000

```

```

/*****
/TEST 20 = IS ONLY TESTED WHEN SIMULATOR IS SELECTED, THE TESTS CHECKS
/THAT DATA AVAILABLE CAN BE SET BY DBTD AND CLEARED BY CAF,
/*****

```

```

1343 4423 TEST20, LOOPPC /SETUP TEST COUNT AND TEST LOOP ADDRESS
1344 7777 =1 /SIMULATOR ITERATION COUNTER
1345 4436 SIMCHK /CHECK TO SEE IF SIMULATOR IS SELECTED
1346 4000 4000 /SIMULATOR CONTROL WORD
1347 4437 LODSIM /LOAD THE CONTROL WORD
1350 0007 CAF /CLEAR ALL FLAGS
1351 4146 RTCEA /SET REAL TIME CLOCK INT ENA
1352 3041 DCA INTFLG /CLEAR THE PROGRAM INTERRUPT FLAG
1353 0001 ION /TURN THE INTERRUPT ON
1354 6156 CLRDET /CLEAR SIMULATOR DETECTOR F/F/S
1355 6165 SKPDAV /SKIP ON DATA AVAILABLE DETECTOR F/F
1356 7610 SKP CLA
1357 4427 ERROR /CAF FAILED TO CLEAR DATA AVAIL, OR IT IS STUCK ON
1360 0574 DBTD /TRANSMIT AND SET DATA READY AND DATA AVAILABLE
1361 0571 DBSK /SKIP ON DATA READY
1362 4427 ERROR /DBTD FAILED TO SET DATA READY
1363 6165 SKPDAV /SKIP ON DATA AVAILABLE DETECTOR F/F
1364 4427 ERROR /DATA AVAILABLE FAILED TO SET
1365 6156 CLRDET /CLEAR DETECTOR F/F/S
1366 6165 SKPDAV /SKIP ON DATA AVAILABLE DETECTOR F/F
1367 4427 ERROR /DATA AVAILABLE GOT CLEARED
1370 0007 CAF /CLEAR ALL FLAGS
1371 4146 RTCEA /SET REAL TIME CLOCK INT ENA
1372 0001 ION /TURN THE INTERRUPT ON
1373 6156 CLRDET /CLEAR THE SIMULATOR DETECTOR F/F/S
1374 6165 SKPDAV /SKIP ON DATA AVAILABLE DETECTOR F/F
1375 7610 SKP CLA
1376 4427 ERROR /INIT FAILED TO CLEAR DATA AVAILABLE
1377 0571 DBSK /SKIP ON DATA READY
1400 7610 SKP CLA
1401 4427 ERROR /INIT FAILED TO CLEAR DATA READY
1402 1041 TAD INTFLG /GET THE PROGRAM INTERRUPT FLAG
1403 7640 SZA CLA
1404 4427 ERROR /ERROR, PROGRAM INTERRUPTED
1405 4424 DONLOP /DONE, OR REPEAT TEST IF SR=1000

```

```

/*****
/TEST 21 = IS ONLY TESTED WHEN THE SIMULATOR IS SELECTED, THE TEST CHECKS
/*****

```


/THAT DBTD WILL SET DATA AVAILABLE AND THAT DBST WILL CLEAR IT.

/*****

```

1406 4423 TEST21, LOOPPC /SETUP TEST COUNT AND TEST LOOP ADDRESS
1407 7777 =1 /SIMULATOR ITERATION COUNTER
1410 4436 SIMCHK /CHECK TO SEE IF THE SIMULATOR IS SELECTED
1411 4000 4000 /SIMULATOR CONTROL WORD
1412 4437 LODSIM /LOAD THE SIMULATOR CONTROL WORD
1413 6007 CAF /CLEAR ALL FLAGS
1414 4146 RTCENA /SET REAL TIME CLOCK INT ENA
1415 3041 DCA INTFLG /CLEAR PROGRAM INTERRUPT FLAG
1416 6001 ION /TURN THE INTERRUPT ON
1417 6156 CLRDET /CLEAR SIMULATOR DETECTOR F/FIS
1420 6165 SKPDAV /SKIP ON SIMULATOR DATA AVAIL, DETECTOR F/F
1421 7610 SKP CLA
1422 4427 ERROR /DATA AVAILABLE SET AFTER INITIALIZE
1423 6574 DBTD /TRANSMIT=SET DATA AVAILABLE AND DATA READY
1424 6571 DBSK /SKIP ON DATA READY
1425 4427 ERROR /DATA READY FLAG NOT SET
1426 6165 SKPDAV /SKIP ON DATA AVAILABLE DETECTOR F/F
1427 4427 ERROR /DBTD FAILED TO SET DATA AVAILABLE
1430 6156 CLRDET /CLEAR SIMULATOR DETECTOR F/FIS
1431 6165 SKPDAV /SKIP ON DATA AVAILABLE DETECTOR F/F
1432 4427 ERROR /DATA AVAILABLE GOT CLEARED
1433 6573 DBCF /CLEAR DATA READY FLAG SET DATA ACCEPTED
1434 6571 DBSK /SKIP ON DATA READY FLAG
1435 7610 SKP CLA
1436 4427 ERROR /DBCF FAILED TO CLEAR DATA READY
1437 6156 CLRDET /CLEAR SIMULATOR DETECTOR F/FIS
1440 6165 SKPDAV /SKIP ON SIMULATOR DETECTOR F/F
1441 4427 ERROR /DATA AVAILABLE GOT CLEARED
1442 6570 DBST /SKIP ON DATA ACCEPTED, ? DATA AVAILABLE
1443 4427 ERROR /DBCF FAILED TO SET DATA ACCEPTED
1444 6156 CLRDET /CLEAR SIMULATOR DETECTOR F/FIS
1445 6165 SKPDAV /SKIP ON DATA AVAILABLE SIMULATOR DETECTOR F/F
1446 7610 SKP CLA
1447 4427 ERROR /DBST FAILED TO CLEAR DATA AVAILABLE
1450 6570 DBST /SKIP ON DATA ACCEPTED
1451 7610 SKP CLA
1452 4427 ERROR /1ST DBST FAILED TO CLEAR DATA ACCEPTED
1453 1041 TAO INTFLG /GET THE PROGRAM INTERRUPT FLAG
1454 7640 SZA CLA
1455 4427 ERROR /PROGRAM INTERRUPTED
1456 4424 DONLOP /DONE OR REPEAT TEST IS SR = 1000

```

/*****
 /TEST 22 = IS ONLY TESTED WHEN SIMULATOR IS SELECTED; THE TEST CHECKS
 /THAT DATA AVAILABLE CAN BE SET BY DBTD AND CLEARED BY "TS1".
 /*****

```

1457 4423 TEST22, LOOPPC /SETUP TEST COUNT AND TEST LOOP ADDRESS
1460 7777 =1 /SIMULATOR ITERATION COUNTER
1461 4436 SIMCHK /CHECK FOR SIMULATOR
1462 6000 6000 /SIMULATOR CONTROL WORD
1463 4437 LODSIM /LOAD THE CONTROL WORD

```

```

1464 6007 CAF /CLEAR ALL FLAGS
1465 4146 RTCENA /SET REAL TIME CLOCK INT ENA
1466 6001 ION /TURN THE INTERRUPT ON
1467 3041 DCA INTFLG /CLEAR PROGRAM INTERRUPT FLAG
1470 6156 CLRDET /CLEAR SIMULATOR DETECTOR F/FIS
1471 6165 SKPDAV /SKIP ON DATA AVAILABLE DETECTOR F/F
1472 7610 SKP CLA
1473 4427 ERROR /DATA AVAILABLE SET AFTER INITIALIZE
1474 6574 DBTD /TRANSMIT = SET DATA READY AND DATA AVAILABLE
1475 6571 DBSK /SKIP ON DATA READY
1476 4427 ERROR /DBTD FAILED TO SET DATA READY
1477 6165 SKPDAV /SKIP ON DATA AVAILABLE
1480 4427 ERROR /DBTD FAILED TO TO SET DATA AVAILABLE
1501 6156 CLRDET /CLEAR SIMULATOR DETECTOR F/FIS
1502 6165 SKPDAV /SKIP ON DATA AVAILABLE DETECTOR F/F
1503 7610 SKP CLA
1504 4427 ERROR /TS1 FAILED TO CLEAR DATA AVAILABLE
1505 6007 CAF /CLEAR ALL FLAGS
1506 4146 RTCENA /SET REAL TIME CLOCK INT ENA
1507 6001 ION /TURN THE INTERRUPT BACK ON
1510 6571 DBSK /SKIP ON DATA READY
1511 7610 SKP CLA
1512 4427 ERROR /INIT FAILED TO CLEAR DATA READY
1513 6574 DBTD /TRANSMIT = SET DATA READY AND DATA AVAILABLE
1514 6165 SKPDAV /SKIP ON DATA AVAILABLE DETECTOR F/F
1515 4427 ERROR /DATA AVAILABLE FAILED TO SET
1516 6156 CLRDET /CLEAR SIMULATOR DETECTOR F/FIS
1517 6165 SKPDAV /SKIP ON DATA AVAILABLE DETECTOR F/F
1520 7610 SKP CLA
1521 4427 ERROR /TS1 FAILED TO CLEAR DATA AVAILABLE
1522 6007 CAF /CLEAR ALL FLAGS
1523 6571 DBSK /SKIP ON DATA READY
1524 7610 SKP CLA
1525 4427 ERROR /INIT FAILED TO CLEAR DATA READY
1526 4424 DONLOP /DONE OR REPEAT TEST IF SR = 1000

```

/*****
 //FIRST SECTION OF SERIAL LINE UNIT DIAGNOSTIC
 /TEST 23 = TRY TO CLEAR SLU INT ENA BY ISSUING A KIE COMMAND; THEN TEST THE SLU XMIT
 /FLAG TO SET BY TFL AND CLEAR BY TCF; THE FLAG IS CHECKED WITH TSP AND SPI, IF AN
 /INTERRUPT OCCURRED, IT MAY BE DUE TO INT ENA NOT BEING CLEARED BY KIE AND DATA BIT 11 ON A 0.
 /*****

```

1527 4104 TEST23, JMS PATCH
1530 3252 SKPCHN
1531 4423 LOOPPC /SETUP TEST COUNT AND SCOPE LOOPING ADDRESS
1532 7777 =1 /SIMULATOR ITERATION COUNTER
1533 4436 SIMCHK /CHECK TO SEE IF SIMULATOR IS SELECTED
1534 4000 4000 /CONTROL WORD FOR THE SIMULATOR
1535 4437 LODSIM /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
/LOOP = THIS ADDRESS IF SIMULATOR SELECTED
/OTHERWISE SCOPE LOOP IS THIS ADDRESS *1
1536 3041 DCA INTFLG /CLEAR PROGRAM INTERRUPT FLAG
1537 6007 CAF /CLEAR ALL FLAGS * SET SLU INT ENA
1538 4146 RTCENA /SET REAL TIME CLOCK INT ENA

```

```

1541 6801 ION /TURN THE INTERRUPT ON
1542 6831 KSF /CHECK TO SEE IF RECEIVE FLAG IS A 0
1543 7610 SKP CLA /RECEIVE FLAG SET OR KSF SKIPPED
1544 4427 ERROR /CLEAR SLU INT ENA
1545 6835 KIE /KIE SKIPPED
1546 7610 SKP CLA
1547 4427 ERROR
1550 1041 TAD INTFLG
1551 7640 SZA CLA
1552 4427 ERROR /PROGRAM INTERRUPTED
1553 6840 TFL /SET THE TRANSMIT FLAG
1554 7410 SKP
1555 4427 ERROR /TFL SKIPPED
1556 6841 TSF /SKIP ON XMIT FLAG
1557 4427 ERROR /TFL + TP3 FAILED TO SET XMIT FLAG OR NO SKIP OCCURRED
1560 6845 SPI /SKIP ON XMIT/RECEIVE + INT ENA ON A 1
1561 7410 SKP
1562 4427 ERROR /SPI SKIPPED OR KIE AND DATA 11 L FAILED TO CLEAR INT ENA
1563 6831 KSF /SKIP ON RECEIVE FLAG
1564 7410 SKP
1565 4427 ERROR /RECEIVE FLAG SET BY ABOVE CODE
1566 1041 TAD INTFLG /GET THE PROGRAM INTERRUPT FLAG
1567 7640 SZA CLA
1570 4427 ERROR /PROGRAM INTERRUPTED WITHOUT INT ENA SET
1571 6842 TCF /CLEAR TRANSMIT FLAG
1572 7410 SKP
1573 4427 ERROR /TCF SKIPPED
1574 6841 TSF /SKIP ON XMIT FLAG
1575 7410 SKP
1576 4427 ERROR /TCF + TP3 FAILED TO CLEAR XMIT FLAG
1577 6845 SPI /SKIP ON XMIT/RECEIVE + INT ENA ON A 1
1600 7610 SKP CLA
1601 4427 ERROR /SPI SKIPPED WITH XMIT FLAG + INT ENA A 2
1602 6831 KSF /SKIP ON RECEIVE FLAG
1603 7610 SKP CLA
1604 4427 ERROR /RECEIVE FLAG GOT SET BY ABOVE CODE
1605 1041 TAD INTFLG /GET THE PROGRAM INTERRUPT FLAG
1606 7640 SZA CLA
1607 4427 ERROR /PROGRAM INTERRUPTED WITHOUT INT ENA + FLAG
1610 4424 DONLOP /REPEAT TEST IF NOT DONE OR LOOP ON TEST IF SR2=1

```

```

/*****
/TEST 24 = CHECKS THAT CAF WILL CLEAR THE TRANSMIT FLAG, THE PROGRAM
/CHECKS THAT NO INTERRUPTS OCCURRED,
/*****

```

```

1611 4423 TEST24, LOOPPC /SETUP TEST COUNT AND SCOPE LOOPING ADDRESS
1612 7777 =1 /SIMULATOR ITERATION COUNTER
1613 4436 SIMCHK /CHECK TO SEE IF SIMULATOR IS SELECTED
1614 4000 4000 /CONTROL WORD FOR THE SIMULATOR
1615 4437 LOOSIM /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
/LOOP = THIS ADDRESS IF SIMULATOR SELECTED
/OTHERWISE SCOPE LOOP IS THIS ADDRESS +1
1616 3841 DCA INTFLG /CLEAR PROGRAM INTERRUPT FLAG
1617 6807 CAF

```

```

1620 4146 RTCENA /SET REAL TIME CLOCK INT ENA
1621 6801 ION /TURN THE INTERRUPT ON
1622 6835 KIE /CLEAR SLU INT ENA
1623 6840 TFL /SET THE TRANSMIT FLAG
1624 6841 TSF /SKIP ON THE XMIT FLAG
1625 4427 ERROR /TFL AND TP3 FAILED TO SET THE XMIT FLAG
1626 6845 SPI /SKIP ON XMIT/RECEIVE + INT ENA
1627 7410 SKP
1630 4427 ERROR /SPI SKIPPED WITHOUT INT ENA SET OR KIE FAILED
1631 6807 CAF /CLEAR ALL FLAGS
1632 6841 TSF /SKIP ON THE TRANSMIT FLAG
1633 7410 SKP
1634 4427 ERROR /BBUF INIT HIGH FAILED TO CLEAR XMIT FLAG
1635 1041 TAD INTFLG /GET THE PROGRAM INTERRUPT FLAG
1636 7640 SZA CLA
1637 4427 ERROR /PROGRAM INTERRUPTED CHECK INT ENA
1640 6831 KSF /SKIP ON RECEIVE FLAG
1641 7610 SKP CLA
1642 4427 ERROR /RECEIVE FLAG SET BY ABOVE CODE
1643 4424 DONLOP /REPEAT TEST IF NOT DONE OR LOOP IF SR2=1

```

```

/*****
/TEST 25 = CHECK THAT CAF WILL SET SLU INT ENABLE AND THAT KIE
/AND DATA 11 ON A 0 WILL CLEAR IT USING XMIT FLAG TO INTERRUPT ON,
/SPI IS CHECKED TO SKIP AND NOT TO SKIP,
/*****

```

```

1644 4423 TEST25, LOOPPC /SETUP TEST COUNT AND SCOPE LOOPING ADDRESS
1645 7777 =1 /SIMULATOR ITERATION COUNTER
1646 4436 SIMCHK /CHECK TO SEE IF SIMULATOR IS SELECTED
1647 4000 4000 /CONTROL WORD FOR THE SIMULATOR
1650 4437 LOOSIM /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
/LOOP = THIS ADDRESS IF SIMULATOR SELECTED
/OTHERWISE SCOPE LOOP IS THIS ADDRESS +1
1651 3841 DCA INTFLG /CLEAR PROGRAM INTERRUPT FLAG
1652 6807 CAF /CLEAR ALL FLAGS BUT SET SLU INTERRUPT ENABLE
1653 4146 RTCENA /SET REAL TIME CLOCK INT ENA
1654 6801 ION /TURN THE INTERRUPT ON
1655 6841 TSF /SKIP ON XMIT FLAG
1656 7410 SKP
1657 4427 ERROR /XMIT FLAG SET AFTER A CAF
1660 6845 SPI /SKIP ON XMIT/RECEIVE AND INT ENA ON A 1
1661 7410 SKP
1662 4427 ERROR /SPI SKIPPED WITH INT ENA SET AND NO FLAG
1663 1041 TAD INTFLG /GET THE PROGRAM INTERRUPT FLAG
1664 7640 SZA CLA
1665 4427 ERROR /PROGRAM INTERRUPTED WITHOUT XMIT FLAG
1666 6840 TFL /SET THE TRANSMIT FLAG
1667 6841 TSF /SKIP ON THE TRANSMIT FLAG
1670 4427 ERROR /TFL FAILED TO SET THE XMIT FLAG
1671 6845 SPI /SKIP ON XMIT FLAG AND INT ENA ON A 1
1672 4427 ERROR /CAF FAILED TO SET SLU INT ENA OR SPI DIDN'T SKIP
1673 2841 ISE INTFLG /OID THE PROGRAM INTERRUPT WITH XMIT + INT ENA
1674 4427 ERROR /PROGRAM FAILED TO INTERRUPT WITH XMIT + INT ENA SET
1675 7200 CLA /CLEAR THE ACCUMULATED

```

```

1676 6035 KIE /CLEAR INT ENA ON SLU
1677 3041 DCA INTFLG /CLEAR PROGRAM INTERRUPT FLAG;
1700 6001 ION /TURN THE INTERRUPT BACK ON
1701 6041 TSF /SKIP ON TRANSMIT FLAG
1702 4427 ERROR /XMIT FLAG GOT CLEARED
1703 6045 SPI /SKIP ON XMIT AND INT ENA ON A 1
1704 7410 SKP
1705 4427 ERROR /KIE AND DATA 11 FAILED TO CLEAR INT ENA
1706 1041 TAD INTFLG /GET THE PROGRAM INTERRUPT FLAG
1707 7640 SZA CLA
1710 4427 ERROR /PROGRAM INTERRUPTED WITHOUT INT ENA SET
1711 6042 TCF /CLEAR XMIT FLAG
1712 6041 TSF /SKIP ON TRANSMIT FLAG
1713 7410 SKP
1714 4427 ERROR /TCF FAILED TO CLEAR XMIT FLAG
1715 6031 KSF /SKIP ON RECEIVE FLAG
1716 7410 SKP
1717 4427 ERROR /RECEIVE FLAG GOT SET BY ABOVE CODE
1720 4424 DONLOP /REPEAT TEST IF NOT DONE OR LOOP IF SR2=1

```

/*****
 /TEST 26 = CHECKS THAT SLU INT ENA CAN BE SET AND CLEARD BY KIE
 /AND DATA BIT 11 USING THE XMIT FLAG TO INTERRUPT ON;
 /*****

```

1721 4423 TEST26, LOOPPC /SETUP TEST COUNT AND SCOPE LOOPING ADDRESS
1722 7777 =1 /SIMULATOR ITERATION COUNTER
1723 4436 SIMCHK /CHECK TO SEE IF SIMULATOR IS SELECTED
1724 4000 /CONTROL WORD FOR THE SIMULATOR
1725 4437 LODSIM /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
/LOOP = THIS ADDRESS IF SIMULATOR SELECTED
/OTHERWISE SCOPE LOOP IS THIS ADDRESS +1
1726 3041 DCA INTFLG /CLEAR PROGRAM INTERRUPT FLAG
1727 6007 CAF /CLEAR ALL FLAGS
1730 4146 RTCENA /SET REAL TIME CLOCK INT ENA
1731 6035 KIE /CLEAR SLU INTERRUPT ENABLE
1732 6001 ION /TURN THE INTERRUPT ON
1733 6040 TFL /SET THE TRANSMIT FLAG
1734 6041 TSF /SKIP ON TRANSMIT FLAG
1735 4427 ERROR /TFL FAILED TO SET TRANSMIT FLAG
1736 6045 SPI /SKIP ON XMIT/RECEIVE + INT ENA ON A 1
1737 7610 SKP CLA
1740 4427 ERROR /ERROR, INT ENA SET OR KIE FAILED TO CLEAR INT ENA
1741 1041 TAD INTFLG /GET THE PROGRAM INTERRUPT FLAG
1742 7640 SZA CLA
1743 4427 ERROR /PROGRAM INTERRUPTED WITHOUT INT ENA SET
1744 7301 CLA CLL IAC /SET DATA 11 TO A 1
1745 6035 KIE /SET INT ENA
1746 6041 TSF /SKIP ON TRANSMIT FLAG
1747 4427 ERROR /XMIT FLAG GOT CLEARED
1750 6045 SPI /SKIP ON XMIT + INT ENA ON A 1
1751 4427 ERROR /KIE AND DATA 11 ON A 1 FAILED TO SET INT ENA
1752 7200 CLA
1753 2041 ISZ INTFLG
1754 4427 ERROR /PROGRAM FAILED TO INTERRUPT WITH INT ENA + XMIT FLAG

```

```

1755 3041 DCA INTFLG
1756 6035 KIE /CLEAR INTERRUPT ENABLE
1757 6001 ION /TURN THE INTERRUPT ON
1760 6041 TSF /SKIP ON XMIT FLAG
1761 4427 ERROR /XMIT FLAG CLEARED
1762 6045 SPI /SKIP ON XMIT + INT ENA ON A 1
1763 7610 SKP CLA
1764 4427 ERROR /KIE + DATA 11 ON A 0 FAILED TO CLEAR INT ENA
1765 1041 TAD INTFLG /GET THE PROGRAM INTERRUPT FLAG
1766 7640 SZA CLA
1767 4427 ERROR /PROGRAM INTERRUPTED WITHOUT INT ENA SET
1770 6042 TCF /CLEAR THE XMIT FLAG
1771 6041 TSF /SKIP ON SLU XMIT FLAG
1772 7610 SKP CLA
1773 4427 ERROR /TCF FAILED TO CLEAR XMIT FLAG
1774 6031 KSF /SKIP ON RECEIVE FLAG
1775 7610 SKP CLA
1776 4427 ERROR /RECEIVE FLAG SET BY ABOVE CODE
1777 4424 DONLOP /REPEAT TEST IF NOT DONE OR LOOP IF SR2=1

```

/*****
 /TEST 27 = CHECKS THAT TLS WILL CLEAR THE XMIT FLAG AND THEN SET IT WITH
 /XMIT BUFF MT H, THE PROGRAM THEN CLEARS THE XMIT FLAG AND WAITS FOR
 /RCV DATA AVAILABLE W TO SET RECEIVE FLAG, THE RECEIVE FLAG IS CHECKED TO
 /SKIP AND INTERRUPT AND THEN TO CLEAR BY KCF,
 /*****

```

2000 1021 TAD OP1SEL /GET THE HARDWARE CONFIGURATION
2001 0377 AND (100 /MASK OUT THE XOR BIT
2002 7650 SNA CLA /IS IT RUNNING ON THE XOR
2003 5212 JMP TEST27 /NO, GO TO THE NORMAL TEST
2004 4423 LOOPPC /YES, SETUP TEST COUNT AND SCOPE LOOP
2005 7777 =6 /SIMULATOR ITERATION COUNTER
2006 4436 SIMCHK /CHECK TO SEE IF SIMULATOR SELECTED;
2007 4030 /CONTROL WORD FOR THE SIMULATOR
2008 4437 LODSIM /LOAD SIMULATOR+MUST BE SET FOR XOR
2009 5217 JMP TEST27+5 /START TEST
2010 4423 TEST27, LOOPPC /SETUP TEST COUNT AND SCOPE LOOPING ADDRESS
2011 7740 =40 /SIMULATOR ITERATION COUNTER
2012 4436 SIMCHK /CHECK TO SEE IF SIMULATOR IS SELECTED
2013 4000 /CONTROL WORD FOR THE SIMULATOR
2014 4437 LODSIM /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
/LOOP = THIS ADDRESS IF SIMULATOR SELECTED
/OTHERWISE SCOPE LOOP IS THIS ADDRESS +1
2017 3041 DCA INTFLG /CLEAR PROGRAM INTERRUPT FLAG
2020 6007 CAF /CLEAR ALL FLAGS BUT SET SLU INT ENA
2021 4146 RTCENA /SET REAL TIME CLOCK INT ENA
2022 6001 ION /TURN THE INTERRUPT ON
2023 6040 TFL /SET THE TRANSMIT FLAG
2024 6041 TSF /SKIP ON XMIT FLAG
2025 4427 ERROR /TRANSMIT FLAG FAILED TO SET BY TFL
2026 6045 SPI /SKIP ON XMIT FLAG AND INT ENA ON A 1
2027 4427 ERROR /SPI FAILED TO SKIP WITH INT ENA + FLAG SET
2030 2041 ISZ INTFLG /DID THE PROGRAM INTERRUPT
2031 4427 ERROR /PROGRAM FAILED TO INTERRUPT WITH XMIT AND INT ENA SET

```

```

2832 6846      TLS
2833 7618      SKP CLA
2834 4427      ERROR
2835 6881      ION
2836 6841      TSP
2837 7618      SKP CLA
2840 4427      ERROR
2841 4431      TSPHAT
2842 4427      ERROR
2843 2841      ISE INTFLG
2844 4427      ERROR
2845 6845      SPI
2846 4427      ERROR
2847 6842      TCF
2850 6881      ION
2851 4432      KSFHAT
2852 4427      ERROR
2853 6845      SPI
2854 4427      ERROR
2855 2841      ISE INTFLG
2856 4427      ERROR
2857 6838      KCF
2858 7618      SKP CLA
2861 4427      ERROR
2862 6881      ION
2863 6831      KSF
2864 7618      SKP CLA
2865 4427      ERROR
2866 1841      TAD INTFLG
2867 7640      SEA CLA
2870 4427      ERROR
2871 6841      TSP
2872 7618      SKP CLA
2873 4427      ERROR
2874 4424      DONLOP

/LOAD TRANSMIT BUFFER, TRANSMIT AND CLEAR XMIT FLAG
/TLS SKIPPED
/TURN THE INTERRUPT ON
/SKIP ON THE TRANSMIT FLAG
/TLS FAILED TO CLEAR XMIT FLAG
/WAIT FOR TRANSMIT FLAG TO SET
/XMIT BUFF MT FAILED TO SET XMIT FLAG
/DID THE PROGRAM INTERRUPT?
/ERROR, NO INTERRUPT WITH XMIT AND INT ENA SET
/SKIP ON SLU INTERRUPT (XMIT SIDE)
/FAILED TO SKIP OR INT ENA OR FLAG GOT CLEARED
/CLEAR TRANSMIT FLAG
/TURN THE INTERRUPT ON
/WAIT FOR THE RECEIVE FLAG TO SET
/NO SKIP, OR RECEIVE FLAG NOT SET BY RCD DATA AVAILABLE
/SKIP ON RCV FLAG AND INT ENA
/8 SIDE OF RCV FLAG NOT LOW OR FAILED TO INTERRUPT
/DID RCV AND INT ENA CAUSE AN INTERRUPT?
/NO, ERROR
/CLEAR RECEIVE FLAG
/KCF SKIPPED
/TURN THE INTERRUPT ON
/SKIP ON RECEIVE FLAG
/KCF + TP3 FAILED TO CLEAR RECEIVE FLAG
/GET THE PROGRAM INTERRUPT FLAG
/PROGRAM INTERRUPTED WITH RCV FLAG CLEARED
/SKIP ON XMIT FLAG
/TRANSMIT FLAG GOT RESET BY ABOVE CODE
/REPEAT TEST IF NOT DONE OR SCOPE LOOP IF SR2=1

```

```

/*****
/TEST 28 = CHECKS THAT TPC WILL NOT CLEAR XMIT FLAG AND THAT IT WILL
/RESET IT, TEST 28 ALSO CHECKS THAT THE RECEIVE FLAG WILL SET AND THAT IT
/CAN BE CLEARED BY KCC;
/*****

```

```

2875 1021      TAD      OP1SEL      /GET THE HARDWARE CONFIGURATION
2876 0377      AND      1100      /MASK OUT THE XOR BIT
2877 7658      SNA      CLA      /IS THE XOR SELECTED
2880 5307      JMP      TEST28      /NO, DO THE NORMAL TEST
2881 4428      LOOPPC      /YES=SETUP TEST COUNT AND SCOPE LOOP
2882 7772      =6          /SIMULATOR ITERATION COUNTER
2883 4436      SIMCHK      /CHECK TO SEE IF SIMULATOR SELECTED
2884 4818      4818        /CONTROL WORD FOR SIMULATOR
2885 4437      LODSIM      /LOAD SIMULATOR CONTROL WORD
2886 5314      JMP      TEST28+5 /START THE TEST
2887 4423      TEST28, LOOPPC      /SETUP TEST COUNT AND SCOPE LOOPING ADDRESS
2888 7740      =48          /SIMULATOR ITERATION COUNTER
2889 4436      SIMCHK      /CHECK TO SEE IF SIMULATOR IS SELECTED

```

```

2112 4888      4888      /CONTROL WORD FOR THE SIMULATOR
2113 4437      LODSIM      /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
2114 3841      DCA INTFLG /LOOP = THIS ADDRESS IF SIMULATOR SELECTED
2115 6887      CAF          /OTHERWISE SCOPE LOOP IS THIS ADDRESS +1
2116 4146      RTCEA        /CLEAR PROGRAM INTERRUPT
2117 6881      ION          /CLEAR ALL FLAGS BUT SET SLU INT ENA
2118 6840      TFL          /SET REAL TIME CLOCK INT ENA
2119 6841      TSP          /TURN THE INTERRUPT ON
2122 4427      ERROR      /SET THE TRANSMIT FLAG
2123 2841      ISE INTFLG /SKIP ON TRANSMIT FLAG
2124 4427      ERROR      /TFL FAILED TO SET XMIT FLAG
2125 6844      TPC          /PROGRAM FAILED TO INTERRUPT
2126 7618      SKP CLA      /LOAD TRANSMIT BUFFER AND TRANSMIT
2127 4427      ERROR
2130 6841      TSP          /TPC SKIPPED
2131 4427      ERROR      /SKIP ON XMIT FLAG
2132 6842      TCF          /TPC CLEARED XMIT FLAG
2133 6881      ION          /CLEAR TRANSMIT FLAG
2134 4431      TSPHAT      /TURN THE INTERRUPT BACK ON
2135 4427      ERROR      /WAIT FOR XMIT BUFF MT H TO SET XMIT FLAG
2136 2841      ISE INTFLG /TPC FAILED TO SET XMIT FLAG
2137 4427      ERROR      /CHECK TO SEE IF PROGRAM INTERRUPTED
2140 6842      TCF          /PROGRAM FAILED TO INTERRUPT WITH XMIT FLAG + INT ENA
2141 6881      ION          /CLEAR THE TRANSMIT FLAG
2142 4432      KSFHAT      /TURN THE INTERRUPT ON
2143 4427      ERROR      /WAIT FOR RECEIVE FLAG TO SET
2144 6845      SPI          /RECEIVE FLAG FAILED TO SET BY A TPC COMMAND
2145 4427      ERROR      /SKIP ON RCV FLAG AND INT ENA
2146 2841      ISE INTFLG /FAILED TO SKIP
2147 4427      ERROR      /DID THE PROGRAM INTERRUPT
2150 6832      KCC          /CHECKED TO INTERRUPT WITH RCV AND INT ENA SET
2151 7618      SKP CLA      /CLEAN THE RECEIVE FLAG
2152 4427      ERROR
2153 6881      ION          /KCC SKIPPED
2154 6831      KSF          /TURN THE INTERRUPT ON
2155 7618      SKP CLA      /SKIP ON RECEIVE FLAG
2156 4427      ERROR
2157 1841      TAD INTFLG /KCC FAILED TO CLEAR RCV FLAG
2160 7640      SEA CLA      /GET THE PROGRAM INTERRUPT FLAG
2161 4427      ERROR
2162 4424      DONLOP      /PROGRAM INTERRUPTED WITH RCV FLAG CLEARED
2163 5776      JMP      TEST29 /REPEAT TEST IF NOT DONE OR LOOP ON TEST IF SR2=1

2176 2200
2177 2100
2178 2200

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IFDEF OP13K <PAGE>

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```

/*****
/TEST 29 = CHECKS THAT KRB WILL CLEAR THE RCV FLAG, THE RCV FLAG
/IS SET BY ISSUING TLS COMMAND;
/*****

```

```

/*****
2200 4423 TEST29, LOOPPC /SETUP TEST COUNT AND SCOPE LOOPING ADDRESS
2201 7775 =3 /SIMULATOR ITERATION COUNTER
2202 4104 JMS PATCH /SET UP SKIP CHAIN
2203 3252 SKPCHN
2204 3042 DCA CLKFLG /SET INTERRUPT TO IGNORE RTC
2205 4436 SIMCHK /CHECK TO SEE IF SIMULATOR IS SELECTED
2206 4017 4017 /CONTROL WORD FOR THE SIMULATOR
2207 4437 LODSIM /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
/LOOP = THIS ADDRESS IF SIMULATOR SELECTED
/OTHERWISE SCOPE LOOP IS THIS ADDRESS +1
2210 3041 DCA INTFLG /CLEAR PROGRAM INTERRUPT FLAG
2211 6007 CAF /CLEAR ALL FLAGS AND SET SLU INT ENA
2212 4146 RTCENA /SET REAL TIME CLOCK INT ENA
2213 6001 ION /TURN THE INTERRUPT ON
2214 6046 TLS /TRANSMIT AND CLEAR THE FLAG
2215 4431 TSFWAT /WAIT FOR THE XMIT FLAG TO SET
2216 4427 ERROR /XMIT FLAG FAILED TO SET BY TLS
2217 2041 ISE INTFLG /DID THE PROGRAM INTERRUPT
2220 4427 ERROR /FAILED TO INTERRUPT WITH INT ENA AND XMIT FLAG
2221 6042 TCF /CLEAR XMIT FLAG
2222 6001 ION /TURN THE INTERRUPT ON
2223 4432 KSFWAT /WAIT FOR THE RCV FLAG TO SET
2224 4427 ERROR /RECEIVE FLAG FAILED TO SET
2225 6034 KRS /READ THE RECEIVE BUFFER
2226 7610 SKP CLA
2227 4427 ERROR /KRS SKIPPED
2230 6031 KSF /SKIP ON RECEIVE FLAG
2231 4427 ERROR /KRS CLEARED THE RCV FLAG
2232 2041 ISE INTFLG /DID THE PROGRAM INTERRUPT
2233 4427 ERROR /FAILED TO INTERRUPT WITH INT ENA + RCV FLAG
2234 6036 KRB /CLEAR RECEIVE FLAG
2235 7610 SKP CLA
2236 4427 ERROR /KRB SKIPPED
2237 6001 ION /TURN THE INTERRUPT BACK ON
2240 6031 KSF /SKIP ON RECEIVE FLAG
2241 7610 SKP CLA
2242 4427 ERROR /KRB FAILED TO CLEAR RECEIVE FLAG
2243 1041 TAD INTFLG /GET THE PROGRAM INTERRUPT FLAG
2244 7640 SZA CLA
2245 4427 ERROR /PROGRAM INTERRUPTED WITHOUT RCV FLAG SET
2246 4424 DONLOP /REPEAT TEST IF NOT DONE OR LOOP IF SR2=1
*****/
/TEST 30 = CHECKS THAT CAF WILL CLEAR RCV FLAG
/*****

```

```

2247 4423 TEST30, LOOPPC /SETUP TEST COUNT AND SCOPE LOOPING ADDRESS
2250 7775 =3 /SIMULATOR ITERATION COUNTER
2251 4436 SIMCHK /CHECK TO SEE IF SIMULATOR IS SELECTED
2252 4017 4017 /CONTROL WORD FOR THE SIMULATOR
2253 4437 LODSIM /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
/LOOP = THIS ADDRESS IF SIMULATOR SELECTED
/OTHERWISE SCOPE LOOP IS THIS ADDRESS +1

```

```

2254 3041 DCA INTFLG /CLEAR PROGRAM INTERRUPT FLAG
2255 6007 CAF /CLEAR ALL FLAGS
2256 4146 RTCENA /SET REAL TIME CLOCK INT ENA
2257 6001 ION /TURN THE INTERRUPT ON
2258 6046 TLS /TRANSMIT AND CLEAR THE XMIT FLAG
2261 4431 TSFWAT /WAIT FOR XMIT FLAG
2262 4427 ERROR /XMIT FLAG FAILED TO SET
2263 2041 ISE INTFLG /DID THE PROGRAM INTERRUPT?
2264 4427 ERROR /PROGRAM FAILED TO INTERRUPT
2265 6042 TCF /CLEAR TRANSMIT FLAG
2266 6001 ION
2267 4432 KSFWAT /WAIT FOR RECEIVE FLAG
2270 4427 ERROR /RECEIVE FLAG FAILED TO SET
2271 2041 ISE INTFLG /DID THE PROGRAM INTERRUPT
2272 4427 ERROR /PROGRAM FAILED TO INTERRUPT
2273 6007 CAF /CLEAR ALL FLAGS
2274 6001 ION /TURN THE INTERRUPT BACK ON
2275 6031 KSF /SKIP ON RECEIVE FLAG
2276 7610 SKP CLA
2277 4427 ERROR /INITIALIZE FAILED TO CLEAR RECEIVE FLAG
2300 4424 DONLOP /REPEAT TEST IF NOT DONE OR LOOP IF SR2=1

```

/*****
/TEST 31 = CHECKS THE EFFECT OF THE SLU IOT'S UPON THE AC
/*****

```

2301 4423 TEST31, LOOPPC /SETUP TEST COUNT AND SCOPE LOOPING ADDRESS
2302 7777 =1 /SIMULATOR ITERATION COUNTER
2303 4436 SIMCHK /CHECK TO SEE IF SIMULATOR IS SELECTED
2304 4007 4007 /CONTROL WORD FOR THE SIMULATOR
2305 4437 LODSIM /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
/LOOP = THIS ADDRESS IF SIMULATOR SELECTED
/OTHERWISE SCOPE LOOP IS THIS ADDRESS +1
2306 3041 DCA INTFLG /CLEAR PROGRAM INTERRUPT FLAG
2307 6007 CAF /CLEAR ALL FLAGS
2310 4146 RTCENA /SET REAL TIME CLOCK INT ENA
2311 6001 ION /TURN THE INTERRUPT ON
2312 7344 CLA CLL CMA RAL /SET THE AC TO -2
2313 6035 KIE /CLEAR SLU INTERRUPT ENABLE
2314 7050 CMA RAR
2315 7620 SNL CLA
2316 4427 ERROR /KIE CHANGED THE AC
2317 7240 CLA CMA
2320 6032 KCC /CLEAR RECEIVE FLAG AND AC
2321 7640 SZA CLA
2322 4427 ERROR /KCC FAILED TO CLEAR THE AC
2323 7240 CLA CMA
2324 6036 KRB /READ RECEIVE FLAG, CLEAR AC AND READ RECEIVE BUFFER
2325 7510 SPA
2326 4427 ERROR /KRB FAILED TO CLEAR AC
2327 7240 CLA CMA
2330 6034 KRS /READ RECEIVE BUFFER = INCLUSIVE OR WITH AC
2331 7040 CMA /SET THE AC BACK TO 2
2332 7640 SZA CLA
2333 4427 ERROR /KRS CHANGED THE AC

```

2334	7340	CLA CLL CMA	
2335	8031	KSF	/SKIP ON RECEIVE FLAG
2336	7040	CMA	
2337	7040	SEA CLA	
2340	4427	ERROR	/KSF CHANGED THE AC
2341	7240	CLA CMA	
2342	8030	KCF	/CLEAR RECEIVE FLAG
2343	7040	CMA	
2344	7640	SEA CLA	
2345	4427	ERROR	/KCF CHANGED THE AC
2346	7240	CLA CMA	
2347	8040	TFL	/SET TRANSMIT FLAG
2350	7040	CMA	
2351	7640	SEA CLA	
2352	4427	ERROR	/TFL CHANGED THE AC
2353	7240	CLA CMA	
2354	8042	TCF	/CLEAR THE TRANSMIT FLAG
2355	7040	CMA	
2356	7640	SEA CLA	
2357	4427	ERROR	/TCF CHANGED THE AC
2360	7240	CLA CMA	
2361	8041	TSF	/SKIP ON TRANSMIT FLAG
2362	7040	CMA	
2363	7640	SEA CLA	
2364	4427	ERROR	/TSF CHANGED THE AC
2365	7240	CLA CMA	
2366	8044	TPC	/LOAD TRANSMIT BUFFER AND TRANSMIT
2367	7040	CMA	
2370	7640	SEA CLA	
2371	4427	ERROR	/TPC CHANGED THE AC
2372	4431	TSFWAT	/WAIT FOR THE TRANSMIT FLAG
2373	4427	ERROR	/TRANSMIT FLAG FAILED TO SET
2374	4432	KSFHAT	/WAIT FOR THE RECEIVE FLAG
2375	4427	ERROR	/RECEIVE FLAG FAILED TO SET
2376	8042	TCF	/CLEAR THE XMIT FLAG
2377	8030	KCF	/CLEAR THE RECEIVE FLAG
2400	7240	CLA CMA	
2401	8045	SPI	/SKIP IF XMIT/RCV FLAG SET AND INT ENA SET
2402	7040	CMA	
2403	7640	SEA CLA	
2404	4427	ERROR	/SPI CHANGED THE AC
2405	7240	CLA CMA	
2406	8046	TLS	/LOAD TRANSMIT BUFFER, TRANSMIT + CLEAR FLAG
2407	7040	CMA	
2410	7640	SEA CLA	
2411	4427	ERROR	/TLS CHANGED THE AC
2412	4431	TSFWAT	/WAIT FOR THE TRANSMIT FLAG
2413	4427	ERROR	/TRANSMIT FLAG FAILED TO SET
2414	4432	KSFHAT	/WAIT FOR THE RECEIVE FLAG TO SET
2415	4427	ERROR	/ERROR RECEIVE FLAG FAILED TO SET
2416	8042	TCF	/CLEAR THE TRANSMIT FLAG
2417	8032	KCF	/CLEAR AC AND RECEIVE FLAG
2420	1041	TAD INTFLG	/DID THE PROGRAM INTERRUPT?
2421	7640	SEA CLA	
2422	4427	ERROR	/PROGRAM INTERRUPTED WITHOUT INT ENA SET

2423	4424	DONLOP	/REPEAT TEST IF NOT DONE OR LOOP IF SR2=1
/*****			
/TEST 32 - CHECKS THAT ALL ZEROES CAN BE TRANSMITTED AND READ BACK IN			
/*****			
2424	4423	TEST32, LOOPPC	/SETUP TEST COUNT AND SCOPE LOOP ADDRESS
2425	7775	-3	/SIMULATOR ITERATION COUNTER
2426	4436	SIMCHK	/CHECK TO SEE IF SIMULATOR IS SELECTED
2427	4017	4017	/CONTROL WORD FOR THE SIMULATOR
2430	4437	LOADSIM	/LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
			/LOOP = THIS ADDRESS IF SIMULATOR SELECTED
			/OTHERWISE SCOPE LOOP IS THIS ADDRESS +1
			/CLEAR PROGRAM INTERRUPT FLAG
2431	3041	DCA INTFLG	/CLEAR THE WORD TO BE TRANSMITTED
2432	3053	DCA SLUXMT	/GO TRANSMIT, READ AND COMPARE THE WORD
2433	4433	SLUDAT	/DATA ERROR-WORD WAS NON ZERO BEING READ BACK
2434	4434	SLUDER	/REPEAT TEST IF NOT DONE OR LOOP IF SR2=1
2435	4424	DONLOP	
/*****			
/TEST 33 - CHECKS THAT ALL ONES CAN BE TRANSMITTED AND READ BACK			
/*****			
2436	4423	TEST33, LOOPPC	/SETUP TEST COUNT AND SCOPE LOOP ADDRESS
2437	7775	-3	/SIMULATOR ITERATION COUNTER
2440	4436	SIMCHK	/CHECK TO SEE IF SIMULATOR IS SELECTED
2441	4017	4017	/CONTROL WORD FOR THE SIMULATOR
2442	4437	LOADSIM	/LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
			/LOOP = THIS ADDRESS IF SIMULATOR SELECTED
			/OTHERWISE SCOPE LOOP IS THIS ADDRESS +1
			/CLEAR PROGRAM INTERRUPT FLAG
2443	3041	DCA INTFLG	/SET THE WORD TO BE TRANSMITTED TO ALL ONE'S
2444	1056	TAD K377	/GO TRANSMIT, READ AND COMPARE
2445	3053	DCA SLUXMT	/DATA ERROR - WORDS DO NOT COMPARE
2446	4433	SLUDAT	/REPEAT TEST IF NOT DONE OR LOOP IF SR2=1
2447	4434	SLUDER	
2450	4424	DONLOP	
/*****			
/TEST 34 - CHECKS THAT A COMPLEMENTING PATTERN (700-377) CAN BE			
/TRANSMITTED AND READ BACK;			
/*****			
2451	4423	TEST34, LOOPPC	/SETUP TEST COUNT AND SCOPE LOOPING ADDRESS
2452	7775	-3	/SIMULATOR ITERATION COUNTER
2453	4436	SIMCHK	/CHECK TO SEE IF SIMULATOR IS SELECTED
2454	4017	4017	/CONTROL WORD FOR THE SIMULATOR
2455	4437	LOADSIM	/LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
			/LOOP = THIS ADDRESS IF SIMULATOR SELECTED
			/OTHERWISE SCOPE LOOP IS THIS ADDRESS +1
			/CLEAR PROGRAM INTERRUPT FLAG
2456	3041	DCA INTFLG	/CLEAR THE WORD TO BE TRANSMITTED
2457	3053	DCA SLUXMT	/GO TRANSMIT READ AND COMPARE THE WORD
2460	4433	SLUDAT	/DATA ERROR - TRANSMITTING ZEROES
2461	4434	SLUDER	
2462	1056	TAD K377	


```

2463 3853      DCA SLUXMT      /SET THE WORD TO TRANSMIT EQUAL TO 377
2464 4433      SLUPAT          /TRANSMIT, READ AND COMPARE THE WORD
2465 4434      SLUDER          /DATA ERROR = WHILE TRANSMITTING 377
2466 4424      DONLOP          /REPEAT TEST IF NOT DONE OR LOOP IF SR2=1

```

```

/*****
/TEST 35 - CHECKS THAT A COMPLEMENTING PATTERN (252=125) CAN BE
/TRANSMITTED AND READ BACK;
/*****/

```

```

2467 4423      TEST39, LOOPPC      /SETUP TEST COUNT AND SCOPE LOOPING ADDRESS
2470      7775      =3          /SIMULATOR ITERATION COUNTER
2471 4436      SIMCHK          /CHECK TO SEE IF SIMULATOR IS SELECTED
2472 4007      4007          /CONTROL WORD FOR THE SIMULATOR
2473 4437      LODSIM          /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
                                /LOOP = THIS ADDRESS IF SIMULATOR SELECTED
                                /OTHERWISE SCOPE LOOP IS THIS ADDRESS *1
2474 3041      DCA INTFLG      /CLEAR PROGRAM INTERRUPT FLAG
2475 1060      TAD K252
2476 3093      DCA SLUXHT      /SET THE TRANSMIT WORD TO 252
2477 4433      SLUDAT          /TRANSMIT, READ AND COMPARE THE WORD
2500 4434      SLUDER          /DATA ERROR = TRANSMITTED A 252
2501 1061      TAD K125
2502 3093      DCA SLUXHT      /SET TRANSMIT WORD TO 125
2503 4433      SLUDAT          /TRANSMIT, READ AND COMPARE THE WORD
2504 4434      SLUDER          /DATA ERROR = TRANSMITTED A 125
2505 4424      DONLOP          /REPEAT TEST IF NOT DONE OR LOOP IF SR2=1

```

```

/*****
/TEST 36 - CHECKS FOR LOADING AND READING A BINARY COUNT PATTERN.
/*****/

```

```

2506 4423 TEST36, 00PPC /SETUP TEST LOOP ADDRESS
2507 7777 -1 /SIMULATOR ITERATION COUNTER
2510 1056 TAD K377
2511 7041 CIA
2512 3050 DCA SAVCNT /SETUP COUNTER TO TRANSMIT 377 TIMES
2513 1050 TAD SAVCNT
2514 3047 DCA TSTCNT
2515 4436 SIMCHK /CHECK FOR THE SIMULATOR
2516 4007 4007 /CONTROL WORD FOR THE SIMULATOR
2517 4437 LODSIM /LOAD THE SIMULATOR IF SELECTED
2520 1047 TAD TSTCNT /GET THE WORD TO BE TRANSMITTED
2521 0056 AND K377 /MASK OFF THE 8 BITS
2522 3053 DCA SLUXMT /SET TRANSMIT WORD TO THIS NUMBER
2523 4433 SLUDAT /TRANSMIT READ AND COMPARE THE WORD
2524 4434 SLUDER /DATA ERROR=
2525 4424 DONLOP /REPEAT TEST IF NOT DONE OR LOOP IF SR2=

```

```

/*****
/TEST 37 - CHECKS FOR LOADING AND READING A BINARY COUNT PATTERN WITHOUT
/THE SLU INTERRUPT ENABLE SET TO SAVE TIME IN SKIP CHAIN SO THAT THE
/WORD CAN BE READ FASTER

```

```

/*****
2526 4423 TEST37, LOOPPC /SET UP TEST COUNT AN TEST LOOP ADDRESS
2527 7777 /SIMULATOR ITERATION COUNTER
2530 1056 TAD K377 /SETUP COUNTER TO TRANSMIT 377 TIMES
2531 7041 CIA
2532 3050 DCA SAVCNT
2533 1050 TAD SAVCNT
2534 3047 DCA TSTCNT
2535 4436 SIMCHK /CHECK TO SEE IF SIMULATOR IS SELECTED
2536 4017 4017 /SIMULATOR CONTROL WORD
2537 4437 /LOAD THE SIMULATOR CONTROL WORD
2540 6007 CAF /CLEAR ALL FLAGS
2541 4146 RTCENA /SET REAL TIME CLOCK INT ENA
2542 6001 ION /TURN THE INTERRUPT ON
2543 3041 DCA INTFLG /CLEAR PROGRAM INTERRUPT FLAG
2544 6035 KIE /CLEAR SLU INT ENABLE
2545 1047 TAD TSTCNT /GET THE TEST COUNT NUMBER
2546 3056 AND K377 /MASK OUT FOR 8 BITS
2547 3053 DCA SLUXHT /SAVE THE WORD TO BE TRANSMITTED
2550 1053 TAD SLUXHT /GET THE WORD
2551 6046 TLS /TRANSMIT IT
2552 4431 TSFWAT /WAIT FOR THE TRANSMIT FLAG TO SET
2553 4427 ERROR /TRANSMIT FLAG FAILED TO SET
2554 6042 TCF /CLEAR THE TRANSMIT FLAG
2555 4432 KSFWAT /WAIT FOR THE RECEIVE FLAG TO SET
2556 4427 ERROR /RECEIVE FLAG FAILED TO SET
2557 7240 CLA CMA /SET THE AC TO ALL ONES
2560 6036 KRB /READ THE WORD
2561 3054 DCA SLUREC /SAVE THE WORD READ
2562 1053 TAD SLUXHT /COMPARE THE WORD TRANSMITTED WITH THE WORD READ
2563 7041 CIA
2564 1054 TAD SLUREC
2565 7640 SZA CLA /ARE THEY EQUAL?
2566 4434 SLUDER /NO DATA ERROR ON SERIAL LINE UNIT
2567 1041 TAD INTFLG /GET THE PROGRAM INTERRUPT FLAG
2570 7640 SZA CLA
2571 4427 ERROR /PROGRAM INTERRUPTED WITHOUT INT ENA
2572 4424 DONLOP /DONE? OR REPEAT TEST IF SR2=1
2573 7000 NOP
2574 7000 NOP

2575 1021 TAD OP1SEL /GET THE HARDWARE CONFIGURATION
2576 6057 AND K200 /CHECK FOR THE SIMULATOR
2577 7656 SNA CLA /IS IT SELECTED
2602 5602 JMP I ,+2 /NO, GO DO INTERACTION TEST
2601 5203 JMP TEST38 /YES, GO DO SIMULATOR TEST
2602 3124 TEST42 /INTERACTION TEST
*****/

```

```

*****
/THIS TEST IS ENTERED WHEN SIMULATOR IS SELECTED,
/TEST 38 - CHECKS THAT READER RUN CAN BE SET BY KCC AND KRB AND
/CLEARED BY INITIALIZE, THE SIMULATOR IS USED TO CHECK THAT READER
/RUN SETS AND CLEARS.

```

```

*****
2603 4423 TEST38, LOOPPC /SETUP TEST COUNT AND TEST LOOP ADDRESS
2604 7777 =1 /SIMULATOR ITERATION COUNT
2605 4436 SIMCHK /CHECK FOR SIMULATOR
2606 4000 4000 /SIMULATOR CONTROL WORD
2607 4437 LODSIM /LOAD THE SIMULATOR CONTROL WORD
2610 6007 CAF /CLEAR ALL
2611 4146 RTCEA /SET REAL TIME CLOCK INT ENA
2612 3041 DCA INTFLG /CLEAR THE PROGRAM INTERRUPT FLAG
2613 4104 JMS PATCH
2614 3252 SKPCHN
2615 6001 ION /TURN THE INTERRUPT ON
2616 6156 CLRDET /CLEAR READER RUN DETECTOR FLIP-FLOP
2617 6157 SKPRDR /SKIP ON READER RUN F/F SET
2620 7610 SKP CLA
2621 4427 ERROR /READER RUN IS SET AFTER A INITIALIZE
2622 6032 KCC /CLEAR RECEIVE FLAG AND SET READER RUN
2623 6157 SKPRDR /SKIP ON READER RUN SET
2624 4427 ERROR /KCC FAILED TO SET READER RUN
2625 6007 CAF /CLEAR ALL INCLUDING READER RUN F/F
2626 4146 RTCEA /SET REAL TIME CLOCK INT ENA
2627 6001 ION /TURN THE INTERRUPT BACK ON
2630 6156 CLRDET /CLEAR READER RUN DETECTOR F/F
2631 6157 SKPRDR /SKIP ON READER RUN SET
2632 7410 SKP
2633 4427 ERROR /INITIALIZE FAILED TO CLEAR READER RUN
2634 6036 KRB /CLEAR AC AND RECEIVE FLAG AND SET READER RUN
2635 7300 CLA
2636 6157 SKPRDR CLC
2637 4427 ERROR /SKIP ON READER RUN DETECTOR F/F SET
2640 6007 CAF /KRB FAILED TO SET READER RUN
2641 4146 RTCEA /CLEAR ALL INCLUDING READER RUN F/F
2642 6001 ION /SET REAL TIME CLOCK INT ENA
2643 6156 CLRDET /TURN THE INTERRUPT ON
2644 6157 SKPRDR /CLEAR READER RUN DETECTOR F/F
2645 7610 SKP CLA
2646 4427 ERROR /INITIALIZE FAILED TO CLEAR READER RUN
2647 1041 TAD INTFLG /GET THE PROGRAM INTERRUPT FLAG
2650 7640 SZA CLA
2651 4427 ERROR /PROGRAM INTERRUPTED
2652 4424 DONLOP /DONE OR REPEAT TEST IF SR2=1
*****

```

/*****
 /THIS TEST IS ENTERED WHEN SIMULATOR IS SELECTED.
 /TEST 39 - CHECKS THAT READER RUN WILL CLEAR AFTER A WORD HAS BEEN TRANSMITTED
 /AND DATA LOOPS BACK INTO THE RECEIVE BUFFERS USING THE 20 MA CURRENT
 /LOOP FOR 110 BAUD TO 9600 BAUD,
 /*****

```

2653 4423 TEST39, LOOPPC /SETUP TEST COUNT AND TEST LOOP ADDRESS
2654 7771 =7 /SIMULATOR ITERATION COUNTER
2655 4436 SIMCHK /CHECK FOR SIMULATOR
2656 4000 4000 /SIMULATOR CONTROL WORD

```

```

2660 6007 LODSIM /LOAD THE SIMULATOR
2661 4146 CAF /CLEAR ALL FLAGS
2662 6001 ION /SET REAL TIME CLOCK INT ENA
2663 6035 KIE /TURN THE INTERRUPT ON
2664 6156 CLRDET /DISABLE SLU INT ENABLE
2665 6157 SKPRDR /CLEAR READER RUN
2666 7610 SKP CLA
2667 4427 ERROR /READER RUN FAILED TO CLEAR BY INIT
2670 6032 KCC /SET READER RUN
2671 6157 SKPRDR /SKIP ON READER RUN DETECTOR F/F SET
2672 4427 ERROR /KCC FAILED TO SET READER RUN
2673 6046 TFS /TRANSMIT
2674 4431 TSPHAT /WAIT FOR THE TRANSMIT FLAG
2675 4427 ERROR /TRANSMIT FLAG FAILED TO SET
2676 6042 TCF /CLEAR THE TRANSMIT FLAG
2677 4432 KSPHAT /WAIT FOR THE RECEIVE FLAG
2700 4427 ERROR /RECEIVE FLAG FAILED TO SET
2701 6156 CLRDET /CLEAR READER RUN DETECTOR F/F
2702 6157 SKPRDR /SKIP ON READER RUN DETECTOR F/F SET
2703 7610 SKP CLA
2704 4427 ERROR /CLOCK PULSE TO READER RUN FAILED TO CLEAR READER RUN
2705 4424 DONLOP /REPEAT TEST FOR NEXT BAUD RATE
2706 1021 TAD OP1SEL /GET THE HARDWARE CONFIGURATION
2707 0377 AND (100 /MASK OUT THE XOR BIT
2710 7650 SNA CLA /IS THE XOR SELECTED
2711 0776 JMP TEST40 /NO, GO TO THE NEXT TEST
2712 5440 PRGEND /YES, END THE THE PROGRAM THEN
*****
2776 3000
2777 0100
3000 IFDEF OP13X <PAGE>

```

/*****
 /THIS TEST IS ENTERED WHEN SIMULATOR IS SELECTED.
 /TEST 40 - USES THE SIMULATOR TO TEST THE RTC FREQUENCY.
 /*****

```

3000 4423 TEST40, LOOPPC /SETUP TEST COUNT AND TEST LOOP ADDRESS
3001 7777 =1 /SIMULATOR ITERATION COUNTER
3002 4104 JMS PATCH /SETUP INTERRUPT SKIP CHAIN
3003 3252 SKPCHN
3004 3042 DCA CLKFLG /SET INTERRUPT TO IGNORE RTC
3005 4436 SIMCHK /CHECK FOR SIMULATOR
3006 4100 4100 /CONTROL WORD FOR THE SIMULATOR
3007 4437 LODSIM /LOAD THE SIMULATOR CONTROL WORD
3010 1377 TAD (=20
3011 3043 DCA CNT
3012 6007 CAF /CLEAR ALL
3013 4146 RTCEA /SET REAL TIME CLOCK INT ENA
3014 6001 ION /TURN THE INTERRUPT ON
3015 6161 STRFRQ /START A FREQUENCY COUNT
3016 6162 SKPFRQ /SKIP ON FREQUENCY COUNT IN PROGRESS

```



```

3017 7610      SKP   CLA      /FREQUENCY COUNT ENDED GO READ IT
3020 5216      JMP   =2      /WAIT FOR A FREQUENCY COUNT ENDED
3021 6163      LODFRQ      /LOAD THE FREQUENCY COUNT IN TO THE AC
3022 3243      DCA   FROCNT  /SAVE THE FREQUENCY COUNT READ
3023 1244      TAD   RTCFRQ  /GET THE NEGATIVE VALUE OF MAX TOLERANCE
3024 1243      TAD   FROCNT  /GET THE COUNT READ
3025 7450      SNA      /ARE THEY EQUAL?
3026 5241      JMP   RTIMOK  /YES-CHECK FOR LOOP ON TEST
3027 7001      IAC      /ADD 1 TO THE NUMBER
3030 7450      SNA      /ARE THEY EQUAL?
3031 5241      JMP   RTIMOK  /YES-CHECK FOR LOOP ON TEST
3032 2043      ISZ   CNT     /GO BACK FOR NEXT ALLOWED NUMBER
3033 5227      JMP   =4      /RTC TIMING ERROR PRESS "CONTY" FOR
3034 4427      ERROR      /SIMULATOR CONTROL WORD
                          /CHECK SR1 TO LOOP ON ERROR
                          /PUT IT IN BIT 0
3035 4435      SHMCHK      /REPEAT TEST
3036 7004      RAL      /DONE OR REPEAT TEST IF SR2=1
3037 7710      SPA      /GO TO NEXT TEST
3040 5446      JMP   I   TSTLOP
3041 4424      RTIMOK, DONLOP
3042 5245      JMP   TEST41
3043 0000      FROCNT, 0
3044 3062      RTCFRQ, =4716      /RTC FREQUENCY COUNT 2500 + OR = 10

```

 /THIS TEST IS ENTERED WHEN SIMULATOR IS SELECTED,
 /TEST 41 = USES THE SIMULATOR TO CHECK THE TIMING OF THE SERIAL LINE UNIT
 /FROM 110 BAUD TO 9600 BAUD USING THE 20MA CURRENT LOOP

```

3045 4423      TEST41, LOOPPC      /SETUP TEST COUNT AND TEST LOOP ADDRESS
3046 7740      =40      /SIMULATOR ITERATION COUNTER
3047 4436      SIMCHK      /CHECK FOR THE SIMULATOR
3050 4000      4000      /SIMULATOR CONTROL WORD
3051 4437      LODSIM      /LOAD THE SIMULATOR CONTROL WORD
3052 1377      TAD   (=20 CNT
3053 3043      DCA   CNT
3054 6007      CAF      /CLEAR ALL FLAGS
3055 4146      RTCENA      /SET REAL TIME CLOCK INT ENA
3056 6035      KIE      /CLEAR SLU INTERRUPT ENABLE
3057 6001      ION      /TURN THE INTERRUPT ON
3060 6161      STRFRQ      /START A FREQUENCY COUNT
3061 6162      SKPFRQ      /SKIP ON FREQUENCY COUNT IN PROGRESS
3062 7610      SKP   CLA      /FREQUENCY COUNT ENDED GO READ IT
3063 5261      JMP   =2      /WAIT FOR FREQUENCY COUNT ENDED
3064 6163      LODFRQ      /LOAD FREQUENCY COUNT INTO AC
3065 3243      DCA   FROCNT  /SAVE THE WORD READ
3066 1055      TAD   CONTHD  /GET THE CONTROL WORD
3067 0064      AND   K7      /MASK OUT THE BAUD RATE
3070 1376      TAD   (FROTAB /GET THE ADDRESS OF FREQUENCY TABLE
3071 3273      DCA   TABFRQ  /SAVE THE ADDRESS
3072 7410      SKP
3073 7402      TABFRQ, HLT      /POINTER ADDRESS TO FREQUENCY TABLE

```

```

3074 1673      TAD   I   TABFRQ      /GET THE NEG MAXIMUM FREQUENCY COUNT
3075 1243      TAD   FROCNT  /GET THE COUNT READ
3076 7450      SNA      /ARE THEY EQUAL
3077 5312      JMP   SLUTOK /YES, SLU TIMING IS OK
3100 7001      IAC      /ADD ONE TO THE NUMBER
3101 7450      SNA      /ARE THEY EQUAL?
3102 5312      JMP   SLUTOK /YES SLU TIMING IS OK
3103 2043      ISZ   CNT     /BUMP SLU TIMING CHECK COUNTER
3104 5300      JMP   =4      /RETURN TO ADD A 1 TO THE NUMBER
3105 4427      ERROR      /SLU TIMING ERROR-PRESS "CONTINUE" FOR
                          /SIMULATOR CONTROL WORD
3106 4435      SHMCHK      /CHECK FOR LOOP ON ERROR
3107 7004      RAL
3110 7710      SPA      CLA
3111 5446      JMP   I   TSTLOP      /LOOP?
3112 4424      SLUTOK, DONLOP      /YES DO SAME BAUD RATE
3113 5324      JMP   TEST42      /DONE OR REPEAT TEST IF SR2=1
                          /GO DO THE INTERACTION TEST

```

/FREQUENCY COUNT TABLE FOR SLU SIMULATOR TIMING TEST (MAXIMUM COUNTS)

```

3114 2335      FROTAB, =5443      /110 BAUD = 2041 + OR = 10
3115 3723      =4055      /150 BAUD = 2083 + OR = 10
3116 3723      =4055      /300 BAUD = 2083 + OR = 10
3117 3723      =4055      /600 BAUD = 2083 + OR = 10
3120 5744      =2034      /1200 BAUD = 1042 + OR = 10
3121 6755      =1023      /2400 BAUD = 0521 + OR = 10
3122 7362      =0416      /4800 BAUD = 0262 + OR = 10
3123 7564      =0214      /9600 BAUD = 0130 + OR = 10

```

 /TEST 42 = IS AN INTERACTION TEST, THE TEST CHECKS THAT THE RTC, THE
 /SLU AND THE 12 BIT PARALLEL I/O CAN RUN TOGETHER, THE AC AND LINK
 /IS LOADED WITH SOME RANDOM DATA BEFORE THE INTERRUPT IS TURNED ON;
 /THE PROGRAM CHECKS THAT THE AC AND LINK DON'T CHANGE AND THAT DATA
 /CAN BE TRANSMITTED AND READ BACK CORRECTLY,

```

3124 4423      TEST42, LOOPPC      /SETUP TEST COUNT AND SCOPE LOOPING ADDRESS
3125 7777      =1      /SIMULATOR ITERATION COUNTER
3126 4436      SIMCHK      /CHECK TO SEE IF SIMULATOR IS SELECTED
3127 4017      4017      /CONTROL WORD FOR THE SIMULATOR
3130 4437      LODSIM      /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
                          /LOOP = THIS ADDRESS IF SIMULATOR SELECTED
                          /OTHERWISE SCOPE LOOP IS THIS ADDRESS *1
3131 6002      IOF      /TURN THE INTERRUPT OFF
3132 4470      JMS   I   DELAYR      /DELAY FOR APPROXIMATELY 200MS TO
                          /ALLOW FLAGS TO SETTLE
3133 6007      CAF      /CLEAR ALL FLAGS BUT SET SLU INT ENA
3134 4146      RTCENA      /SET REAL TIME CLOCK INT ENA
3135 4104      JMS   PATCH      /SETUP INTERRUPT SERVICE
3136 4200      INTSKP

```

3137	3071	DCA	EXPACD	/CLEAR THE EXPECTED AC DATA
3140	3072	DCA	LINK	/CLEAR THE LINK BIT
3141	3053	DCA	SLUXMT	/SET INITIAL AC DATA TO 0
3142	3051	DCA	PIOXMT	/SET PIO INITIAL DATA TO 0
3143	7240	CLA	CMA	
3144	3073	DCA	XMTFLG	/SET SLU XMT FLAG TO INACTIVE
3145	7240	CLA	CMA	
3146	3074	DCA	RCVFLG	/SET SLU RCV FLAG TO INACTIVE
3147	7240	CLA	CMA	
3150	3075	DCA	RTGFLG	/SET RTG FLAG TO INACTIVE
3151	1066	TAD	H10	
3152	3076	DCA	PNOINT	/SETUP A COUNT FOR NO INT'S ON P 1/0
3153	1367	TAD	H40	/SET DEVICE INACTIVE COUNTER TO -40
3154	3077	DCA	INACTV	/
3155	7352	CLA	CLL CMA RTR	/SETUP TEST COUNT
3156	3047	DCA	TSTCNT	/SAVE IT
3157	7301	CLA	CLL IAC	/SET DATA BIT 11
3160	6135	CLLE		/SET RTG INT ENA
3161	7200	CLA		
3162	6575	DBSE		/SET 12 BIT PARALLEL I/O INT ENA
3163	6046	TLS		/LOAD AND TRANSMIT ON SLU
3164	6574	DBTD		/TRANSMIT ALL 0'S ON P 1/0
3165	6001	ION		/TURN THE INTERRUPT ON
3166	5366	JMP		/GO BABY GO!!!!

3167 7740 H40, -40

3176 3114
3177 7760
3200 PAGE

/ROUTINE TO SETUP # OF PASSES/TEST AND TO STORE THE RETURN ADDRESS FOR SCOPE LOOPING

3200	0000	PCLOOP, 0	
3201	7340	CLA	CLL CMA
3202	1200	TAD	PCLOOP
3203	3045	DCA	TEST
3204	1600	TAD	I PCLOOP
3205	3067	DCA	SIMCNT
3206	7240	CLA	CMA
3207	7050	DCA	SAVCNT
3210	1050	TAD	SAVCNT
3211	3047	DCA	TSTCNT
3212	2200	ISE	PCLOOP
3213	5600	JMP	I PCLOOP

3214	0000	SIMLOD, 0	
3215	1055	TAD	CONTRD
3216	6151	LOADSM	/GET THE CONTROL WORD
3217	7300	CLA	CLL
3220	5614	JMP	I SIMLOD
3221	0000	LOPDON, 0	
3222	4623	JMS	I ,+1
3223	4626	DONONE	/GO CHECK TO SEE IF XOR ERROR
3224	1021	TAD	OPISEL
3225	1057	AND	K200
3226	7650	SNA	CLA
3227	9237	JMP	LOOPSW
3230	2067	ISE	SIMCNT
3231	7610	SKP	CLA
3232	9237	JMP	LOOPSW
3233	2055	ISE	CONTRD
3234	1050	TAD	SAVCNT
3235	3047	DCA	TSTCNT
3236	5446	JMP	I TSTLOP
3237	4435	SWCHK	/CHECK FOR SR2=1
3240	7000	RTL	
3241	7700	SNA	CLA
3242	5621	JMP	I LOPDON
3243	5445	JMP	I TEST

3244	6102	SIMINT, SPL	/SKIP ON POWER LOW
3245	7410	SKP	
3246	9777	JMP	POWFAL
3247	3251	DCA	AC
3250	5317	JMP	FLGCK5

3251 0000 AC, 0

3252	6102	SKPCHN, SPL	/SKIP ON POWER LOW
3253	7410	SKP	
3254	9777	JMP	POWFAL
3255	3251	DCA	AC
3256	1042	TAD	CLKFLG
3257	7650	SNA	CLA
3260	4776	JMS	CHKACT
3261	6137	CLSK	/GO CHECK FOR THE ACT LINE
3262	7410	SKP	/YES = SKIP ON REAL TIME CLOCK FLAG
3263	5303	JMP	FLGCK1
3264	1134	TAD	ACTFLG
3265	7440	SZA	/GET THE ACT FLAG
3266	5276	JMP	ACTCK2
3267	4775	JMS	INTXOR
3270	6031	KSP	/GO CHECK FOR THE XOR BIT AND TSP FLAG
3271	7410	SKP	/WAS IT A RECEIVE FLAG?
3272	5311	JMP	FLGCK3
3273	6571	DBSK	/YES = GO CHECK THE OTHER FLAGS
3274	7410	SKP	/WAS THE DATA READY FLAG SET?

```

3275 5314      JMP FLGCK4      /YES = CHECK DATA ACCEPTED FLAG
3276 6570      ACTCK2, DBST    /HAS DATA ACCEPTED SET=IF SO CLEAR IT
3277 7640      SZA CLA
3300 5315      JMP FLGCK5=2    /YES, THE FLAG SHOULD BE CLEAR NOW
3301 4427      ERROR          /ILLEGAL INTERRUPT =
3302 5315      JMP FLGCK5=2    /RETURN
3303 6041      FLGCK1, TSF     /SKIP ON XMIT FLAG
3304 7410      SKP
3305 4427      ERROR          /XMIT FLAG SET
3306 6031      FLGCK2, KSF     /SKIP ON RECEIVE FLAG
3307 7410      SKP
3312 4427      ERROR          /RECEIVE FLAG SET
3311 6571      FLGCK3, DBSK    /SKIP ON P I/O DATA READY
3312 7410      SKP
3313 4427      ERROR          /DATA READY FLAG SET
3314 6570      FLGCK4, DBST    /SKIP ON DATA ACCEPTED
3315 7610      SKP CLA
3316 4427      ERROR          /DATA ACCEPTED FLAG SET
3317 3134      FLGCK5, DCA ACTFLG /CLEAR THE ACT FLAG
3320 7240      CLA CMA
3321 3041      DCA INTFLG      /SET INTERRUPT FLAG
3322 4774      JMS RETURN
3323 3326      INTRET
3324 1251      TAD AC
3325 5726      JMP I INTRET
3326 0000      INTRET, 0

```

/ROUTINE TO WAIT FOR SERIAL LINE UNITS XMIT FLAG

```

3327 0000      WATTSF, 0
3330 7300      CLA            CLL
3331 6035      KIE            /CLEAR INTERRUPT ENABLE P/F
3332 1150      TAD            K7710
3333 3044      DCA            CNT1
3334 3043      DCA            CNT
3335 4773      JMS            TSFXOR /GO CHECK FOR XOR AND XMIT FLAG
3336 4362      JMS            ADDTIM /GO ADD ONE TO THE COUNTER
3337 2327      ISZ            WATTSF
3340 5727      JMP I WATTSF      /RETURN TO THE PROGRAM=GET THE FLAG

```

/ROUTINE TO WAIT FOR THE SERIAL LINE UNIT RECEIVE FLAG

```

3341 0000      WATKSF, 0
3342 7300      CLA            CLL
3343 1150      TAD            K7710
3344 3044      DCA            CNT1
3345 3043      DCA            CNT
3346 6031      KSF            /SKIP ON SLU RECEIVE FLAG
3347 4362      JMS            ADDTIM /GO ADD A ONE TO THE COUNTER
3350 2341      ISZ            WATKSF
3351 5741      JMP I WATKSF      /RETURN TO THE PROGRAM=GET THE FLAG

```

/ROUTINE TO WAIT FOR THE REAL TIME CLOCK FLAG

```

3352 0000      WTCLSK, 0
3353 7240      CLA            CMA
3354 3044      DCA            CNT1
3355 3043      DCA            CNT
3356 4577      JMS I ICLKXOR    /GO CHECK FOR THE REAL TIME CLOCK FLAG
3357 4362      JMS            ADDTIM /GO ADD ONE TO THE COUNTER
3360 2352      ISZ            WTCLSK
3361 5752      JMP I WTCLSK      /RETURN TO THE PROGRAM=GET THE FLAG

```

/ROUTINE TO WAIT FOR THE FLAG

```

3362 0000      ADDTIM, 0
3363 2043      ISZ            CNT
3364 7610      SKP            CLA
3365 2044      ISZ            CNT1
3366 7346      CLA CLL CMA RTL
3367 7001      IAC
3370 1362      TAD            ADDTIM
3371 3362      DCA            ADDTIM
3372 5762      JMP I ADDTIM

```

```

3373 4637
3374 3420
3375 4714
3376 3544
3377 3441
3400

```

PAGE

/THIS IS THE END OF A PROGRAM PASS; IF SR3=1 HALT, IF NOT START PROGRAM OVER

```

3400 6160      ENDPAS, SIMCLR    /CLEAR THE SIMULATOR
3401 4435      SWMCHK            /GO GET SWITCH REGISTER
3402 7006      RTL
3403 7004      RAL
3404 4605      JMS I ,+1
3405 4600      PASSED
3406 5777      JMP            #200 /START PROGRAM OVER

```

/CHECK TO SEE IF FRONT PANEL IS AVAILABLE TO DO EITHER A TAD SWITCH OR A LAS COMMAND

```

3407 0000      CHKSWH, 0
3410 7200      CLA
3411 1021      TAD OPSEL
3412 7700      SMA CLA
3413 5210      JMP ,+3
3414 7604      LAS
3415 5607      JMP I CHKSWH
3416 1020      TAD SWITCH
3417 5607      JMP I CHKSWH

```

/THIS ROUTINE SETS UP A RETURN ADDRESS FOR INTERRUPT RETURNS FROM ANOTHER FIELD

```

3420 0000 RETURN, 0
3421 6201 CDF /CHANGE DATA FIELD TO FIELD 0
3422 1636 TAD I K0 /GET THE INTERRUPT PC
3423 3237 DCA RETADD /SAVE IT
3424 6224 RIF /READ THE PROGRAM INSTRUCTION FIELD
3425 1132 TAD KCDF /ADD A CDF INSTRUCTION TO IT
3426 3227 DCA ,+1 /SAVE IT IN THE NEXT LOCATION
3427 7402 HLT/CDF /RETURN TO THE PROGRAM DATA FIELD
3430 1620 TAD I RETURN /GET THE INTERRUPT RETURN LOCATION
3431 3240 DCA SAVLOC /SAVE IT
3432 2220 ISZ RETURN
3433 1237 TAD RETADD
3434 3640 DCA I SAVLOC
3435 5620 JMP I RETURN

```

```

3436 0000 K0, 0
3437 0000 RETADD, 0
3440 0000 SAVLOC, 0

```

/POWER FAIL ROUTINE. THE PROGRAM WILL DO IT'S OWN AUTO-RESTART
/AT THE BEGINNING OF THE TEST THAT IT WAS EXECUTING UNLESS ALL POWER
/WENT AWAY. THEN THE POWER FAIL AUTO-RESTART OPTION WOULD TRY TO DO
/A RESTART IF IT WAS SELECTED.

```

3441 7200 POWFAL, CLA CLA
3442 6201 CDF 00
3443 1265 TAD KJMP7
3444 3636 DCA I K0
3445 1045 TAD TEST
3446 3666 DCA I KTEST
3447 1267 TAD FLGHST
3448 3670 DCA I C7
3449 1133 TAD KRTF
3450 3671 DCA I K10
3451 1272 TAD KJMPRT
3452 3673 DCA I K11
3453 6004 GTF
3454 3674 DCA I K12
3455 6244 RMP
3456 6103 CAL
3457 6102 SPL
3458 7610 SKP CLA
3459 5261 JMP ,+2
3460 5445 JMP I TEST

```

```

3465 5007 KJMP7, JMP 7
3466 0045 KTEST, TEST
3467 1012 FLGHST, TAD 12
3470 0007 C7, 7
3471 0010 K10, 10
3472 5445 KJMPRT, JMP I TEST
3473 0011 K11, 11
3474 0012 K12, 12

```

/LOGIC ERROR ROUTINE - RESTART TEST IF SR1=1

```

3475 0000 AERROR, 0
3476 4326 JMS ACTCHK /GO CHECK TO SEE IF RUNNING ON ACT LINE
3477 4435 SHHCHK /CHECK SR0 TO INHIBIT ERROR HALT
3500 7710 SPA CLA
3501 5307 JMP AERSWH /SR0=1 CHECK LOOP ON LOGIC ERROR
3502 7240 CLA CMA
3503 1275 TAD AERROR
3504 7402 HLT
3505 4314 JMS SIMWRD /AC = ADDRESS WHERE ERROR WAS DETECTED
3506 7402 HLT /WAS THE SIMULATOR SELECTED
3507 4435 AERSWH, SHHCHK /AC=SIMULATOR CONTROL WORD
3510 7004 RAL /CHECK SR1=1 TO LOOP ON ERROR
3511 7700 SMA CLA
3512 5675 JMP I AERROR /RETURN WITHOUT LOOPING ON TEST
3513 5446 JMP I TSTLOP /SCOPE LOOP GO BACK TO START OF TEST SECTION

```

```

3514 0000 SIMWRD, 0
3515 7300 CLA CLL
3516 1021 TAD OP1SEL
3517 0057 AND K200
3520 7650 SMA CLA
3521 5324 JMP ,+3
3522 1055 TAD CONTWD
3523 5714 JMP I SIMWRD
3524 2314 ISZ SIMWRD
3525 5714 JMP I SIMWRD

```

/ROUTINE TO EXIT TO PROM ON AN ERROR IF RUNNING ON THE ACT LINE

```

3526 0000 ACTCHK, 0
3527 7300 CLA CLL
3530 1022 TAD OP2SEL /GET THE HARDWARE CONTROL WORD
3531 7700 SMA CLA /IS THE PROGRAM RUNNING ON THE ACT LINE?
3532 5726 JMP I ACTCHK /NO, RETURN TO ERROR ROUTINE
3533 6002 IOF /TURN THE INTERRUPT OFF
3534 7344 CLA CLL CMA RAL
3535 1326 TAD ACTCHK
3536 3343 DCA ERRPC
3537 7240 CLA CMA
3540 1743 TAD I ERRPC /GET THE LOCATION WHERE THE ERROR WAS DETECTED
3541 6272 CIF 70 /CHANGE INSTRUCTION FIELD TO FIELD 7
3542 5500 JMP I BADPAS /GO TO THE PROM
3543 0000 ERRPC, 0

```

```

3544 0000      CHKACT, 0
3545 6137      CLSK      /WAS THE CLOCK FLAG SET
3546 7410      SKP      /NO-RETURN TO INT SERVICE ROUTINE
3547 5352      JMP      CLKSET /YES-CLEAR THE FLAG
3550 2344      ISZ      CHKACT /ADD 1 TO THE INCOMING PC
3551 5744      JMP I    CHKACT /RETURN TO SKIP CHAIN
3552 6136      CLKSET, CLCL /CLEAR THE CLOCK FLAG
3553 1022      TAD      /GET THE ACT LINE BIT
3554 7710      SPA      CLA      /IS THE PROGRAM RUNNING ON ACT LINE
3555 5365      JMP      ONACTL /YES,CHECK FOR # OF CLOCK TICKS
3556 5350      JMP      CHKACT+4 /RETURN TO INTERRUPT ROUTINE
3557 4220      JMS      RETURN /NO,RETURN TO THE PROGRAM
3560 3564      ACTRET
3561 1776      TAD      AC
3562 6001      ION
3563 9764      JMP I    ACTRET /TURN THE INTERRUPT ON
3564 0000      ACTRET /RETURN TO THE PROGRAM
3565 2102      ACTRET, 0
3566 5357      ONACTL, ISZ      ACTCNT /100 CLOCK TICKS YET?
3567 1103      JMP      CLKSET+5 /NO RETURN TO PROGRAM
3570 3102      TAD      M144 /RESET ACT TIME COUNTER
3571 6272      DCA      ACTCNT /SAVE THE NUMBER
3572 4501      JMS I    70      /CHANGE INSTRUCTION FIELD TO 7
3573 7240      CLA      GOODPS /SIGNAL FROM THAT PROGRAM STILLS PAS
3574 3134      DCA      CMA
3575 5357      JMP      ACTFLG /SET THE ACT LINE FLAG TO ONES
3576 3251      CLKSET+5 /RETURN TO THE PROGRAM
3577 0200
3600

```

PAGE

/ROUTINE FOR TRANSMITTING, READING AND COMPARING DATA FOR PARALLEL I/O

```

3602 0000      DATPIO, 0
3601 6007      CAF      /CLEAR ALL
3602 4146      RTCEA     /SET REAL TIME CLOCK INT ENA
3603 6001      ION      /TURN THE INTERRUPT ON
3604 4575      DBSE     /SET PARALLEL I/O INT ENA
3605 1051      TAD PIOXMT /GET THE WORD TO BE LOADED INTO PARALLEL I/O
3606 4574      DBTD     /LOAD AND TRANSMIT THE WORD
3607 7200      CLA
3610 6571      DBSK     /SKIP ON DATA READY
3611 4427      ERROR    /ERROR, DATA READY FLAG FAILED TO SET SY DBTD
3612 2041      ISZ INTFLG /GET PROGRAM INTERRUPT FLAG
3613 4427      ERROR    /PROGRAM FAILED TO INTERRUPT WITH INT ENA + FLAG SET
3614 3041      DCA INTFLG /CLEAR PROGRAM INTERRUPT FLAG
3615 6572      DBRD     /READ THE 12 BIT PARALLEL I/O BUFFER
3616 3092      DCA PIOREC /SAVE THE WORD READ
3617 6571      DBSK     /SKIP ON DATA READY FLAG
3620 4427      ERROR    /DBRD CLEARED DATA READY FLAG
3621 6573      DBCF     /CLEAR DATA READY FLAG
3622 6001      ION      /TURN INTERRUPT BACK ON
3623 7000      NOP      /SHOULD INTERRUPT HERE FOR DATA ACCEPT FLAG

```

```

3624 6570      DBST     /SKIP ON DATA ACCEPT
3625 7610      SKP CLA
3626 4427      ERROR    /DATA ACCEPT FAILED TO CLEAR IN INTERRUPT ROUTINE
3627 2041      ISZ INTFLG /CHECK TO SEE IF IT INTERRUPTED
3630 4427      ERROR    /DATA ACCEPT FLAG FAILED TO INTERRUPT
3631 6001      ION      /TURN THE INTERRUPT BACK ON
3632 7000      NOP
3633 1041      TAD INTFLG /GET PROGRAM INTERRUPT FLAG
3634 7640      SZA CLA    /DID IT INTERRUPT?
3635 4427      ERROR    /PROGRAM INTERRUPTED WITHOUT DATA READY SET
3636 1051      TAD PIOXMT /GET THE WORD TRANSMITTED
3637 7041      CIA
3640 1052      TAD PIOREC /GET THE WORD READ
3641 7640      SZA CLA    /ARE THEY EQUAL?
3642 5600      JMP I DATPIO /DATA ERROR RETURN TO REPORT ERROR
3643 6007      CAF      /CLEAR ALL FLAGS AND P I/O BUFFER
3644 4146      RTCEA
3645 6001      ION      /TURN THE INTERRUPT ON
3646 6572      DBRD     /READ THE 12 BIT P I/O BUFFER
3647 7640      SZA CLA
3650 4427      ERROR    /CAF FAILED TO CLEAR THE 12 BIT DATA BUFFER
3651 2200      ISZ DATPIO /BUMP RETURN ADDRESS POINTER BY 1
3652 5600      JMP I DATPIO /RETURN TO TEST

```

/ROUTINE FOR TRANSMITTING, READING AND COMPARING DATA FOR SLU

```

3653 0000      DATSLU, 0
3654 6007      CAF      /CLEAR ALL FLAGS BUT SET INT ENA ON SLU
3655 4146      RTCEA     /SET REAL TIME CLOCK INT ENA
3656 6001      ION      /TURN THE INTERRUPT ON
3657 3041      DCA      INTFLG /CLEAR THE PROGRAM INTERRUPT FLAG
3660 1053      TAD      SLUXMT /GET THE WORD TO BE TRANSMITTED
3661 6046      TFS      /LOAD AND TRANSMIT IT AND CLEAR THE FLAG
3662 4431      TFSWAT    /WAIT FOR THE TRANSMIT FLAG
3663 4427      ERROR    /XMIT FLAG FAILED TO SET
3664 2041      ISZ      INTFLG /DID THE PROGRAM INTERRUPT?
3665 4427      ERROR    /PROGRAM FAILED TO INTERRUPT
3666 6042      TCF      /CLEAR THE XMIT FLAG
3667 6001      ION      /TURN THE INTERRUPT BACK ON
3670 4432      KFSWAT    /WAIT FOR THE RECEIVE FLAG TO SET
3671 4427      ERROR    /RECEIVE FLAG FAILED TO SET
3672 2041      ISZ      INTFLG /DID THE RECEIVE FLAG CAUSE A INTERRUPT
3673 4427      ERROR    /RECEIVE FLAG FAILED TO CAUSE A INTERRUPT
3674 6036      KRB      /CLEAR THE AC AND RCV FLAG AND READ BUFFER
3675 3054      DCA      SLUREC /SAVE THE WORD READ BACK
3676 6001      ION      /TURN THE INTERRUPT BACK ON
3677 1041      TAD      INTFLG /CHECK THAT KRB CLEARED THE RCV FLAG
3680 7640      SZA      CLA
3681 4427      ERROR    /KRB FAILED TO CLEAR RCV FLAG OR INTERRUPTED
3682 1053      TAD      SLUXMT /GET THE WORD TRANSMITTED
3683 7041      CIA
3684 1054      TAD      SLUREC /GET THE WORD READ BACK
3685 7640      SZA      CLA
3686 5653      JMP I DATSLU /DATA ERROR-RETURN TO REPORT THE ERROR
3687 2253      ISZ      DATSLU /BUMP RETURN ADDRESS POINTER BY ONE

```

3710 5653 JMP 1 DATSLU /RETURN TO TEST

/DATA ERROR ROUTINE FOR PARALLEL I/O

```

3711 0000 DERPIO, 0
3712 4777' JMS ACTCHK /CHECK TO SEE IF RUNNING ON ACT LINE
3713 4435 SHMCHK /CHECK SR0 TO INHIBIT ERROR HALT
3714 7710 SPA CLA /IS SR0 SET?
3715 5327 JMP P10SWH /YES, GO CHECK SR1 TO LOOP ON ERROR
3716 7240 CLA CMA
3717 1311 TAD DERPIO
3720 7402 HLT /AC = ADDRESS WHERE ERROR WAS DETECTED
3721 7200 CLA
3722 1051 TAD P10XMT /GET THE WORD TRANSMITTED
3723 7402 HLT /AC = THE GOOD WORD
3724 7200 CLA
3725 1052 TAD P10REC /GET THE WORD READ
3726 7402 HLT /AC = THE BAD WORD = WORD READ
3727 4435 P10SWH, SHMCHK /LOOP ON DATA ERROR IF SR1=1
3730 7004 RAL
3731 7700 SMA CLA /LOOP?
3732 5711 JMP 1 DERPIO /NO, RETURN TO TEST
3733 5446 JMP 1 TSTLOP /RETURN AND DO SAME PATTERN(S)
    
```

/DATA ERROR ROUTINE FOR SERIAL LINE UNIT

```

3734 0000 DERSLU, 0
3735 4777' JMS ACTCHK /CHECK TO SEE IF RUNNING ON THE ACT LINE
3736 4435 SHMCHK /CHECK SR0=1 TO INHIBIT ERROR HALT
3737 7710 SPA CLA
3740 5354 JMP SLUSWH /GO CHECK SR1=1 TO LOOP ON ERROR
3741 7240 CLA CMA
3742 1334 TAD DERSLU /
3743 7402 HLT /AC=ADDRESS WHERE ERROR WAS DETECTED
3744 7200 CLA
3745 1053 TAD SLUXMT /GET THE WORD TRANSMITTED
3746 7402 HLT /AC=GOOD WORD=THE WORD TRANSMITTED
3747 7200 CLA
3750 1054 TAD SLUREC /GET THE WORD READ
3751 7402 HLT /AC=THE BAD WORD=THE WORD READ
3752 4776' JMS SIMWRD /WAS THE SIMULATOR SELECTED
3753 7402 HLT /AC=THE SIMULATOR CONTROL WORD
3754 4435 SLUSWH, SHMCHK /LOOP ON DATA ERROR IF SR1=1
3755 7004 RAL
3756 7700 SMA CLA /LOOP?
3757 5734 JMP 1 DERSLU /NO, RETURN TO TEST
3760 5446 JMP 1 TSTLOP
    
```

3761 0000 CHKSIM, 0

```

3762 1021 TAD OP1SEL /CHECK FOR SIMULATOR
3763 0057 AND K200
3764 7650 SNA CLA
3765 5371 JMP ,+4 /NO
3766 1761 TAD 1 CHKSIM /GET THE CONTROL WORD
3767 3055 DCA CONTWD /SAVE IT
3770 7410 SKP
3771 2361 ISZ CHKSIM
3772 2361 ISZ CHKSIM
3773 1361 TAD CHKSIM
3774 3046 DCA TSTLOP
3775 5761 JMP 1 CHKSIM
    
```

3776 3514
3777 3526
4000

PAGE

/*****
/REAL TIME CLOCK TIMING TEST
/*****/

```

4000 6160 RTCTIM, SIMCLR
4001 4104 JMS PATCH /SETUP INTERRUPT SERVICE
4002 4015 RTCTIM, PATCH
4003 1377 TAD (=5667 /SET UP A COUNT FOR 2999 CLOCK TICKS
4004 3047 DCA TSTCNT /SAVE CLOCK TICK COUNTER
4005 6007 CAF /CLEAR ALL FLAGS
4006 6137 CLSK /WAIT FOR THE FIRST CLOCK FLAG
4007 5206 JMP ,=1
4010 6136 CLCL /CLEAR THE CLOCK FLAG
4011 7301 CLA CLL IAC
4012 6135 CLLE /LOAD CLOCK INTERRUPT ENABE
4013 6001 ION /TURN THE INTERRUPT ON
4014 5214 JMP
4015 6136 RTCTIM, CLCL /CLEAR THE CLOCK FLAG
4016 7300 CLA /CLEAR THE AC AND LINK
4017 2047 ISZ TSTCNT /DONE YET ?
4020 5213 JMP RTCTIM=2 /RETURN TO WAIT FOR NEXT FLAG
4021 7602 HLT CLA /WAS IT 30 SECONDS
4022 5200 JMP RTCTIM /DO TEST OVER OR DO ANOTHER TEST
    
```

/*****
/SERIAL LINE UNIT TIMING TEST
/*****/

```

4023 6160 SLUTIM, SIMCLR
4024 4104 JMS PATCH /SETUP INTERRUPT SERVICE
4025 4071 SLUINT
4026 7402 HLT /SET THE SR IF SELECTED OR LOCATION 20
/TO THE BAUD RATE AND # OF STOP BITS
/TO BE TESTED,
    
```

```

4027 4435 SWCHK /GO GET LOCATION 20 OR THE SR
4030 0376 AND /MASK OUT THE BAUD RATE AND STOP BIT
4031 3304 DCA BAUDWD /SAVE THE BAUD RATE AND STOP BIT
4032 1304 TAD BAUDWD /GET THE WORD
4033 0064 AND K7 /MASK OUT THE BAUD RATE
4034 3305 DCA BAUDRT /SAVE IT
4035 1304 TAD BAUDWD /CHECK FOR THE NUMBER OF STOP BITS
4036 0375 AND /10
4037 7640 SZA CLA /1 OR 2 STOP BITS
4040 7326 CLA CLL CML RTL /STOP BITS EQUAL 2
4041 3306 DCA STPBIT /SAVE THE STOP BITS
4042 1305 TAD BAUDRT /GET THE BAUD RATE (N = 7)
4043 1374 TAD (BAUDTB /GET THE ADDRESS OF THE BAUD RATE TABLE
4044 3307 DCA BDPNTR /SAVE THE TABLE POINTER ADDRESS
4045 1707 TAD I BDPNTR /GET THE ADDRESS OF THE CONSTANTS
4046 1306 TAD STPBIT /ADD 0 FOR 1 SB OR 2 FOR 2 SB
4047 3307 DCA BDPNTR /SAVE THE POINTER TO THE CONSTANTS
4050 1307 TAD BDPNTR /ACTUAL TEST STARTS HERE
4051 3047 DCA TSTCNT /SAVE THE POINTER IN TEST COUNT
4052 1447 TAD I TSTCNT /GET THE FIRST CONSTANT
4053 3043 DCA CNT /SAVE IT
4054 2047 ISZ TSTCNT /ADD 1 TO THE WORKING POINTER
4055 1447 TAD I TSTCNT /GET THE SECOND CONSTANT
4056 3044 DCA CNT1 /DCA CNT1
4057 0007 CAF /CLEAR ALL FLAGS
4060 0046 TLS /LOAD AND TRANSMIT THE FIRST CHARACTER
4061 0041 TSF /THE FIRST FLAG COMES UP WITHIN USEC'S
4062 5261 JMP ,=1
4063 5266 JMP ,=3 /GO AND CLEAR FLAG AND TRANSMIT AGAIN
4064 0036 INTON, KRS /CLEAR THE RECEIVE FLAG
4065 7610 SKP CLA
4066 0046 TLS /LOAD AND TRANSMIT AND CLEAR FLAG
4067 0001 ION /TURN THE INTERRUPT ON
4070 5270 JMP
4071 0031 SLUINT, KSF /SKIP ON THE RECEIVE FLAG
4072 7610 SKP CLA
4073 5264 JMP INTON /CLEAR THE RECEIVE FLAG AND TURN INT ON
4074 0041 TSF /SKIP IF TRANSMIT FLAG SET
4075 4427 ERROR /ILLEGAL INTERRUPT
4076 2043 ISZ CNT /ADD ONE TO THE FIRST COUNTER
4077 5266 JMP INTON+2
4100 2044 ISZ CNT1 /OVERFLOWED FIRST COUNT ADD 1 TO SECOND
4101 5266 JMP INTON+2 /GO DO ANOTHER 4295 INTERRUPTS
4102 7602 HLT CLA /WAS IT 30 SECONDS ???
4103 5223 JMP SLUTIM /GO DO IT AGAIN OR START ANOTHER TEST

4104 0000 BAUDWD, 0
4105 0000 BAUDRT, 0
4106 0000 STPBIT, 0
4107 0000 BDPNTR, 0

```

/POINTERS TO BAUD RATE TABLES

4110 4120 BAUDTB, BR110

```

4111 4124 BR150
4112 4130 BR300
4113 4134 BR600
4114 4140 BR1200
4115 4144 BR2400
4116 4150 BR4800
4117 4154 BR9600

/BAUD RATE CONSTANTS FOR 110 BAUD
4120 7266 BR110, =512 /10 BITS AT 11 CHAR/SEC=330 CHAR/30 SEC
4121 7777 =1
4122 7324 =454 /11 BITS AT 10 CHAR/SEC=300 CHAR/30 SEC
4123 7777 =1

/BAUD RATE CONSTANTS FOR 150 BAUD
4124 7076 BR150, =702 /10 BITS AT 15 CHAR/SEC=450 CHAR/30 SEC
4125 7777 =1
4126 7147 =631 /11 BITS AT 13.64 CHAR/SEC=429 CHAR/30 SEC
4127 7777 =1

/BAUD RATE CONSTANTS FOR 300 BAUD
4130 6174 BR300, =1604 /10 BITS AT 30 CHAR/SEC=900 CHAR/30 SEC
4131 7777 =1
4132 6316 =1462 /11 BITS AT 27.27 CHAR/SEC=818 CHAR/30 SEC
4133 7777 =1

/BAUD RATE CONSTANTS FOR 600 BAUD
4134 4370 BR600, =3410 /10 BITS AT 60 CHAR/SEC=1800 CHAR/30 SEC
4135 7777 =1
4136 4633 =3145 /11 BITS AT 54.45 CHAR/SEC=1637 CHAR/30 SEC
4137 7777 =1

/BAUD RATE CONSTANTS FOR 1200 BAUD
4140 0760 BR1200, =7020 /10 BITS AT 120 CHAR/SEC=3600 CHAR/30 SEC
4141 7777 =1
4142 1467 =6311 /11 BITS AT 109.09 CHAR/SEC=3273 CHAR/30 SEC
4143 7777 =1

/BAUD RATE CONSTANTS FOR 2400 BAUD
4144 1737 BR2400, =6041 /10 BIT AT 240 CHAR/SEC=7200 CHAR/30 SEC
4145 7776 =2
4146 3150 =4622 /11 BITS AT 210.18 CHAR/SEC=6545 CHAR/30 SEC
4147 7776 =2

/BAUD RATE CONSTANTS FOR 4800 BAUD
4150 3675 BR4800, =4103 /10 BITS AT 480 CHAR/SEC=14,400 CHAR/30 SEC
4151 7774 =4
4152 6332 =1446 /11 BITS AT 436.36 CHAR/SEC=13,091 CHAR/30 SEC

```

4153 7774

=4

/BAUD RATE CONSTANTS FOR 9600 BAUD

4154 7571

BR9600, =207

/10 BITS AT 960 CHAR/SEC=20,800 CHAR/30 SEC

4155 7770

=10

4156 4664

=3114

/11 BITS AT 872,73 CHAR/SEC=26,182 CHAR/30 SEC

4157 7771

=7

/THIS ROUTINE WILL WAIT FOR APPROXIMATELY 255MS BEFORE EXITING TO ALLOW FLAGS TO SETTLE.

4160 0000

DELAY, 0

4161 1371

TAD M15

4162 3044

DCA CNT1

4163 3043

DCA CNT

4164 2043

ISE CNT

4165 5364

JMP ,=1

4166 2044

ISE CNT1

4167 5364

JMP ,=3

4170 5760

JMP I DELAY

4171 7763

M15, =15

4174 4110

4175 0010

4176 0017

4177 2111

4200

PAGE

/INTERACTIVE SKIP CHAIN FOR SLU, RTC, AND I/O TEST 42

4200 3325

INTSKP, DCA

ACCRET

/SAVE THE AC

4201 7010

RAR

LINKRT

/SAVE THE LINK

4202 3326

DCA

SPL

/SKIP ON POWER LOW FLAG

4203 6102

SKP

CLA

4204 7610

JMP

POWFAL

/POWER GOING DOWN

4205 5777

TSF

CLA

/SKIP ON SLU XMIT FLAG

4206 6041

SKP

XMTSER

/XMIT FLAG SET GO SERVICE IT

4207 7610

JMP

KSF

/SKIP ON RECEIVE FLAG

4210 5327

SKP

CLA

4211 6031

JMP

RECSE

/SERVICE THE RECEIVE FLAG AND COMPARE DATA

4212 7610

CLSK

CLA

/SKIP ON REAL TIME CLOCK FLAG

4213 5776

SKP

RTCSER

/GO SERVICE THE RTC FLAG

4214 6137

JMP

DBSK

/SKIP ON P I/O DATA READY FLAG

4215 7610

SKP

CLA

4216 5333

JMP

PIOSER

/GO SERVICE THE PARALLEL I/O FLAG

4217 6571

SKP

CLA

/ILLEGAL INTERRUPT

4220 7610

JMP

PIOSER

/RESTART THE TEST

4221 5224

ERROR

4222 4427

JMP I TEST

4223 5445

/12 BIT PARALLEL I/O INTERACTIVE SERVICE ROUTINE TEST 42

4224 1066

PIOSER, TAD

M10

/SET UP A COUNTER OF M10 FOR

4225 3076

DCA

PNOINT

/PARALLEL I/O NO INTERRUPT ERROR

4226 6572

DBRD

DBCF

/READ THE 12 BIT P I/O DATA WORD

4227 6573

DCA

PIOREC

/CLEAR THE DATA READY FLAG

4230 3052

DBST

ERROR

/SAVE THE WORD READ

4231 6570

DBST

CLA

/SKIP AND CLEAR DATA ACCEPTED & DATA AVAIL.

4232 4427

SKP

CLA

/DBCF FAILED TO SET DATA ACCEPTED

4233 6570

SKP

CLA

/SKIP ON DATA ACCEPTED

4234 7610

ERROR

JMS

/DBST FAILED TO CLEAR DATA ACCEPTED

4235 4427

TAD

PIOXMT

/COMPARE THE AC DATA AND LINK

4236 4775

CIA

PIOXMT

/COMPARE THE XMITTED WITH WORD READ

4237 1051

TAD

PIOXMT

4240 7041

CIA

PIOXMT

4241 1052

TAD

PIOXMT

4242 7640

SZA

PIOXMT

/ARE THEY EQUAL?

4243 4774

JMS

PIOXMT

/NO DATA ERROR

4244 7301

CLA

CLL

/GENERATE A RANDOM AC DATA WORD

4245 1323

TAD

RAN1

4246 1324

TAD

RAN2

4247 7106

CLL

RTL

4250 3323

DCA

RAN1

4251 1324

TAD

RAN2

4252 7012

RTR

4253 1323

TAD

RAN1

4254 3324

DCA

RAN2

4255 1324

TAD

RAN2

4256 3071

DCA

EXPACD

/SAVE THE EXPECTED AC DATA WORD

4257 7010

RAR

4260 3072

DCA

LINK

/SAVE THE EXPECTED LINK

4261 2051

ISE

PIOXMT

/ADD ONE TO THE WORD TO BE TRANSMITTED

4262 1051

TAD

PIOXMT

/GET THE WORD

4263 6574

DBTD

CLA

/LOAD AND TRANSMIT IT

4264 7300

CLA

CLL

4265 5306

JMP

ACTION

/GO GET THE AC DATA WORD AND L, ION

4266 1073

RTCSLU, TAD

XMTFLG

/CHECK ALL DEVICES TO BE INTERRUPTING

4267 1074

TAD

RECFLG

/

4270 1075

TAD

RTCSLU

/

4271 7650

SNA

CLA

/ARE THEY?

4272 5276

JMP

RESET

/YES RESET FLAGS TO INACTIVE

4273 2077

ISE

INACTV

/BUMP DEVICE INACTIVE COUNTER

4274 5306

JMP

ACTION

/CONTINUE THE TEST

4275 4773

JMS

INACDV

/ERROR A DEVICE IS INACTIVE

4276 7340

RESET, CLA

CLL

/SET SLU XMIT FLAG TO INACTIVE

4277 3073

DCA

XMTFLG

4300 7240

CLA

CMA

/SET SLU REC FLAG TO INACTIVE

4301 3074

DCA

RECFLG

4302 7240

CLA

CMA

4303 3075

DCA

RTCSLU

/SET RTC FLAG TO INACTIVE

4304 1372

TAD

(-40)

/RESET DEVICE INACTIVE COUNTER

4305 3077

DCA

INACTV

/TO -40

4306 4771

ACTION, JMS

RETURN

/SETUP INTERRUPT RETURN

4307 4322

INTERA

4310 7300

CLA

CLL

/SETUP AC AND LINK AND TURN INTERRUPT ON

4311 1072

TAD

LINK

/GET THE LINK


```

4312 7004 RAL
4313 1071 TAD EXPACD /GET THE AC DATA WORD
4314 6001 ION /TURN THE INTERRUPT ON
4315 2076 ISZ PNOINT /ADD 1 TO P I/O NO INTERRUPT COUNTER
4316 5722 JMP I INTERA /RETURN TO PROGRAM
4317 7300 CLA CLL
4320 4427 ERROR /ERROR PARALLEL I/O FAILED TO INTERRUPT
4321 5445 JMP I TEST /RESTART THE TEST

4322 0000 INTERA, 0
4323 1234 RAN1, 1234
4324 5670 RAN2, 5670
4325 0000 ACORET, 0
4326 0000 LINKRT, 0

```

/SERIAL LINE UNIT INTERACTIVE TRANSMITTER SERVICE ROUTINE TEST 42

```

4327 3073 XMTSER, DCA XMTFLG /SET TRANSMITTER ACTIVE FLAG
4330 6042 TCF /CLEAR THE TRANSMIT FLAG
4331 4775 JMS CMPACL /COMPARE THE AC DATA WORD AND LINK
4332 5266 JMP RTCSLU /GO CHECK FOR ACTIVE DEVICES

```

/REAL TIME CLOCK INTERACTIVE CLOCK SERVICE ROUTINE TEST 42

```

4333 3075 RTCSER, DCA RTCFLG /SET CLOCK ACTIVE FLAG
4334 6136 CLCL /CLEAR THE CLOCK FLAG
4335 4775 JMS CMPACL /COMPARE THE AC AND LINK
4336 1022 TAD OP2SEL /CHECK TO SEE IF RUNNING ON ACT LINE
4337 7700 SMA CLA /IS IT?
4340 5346 JMP ,+6 /NO
4341 2102 ISZ ACTCNT /1 SECOND YET?
4342 5346 JMP ,+4
4343 1103 TAD M144 /RESET ACT COUNTER
4344 3102 DCA ACTCNT /SAVE IT
4345 4136 JMS TSTGOD /GOOD PAS SO FAR
4346 2047 ISZ TSTCNT /INCREMENT PROGRAM TEST COUNTER
4347 5266 JMP RTCSLU /GO CHECK FOR ACTIVE DEVICES
4350 4470 JMS I DELAYR /DELAY FOR 200MS TO ALLOW FLAGS TO SETTLE
4351 6007 CAF /CLEAR ALL FLAGS BUT SET SLU INT ENA
4352 4136 JMS TSTGOD /GOOD AGAIN!!!!
4353 4435 SHHCHK /CHECK SR2=1 TO LOOP ON TEST
4354 7006 RTL
4355 7710 SPA CLA /LOOP?
4356 5445 JMP I TEST /YES, DO TEST OVER
4357 5440 PRGEND /NO, END OF TEST

4371 3420
4372 7740
4373 4470
4374 4542
4375 4421
4376 4400
4377 3441
4400

```

PAGE

/SERIAL LINE UNIT INTERACTIVE RECEIVER SERVICE ROUTINE TEST 42

```

4400 3074 REC SER, DCA RECFLG /SET RECEIVE FLAG TO ACTIVE
4401 6036 KRB /CLEAR AC AND FLAG AND READ BUFFER
4402 3054 DCA SLUREC /SAVE THE WORD READ
4403 4221 JMS CMPACL /COMPARE THE AC AND LINK
4404 1053 TAD SLUXMT /COMPARE THE WORD TRANSMITTED WITH WORD READ
4405 7041 CIA
4406 1054 TAD SLUREC
4407 7640 SZA CLA /ARE THEY EQUAL?
4410 4317 JMS SLUERR /NO, DATA ERROR
4411 1053 TAD SLUXMT /ADD ONE TO THE WORD TO BE TRANSMITTED
4412 7001 IAC /
4413 0056 AND K377 /MASK OUT FOR THE EIGHT BITS
4414 3053 DCA SLUXMT /SAVE THE NEW WORD
4415 1053 TAD SLUXMT /GET THE WORD AND TRANSMIT IT?
4416 6046 TLS /LOAD AND TRANSMIT THE WORD
4417 7300 CLA CLL
4420 5777 JMP RTCSLU /GO CHECK FOR ACTIVE DEVICES AND RESET THE AC

```

/ROUTINE TO CHECK THAT THE AC AND LINK DIDN'T CHANGE DURING INTERACTION TEST 42

```

4421 0000 CMPACL, 0
4422 1071 TAD EXPACD /GET THE EXPECTED AC DATA
4423 7041 CIA
4424 1776 TAD ACORET /GET THE DATA RETURNED
4425 7640 SZA CLA /ARE THEY EQUAL?
4426 5234 JMP ACLERR /NO, ERROR
4427 1072 TAD LINK /GET EXPECTED LINK
4430 7041 CIA
4431 1775 TAD LINKRT /GET THE RETURN LINK
4432 7650 SNA CLA /ARE THEY EQUAL?
4433 5621 JMP I CMPACL /YES, RETURN TO TEST
4434 1221 ACLERR, TAD CMPACL
4435 3237 DCA ,+2
4436 7610 SKP CLA
4437 7402 HLT/CMPACL
4440 4774 JMS ACTCHK /CHECK TO SEE IF RUNNING ON ACT LINE
4441 4435 SHHCHK /CHECK SR0=1 TO INHIBIT ERROR HALT
4442 7710 SPA CLA
4443 5263 JMP ACLLOP /INHIBIT ERROR HALT, GO CHECK LOOP SWITCH
4444 7240 CLA CMA
4445 1221 TAD CMPACL
4446 7402 HLT
4447 7200 CLA /AC CONTAINS ADDRESS WHERE THE ERROR WAS DETECTED
4450 1071 TAD EXPACD
4451 7402 HLT
4452 7200 CLA /THE AC CONTAINS AC DATA BEFORE INTERRUPT
4453 1776 TAD ACORET /

```

```

4454 7402      HLT
4455 7200      CLA
4456 1072      TAD      LINK
4457 7402      HLT
4460 7200      CLA
4461 1775      TAD      LINKRT
4462 7402      HLT
4463 4435      ACDLOP, SWHCHK
4464 7004      RAL
4465 7710      SPA      CLA
4466 5446      JMP I    TSTLOP
4467 5621      JMP I    CMPACL

```

```

/AC CONTAINS AC DATA AFTER INTERRUPT
/
/AC CONTAINS THE LINK BEFORE INTERRUPT
/
/AC CONTAINS LINK AFTER INTERRUPT
/CHECK SR 1 TO LOOP ON ERROR
/SCOPE LOOP
/RETURN TO TEST

```

/INACTIVE DEVICE ERROR

```

4470 0000      INACDV, 0
4471 4774      JMS      ACTCHK
4472 4435      SWHCHK
4473 7710      SPA      CLA
4474 5312      JMP      INACLP
4475 7240      CLA      CMA
4476 1270      TAD      INACDV
4477 7402      HLT
4480 7300      CLA      CLC
4481 1073      TAD      XMTFLG
4482 7640      SZA      CLA
4483 7402      HLT
4484 1074      TAD      RECFLG
4485 7640      SZA      CLA
4486 7402      HLT
4487 1075      TAD      RTCFLG
4488 7640      SZA      CLA
4489 7402      HLT
4490 4435      INACLP, SWHCHK
4491 7004      RAL
4492 7710      SPA      CLA
4493 5446      JMP I    TSTLOP
4494 5670      JMP I    INACDV

```

```

/CHECK TO SEE IF RUNNING ON THE ACT LINE
/INHIBIT ERROR HALT?
/YES CHECK LOOP SWITCH
/AC = ADDRESS WHERE ERROR WAS DETECTED
/SLU XMIT FLAG IS INACTIVE
/SLU RECEIVE FLAG IS INACTIVE
/RTC FLAG IS INACTIVE
/CHECK SR1 TO LOOP ON ERROR
/SCOPE LOOP
/RETURN TO THE TEST

```

/SLU DATA ERROR DURING INTERACTION TEST 42

```

4517 0000      SLUERR, 0
4520 4774      JMS      ACTCHK
4521 4435      SWHCHK
4522 7710      SPA      CLA
4523 5335      JMP      SLULOP
4524 7240      CLA      CMA
4525 1317      TAD      SLUERR
4526 7402      HLT
4527 7200      CLA
4528 1053      TAD      SLUXMT
4529 7402      HLT
4530 7200      CLA
4531 1054      TAD      SLUREC
4532 7402      HLT

```

```

/CHECK TO SEE IF RUNNING ON ACT LINE
/
/SR=1 INHIBIT ERROR HALT=CHECK LOOP SW
/AC = ADDRESS WHERE ERROR WAS DETECTED
/AC = WORD TRANSMITTED
/AC = WORD THAT WAS READ

```

```

4535 4435      SLULOP, SWHCHK
4536 7004      RAL
4537 7710      SPA      CLA
4540 5446      JMP I    TSTLOP
4541 5717      JMP I    SLUERR

```

```

/CHECK SR1=1 TO LOOP ON ERROR
/SCOPE LOOP
/RETURN TO TEST

```

/PARALLEL I/O DATA ERROR DURING INTERACTION TEST 42

```

4542 0000      PIOERR, 0
4543 4774      JMS      ACTCHK
4544 4435      SWHCHK
4545 7710      SPA      CLA
4546 5360      JMP      PIOLOP
4547 7240      CLA      CMA
4548 1342      TAD      PIOERR
4549 7402      HLT
4550 7200      CLA
4551 1051      TAD      PIOXMT
4552 7402      HLT
4553 7200      CLA
4554 1052      TAD      PIOREC
4555 7402      HLT
4556 4435      PIOLOP, SWHCHK
4557 7004      RAL
4558 7710      SPA      CLA
4559 5446      JMP I    TSTLOP
4560 5742      JMP I    PIOERR

```

```

/CHECK TO SEE IF RUNNING ON ACT LINE
/INHIBIT ERROR HALT?
/YES, CHECK LOOP SWITCH
/AC = ADDRESS WHERE ERROR WAS DETECTED
/AC = THE WORD TRANSMITTED
/AC = THE WORD READ FROM P I/O
/LOOP ON ERROR IF SR1=1
/SCOPE LOOP
/RETURN TO TEST

```

```

4574 3526
4575 4326
4576 4325
4577 4266
4600

```

PAGE

```

4600 0000      PASSED, 0
4601 7710      SPA      CLA
4602 7402      HLT
4603 1021      TAD      OP1SEL
4604 1377      AND      (100
4605 7650      CLA      SNA
4606 5224      JMP      STNPAS
4607 5007      CAF
4608 5173      STIP
4609 7410      SKP
4610 5216      JMP      ,+4
4611 6007      CAF
4612 6170      XRON
4613 5224      JMP      STNPAS
4614 6160      SIMCLR
4615 6007      CAF
4616 6171      SKXR
4617 6170      XRON
4618 6007      CAF
4619 5224      JMP      STNPAS

```

```

/SR3=1 END OF A COMPLETE PROGRAM PASS
/GET THE HARDWARE CONFIGURATION
/MASK OUT XOR BIT
/IS IT SET?
/NO RETURN
/CLEAR ALL FLAGS
/SKIP IF MUT POWER ON AND 1ST XRON
/MUT POWER ON GO ISSUE SECOND XRON
/CLEAR ALL FLAGS
/START INITIALIZATION OF MUX
/RETURN TO PROGRAM
/CLEAR THE SIMULATOR
/CLEAR ALL FLAGS
/SKIP IF ERROR 1 FLOP SET
/START ACTUAL TEST AND ENABLE ALL ERRORS
/CLEAR ALL FLAGS
/RETURN TO PROGRAM

```

```

4624 2200 STNPAS, ISZ PASSED /BUMP RETURN POINTER
4625 5600 JMP I PASSED /RETRUN TO PROGRAM

4626 0000 DONONE, 0
4627 1021 TAD OP1SEL /GET THE HARDWARE CONFIGURATION
4630 0377 AND (100 /MASK OFF XOR BIT
4631 7640 SZA CLA /IS IT SET ?
4632 6171 SKXR /YES, SKIP IF XOR ERROR 1 SET
4633 2047 ISZ TSTCNT /INCREMENT TEST COUNTER
4634 5446 JMP I TSTLOP /GO BACK TO SAME TEST
4635 2226 ISZ DONONE /BUMP RETURN POINTER
4636 5626 JMP I DONONE /RETURN FOR NEXT TEST OR SAME TEST

4637 0000 TSFXOR, 0
4640 1021 TAD OP1SEL /GET THE HARDWARE CONFIGURATION
4641 0377 AND (100 /MASK OUT THE XOR BIT
4642 7640 SZA CLA /IS THE XOR BIT SET
4643 5251 JMP XORTSF /YES, GO WAIT FOR THE FLAGS
4644 4267 JMS OFONKI /CHECK TO SEE IF INT ENA
4645 6041 TSF /NO, SKIP ON THE SLU XMIT FLAG
4646 5637 JMP I TSFXOR /FLAG NOT SET RETURN TO BUMP COUNTER
4647 2237 TSFRET, ISZ TSFXOR /BUMP A LOCATION TO SIMULATE A SKIP
4650 5637 JMP I TSFXOR /RETURN TO THE PROGRAM

4651 0002 XORTSF, IOF /TURN THE INTERRUPT OFF
4652 1055 TAD CONTWD /GET THE SIMULATOR CONTROL WORD
4653 0064 AND K7 /MASK THE BAUD RATE BITS OUT
4654 1376 TAD (X100 /GET THE TABLE STARTING ADDRESS
4655 3303 DCA TEMP /SAVE THE ADDRESS
4656 1703 TAD I TEMP /GET THE BAUD RATE CONSTANT
4657 3347 DCA NDELAY /SAVE IT FOR THE DELAY
4660 4324 JMS DELAYB /DELAY ACCORDING TO BAUD RATE
4661 6041 TSF /SKIP ON SLU XMIT FLAG
4662 4427 ERROR /FLAG NOT SET IN ALLOTTED TIME
4663 4267 JMS OFONKI /CHECK INT ENA FOR ON OR OFF
4664 6001 ION /TURN THE INTERRUPT ON
4665 7000 NOP /SHOULD INTERRUPT WERE IF GOING TO
4666 5247 JMP TSFRET /RETURN TO THE PROGRAM

4667 0000 OFONKI, 0 /ROUTINE TO TURN INT ENA OFF OR ON
4670 1045 TAD TEST /GET THE TEST BEING EXECUTED
4671 1375 TAD (=TEST31
4672 7650 SNA CLA /HAS IT TEST 31
4673 5300 JMP +5 /YES-DISABLE SLU INT ENA
4674 1045 TAD TEST /GET THE TEST BEING EXECUTED
4675 1374 TAD (=TEST37
4676 7640 SZA CLA /HAS IT TEST 37
4677 7301 CLA CLL IAC /NO, SET THE AC TO 0001
4700 6035 KIE /ENABLE OR DISABLE SLU INT ENA
4701 7200 CLA /CLEAR THE AC BIT IF SET
4702 5667 JMP I OFONKI /RETURN

```

```

4703 0000 TEMP, 0
4704 5664 X1100B, -1100 /110MS
4705 6340 X1500B, -800 /80MS
4706 7160 X3000B, -400 /40MS
4707 7470 X6000B, -200 /20MS
4710 7634 X12000B, -100 /10MS
4711 7716 X24000B, -50 /5MS
4712 7747 X48000B, -25 /2.5MS
4713 7763 X96000B, -13 /1.3MS
OCTAL

4714 0000 INTXOR, 0
4715 6041 TSF /SKIP ON SLU XMIT FLAG
4716 9714 JMP I INTXOR /NOT XMIT FLAG- RETURN TO SKIP CHAIN
4717 1021 TAD OP1SEL /GET THE HARDWARE CONFIGURATION
4720 0377 AND (100 /MASK OUT THE XOR BIT
4721 7640 SZA CLA /IS THE XOR SELECTED
4722 5773 JMP FLGCK3 /YES-SKIP OVER RECEIVE FLAG CHECK
4723 5772 JMP FLGCK2 /NO-CHECK SLU RECEIVE FLAG

4724 0000 DELAYB, 0
4725 7300 CLA CLL /SKIP ON SLU XMIT FLAG
4726 1347 TAD NDELAY /NOT XMIT FLAG- RETURN TO SKIP CHAIN
4727 3350 DCA DELAYN /GET THE HARDWARE CONFIGURATION
4730 1351 DELLOP, TAD CON100 /MASK OUT THE XOR BIT
4731 3352 DCA US100 /IS THE XOR SELECTED
4732 2352 ISZ US100 /YES-SKIP OVER RECEIVE FLAG CHECK
4733 5332 JMP ,=1 /NO-CHECK SLU RECEIVE FLAG
4734 7200 CLA
4735 7200 CLA
4736 7200 CLA
4737 7200 CLA
4740 2350 ISZ DELAYN
4741 7610 SKP CLA
4742 5724 JMP I DELAYB
4743 5724 AND I DELAYB
4744 5724 AND I DELAYB
4745 5324 AND DELAYB
4746 5330 JMP DELLOP

4747 0000 NDELAY, 0
4750 0000 DELAYN, 0
4751 7754 CON100, -24
4752 0000 US100, 0

4753 0000 CLKXOR, 0
4754 1021 TAD OP1SEL /GET THE HARDWARE CONFIGURATION
4755 0377 AND (100 /MASK OUT THE XOR BIT
4756 7640 SZA CLA /IS THE XOR BIT SET ?
4757 4771 JMS XORCLK /YES, GO WAIT FOR THE FLAG
4760 6137 CLSK /NO, SKIP ON THE CLOCK FLAG
4761 5753 JMP I CLKXOR /FLAG NOT SET - RETURN TO BUMP COUNTER

```

```

4762 2353      ISZ   CLKXOR      /BUMP LOCATION TO SIMULATE THE SKIP
4763 5753      JMP   I  CLKXOR      /RETURN TO THE PROGRAM

4771 5000
4772 3306
4773 3311
4774 5252
4775 5477
4776 4704
4777 0100
5000      PAGE

5000 0000      XORCLK, 0
5001 6135      CLLE
5002 6002      IOF
5003 1777      TAD      X1200B
5004 3776      DCA      NDELAY
5005 4775      JMS      DELAYB
5006 6137      CLSK
5007 4427      ERROR
5010 1774      TAD      WTCCLK
5011 1373      TAD      (=XORENA
5012 7650      SNA      CLA
5013 7301      CLA  CLL  IAC
5014 6135      CLLE
5015 7200      CLA
5016 6001      ION
5017 7000      NOP
5020 2200      ISZ      XORCLK
5021 2200      ISZ      XORCLK
5022 5600      JMP   I  XORCLK

/CLEAR CLK INT ENA
/TURN THE INTERRUPT OFF
/GET A 10MS CONSTANT
/SAVE IT FOR THE DELAY
/DELAY FOR APPROXIMATELY 10MS
/SKIP ON THE CLOCK FLAG
/FLAG NOT SET IN ALLOTTED TIME
/GET THE ADDRESS INTO CLOCK WAIT ROUTINE
/CHECK TO SEE IF ENABLE OR DISABLE INT ENA
/ENABLE OR DISABLE CLK INT ENA ?
/ENABLE THE CLK INT ENA
/DISABLE IT IF ABOVE SKIPPED

/TURN THE INTERRUPT ON
/SHOULD INTERRUPT HERE IF IT IS GOING TO
/BUMP RETURN POINTER BY 2
/
/RETURN TO THE PROGRAM

5173 7404
5174 3352
5175 4724
5176 4747
5177 4710
      *200

```

0177 4753

```

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

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

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

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

1000 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
1100 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11110001

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

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

1600 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
1700 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111

2000 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
2100 11111111 11111111 11111111 11111111 11111111 11111111 11110000 00000001

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 11100000 00000000 00000000 00000000 00000000 00000000 00000001

3000 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
3100 11111111 11111111 11111111 11111111 11111111 11111111 11111111 00000001

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 11111111 11111111 11111111

```

```

4000 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
4100 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11001111

4200 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
4300 11111111 11111111 11111111 11111111 11111111 11111111 00000000 01111111

4400 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
4500 11111111 11111111 11111111 11111111 11111111 11111111 11111000 00001111

4600 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
4700 11111111 11111111 11111111 11111111 11111111 11111111 11110000 01111111

5000 11111111 11111111 11000000 00000000 00000000 00000000 00000000 00000000
5100 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00011111

5200
5300

5400
5500

5600
5700

6000
6100

6200
6300

6400
6500

6600
6700

7000
7100

7200
7300

7400
7500

7600
7700

```

AC	3251	DBSE	6575	K7	0064	RECSER	4400
ACDRET	4325	DBSK	6571	K7710	0150	RESEF	4276
ACLERR	4434	DBSS	6577	KCC	0032	RETAOD	3437
ACLION	4306	DBST	6570	KCDF	0132	RETURN	3420
ACLOP	4463	DBTD	6574	KCF	0030	RMF	6244
ACTCHK	3526	DELAY	4160	KIE	0035	RTCENA	4146
ACTCK2	3276	DELAYB	4724	KJHP	0130	RTCFGL	0075
ACTCNT	3102	DELAYN	4750	KJHP7	3465	RTCFRQ	3044
ACTFLG	3134	DELAYR	0070	KJHPRT	3472	RTCINT	4015
ACTRET	3564	DELOP	4730	KHB	0036	RTCSER	4333
ADDTIM	3362	DERPIO	3711	KRMF	0131	RTCSLU	4266
AERROR	3475	DERSLU	3734	KRS	0034	RTCTIM	4000
AERSWH	3507	DONLOP	4424	KRTF	0133	RTF	6005
BADPAS	0100	DONONE	4626	KSF	0031	RTIMOK	3041
BAUDRT	4105	ENARTC	0146	KSFHAT	4432	SAVADD	0124
BAUDTB	4110	ENDPAS	3400	KTEST	3466	SAVCNT	0050
BAUDWD	4104	ERROR	4427	LINK	0072	SAVLOC	3440
BDPNTR	4107	ERRPC	3543	LINKRT	4320	SBE	6101
BR110	4120	EXPACD	0071	LOADSM	6151	SIMCHK	4436
BR1200	4140	FLGCK1	3303	LODFRQ	6163	SIMCLR	6160
BR120	4124	FLGCK2	3306	LODSIM	4437	SIMCNT	0067
BR2400	4144	FLGCK3	3311	LOPPC	4423	SIMINT	3244
BR300	4130	FLGCK4	3314	LOOPSW	3237	SIMLOD	3214
BR4000	4150	FLGCK5	3317	LOPDON	3221	SIMWRD	3514
BR600	4134	FLGRST	3467	M10	0066	SKPCWN	3252
BR9600	4154	FROCTN	3043	M144	0103	SKPDAV	6165
C7	3470	FROTAB	3114	M15	4171	SKPFRQ	6162
CAF	6007	GOODPS	0101	M4	0065	SKPRDR	6157
CAL	6133	GTF	6004	M40	3167	SKPSTR	6167
CHKACT	3544	HLT	7402	NDELAY	4747	SKXR	6171
CHKSIM	3761	INACOV	4470	OFONKI	4667	SLUDAT	4433
CHKSWH	3407	INACLP	4512	ONACTL	3565	SLUDER	4434
CLCL	6136	INACTV	0077	OP13K	0000	SLUERR	4517
CLKFLG	0042	INTERA	4322	OP1SEL	0021	SLUINT	4071
CLKSET	3502	INTFLG	0041	OP2SEL	0022	SLULOP	4535
CLKSNC	2135	INTON	4064	PASSEU	4600	SLUREC	0054
CLKXOR	4753	INTRET	3326	PATCH	0104	SLUSTYR	4050
CLLE	6135	INTSKP	4200	PCLOOP	3200	SLUSWH	3754
CLROET	6156	INTXOR	4714	PIODAT	4426	SLUTIM	4023
CLRSIM	6150	K0	3436	PIODER	4430	SLUTOK	3112
CLSK	6137	K1	0125	PIODER	4542	SLUXMT	0053
CLSKWT	4425	K10	3471	PIOLOP	4550	SPI	6045
COMPACL	4421	K11	3473	PIOMEC	0052	SPL	6102
CNT	2043	K12	3474	PIOSER	4224	STIP	6173
CNT1	0044	K125	0061	PIOSWH	3727	SYNPAS	4624
CON100	4751	K2	0126	PIOXMT	0051	STPBIT	4106
CONTHD	0055	K200	0057	PNOINT	0076	STRFRQ	6161
DATP10	3600	K252	0060	POWFAL	3441	SWHCHK	4435
DATSLU	3653	K2525	0063	PROEND	5440	SWITCH	0020
DBCE	6576	K3	0127	RAN1	4323	SXRC	6175
DBCF	6573	K377	0056	RAN2	4324	TABFRQ	3073
DBRD	6572	K9292	0062	RECFLG	0074	TCF	6042

TEMP	4703	TSTGOD	0136
TEST	0045	TSTLOP	0046
TEST1	0200	US100	4752
TEST10	0663	WATKSF	3341
TEST11	0733	WATTSF	3327
TEST12	0774	WTCLSK	3352
TEST13	1027	X1100	4704
TEST14	1124	X1200B	4710
TEST15	1137	X1500B	4705
TEST16	1155	X2400B	4711
TEST17	1200	X3000B	4706
TEST18	1221	X4000B	4712
TEST19	1273	X6000B	4707
TEST2	0246	X9600B	4713
TEST20	1343	XMTFLG	0073
TEST21	1406	XMTSER	4327
TEST22	1457	XORCLK	5000
TEST23	1527	XORENA	0374
TEST24	1611	XORTSF	4651
TEST25	1644	XRCI	6172
TEST26	1721	XRON	6170
TEST27	2012	XRSI	6174
TEST28	2107	XRT0	6176
TEST29	2200		
TEST3	0304		
TEST30	2247		
TEST31	2301		
TEST32	2424		
TEST33	2436		
TEST34	2451		
TEST35	2467		
TEST36	2506		
TEST37	2526		
TEST38	2603		
TEST39	2653		
TEST4	0337		
TEST40	3000		
TEST41	3045		
TEST42	3124		
TEST5	0413		
TEST6	0452		
TEST7	0503		
TEST8	0547		
TEST9	0620		
TFL	6040		
TLS	6046		
TPC	6044		
TSF	6041		
TSFRET	4647		
TSFWAT	4431		
TSFXOR	4637		
TSTCNT	0047		

ERRORS DETECTED: 0
 LINKS GENERATED: 38
 RUN-TIME: 22 SECONDS
 3K CORE USED

/DKC8=AA OPTION TEST 1 MAINDEC=08=DJDKA-B=L 1K PART 1
 /
 /COPYRIGHT (C) 1974, 1975 DIGITAL EQUIPMENT CORPORATION
 /
 /PROGRAMMER: BRUCE HANSEN
 /

////////////////////////////////////
 /THE FOLLOWING LISTING WILL CORRESPOND TO THE PAPER TAPE LABELED
 /MAINDEC=08=DJDKA-B=PM1, 1K VERSION 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,
 //////////////////////////////////

/DKC8=AA OPTION TEST 1 MAINDEC=08=DJDKA-B=L 1K PART 1
 /
 /COPYRIGHT (C) 1974, 1975 DIGITAL EQUIPMENT CORPORATION
 /
 /PROGRAMMER: BRUCE HANSEN
 /

/PROCESSOR INSTRUCTIONS
 6007 CAF=6007 /CLEAR ALL FLAGS
 6102 SPL=6102 /SKIP ON AC LOW FLIP=FLOP
 6103 CAL=6103 /CLEAR AC LOW FLIP=FLOP
 6101 SBE=6101 /SKIP ON BATTERY EMPTY
 7402 HLT=7402
 6244 RMF=6244 /RESTORE MEMORY FIELD
 6005 RTF=6005
 6004 GTF=6004
 /OPTION BOARD NUMBER 1 IOT'S
 //SERIAL LINE UNIT
 /RECEIVER IOTS
 6030 KCF=6030 /CLEAR RECEIVE FLAG, DON'T SET READER RUN
 6031 KSF=6031 /SKIP ON RECEIVE FLAG
 6032 KCC=6032 /CLEAR RECEIVE FLAG AND AC, SET READER RUN
 6034 KRS=6034 /READ RECEIVE BUFFER
 6035 KIE=6035 /AC 11=1 SET INTERRUPT ENABLE
 /AC 11=0 CLEAR INTERRUPT ENABLE
 6036 KRB=6036 /CLEAR RECEIVE FLAG AND AC, SET READER RUN AND READ
 /RECEIVE BUFFER
 /TRANSMIT IOTS
 6040 TFL=6040 /SET TRANSMIT FLAG
 6041 TSF=6041 /SKIP ON TRANSMIT FLAG
 6042 TCF=6042 /CLEAR THE TRANSMIT FLAG
 6044 TPC=6044 /LOAD TRANSMIT BUFFER AND TRANSMIT
 6045 SPI=6045 /SKIP IF TRANSMIT OR RECEIVE FLAG SET AND INT ENA SET TO A 1
 6046 TLS=6046 /LOAD TRANSMIT BUFFER, TRANSMIT AND CLEAR TRANSMIT FLAG
 /REAL TIME CRYSTAL CLOCK
 6135 CLLE=6135 /AC 11=1 SET INTERRUPT ENABLE
 /AC 11=0 CLEAR INTERRUPT ENABLE
 6136 CLCL=6136 /CLEAR CLOCK FLAG
 6137 CLSK=6137 /SKIP ON CLOCK FLAG
 /12 BIT PARALLEL I/O
 6570 DBST=6570 /SKIP ON DATA ACCEPTED, CLEAR DATA ACCEPTED AND DATA AVAILABLE
 6571 DBSK=6571 /SKIP ON DATA READY FLAG
 6572 DBRD=6572 /READ DATA INTO AC 0=11
 6573 DBCF=6573 /CLEAR DATA READY FLAG, ISSUE DATA ACCEPTED OUT
 6574 DBTD=6574 /LOAD AC 0=11 INTO BUFFER AND TRANSMIT DATA OUT
 6575 DBSE=6575 /SET INTERRUPT ENABLE TO A 1

```

6576 DBCE=6576 /SET INTERRUPT ENABLE TO A 0
6577 DBSS=6577 /ISSUE A STROBE PULSE

/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

/OPTION BOARD 1 SIMULATOR IOT/S
6150 CLRSIM=6150 /CLEAR SIMULATOR CONTROL REGISTERS
6151 LOADSM=6151 /LOAD SIMULATOR CONTROL WORD 1
6156 CLRDET=6156 /CLEAR READER RUN, STROBE, AND DATA AVAILABLE CATCHER F/F/S
6157 SKPRDR=6157 /SKIP ON READER RUN CATCHER F/F SET
6160 SIMCLR=6160 /CLEAR CONTROL REGISTERS AND MOST OF LOGIC ON SIMULATOR
6161 STRFRQ=6161 /START FREQUENCY CHECK (SLU OR RTC)
6162 SKPFRQ=6162 /SKIP ON FREQUENCY CHECK IN PROGRESS
6163 LODFRQ=6163 /READ FREQUENCY COUNT INTO AC
6165 SKPAV=6165 /SKIP ON DATA AVAILABLE CATCHER F/F SET
6167 SKPSTR=6167 /SKIP ON STROBE CATCHER F/F SET

/OPTION BOARD 1 SIMULATOR CONTROL WORD BIT ASSIGNMENTS
/BIT 0 COUNTER RESET 1=ACTIVATE
/ 2=NO ACTION

/BIT 1 PARALLEL I/O CLEAR DATA 1=TS1
/ AVAILABLE SELECT 2=DATA ACCEPTED IN

/BIT 2 NOT USED
/BIT 3 NOT USED
/BIT 4 NOT USED

/BIT 5 RTC FREQUENCY OR 1=RTC
/ SLU FREQUENCY CHECK 2=SLU BAUD RATES

/BIT 6 REAL TIME CLOCK 1=OFF
/ 2=ON

/BIT 7 SLU EIA/20MA SELECT 1=EIA RECEIVE DATA
/ 2=20 MA RECEIVE DATA

/BIT 8 STOP BIT SELECT 1=1 STOP BITS
/ 2=2 STOP BIT

/BIT 9 BAUD RATE SELECT BIT 9, 10, 11 ALL 0'S
/BIT 10 BAUD RATE SELECT EQUALS 110 BAUD, EACH
/BIT 11 BAUD RATE SELECT INCREASING BIT SELECTS

```

```

0000 0000 *0 302 /PROGRAM REVISION LETTER=MAINDEC=08-DJOKA=8
0001 0302 RMF /RESTORE MEMORY FIELDS
0002 6244 JMP I 3 /RETURN TO INTERRUPT SERVICE ROUTINE
0003 1244 SIMINT/SKPCHN/SIMCHK/RTCINT/SLUINT /INTERRUPT SERVICE ROUTINES

0020 *20

0020 0000 SWITCH, 0
0021 2000 OP1SEL, 2000

/BIT 0=0 USE LOCATION 20 AS A PSEUDO SWITCH REGISTER
/BIT 0=1 USE HARDWARE FRONT PANEL SWITCH REGISTER
/BIT 1=1 HAS OPTION 1
/BIT 2=1 HAS OPTION 2
/BIT 3=1 HAS 8A CPU SIMULATOR
/BIT 4=1 HAS 8A OPTION 1+2 SIMULATOR
/BIT 5=1 PROGRAM ON PDP-8A XOR(REQUIRES BIT 4 SET ALSO)
/BIT 6=1 HAS PDP-8E TYPE CPU
/BIT 7=11 MEMORY SIZE = 0'S=1K, 37=32K, MEMORY
/SIZE CAN BE INCREASED IN 1K INCREMENTS BY ADDING
/ONE TO THE NUMBER IN BITS 7 = 11
/BIT 0 IS SET FOR THE ACT LINE

0022 0000 OP2SEL, 0
4423 LOOPPC=JMS I,
0023 1200 PCLOOP
4424 DONLOP=JMS I,
0024 1221 LOPDON
4425 CLSKWT=JMS I,
0025 1353 WTCLSK
4426 PIODAT=JMS I,
0026 1600 DATPIO
4427 ERROR=JMS I,
0027 1475 AERROR
4430 PIODER=JMS I,
0030 1711 DERPIO
4431 TSFWAT=JMS I,
0031 1331 WATTSF
4432 KSFHAT=JMS I,
0032 1342 WATKSF
4433 SLUDAT=JMS I,
0033 1653 DATSLU
4434 SLUDER=JMS I,
0034 1734 DERSLU
4435 SHWCHK=JMS I,
0035 1407 CHKSWH
4436 SIMCHK=JMS I,
0036 1761 CHKSIM
4437 LODSIM=JMS I,
0037 1214 SIMLOD
4445 RTCENA=JMS ENARTC

```



```

0040 1400 PRGEND=JMP I,
ENDPAS

/LOCATIONS USED BY THE PROGRAM

0041 0000 INTFLG, 0
0042 0000 CLKFLG, 0
0043 0000 CNT, 0
0044 0000 CNT1, 0
0045 0000 TEST, 0
0046 0000 TSTLOP, 0
0047 0000 TSTCNT, 0
0050 0000 SAVCNT, 0
0051 0000 PLOXMT, 0
0052 0000 PLOREC, 0
0053 0000 SLUXMT, 0
0054 0000 SLUREC, 0
0055 0000 CONTWD, 0
0056 0377 K377, 377
0057 0200 K200, 200
0060 0252 K252, 252
0061 0125 K125, 125
0062 5252 K5252, 5252
0063 2525 K2525, 2525
0064 0007 K7, 7
0065 7774 M4, -4
0066 7770 M10, -10
0067 0000 SIMCNT, 0

0070 0000 EXPACD, 0
0071 0000 LINK, 0
0072 0000 XMTFLG, 0
0073 0000 RECFLG, 0
0074 0000 RTCFLG, 0
0075 0000 PNOINT, 0
0076 0000 INACTV, 0
0077 6520 BADPAS, 6520
0100 6500 GOODPS, 6500
0101 7634 ACTCNT, -144
0102 7634 M144, -144

```

/ACT LINE ERROR RETURN TO FIELD 7
/ACT LINE GOOD RETURN TO FIELD 7

/ROUTINE TO SETUP FIELD 0 TO HANDLE INTERRUPTS FROM ANOTHER FIELD

```

0103 0000 PATCH, 0
0104 1503 TAD I PATCH
0105 3123 DCA SAVADD
0106 6201 CDF
0107 1130 TAD KRMF
0110 3524 DCA I K1
0111 1127 TAD KJMP
0112 3525 DCA I K2
0113 1123 TAD SAVADD

```

/GET THE INTERRUPT SERVICE ADDRESS
/SAVE INTERRUPT ADDRESS
/CHANGE DATA FIELD TO FIELD 0
/GET THE INSTRUCTION RMF
/PUT IT IN LOCATION 1 OF FIELD 0
/GET THE INSTRUCTION JMP I 3
/PUT IT IN LOCATION 2 OF FIELD 0
/GET THE INTERRUPT SERVICE ADDRESS

```

0114 3526 DCA I K3
0115 6224 RIF
0116 1131 TAD KCDF
0117 3120 DCA ,*1
0120 7402 HLT/CDF
0121 2103 ISZ
0122 5503 JMP I PATCH
0123 0000 SAVADD, 0
0124 0001 K1, 1
0125 0002 K2, 2
0126 0003 K3, 3
0127 5403 KJMP, JMP I 3
0130 6244 KRMF, 6244
0131 6201 KCDF, CDF
0132 6005 KRTF, RTF
0133 0000 ACTFLG, 0
0134 0000 CLKSNC, 0

```

/THIS ROUTINE USED WHEN RUNNING ON THE ACT LINE TO SIGNIFY THAT NO
/ERRORS HAVE BEEN ENCOUNTERED

```

0135 0000 TSTGOD, 0
0136 1022 TAD OP2SEL
0137 7700 SMA CLA
0140 5535 JMP I TSTGOD
0141 6002 IOF
0142 6272 CIF 70
0143 4500 JMS I GOODPS
0144 5535 JMP I TSTGOD

```

/GET THE HARDWARE FLAG
/ARE WE ON THE ACT LINE?
/NO, RETURN TO THE PROGRAM
/TURN THE INTERRUPT OFF
/CHANGE THE INSTRUCTION TO FIELD 7
/GO TO PROM
/RETURN TO THE PROGRAM

```

0145 0000 ENARTC, 0
0146 1022 TAD OP2SEL
0147 7710 K7710, SPA CLA
0150 7301 CLA CLL IAC
0151 6135 CLLE
0152 7200 CLA
0153 5545 JMP I ENARTC

```

0200 -200

/INITIALIZATION TEST
/TEST 1 - CHECKS THAT INITIALIZE WILL CLEAR ALL FLAGS, ANY ERROR MAYBE DUE TO A
/FLAG STUCK ON OR THE IOT SKIPPED, THE PARALLEL I/O BUFFER IS CHECKED TO CONTAIN
/ZEROS, HOWEVER, THE READ COMMAND (6972) MAY NOT WORK, THE TEST WAITS FOR THE
/RTC FLAG TO SET AND CHECKS THE FLAG TO SKIP, NO INTERRUPTS SHOULD OCCUR,
/NOTE! INITIALIZE SETS THE SERIAL LINE UNIT'S INTERRUPT ENABLE,

0200 6160 TEST1, SIMCLR

```

0201 4103 JMS PATCH /SETUP INTERRUPT SERVICE
0202 1244 SIMINT
0203 4423 LOOPPC /STORE THE LOOPING PC AND SETUP TEST COUNT
0204 7777 =1 /SETUP SIMULATOR ITERATION COUNTER
0205 4436 SIMCHK /CHECK FOR SIMULATOR
0206 4000 4000 /CONTROL WORD FOR SIMULATOR
0207 4437 LODSIM /LOAD SIMULATOR=TEST LOOP USING SIMULATOR
0210 3041 DCA INTFLG /CLEAR PROGRAM INTERRUPT FLAG
0211 6007 CAF /INITIALIZE THE MODULE = CAF SETS INT ENA ON SLU
0212 6001 ION /TURN THE INTERRUPT ON
0213 6001 KSF /SKIP ON RECEIVE FLAG
0214 7410 SKP
0215 4427 ERROR /RECEIVE FLAG SET OR KSF SKIPPED
0216 6041 TSF /SKIP ON TRANSMIT FLAG
0217 7410 SKP
0220 4427 ERROR /TRANSMIT FLAG SET OR TSF SKIPPED
0221 6045 SPI /SKIP ON XMIT/RECEIVE + INT ENA
0222 7410 SKP
0223 4427 ERROR /0 SIDE OF XMIT/RECEIVE HELD LOW OR SPI SKIPPED
0224 6571 DBSK /SKIP ON DATA READY FLAG
0225 7410 SKP
0226 4427 ERROR /DATA READY FLAG SET OR DBSK SKIPPED
0227 6570 DBST /SKIP ON DATA ACCEPTED 0 IT AND DATA AVAILABLE
0230 7410 SKP
0231 4427 ERROR /DBST SKIPPED OR DATA ACCEPTED SET
0232 7240 CLA CMA /SET THE AC TO ALL ONES
0233 6572 DBRD /READ THE 12 BIT PARALLEL I/O BUFFER
0234 7410 SKP
0235 4427 ERROR /DBRD SKIPPED
0236 7640 SEA CLA
0237 4427 ERROR /CAF FAILED TO CLEAR XMIT BUFFER OR DBRD FAILED,
0240 4425 CLSKWT /WAIT FOR REAL TIME CLOCK FLAG TO SET
0241 4427 ERROR /CLOCK FLAG FAILED TO SET WITHIN A 152 LOOP
0242 1041 TAD INTFLG /DID THE PROGRAM INTERRUPT
0243 7640 SEA CLA
0244 4427 ERROR /PROGRAM INTERRUPTED = ALL FLAGS ZERO EXCEPT CLK FLG
0245 4424 DONLOP /CHECK TO SEE IF DONE, OR LOOP ON TEST IF SR2=1

```

```

/*****
//FIRST SECTION OF THE REAL TIME CLOCK DIAGNOSTIC
//TEST 2 - CHECKS THAT KLKL TICK WILL SET CLK FLAG AND THAT CAF WILL CLEAR IT, THE
//PROGRAM IS CHECKED NOT TO INTERRUPT.
/*****

```

```

0246 4103 TEST2, JMS PATCH /SETUP INTERRUPT SERVICE
0247 1252 SKPCHN
0250 7240 CLA CMA
0251 3042 DCA CLKFLG /SET INTERRUPT CHAIN TO ACKNOWLEDGE CLOCK INTERRUPTS,
0252 4423 LOOPPC /SETUP TEST COUNT AND SCOPE LOOPING ADDRESS
0253 7777 =1 /SIMULATOR ITERATION COUNTER
0254 4436 SIMCHK /CHECK TO SEE IF SIMULATOR IS SELECTED
0255 4000 4000 /CONTROL WORD FOR THE SIMULATOR
0256 4437 LODSIM /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
/LOOP = THIS ADDRESS IF SIMULATOR SELECTED
/OTHERWISE SCOPE LOOP IS THIS ADDRESS +1

```

```

0257 7344 CLA CLL CMA RAL /SETUP A PROGRAM LOOP TO LOOK AT 2 CLOCK FLAGS
0260 3134 DCA CLKSNC /TO SYNC THE REAL TIME CLOCK
0261 3041 DCA INTFLG /CLEAR PROGRAM INTERRUPT FLAG
0262 6007 CAF /CLEAR ALL FLAGS BUT SET INT ENA ON SLU
0263 6001 ION /TURN THE INTERRUPT ON
0264 4425 CLSKWT /WAIT FOR THE CLOCK FLAG TO SET
0265 4427 ERROR /CLK FLAG FAILED TO SET OR NO KLKL TICK PULSE
0266 1041 TAD INTFLG /GET THE PROGRAM INTERRUPT FLAG
0267 7640 SEA CLA /DID IT INTERRUPT?
0270 4427 ERROR /PROGRAM INTERRUPTED WITHOUT CLK INT ENA
0271 2134 152 CLKSNC /2ND FLAG SET?
0272 5261 JMP ,=11 /NO, GO AND TRY TO CLEAR CLK FLAG WITH CAF
0273 6007 CAF /CLEAR ALL FLAGS BUT SET SLU'S INT ENA
0274 6001 ION /TURN THE INTERRUPT BACK ON
0275 6137 CLSK /SKIP ON THE CLOCK FLAG
0276 7610 SKP CLA
0277 4427 ERROR /CAF FAILED TO CLEAR CLK FLAG OR CLSK SKIPPED,
0300 1041 TAD INTFLG /GET THE PROGRAM INTERRUPT FLAG
0301 7640 SEA CLA
0302 4427 ERROR /PROGRAM INTERRUPTED WITHOUT CLK INT ENA + CLK FLAG
0303 4424 DONLOP /REPEAT TEST IF NOT DONE OR LOOP ON TEST IF SR2=1

```

```

/*****
//TEST 3 - CHECKS THAT KLKL TICK WILL SET CLK FLAG AND THAT IT CAN BE CLEARED BY CLCL.
//THE CLK FLAG IS CHECKED NOT TO CAUSE AN INTERRUPT,
/*****

```

```

0304 4423 TEST3, LOOPPC /SETUP TEST COUNT AND SCOPE LOOPING ADDRESS
0305 7777 =1 /SIMULATOR ITERATION COUNTER
0306 4436 SIMCHK /CHECK TO SEE IF SIMULATOR IS SELECTED
0307 4000 4000 /CONTROL WORD FOR THE SIMULATOR
0310 4437 LODSIM /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
/LOOP = THIS ADDRESS IF SIMULATOR SELECTED
/OTHERWISE SCOPE LOOP IS THIS ADDRESS +1
0311 7344 CLA CLL CMA RAL /SETUP A PROGRAM LOOP TO LOOK AT 2 CLK FLAGS TO
0312 3134 DCA CLKSNC /SYNC THE REAL TIME CLOCK
0313 3041 DCA INTFLG /CLEAR PROGRAM INTERRUPT FLAG
0314 6007 CAF /CLEAR ALL FLAGS BUT SET INT ENA ON SLU
0315 6001 ION /TURN INTERRUPT ON
0316 4425 CLSKWT /WAIT FOR CLK FLAG
0317 4427 ERROR /CLOCK FLAG FAILED TO SET
0320 1041 TAD INTFLG /GET THE PROGRAM INTERRUPT FLAG
0321 7640 SEA CLA /DID IT INTERRUPT?
0322 4427 ERROR /PROGRAM INTERRUPTED WITH CLK INT ENA,
0323 2134 152 CLKSNC /2ND FLAG SET?
0324 5313 JMP ,=11 /NO, GO CLEAR THE FLAG WITH CAF AND WAIT FOR NEXT ONE
0325 6136 CLCL /CLEAR THE CLK FLAG
0326 7610 SKP CLA
0327 4427 ERROR /CLCL SKIPPED
0330 6137 CLSK /SKIP ON CLOCK FLAG
0331 7610 SKP CLA
0332 4427 ERROR /CLCL FAILED TO CLEAR CLK FLAG
0333 1041 TAD INTFLG /GET THE PROGRAM INTERRUPT FLAG
0334 7640 SEA CLA /DID THE PROGRAM INTERRUPT?
0335 4427 ERROR /PROGRAM INTERRUPTED, COULD BE CLCL SHORTED TO CLLE

```

```

0336 4424      DONLOP      /REPEAT TEST IF NOT DONE OR LOOP ON TEST IF SR2=1
/*****
/TEST 4 = CHECK THAT CLK INT ENA CAN BE SET AND CLEARED BY DATA BIT 11
/AND CLLE USING THE CLK FLAG TO INTERRUPT ON
/*****
0337 4423      TEST4, LOOPPC      /SETUP TEST COUNT AND SCOPE LOOPING ADDRESS
0340 7777      =1              /SIMULATOR ITERATION COUNTER
0341 4436      SIMCHK          /CHECK TO SEE IF SIMULATOR IS SELECTED
0342 4000      4000           /CONTROL WORD FOR THE SIMULATOR
0343 4437      LODSIM          /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
                                /LOOP = THIS ADDRESS IF SIMULATOR SELECTED
                                /OTHERWISE SCOPE LOOP IS THIS ADDRESS +1
0344 7344      CLA CLL CMA RAL /SETUP A PROGRAM LOOP TO LOOK AT 2 CLK FLAGS
0345 3134      DCA CLKSNCRAL /TO SYNC UP THE REAL TIME CLOCK
0346 3041      DCA INTFLG     /CLEAR PROGRAM INTERRUPT FLAG
0347 6007      CAF           /CLEAR ALL FLAGS BUT SET INT ENA ON SLU
0350 6001      ION           /TURN THE INTERRUPT ON
0351 4425      CLSKWT        /WAIT FOR THE CLK FLAG
0352 4427      ERROR         /CLK FLAG FAILED TO SET
0353 1041      TAD INTFLG     /GET THE PROGRAM INTERRUPT FLAG
0354 7640      SZA CLA        /DID THE PROGRAM INTERRUPT?
0355 4427      ERROR         /FLAG INTERRUPTED WITHOUT CLK INT ENA
0356 2134      ISZ CLKSNCRAL /2ND FLAG SET?
0357 5346      JMP ,=11       /NO, GO CLEAR FLAG WITH CAF AND WAIT FOR NEXT FLAG
0360 6136      CLCL          /CLEAR THE CLOCK FLAG
0361 6137      CLSK          /SKIP ON CLOCK FLAG
0362 7610      SKP CLA        /CLCL FAILED TO CLEAR CLK FLAG
0363 4427      ERROR         /SET DATA BIT 11 TO A ONE
0364 7301      CLA CLL IAC     /TRY AND SET CLK INT ENA
0365 6135      CLLE          /CLLE SKIPPED,
0366 7610      SKP CLA        /GET THE PROGRAM INTERRUPT FLAG
0367 4427      ERROR         /PROGRAM INTERRUPTED WITHOUT CLK FLAG SET
0370 1041      TAD INTFLG     /WAIT FOR NEXT CLK FLAG
0371 7640      SZA CLA        /CLK FLAG FAILED TO SET
0372 4427      ERROR         /DID THE PROGRAM INTERRUPT
0373 4425      CLSKWT        /CLLE FAILED TO SET CLK INT ENA OR FAILED TO INT
0374 4427      XORENA,       /CLEAR THE PROGRAM INTERRUPT FLAG
0375 2041      ISZ INTFLG     /CLEAR CLK INT ENA
0376 4427      ERROR         /TURN THE INTERRUPT ON
0377 3041      DCA INTFLG     /
0400 6135      CLLE          /GET THE PROGRAM INTERRUPT FLAG
0401 6001      ION           /DID IT INTERRUPT?
0402 7300      CLA CLL        /YES, CLLE FAILED TO CLEAR CLK INT ENA
0403 1041      TAD INTFLG     /CLEAR THE CLOCK FLAG
0404 7640      SZA CLA        /SKIP ON CLOCK FLAG
0405 4427      ERROR         /ERROR CLCL FAILED TO CLEAR CLOCK FLAG
0406 6136      CLCL          /REPEAT TEST IF NOT DONE OR LOOP ON TEST IF SR2=1
0407 6137      CLSK
0410 7610      SKP CLA
0411 4427      ERROR
0412 4424      DONLOP

```

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/*****
/TEST 5 = CHECKS THAT CLK INT ENA CAN BE SET AND THAT CAF WILL CLEAR IT
/USING THE CLK FLAG TO INTERRUPT ON,
/*****
0413 4423      TEST5, LOOPPC      /SETUP TEST COUNT AND SCOPE LOOPING ADDRESS
0414 7777      =1              /SIMULATOR ITERATION COUNTER
0415 4436      SIMCHK          /CHECK TO SEE IF SIMULATOR IS SELECTED
0416 4000      4000           /CONTROL WORD FOR THE SIMULATOR
0417 4437      LODSIM          /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
                                /LOOP = THIS ADDRESS IF SIMULATOR SELECTED
                                /OTHERWISE SCOPE LOOP IS THIS ADDRESS +1
0420 7344      CLA CLL CMA RAL /SETUP A PROGRAM LOOP TO LOOK AT 2 CLOCK FLAGS
0421 3134      DCA CLKSNCRAL /TO SYNC UP THE REAL TIME CLOCK
0422 3041      DCA INTFLG     /CLEAR PROGRAM INTERRUPT FLAG
0423 6007      CAF           /CLEAR ALL FLAGS AND SET INT ENA ON SLU
0424 6001      ION           /TURN THE INTERRUPT ON
0425 4425      CLSKWT        /WAIT FOR THE CLOCK FLAG
0426 4427      ERROR         /CLK FLAG FAILED TO SET
0427 1041      TAD INTFLG     /GET THE PROGRAM INTERRUPT FLAG
0430 7640      SZA CLA        /PROGRAM INTERRUPTED WITHOUT CLK INT ENA
0431 4427      ERROR         /2ND FLAG SET?
0432 2134      ISZ CLKSNCRAL /NO, GO CLEAR FLAG AND WAIT FOR NEXT
0433 5222      JMP ,=11
0434 7301      CLA CLL IAC     /SET INTERRUPT INABLE TO A ONE
0435 6135      CLLE          /SHOULD INTERRUPT HERE
0436 7300      CLA CLL        /DID THE PROGRAM INTERRUPT
0437 2041      ISZ INTFLG     /PROGRAM FAILED TO INTERRUPT WITH CLK FLAG + CLK INT ENA
0440 4427      ERROR         /CLEAR ALL FLAGS
0441 6007      CAF           /WAIT FOR CLK FLAG
0442 6001      ION           /CLK FLAG FAILED TO RESET
0443 4425      CLSKWT        /GET THE PROGRAM INTERRUPT FLAG
0444 4427      ERROR         /DID IT INTERRUPT
0445 1041      TAD INTFLG     /CAF FAILED TO CLEAR CLK INT ENA
0446 7640      SZA CLA        /CLEAR THE CLOCK FLAG
0447 4427      ERROR         /REPEAT TEST IF NOT DONE OR LOOP ON TEST IF SR2=1
0450 6136      CLCL
0451 4424      DONLOP
/*****
/TEST 6 = CHECKS THAT THE THREE RTC IOT'S DON'T EFFECT THE AC
/*****
0452 4423      TEST6, LOOPPC      /STORE THE TEST LOOPING PC
0453 7777      =1              /SIMULATOR ITERATION COUNTER
0454 4436      SIMCHK          /CHECK TO SEE IF SIMULATOR IS SELECTED
0455 4000      4000           /CONTROL WORD FOR THE SIMULATOR
0456 4437      LODSIM          /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
                                /LOOP = THIS ADDRESS IF SIMULATOR SELECTED
                                /OTHERWISE SCOPE LOOP IS THIS ADDRESS +1
0457 6007      CAF           /CLEAR CLK INT ENABLE
0458 6001      ION
0461 7344      CLA CLL CMA RAL
0462 6135      CLLE
0463 1125      TAD K2

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```

0464 7640      SEA CLA
0465 4427      ERROR          /CLIE CHANGED THE AC
0466 7240      CLA CMA
0467 6136      CLCL          /CLEAR CLOCK FLAG
0470 7001      IAC
0471 7640      SEA CLA
0472 4427      ERROR          /CLCL CHANGED THE AC
0473 7240      CLA CMA
0474 6137      CLSK          /SKIP ON CLOCK FLAG
0475 7000      NOP
0476 7001      IAC
0477 7640      SEA CLA
0500 4427      ERROR          /CLSK CHANGED THE AC
0501 4424      DONLOP        /CHECK TO SEE IF DONE OR LOOP ON TEST,
0502 4135      JMS          TSTG0D /GO CHECK FOR THE ACT LINE

```

```

/*****
/FIRST SECTION OF THE 12 BIT PARALLEL I/O DIAGNOSTIC TESTS
/THE PARALLEL I/O MUST BE CONNECTED IN LOOP BACK MODE (12 BIT DATA OUT
/TO 12 BIT DATA IN, DATA AVAILABLE TO SET DATA READY, AND DATA ACCEPTED
/OUT TO DATA ACCEPTED IN), THE SWITCH FOR TS1 TO CLEAR DATA AVAILABLE SHOULD
/BE LEFT OFF TO RUN THIS SECTION OF THE PROGRAM,
/*****

```

```

/*****
/TEST 7 - CHECKS THE DATA ACCEPTED AND THE DATA READY FLIP-FLOPS TO BE
/ZERO FOLLOWING A CAF, THE PROGRAM ISSUES THE 10T DBCF TO CLEAR THE DATA
/READY FLAG AND TO SET THE DATA ACCEPTED F/F, THE 10T DBST IS THEN
/ISSUED TO CHECK THAT IT WILL SKIP ON DATA ACCEPTED F/F AND THEN RE-
/ISSUED TO CHECK THAT THE FIRST DBST CLEARED DATA ACCEPTED,
/*****

```

```

0503 4103      TEST7, JMS PATCH
0504 1292      SKPCHN
0505 4423      LOOPPC        /SETUP TEST COUNT AND TEST LOOPING ADDRESS
0506 7777      -1           /SIMULATOR ITERATION COUNTER
0507 4436      SIMCHK        /CHECK TO SEE IF SIMULATOR IS SELECTED
0510 4000      4000        /SIMULATOR CONTROL WORD
0511 4437      LODSIM        /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE LOOP
                                /EQUAL THIS ADDRESS IF SELECTED OTHERWISE
                                /SET IT TO THE NEXT ADDRESS
0512 6007      CAF          /CLEAR ALL FLAGS
0513 4145      RTCENA        /SET REAL TIME CLOCK INT ENA
0514 3041      DCA          /CLEAR PROGRAM INTERRUPT FLAG
                                INTFLG
0515 3042      DCA          /SET INTERRUPT SERVICE TO IGNORE CLOCK FLAG
                                CLKFLG
0516 6001      ION          /TURN THE INTERRUPT ON
0517 6571      DBSK          /SKIP ON THE DATA READY FLAG
                                CLA
0520 7640      SEA          /CHECK THAT DBSK DIDN'T READ ANYTHING INTO AC
0521 4427      ERROR        /INIT FAILED TO 0 DATA READY, DBSK SKIPPED OR
                                /READ SOMETHING INTO THE AC
                                /SKIP ON DATA ACCEPTED, 0 DATA ACCEPTED AND DATA AVAILABLE
0522 6570      DBST
0523 7640      SEA          CLA
0524 4427      ERROR        /INIT FAILED TO 0 DATA ACCEPTED, DBST SKIPPED OR
                                /DBST READ SOMETHING INTO THE AC
0525 1041      TAD          INTFLG /GET THE PROGRAM INTERRUPT FLAG

```

```

0526 7640      SEA          CLA
0527 4427      ERROR        /PROGRAM INTERRUPTED WITHOUT INT ENA AND FLAG SET
0530 6573      DBCF          /CLEAR DATA READY SET DATA ACCEPTED
0531 7640      SEA          CLA
0532 4427      ERROR        /DBCF SKIPPED OR READ SOMETHING INTO AC
0533 6571      DBSK          /SKIP ON DATA READY
0534 7610      SKP          CLA
0535 4427      ERROR        /DATA READY FLAG GOT SET BY DBST OR DBCF
0536 6570      DBST          /SKIP ON DATA ACCEPTED AND CLEAR IT
0537 4427      ERROR        /DATA ACCEPTED NOT SET OR DBST FAILED TO SKIP
0540 6570      DBST          /SKIP ON DATA ACCEPTED TO CHECK THAT IT CLEARED
0541 7610      SKP          CLA
0542 4427      ERROR        /DBST AND TP4 FAILED TO CLEAR DATA ACCEPTED F/F
0543 1041      TAD          INTFLG /GET THE PROGRAM INTERRUPT FLAG
0544 7640      SEA          CLA
0545 4427      ERROR        /PROGRAM INTERRUPTED WITHOUT INT ENA SET
0546 4424      DONLOP        /REPEAT TEST IF SR EQUAL TO 1000

```

```

/*****
/TEST 8 - CHECKS THAT THE DATA READY FLAG CAN BE SET AND CLEARED, TO
/SET THE DATA READY FLAG, THE PROGRAM ISSUES THE 10T DBTD TO TRANSMIT
/AND SET DATA AVAILABLE F/F, THE SETTING OF DATA AVAILABLE F/F IN LOOP
/BACK MODE SETS THE DATA READY F/F, THE 10T DBSK IS THEN ISSUED TO
/CHECK THAT THE FLAG IS SET AND THAT THE 10T WILL SKIP, THE PROGRAM
/THEN CLEARS THE DATA READY FLAG WITH DBCF WHICH ALSO SETS DATA ACCEPTED,
/THE DATA READY FLAG IS CHECKED TO BE CLEARED BY ISSUING A DBSK AND
/DATA ACCEPTED F/F IS CHECKED TO BE SET BY ISSUING A DBST, THE DATA
/ACCEPT F/F IS CHECKED AGAIN TO BE CLEARED BY ISSUING ANOTHER DBST,
/*****

```

```

0547 4423      TEST8, LOOPPC /SETUP TEST COUNT AND TEST LOOPING ADDRESS
0550 7777      -1           /SIMULATOR ITERATION COUNTER
0551 4436      SIMCHK        /CHECK TO SEE IF THE SIMULATOR IS SELECTED
0552 4000      4000        /SIMULATOR CONTROL WORD
0553 4437      LODSIM        /LOAD SIMULATOR IF SELECTED, ALSO SET SCOPE
                                /LOOP = THIS ADDRESS IF SELECTED OTHERWISE
                                /SCOPE LOOP WILL BE NEXT ADDRESS,
0554 6007      CAF          /CLEAR ALL FLAGS
0555 4145      RTCENA        /SET REAL TIME CLOCK INT ENA
0556 3041      DCA          /CLEAR PROGRAM INTERRUPT FLAG
                                INTFLG
0557 6001      ION          /TURN THE INTERRUPT ON
0560 6571      DBSK          /SKIP ON DATA READY FLAG
                                CLA
0561 7610      SKP
0562 4427      ERROR        /DATA READY FLAG SET OR DBSK SKIPPED
0563 6570      DBST          /SKIP ON DATA ACCEPTED, 0 DATA ACCEPTED AND DATA AVAILABLE
0564 7610      SKP          CLA
0565 4427      ERROR        /DATA ACCEPTED SET OR DBST SKIPPED
0566 6574      DBTD          /TRANSMIT AND SET DATA AVAILABLE AND DATA READY
0567 7640      SEA          CLA /CHECK THAT DBTD DIDN'T READ ANYTHING INTO AC
0570 4427      ERROR        /DBTD SKIPPED
0571 6571      DBSK          /SKIP ON DATA READY FLAG
0572 4427      ERROR        /DBTD FAILED TO SET DATA READY FLAG
0573 6570      DBST          /SKIP ON DATA ACCEPTED, 0 DATA AVAILABLE AND DATA ACCEPTED
0574 7610      SKP          CLA
0575 4427      ERROR        /DATA ACCEPTED SET BEFORE DBCF WAS ISSUED

```

```

0576 0571 DBSK /SKIP ON DATA READY
0577 0427 ERROR /DATA READY FLAG CLEARED
0600 1041 TAD INTFLG /GET THE PROGRAM INTERRUPT FLAG
0601 7640 SZA CLA
0602 0427 ERROR /PROGRAM INTERRUPTED WITHOUT SETTING INT ENA
0603 0573 DBCF /CLEAR DATA READY SET DATA ACCEPTED
0604 0571 DBSK /SKIP ON DATA READY
0605 7410 SKP
0606 0427 ERROR /DBCF FAILED TO CLEAR DATA READY
0607 0570 DBST /SKIP ON DATA ACCEPTED AND CLEAR IT AND DATA AVAIL,
0610 0427 ERROR /DBCF FAILED TO SET DATA ACCEPTED OR DBST FAILED TO SKIP
0611 0570 DBST /SKIP ON DATA ACCEPTED
0612 7410 SKP
0613 0427 ERROR /THE FIRST DBST FAILED TO CLEAR DATA ACCEPTED
0614 1041 TAD INTFLG /GET THE PROGRAM INTERRUPT FLAG
0615 7640 SZA CLA
0616 0427 ERROR /PROGRAM INTERRUPTED WITHOUT INT ENA SET
0617 0424 DONLOP /REPEAT TEST IF SR = 1000

```

 /TEST 9 - CHECKS THAT CAF WILL CLEAR THE DATA READY FLAG AND THE
 /DATA ACCEPTED FLAG.

```

0620 0423 TEST9, LOOPPC /SETUP TEST COUNT AND TEST LOOPING ADDRESS
0621 7777 =1 /SIMULATOR ITERATION COUNTER
0622 0436 SIMCHK /CHECK TO SEE IF SIMULATOR IS SELECTED
0623 0000 4000 /SIMULATOR CONTROL WORD
0624 0437 LOOSIM /LOAD SIMULATOR IF SELECTED, ALSO SET SCOPE
/LOOP EQUAL THIS ADDRESS IF SIMULATOR SELECTED
/OTHERWISE SCOPE LOOP WILL BE NEXT ADDRESS
0625 0007 CAF /CLEAR ALL FLAGS
0626 0145 RTCENA /SET REAL TIME CLOCK INT ENA
0627 3041 DCA INTFLG /CLEAR PROGRAM INTERRUPT FLAG
0630 0001 ION /TURN THE INTERRUPT ON
0631 0574 DBTD /TRANSMIT AND SET DATA READY FLAG
0632 0571 DBSK /SKIP ON DATA READY FLAG
0633 0427 ERROR /DBTD FAILED TO SET DATA READY
0634 0570 DBST /SKIP ON DATA ACCEPTED AND CLEAR IT
0635 7410 SKP
0636 0427 ERROR /DATA ACCEPTED GOT SET BEFORE A DBCF WAS ISSUED
0637 1041 TAD INTFLG /GET THE PROGRAM INTERRUPT FLAG
0640 7640 SZA CLA
0641 0427 ERROR /PROGRAM INTERRUPTED WITHOUT INT ENA SET
0642 0007 CAF /CLEAR DATA READY FLAG
0643 0145 RTCENA /SET REAL TIME CLOCK INT ENA
0644 0571 DBSK /SKIP ON DATA READY FLAG
0645 7610 SKP CLA
0646 0427 ERROR /INIT FAILED TO CLEAR DATA READY FLAG
0647 0001 ION /TURN THE INTERRUPT BACK ON
0650 0573 DBCF /CLEAR DATA READY SET DATA ACCEPTED
/THE PROGRAM ASSUMES THAT DBCF SET DATA ACCEPTED
0651 0007 CAF /CLEAR DATA ACCEPTED
0652 0145 RTCENA /SET REAL TIME CLOCK INT ENA
0653 0001 ION /TURN THE INTERRUPT ON

```

```

0654 0570 DBST /SKIP ON DATA ACCEPTED
0655 7640 SZA CLA
0656 0427 ERROR /INIT FAILED TO CLEAR DATA ACCEPTED
0657 1041 TAD INTFLG /GET THE PROGRAM INTERRUPT FLAG
0660 7640 SZA CLA
0661 0427 ERROR /PROGRAM INTERRUPTED WITHOUT INT ENA SET
0662 0424 DONLOP /REPEAT TEST IF SR = 1000

```

 /TEST 10 - CHECKS THAT INT ENA CAN BE SET AND CLEARED USING THE
 /DATA READY FLAG TO SKIP AND INTERRUPT ON;

```

0663 0423 TEST10, LOOPPC /SETUP TEST COUNT AND TEST LOOPING ADDRESS
0664 7777 =1 /SIMULATOR ITERATION COUNTER
0665 0436 SIMCHK /CHECK TO SEE IF SIMULATOR SELECTED
0666 0000 4000 /SIMULATOR CONTROL WORD
0667 0437 LOOSIM /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
/LOOP = THIS ADDRESS IF SIMULATOR SELECTED
/OTHERWISE SCOPE LOOP IS NEXT ADDRESS
0670 0007 CAF /CLEAR ALL FLAGS
0671 0145 RTCENA /SET REAL TIME CLOCK INT ENA
0672 3041 DCA INTFLG /CLEAR PROGRAM INTERRUPT FLAG
0673 0001 ION /TURN THE INTERRUPT ON
0674 0571 DBSK /SKIP ON DATA READY FLAG
0675 7610 SKP CLA
0676 0427 ERROR /DATA READY FLAGS SET FOLLOWING INIT
0677 0570 DBST /SKIP ON DATA ACCEPTED
0680 7610 SKP CLA
0681 0427 ERROR /DATA ACCEPTED SET FOLLOWING INIT
0682 1041 TAD INTFLG /CHECK THAT THE PROGRAM DID NOT INTERRUPT
0683 7640 SZA CLA
0684 0427 ERROR /PROGRAM INTERRUPTED WITHOUT FLAGS AND INT ENA SET
0685 0575 DBSE /SET INTERRUPT ENABLE TO A 1
0686 7640 SZA CLA /CHECK THAT DBSE DIDN'T CHANGE THE AC
0687 0427 ERROR /DBSE SKIPPED OR READ SOMETHING INTO AC
0690 1041 TAD INTFLG /GET THE PROGRAM INTERRUPT FLAG
0691 7640 SZA CLA
0692 0427 ERROR /PROGRAM INTERRUPTED WITHOUT FLAG SET
0693 0574 DBTD /TRANSMIT AND SET DATA READY
0694 0571 DBSK /SKIP ON DATA READY FLAG
0695 0427 ERROR /DBTD FAILED TO SET DATA READY
0696 2041 ISZ INTFLG /DID THE PROGRAM INTERRUPT?
0697 0427 ERROR /PROGRAM FAILED TO INTERRUPT OR INT ENA NOT SET
0698 0576 DBCE /CLEAR INTERRUPT ENABLE
0699 7640 SZA CLA /CHECK THAT DBCE DIDN'T CHANGE THE AC
0702 0427 ERROR /DBCE SKIPPED OR CHANGED THE AC
0703 0001 ION /TURN THE INTERRUPT ON
0704 0571 DBSK /SKIP ON DATA READY
0705 0427 ERROR /DATA READY FLAG GOT CLEARED
0706 1041 TAD INTFLG /GET THE PROGRAM INTERRUPT FLAG
0707 7640 SZA CLA
0708 0427 ERROR /PROGRAM INTERRUPTED, DBCE FAILED TO 0 INT ENA
0711 0007 CAF /CLEAR ALL FLAGS

```

```

0732 4424      DONLOP      /REPEAT TEST IF SR = 1000

/*****
/TEST 11 = CHECKS THAT INITIALIZE WILL CLEAR INT ENA F/F USING THE
/*****
/*****
/TEST 11, LOOPPC      /SETUP TEST COUNT AND TEST LOOPING ADDRESS
0734 7777      -1          /SIMULATOR ITERATION COUNTER
0735 4436      SIMCHK      /CHECK TO SEE IF SIMULATOR SELECTED
0736 4000      4000      /SIMULATOR CONTROL WORD
0737 4437      LODSIM      /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
                        /LOOP = THIS ADDRESS IF SIMULATOR SELECTED
                        /OTHERWISE SCOPE LOOP IS NEXT ADDRESS

0740 6007      CAF          /CLEAR ALL FLAGS
0741 4145      RTCENA      /SET REAL TIME CLOCK INT ENA
0742 3041      DCA          /CLEAR PROGRAM INTERRUPT FLAG
0743 6001      ION          /TURN THE INTERRUPT ON
0744 6574      DBTD        /TRANSMIT AND SET DATA READY
0745 6571      DBSK        /SKIP ON DATA READY FLAG
0746 4427      ERROR      /DBTD FAILED TO SET DATA READY
0747 6575      DBSE        /SET INTERRUPT ENABLE
0750 7000      NOP          /PROGRAM SHOULD INTERRUPT HERE
0751 2041      ISZ          /DID THE PROGRAM INTERRUPT
0752 4427      ERROR      /NO, PROGRAM FAILED TO INTERRUPT
0753 6007      CAF          /CLEAR ALL FLAGS
0754 4145      RTCENA      /SET REAL TIME CLOCK INT ENA
0755 6001      ION          /TURN THE INTERRUPT BACK ON
0756 6571      DBSK        /SKIP ON DATA READY FLAG
0757 7410      SKP          /INIT FAILED TO CLEAR DATA READY
0760 4427      ERROR      /TRANSMIT AND SET DATA READY
0761 6574      DBTD        /SKIP ON DATA READY FLAG
0762 6571      DBSK        /SKIP ON DATA READY FLAG
0763 4427      ERROR      /DBTD FAILED TO SET DATA READY FLAG
0764 1041      TAD          /GET THE PROGRAM INTERRUPT FLAG
0765 7640      SEA          /PROGRAM INTERRUPTED= INIT FAILED TO
0766 4427      ERROR      /CLEAR INTERRUPT ENABLE F/F
                        /CLEAR DATA READY FLAG
                        /SKIP ON DATA READY FLAG

0767 6007      CAF          /CLEAR DATA READY FLAG
0770 6571      DBSK        /SKIP ON DATA READY FLAG
0771 7410      SKP          /INIT FAILED TO CLEAR DATA READY
0772 4427      ERROR      /REPEAT TEST IF SR = 1000
0773 4424      DONLOP

```

```

/*****
/TEST 12 = CHECKS THAT DATA ACCEPTED CAN CAUSE A INTERRUPT,
/*****
/*****

```

```

0774 4423      TEST12, LOOPPC      /SETUP TEST COUNT AND TEST LOOPING ADDRESS
0775 7777      -1          /SIMULATOR ITERATION COUNTER
0776 4436      SIMCHK      /CHECK TO SEE IF SIMULATOR IS SELECTED
0777 4000      4000      /SIMULATOR CONTROL WORD
1000 4437      LODSIM      /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
                        /LOOP = THIS ADDRESS IF SIMULATOR SELECTED
                        /OTHERWISE SCOPE LOOP IS NEXT ADDRESS

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```

1001 6007      CAF          /CLEAR ALL FLAGS
1002 4145      RTCENA      /SET REAL TIME CLOCK INT ENA
1003 3041      DCA          /CLEAR PROGRAM INTERRUPT FLAG
1004 6001      ION          /TURN THE INTERRUPT ON
1005 6573      DBCF        /CLEAR DATA READY SET DATA ACCEPTED
1006 7000      NOP          /SHOULDN'T INTERRUPT HERE
1007 1041      TAD          /GET THE PROGRAM INTERRUPT FLAG
1010 7640      SEA          /PROGRAM INTERRUPTED WITHOUT INT ENA SET
1011 4427      ERROR      /SET INTERRUPT ENABLE
1012 6575      DBSE        /SHOULD INTERRUPT HERE WITH INT ENA AND FLAG SET
1013 7000      NOP          /DID THE PROGRAM INTERRUPT
1014 2041      ISZ          /DID THE PROGRAM INTERRUPT
1015 4427      ERROR      /NO, FAILED TO INTERRUPT WITH INT ENA AND DATA ACCEPTED SET
1016 6001      ION          /TURN THE INTERRUPT BACK ON
1017 6570      DBST        /CHECK THAT DATA ACCEPTED GOT CLEARED BY 1ST DBST IN SKIP CHAIN
1020 7610      SKP          /DATA ACCEPTED DIDN'T CLEAR IN INTERRUPT SKIP CHAIN
1021 4427      ERROR      /GET THE PROGRAM INTERRUPT FLAG
1022 1041      TAD          /GET THE PROGRAM INTERRUPT FLAG
1023 7640      SEA          /PROGRAM INTERRUPTED WITH DATA ACCEPTED CLEARED
1024 4427      ERROR      /CLEAR INTERRUPT ENABLE
1025 6576      DBCE        /REPEAT TEST IF SR = 1000
1026 4424      DONLOP

```

```

/*****
/TEST 13 = CHECKS THE EFFECT OF THE IOT ON THE AC, DBRD SHOULD BE THE ONLY
/IOT TO CHANGE THE AC
/*****
/*****

```

```

1027 4423      TEST13, LOOPPC      /STORE THE TEST LOOPING ADDRESS AND SETUP TEST COUNT
1030 7777      -1          /SIMULATOR ITERATION COUNTER
1031 4436      SIMCHK      /CHECK TO SEE IF SIMULATOR IS SELECTED
1032 4000      4000      /CONTROL WORD FOR THE SIMULATOR
1033 4437      LODSIM      /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
                        /LOOP = THIS ADDRESS IF SIMULATOR SELECTED
                        /OTHERWISE SCOPE LOOP IS THIS ADDRESS +1

1034 3041      DCA          /CLEAR PROGRAM INTERRUPT FLAG
1035 6007      CAF          /CLEAR ALL FLAGS
1036 4145      RTCENA      /SET REAL TIME CLOCK INT ENA
1037 6001      ION          /TURN INTERRUPT ON
1040 7240      CLA CMA      /SET THE AC TO ALL ONES
1041 6574      DBTD        /TRANSMIT DATA
1042 7001      IAC          /DBTD CHANGED THE AC
1043 7640      SEA CLA      /CLEAR ALL
1044 4427      ERROR      /SET REAL TIME CLOCK INT ENA
1045 6007      CAF          /TURN INTERRUPT BACK ON
1046 4145      RTCENA      /SET THE AC TO ALL ONES
1047 6001      ION          /READ THE 12 BIT PARALLEL I/O
1050 7240      CLA CMA      /DBRD FAILED TO READ OR CAF FAILED TO CLEAR XMIT BUFFERS
1051 6572      DBRD        /SET AC TO ALL ONES
1052 7640      SEA CLA      /SKIP ON DATA READY
1053 4427      ERROR
1054 7240      CLA CMA
1055 6571      DBSK
1056 7001      IAC
1057 7640      SEA CLA

```


1060	4427	ERROR	/DBSK CHANGED THE AC
1061	6002	IOF	
1062	7240	CLA CMA	/SET THE AC TO ALL ONES
1063	6573	DBCF	/CLEAR DATA READY FLAG SET DATA ACCEPT FLAG
1064	7001	IAC	
1065	7640	SZA CLA	
1066	4427	ERROR	/DBCF CHANGED THE AC
1067	6007	CAF	/CLEAR ALL FLAGS
1070	4145	RTCENA	/SET REAL TIME CLOCK INT ENA
1071	6001	ION	/SET INTERRUPT ENABLE
1072	7240	CLA CMA	
1073	6570	DBST	/SKIP AND CLEAR DATA ACCEPTED AND DATA AVAILABLE
1074	7001	IAC	
1075	7640	SZA CLA	
1076	4427	ERROR	/DBST SKIPPED OR CHANGED THE AC
1077	7240	CLA CMA	
1102	6575	DBSE	/SET PARALLEL INTERRUPT ENABLE
1101	7001	IAC	
1102	7640	SZA CLA	
1103	4427	ERROR	/DBSE CHANGED THE AC
1104	7240	CLA CMA	
1105	6576	DBCE	/CLEAR INTERRUPT ENABLE
1106	7001	IAC	
1107	7640	SZA CLA	
1110	4427	ERROR	/DBCE CHANGED THE AC
1111	7240	CLA CMA	/SET THE AC TO ALL ONES
1112	6577	DBSS	/ISSUE A STROBE PULSE
1113	7410	SKP	
1114	4427	ERROR	/DBSS SKIPPED
1115	7001	IAC	
1116	7640	SZA CLA	
1117	4427	ERROR	/DBSS CHANGED THE AC
1120	1041	TAD INTFLG	/DID THE PROGRAM INTERRUPT
1121	7640	SZA CLA	
1122	4427	ERROR	/PROGRAM INTERRUPTED
1123	4424	DONLOP	/CHECK TO SEE IF DONE OR LOOP ON TEST

 /TEST 14 = CHECKS THAT ALL ONES CAN BE TRANSMITTED AND READ BACK, IT ALSO CHECKS THAT
 /CAF CAN CLEAR THE XMIT BUFFERS, INTERRUPTS ARE ALSO CHECKED

1124	4423	TEST14, LOOPPC	/SETUP SCOPE LOOP ADDRESS AND SETUP TEST COUNT;
1125	7777	=1	/SIMULATOR ITERATION COUNTER
1126	4436	SIMCHK	/CHECK TO SEE IF SIMULATOR IS SELECTED
1127	4000		/CONTROL WORD FOR THE SIMULATOR
1130	4437	LOADSIM	/LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
			/LOOP = THIS ADDRESS IF SIMULATOR SELECTED
			/OTHERWISE SCOPE LOOP IS THIS ADDRESS +1
			/CLEAR PROGRAM INTERRUPT FLAG
1131	3041	DCA INTFLG	
1132	7240	CLA CMA	
1133	3051	DCA PIOXMT	/SET THE WORD TO BE TRANSMITTED TO ALL ONES
1134	4426	PIODAT	/GO TRANSMIT AND COMPARE THE WORD
1135	4430	PIODER	/DATA ERROR = WORD DIDN'T COMPARE IN ROUTINE PIODAT
1136	4424	DONLOP	/REPEAT TEST IF NOT DONE OR LOOP ON TEST IF SR2=1

 /TEST 15 = CHECKS FOR A COMPLEMENTING DATA PATTERN OF 7777 THEN 0000 AND CHECKS THAT CAF
 /WILL CLEAR THE DATA BUFFER, THE PROGRAM IS CHECKED TO INTERRUPT

1137	4423	TEST15, LOOPPC	/SETUP TEST SCOPE LOOP AND TEST COUNT
1140	7777	=1	/SIMULATOR ITERATION COUNTER
1141	4436	SIMCHK	/CHECK TO SEE IF SIMULATOR IS SELECTED
1142	4000		/CONTROL WORD FOR THE SIMULATOR
1143	4437	LOADSIM	/LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
			/LOOP = THIS ADDRESS IF SIMULATOR SELECTED
			/OTHERWISE SCOPE LOOP IS THIS ADDRESS +1
			/CLEAR PROGRAM INTERRUPT FLAG
1144	3041	DCA INTFLG	
1145	7240	CLA CMA	/SET THE FIRST WORD TO ALL ONES
1146	3051	DCA PIOXMT	/SAVE IT
1147	4426	PIODAT	/GO TRANSMIT AND COMPARE THE WORD
1150	4430	PIODER	/DATA ERROR = WORD DIDN'T COMPARE IN ROUTINE PIODAT
1151	3051	DCA PIOXMT	/SET THE WORD TO 0
1152	4426	PIODAT	/GO TRANSMIT AND COMPARE THE WORD
1153	4430	PIODER	/DATA ERROR= FAILED TO READ ZEROES BACK
1154	4424	DONLOP	/REPEAT TEST IF NOT DONE OR LOOP ON TEST IF SR2=1

 /TEST 16 = CHECKS FOR A COMPLEMENTING DATA PATTERN OF 5252 = 2525 AND CHECKS
 /THAT CAF WILL CLEAR THE XMIT BUFFERS, THE PROGRAM IS CHECKED TO INTERRUPT

1155	4423	TEST16, LOOPPC	/SETUP TEST LOOP AND TEST COUNT
1156	7777	=1	/SIMULATOR ITERATION COUNTER
1157	4436	SIMCHK	/CHECK TO SEE IF SIMULATOR IS SELECTED
1160	4000		/CONTROL WORD FOR THE SIMULATOR
1161	4437	LOADSIM	/LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
			/LOOP = THIS ADDRESS IF SIMULATOR SELECTED
			/OTHERWISE SCOPE LOOP IS THIS ADDRESS +1
			/CLEAR PROGRAM INTERRUPT FLAG
1162	3041	DCA INTFLG	
1163	1062	TAD K5252	
1164	3051	DCA PIOXMT	/SET THE FIRST WORD TO TRANSMIT=5252
1165	4426	PIODAT	/GO TRANSMIT AND COMPARE THE DATA WORD
1166	4430	PIODER	/DATA ERROR = WORD DIDN'T COMPARE
1167	1263	TAD K2525	
1170	3051	DCA PIOXMT	/SET THE SECOND WORD TO TRANSMIT = 2525
1171	4426	PIODAT	/GO TRANSMIT AND COMPARE THE WORD
1172	4430	PIODER	/DATA ERROR=THE WORD DIDN'T COMPARE
1173	4424	DONLOP	/REPEAT THE TEST IF NOT DONE OR LOOP ON TEST IF SR2=1

1174 5440 PRGEND /END OF 1ST 1K SEGMENT

IFDEF OP13K <PAGE>

IFDEF OP13K <PAGE>

IFDEF OP13K <PAGE>

1200 PAGE

/ROUTINE TO SETUP # OF PASSES/TEST AND TO STORE THE RETURN ADDRESS FOR SCOPE LOOPING

```

1200 0000 PCLOOP, 0
1201 7340 CLA CLL CMA
1202 1200 TAD PCLOOP
1203 3045 DCA TEST
1204 1600 TAD I PCLOOP
1205 3047 DCA SIMCNT
1206 7240 CLA CMA
1207 3050 DCA SAVCNT
1210 1050 TAD SAVCNT
1211 3047 DCA TSTCNT
1212 2200 ISZ PCLOOP
1213 5600 JMP I PCLOOP

1214 0000 SIMLOD, 0
1215 1055 TAD CONTWD /GET THE CONTROL WORD
1216 6191 LOADSM /LOAD THE SIMULATOR CONTROL WORD
1217 7300 CLA CLL
1220 5614 JMP I SIMLOD

1221 0000 LOPDON, 0
1222 2047 ISZ TSTCNT /TEST DONE?
1223 5446 JMP I TSTLOP /NO RETURN TO TEST
1224 1021 TAD OPISL /IS THE SIMULATOR SELECTED
1225 0057 AND K200
1226 7650 SNA CLA
1227 5237 JMP LOOPSW /SIMULATOR NOT SELECTED,CHECK TEST LOOP SWITCH
1230 2047 ISZ SIMCNT /ADD A 1 TO THE CONTROL WORD?
1231 7610 SKP CLA
1232 5237 JMP LOOPSW /NO,CHECK TEST LOOP SWITCH
1233 2055 ISZ CONTWD /ADD 1 TO THE CONTROL WORD FOR BAUD RATES
1234 1050 TAD SAVCNT /GET THE TEST COUNT
1235 3047 DCA TSTCNT /RESTORE IT FOR A NEW PASS FOR A DIFFERENT BAUD
1236 5446 JMP I TSTLOP /RETURN FOR NEW BAUD RATE
1237 4435 LOOPSW, SWCHK /CHECK FOR SR2=1
1240 7006 RTL
1241 7700 SNA CLA /LOOP?
1242 5621 JMP I LOPDON /NO,GO TO NEXT TEST
1243 5445 JMP I TEST /YES,LOOP ON THIS TEST

1244 6102 SIMINT, SPL /SKIP ON POWER LOW
1245 7410 SKP
1246 5777 JMP POWFAL /POWER GOING DOWN = GO SAVE EVERYTHING

```

```

1247 3251 DCA AC /SAVE THE AC
1250 5321 JMP FLGCK5 /RETURN TO THE PROGRAM

1251 0000 AC, 0

1252 6102 SKPOHN, SPL /SKIP ON POWER LOW
1253 7410 SKP
1254 5777 JMP POWFAL /POWER GOING DOWN SAVE EVERYTHING
1255 3251 DCA AC /SAVE THE AC
1256 1042 TAD CLKFLG /WERE WE EXPECTING A CLOCK INTERRUPT?
1257 7650 SNA CLA
1260 4776 JMS CHKACT /GO CHECK FOR THE ACT LINE
1261 6137 CLSK /YES = SKIP ON REAL TIME CLOCK FLAG
1262 7410 SKP
1263 5305 JMP FLGCK1 /GO CHECK THE OTHER FLAGS
1264 1133 TAD ACTFLG /GET THE ACT FLAG
1265 7440 SZA /DID THE PROGRAM GO TO THE PROM ?
1266 5300 JMP ACTCK2 /YES,CHECK PARALLEL I/O DATA ACCEPTED
1267 6041 TSF /WAS IT A TRANSMIT FLAG?
1270 7610 SKP CLA
1271 5310 JMP FLGCK2 /TRANSMIT FLAG SET = CHECK THE OTHER FLAGS
1272 6031 KSF /WAS IT A RECEIVE FLAG?
1273 7410 SKP
1274 5313 JMP FLGCK3 /YES = GO CHECK THE OTHER FLAGS
1275 6571 DBSK /WAS THE DATA READY FLAG SET?
1276 7410 SKP
1277 5316 JMP FLGCK4 /YES = CHECK DATA ACCEPTED FLAG
1300 6570 ACTCK2, DBST /WAS DATA ACCEPTED SET=IF SO CLEAR IT
1301 7640 SZA CLA
1302 5317 JMP FLGCK5=2 /YES,THE FLAG SHOULD BE CLEAR NOW
1303 4427 ERROR /ILLEGAL INTERRUPT =
1304 5317 JMP FLGCK5=2 /RETURN
1305 6041 TSF /SKIP ON XMIT FLAG
1306 7410 SKP
1307 4427 ERROR /XMIT FLAG SET
1310 6031 FLGCK2, KSF /SKIP ON RECEIVE FLAG
1311 7410 SKP
1312 4427 ERROR /RECEIVE FLAG SET
1313 6571 FLGCK3, DBSK /SKIP ON P I/O DATA READY
1314 7410 SKP
1315 4427 ERROR /DATA READY FLAG SET
1316 6570 FLGCK4, DBST /SKIP ON DATA ACCEPTED
1317 7610 SKP CLA
1320 4427 ERROR /DATA ACCEPTED FLAG SET
1321 3133 FLGCK5, DCA ACTFLG /CLEAR THE ACT FLAG
1322 7240 CLA CMA
1323 3041 DCA INTFLG /SET INTERRUPT FLAG
1324 4775 JMS RETURN
1325 1330 INTRET
1326 1251 TAD AC
1327 5730 JMP I INTRET

1330 0000 INTRET, 0

```



```

/ROUTINE TO WAIT FOR SERIAL LINE UNITS XMIT FLAG
1331 0000 WATTSF, 0
1332 7300 CLA CLL
1333 1147 TAD K7710
1334 3044 DCA CNT1
1335 3043 DCA CNT
1336 6041 TSF /SKIP ON SLU TRANSMIT FLAG
1337 4363 JMS ADDTIM /GO ADD ONE TO THE COUNTER
1340 2331 ISZ WATTSF
1341 5731 JMP I WATTSF /RETURN TO THE PROGRAM=GET THE FLAG

```

```

/ROUTINE TO WAIT FOR THE SERIAL LINE UNIT RECEIVE FLAG
1342 0000 WATKSF, 0
1343 7300 CLA CLL
1344 1147 TAD K7710
1345 3044 DCA CNT1
1346 3043 DCA CNT
1347 6031 KSF /SKIP ON SLU RECEIVE FLAG
1350 4363 JMS ADDTIM /GO ADD ONE TO THE COUNTER
1351 2342 ISZ WATKSF
1352 5742 JMP I WATKSF /RETURN TO THE PROGRAM=GET THE FLAG

```

```

/ROUTINE TO WAIT FOR THE REAL TIME CLOCK FLAG
1353 0000 WTCCLK, 0
1354 7240 CLA CMA
1355 3044 DCA CNT1
1356 3043 DCA CNT
1357 6137 CLSK /SKIP ON THE REAL TIME CLOCK FLAG
1360 4363 JMS ADDTIM /GO ADD ONE TO THE COUNTER
1361 2393 ISZ WTCCLK
1362 5753 JMP I WTCCLK /RETURN TO THE PROGRAM=GET THE FLAG

```

```

/ROUTINE TO WAIT FOR THE FLAG
1363 0000 ADDTIM, 0
1364 2043 ISZ CNT
1365 7610 SKP CLA
1366 2044 ISZ CNT1
1367 7346 CLA CLL CMA RTL
1370 7001 TAC
1371 1363 TAD ADDTIM
1372 3363 DCA ADDTIM
1373 5763 JMP I ADDTIM

```

```

1375 1420
1376 1544
1377 1441
1400

```

PAGE

```

/THIS IS THE END OF A PROGRAM PASS; IF SR3=1 HALT; IF NOT START PROGRAM OVER
1400 6160 ENDPAS, SIMCLR /CLEAR THE SIMULATOR
1401 4435 SWCHK /GO GET SWITCH REGISTER
1402 7006 RTL
1403 7004 RAL
1404 7710 SPA CLA
1405 7402 HLT /SR3=1 END OF A COMPLETE PROGRAM PASS
1406 5777 JMP 0200 /START PROGRAM OVER

/CHECK TO SEE IF FRONT PANEL IS AVAILABE TO DO EITHER A TAD SWITCH OR A LAS COMMAND
1407 0000 CHKSWH, 0
1410 7200 CLA
1411 1021 TAD OPISL
1412 7700 SMA CLA
1413 5216 JMP ,+3
1414 7604 LAS
1415 5607 JMP I CHKSWH
1416 1020 TAD SWITCH
1417 5607 JMP I CHKSWH

```

```

/THIS ROUTINE SETS UP A RETURN ADDRESS FOR INTERRUPT RETURNS FROM ANOTHER FIELD
1420 0000 RETURN, 0
1421 6201 CDF
1422 1636 TAD I K0 /CHANGE DATA FIELD TO FIELD 0
1423 3237 DCA RETADD /GET THE INTERRUPT PC
1424 6224 RIF /SAVE IT
1425 1131 TAD KCDF /READ THE PROGRAM INSTRUCTION FIELD
1426 3227 DCA ,+1 /ADD A CDF INSTRUCTION TO IT
1427 7402 HLT/CDF /SAVE IT IN THE NEXT LOCATION
1430 1620 TAD I RETURN /RETURN TO THE PROGRAM DATA FIELD
1431 3240 DCA SAVLOC /GET THE INTERRUPT RETURN LOCATION
1432 2220 ISZ RETURN /SAVE IT
1433 1237 TAD RETADD
1434 3640 DCA I SAVLOC
1435 5620 JMP I RETURN

```

```

1436 0000 K0, 0
1437 0000 RETADD, 0
1440 0000 SAVLOC, 0

```

/POWER FAIL ROUTINE. THE PROGRAM WILL DO IT'S OWN AUTO-RESTART
/AT THE BEGINNING OF THE TEST THAT IT WAS EXECUTING UNLESS ALL POWER
/WENT AWAY. THEN THE POWER FAIL AUTO-RESTART OPTION WOULD TRY TO DO
/A RESTART IF IT WAS SELECTED.

```

1441 7200 POWFAL, CLA CLA
1442 6201 CDF 00
1443 1265 TAD KJMP7
1444 3636 DCA I K0
1445 1045 TAD TEST
1446 3666 DCA I KTEST

```

```

1447 1267 TAD FLGRST
1450 3670 DCA I C7
1451 1132 TAD KRTF
1452 3671 DCA I K10
1453 1272 TAD KJMPRT
1454 3673 DCA I K11
1455 6004 GTF
1456 3674 DCA I K12
1457 6244 RMF
1460 4103 CAL
1461 6102 SPL
1462 7610 SKP CLA
1463 5261 JMP I=2
1464 5445 JMP I TEST

```

```

1465 5007 KJMP7, JMP 7
1466 0045 KTEST, TEST
1467 1012 FLGHST, TAD 12
1470 0007 C7, 7
1471 0010 K10, 10
1472 5445 KJMPRT, JMP I TEST
1473 0011 K11, 11
1474 0012 K12, 12

```

/LOGIC ERROR ROUTINE - RESTART TEST IF SR1=1

```

1475 0000 AERROR, 0
1476 4326 JMS ACTCHK /GO CHECK TO SEE IF RUNNING ON ACT LINE
1477 4435 SWMCHK /CHECK SR0 TO INHIBIT ERROR WALT
1500 7710 SPA CLA
1501 5307 JMP AERSWH /SR0=1 CHECK LOOP ON LOGIC ERROR
1502 7240 CLA CMA
1503 1275 TAD AERROR
1504 7402 HLT
1505 4314 JMS SIMWRD /AC = ADDRESS WHERE ERROR WAS DETECTED
1506 7402 HLT /WAS THE SIMULATOR SELECTED
1507 4435 AERSWH, SWMCHK /AC=SIMULATOR CONTROL WORD
1510 7004 RAL /CHECK SR1=1 TO LOOP ON ERROR
1511 7700 SMA CLA
1512 5675 JMP I AERROR /RETURN WITHOUT LOOPING ON TEST
1513 5446 JMP I TSTLOP /SCOPE LOOP GO BACK TO START OF TEST SECTION

1514 0000 SIMWRD, 0
1515 7300 CLA CLL
1516 1021 TAD OPSEL
1517 0057 AND K200
1520 7650 SMA CLA
1521 5324 JMP ,+3
1522 1055 TAD CONTWD
1523 5714 JMP I SIMWRD
1524 2314 ISZ SIMWRD
1525 5714 JMP I SIMWRD

```

/ROUTINE TO EXIT TO PROM ON AN ERROR IF RUNNING ON THE ACT LINE

```

1526 0000 ACTCHK, 0
1527 7300 CLA CLL
1528 1022 TAD OP2SEL /GET THE HARDWARE CONTROL WORD
1531 7700 SMA CLA /IS THE PROGRAM RUNNING ON THE ACT LINE?
1532 5726 JMP I ACTCHK /NO, RETURN TO ERROR ROUTINE
1533 6002 IOF /TURN THE INTERRUPT OFF
1534 7344 CLA CLL CMA RAL
1535 1326 TAD ACTCHK
1536 3343 DCA ERRPC
1537 7240 CLA CMA
1540 1743 TAD I ERRPC /GET THE LOCATION WHERE THE ERROR WAS DETECTED
1541 6272 CIF 70 /CHANGE INSTRUCTION FIELD TO FIELD 7
1542 5477 JMP I BADPAS /GO TO THE PROM

1543 0000 ERRPC, 0

```

```

1544 0000 CHKACT, 0
1545 6137 CLSK /WAS THE CLOCK FLAG SET
1546 7410 SKP /NO-RETURN TO INT SERVICE ROUTINE
1547 5352 JMP CLKSET /YES-CLEAR THE FLAG
1550 2344 ISZ CHKACT /ADD 1 TO THE INCOMING PC
1551 5744 JMP I CHKACT /RETURN TO SKIP CHAIN
1552 6136 CLKSET, CLCL /CLEAR THE CLOCK FLAG
1553 1022 TAD OP2SEL /GET THE ACT LINE BIT
1554 7710 SPA CLA /IS THE PROGRAM RUNNING ON ACT LINE
1555 5305 JMP ONACTL /YES,CHECK FOR # OF CLOCK TICKS
1556 5350 JMP CHKACT+4 /RETURN TO INTERRUPT ROUTINE
1557 4220 JMS RETURN /NO,RETURN TO THE PROGRAM
1560 1544 ACTRET
1561 1776 TAD AC
1562 6021 IOV
1563 5764 JMP I ACTRET /TURN THE INTERRUPT ON
1564 0000 ACTRET, 0 /RETURN TO THE PROGRAM
1565 2101 ONACTL, ISZ ACTCNT /100 CLOCK TICKS YET?
1566 5357 JMP CLKSET+5 /NO RETURN TO PROGRAM
1567 1102 TAD M144 /RESET ACT TIME COUNTER
1572 3101 DCA ACTCNT /SAVE THE NUMBER
1571 6272 CIF 70 /CHANGE INSTRUCTION FIELD TO 7
1572 4500 JMS I GOODPS /SIGNAL PROM THAT PROGRAM STILLS PAS
1573 7240 CLA CMA
1574 3133 DCA ACTFLG /SET THE ACT LINE FLAG TO ONES
1575 5357 JMP CLKSET+5 /RETURN TO THE PROGRAM

```

```

1576 1251
1577 0200

```

1600

PAGE

/ROUTINE FOR TRANSMITTING, READING AND COMPARING DATA FOR PARALLEL I/O

```

1600 0000 DATPIO, 0
1601 6007 CAF /CLEAR ALL
1602 4145 RTCENA /SET REAL TIME CLOCK INT ENA
1603 6001 ION /TURN THE INTERRUPT ON
1604 6575 DBSE /SET PARALLEL I/O INT ENA
1605 1051 TAD PIOXMT /GET THE WORD TO BE LOADED INTO PARALLEL I/O
1606 6574 DBTD /LOAD AND TRANSMIT THE WORD
1607 7200 CLA
1608 6571 DBSK /SKIP ON DATA READY
1609 4427 ERROR /ERROR, DATA READY FLAG FAILED TO SET BY DBTD
1610 2041 ISZ INTFLG /GET PROGRAM INTERRUPT FLAG
1611 4427 ERROR /PROGRAM FAILED TO INTERRUPT WITH INT ENA + FLAG SET
1612 3041 DCA INTFLG /CLEAR PROGRAM INTERRUPT FLAG
1613 6572 DBRD /READ THE 12 BIT PARALLEL I/O BUFFER
1614 3052 DCA PIOREC /SAVE THE WORD READ
1615 6571 DBSK /SKIP ON DATA READY FLAG
1616 4427 ERROR /DBRD CLEARED DATA READY FLAG
1617 6573 DBCF /CLEAR DATA READY FLAG
1618 6001 ION /TURN INTERRUPT BACK ON
1619 7000 NOP /SHOULD INTERRUPT HERE FOR DATA ACCEPT FLAG
1620 6570 DBST /SKIP ON DATA ACCEPT
1621 7610 SKP CLA
1622 4427 ERROR /DATA ACCEPT FAILED TO CLEAR IN INTERRUPT ROUTINE
1623 2041 ISZ INTFLG /CHECK TO SEE IF IT INTERRUPTED
1624 4427 ERROR /DATA ACCEPT FLAG FAILED TO INTERRUPT
1625 6001 ION /TURN THE INTERRUPT BACK ON
1626 7000 NOP
1627 1041 TAD INTFLG /GET PROGRAM INTERRUPT FLAG
1628 7640 SZA CLA /DID IT INTERRUPT?
1629 4427 ERROR /PROGRAM INTERRUPTED WITHOUT DATA READY SET
1630 1051 TAD PIOXMT /GET THE WORD TRANSMITTED
1631 7041 CIA
1632 1052 TAD PIOREC /GET THE WORD READ
1633 7640 SZA CLA /ARE THEY EQUAL?
1634 5600 JMP I DATPIO /DATA ERROR RETURN TO REPORT ERROR
1635 6007 CAF /CLEAR ALL FLAGS AND P I/O BUFFER
1636 4145 RTCENA
1637 6001 ION /TURN THE INTERRUPT ON
1638 6572 DBRD /READ THE 12 BIT P I/O BUFFER
1639 7640 SZA CLA
1640 4427 ERROR /CAF FAILED TO CLEAR THE 12 BIT DATA BUFFER
1641 2200 ISZ DATPIO /BUMP RETURN ADDRESS POINTER BY 1
1642 5600 JMP I DATPIO /RETURN TO TEST

```

/ROUTINE FOR TRANSMITTING, READING AND COMPARING DATA FOR SLU

```

1653 0000 DATSLU, 0
1654 6007 CAF /CLEAR ALL FLAGS BUT SET INT ENA ON SLU
1655 4145 RTCENA /SET REAL TIME CLOCK INT ENA
1656 6001 ION /TURN THE INTERRUPT ON
1657 3041 DCA INTFLG /CLEAR THE PROGRAM INTERRUPT FLAG

```

```

1660 1053 TAD SLUXMT /GET THE WORD TO BE TRANSMITTED
1661 6046 TLS /LOAD AND TRANSMIT IT AND CLEAR THE FLAG
1662 4431 TSFWAT /WAIT FOR THE TRANSMIT FLAG
1663 4427 ERROR /XMIT FLAG FAILED TO SET
1664 2041 ISZ INTFLG /DID THE PROGRAM INTERRUPT?
1665 4427 ERROR /PROGRAM FAILED TO INTERRUPT
1666 6042 TCF /CLEAR THE XMIT FLAG
1667 6001 ION /TURN THE INTERRUPT BACK ON
1668 4432 KSFWAT /WAIT FOR THE RECEIVE FLAG TO SET
1669 4427 ERROR /RECEIVE FLAG FAILED TO SET
1670 2041 ISZ INTFLG /DID THE RECEIVE FLAG CAUSE A INTERRUPT
1671 4427 ERROR /RECEIVE FLAG FAILED TO CAUSE A INTERRUPT
1672 6036 KRB /CLEAR THE AC AND RCV FLAG AND READ BUFFER
1673 3054 DCA SLUREC /SAVE THE WORD READ BACK
1674 6001 ION /TURN THE INTERRUPT BACK ON
1675 1041 TAD INTFLG /CHECK THAT KRB CLEARED THE RCV FLAG
1676 7640 SZA CLA
1677 4427 ERROR /KRB FAILED TO CLEAR RCV FLAG OR INTERRUPTED
1678 1053 TAD SLUXMT /GET THE WORD TRANSMITTED
1679 7041 CIA
1680 1054 TAD SLUREC /GET THE WORD READ BACK
1681 7640 SZA CLA
1682 5653 JMP I DATSLU /DATA ERROR-RETURN TO REPORT THE ERROR
1683 2253 ISZ DATSLU /BUMP RETURN ADDRESS POINTER BY ONE
1684 5653 JMP I DATSLU /RETURN TO TEST

```

/DATA ERROR ROUTINE FOR PARALLEL I/O

```

1711 0000 DERPIO, 0
1712 4777 JMS ACTCHK /CHECK TO SEE IF RUNNING ON ACT LINE
1713 4435 SWCHK /CHECK SR0 TO INHIBIT ERROR HALT
1714 7710 SPA CLA /IS SR0 SET?
1715 5327 JMP PIOSWH /YES, GO CHECK SR1 TO LOOP ON ERROR
1716 7240 CLA CMA
1717 1311 TAD DERPIO
1718 7402 WLT /AC = ADDRESS WHERE ERROR WAS DETECTED
1719 7200 CLA
1720 1051 TAD PIOXMT /GET THE WORD TRANSMITTED
1721 7402 WLT /AC = THE GOOD WORD
1722 7200 CLA
1723 1052 TAD PIOREC /GET THE WORD READ
1724 7402 WLT /AC = THE BAD WORD = WORD READ
1725 4435 PIOSWH, SWCHK /LOOP ON DATA ERROR IF SR1=1
1726 7004 RAL
1727 7700 SNA CLA /LOOP?
1728 5711 JMP I DERPIO /NO, RETURN TO TEST
1729 5446 JMP I TSTLOP /RETURN AND DO SAME PATTERN(S)

```

/DATA ERROR ROUTINE FOR SERIAL LINE UNIT

```

1734 0000 DERSLU, 0
1735 4777 JMS ACTCHK /CHECK TO SEE IF RUNNING ON THE ACT LINE
1736 4435 SWCHK /CHECK SR0=1 TO INHIBIT ERROR HALT

```

1737	7710	SPA	CLA	
1740	5354	JMP	SLUSWH	/GO CHECK SR1=1 TO LOOP ON ERROR
1741	7240	CLA	CMA	
1742	1334	TAD	DESLU	/
1743	7402	HLT		/AC=ADDRESS WHERE ERROR WAS DETECTED
1744	7200	CLA		
1745	1053	TAD	SLUXMT	/GET THE WORD TRANSMITTED
1746	7402			/AC=GOOD WORD=THE WORD TRANSMITTED
1747	7200	CLA		
1750	1054	TAD	SLUREC	/GET THE WORD READ
1751	7402	HLT		/AC=THE BAD WORD=THE WORD READ
1752	4776	JMS	SIHNRD	/HAS THE SIMULATOR SELECTED
1753	7402	HLT		/AC=THE SIMULATOR CONTROL WORD
1754	4435	SLUSWH, SHMCHK		/LOOP ON DATA ERROR IF SR1=1
1755	7004	RAL		
1756	7700	SMA	CLA	/LOOP?
1757	5734	JMP I	DESLU	/NO, RETURN TO TEST
1760	5446	JMP I	TSTLOP	

1761	0000	CHKSIM, 0		
1762	1021	TAD OP1SEL		/CHECK FOR SIMULATOR
1763	0057	AND K200		
1764	7650	SNA CLA		
1765	5371	JMP ,+4		/NO
1766	1761	TAD I CHKSIM		/GET THE CONTROL WORD
1767	3055	DCA CONTWD		/SAVE IT
1770	7410	SKP		
1771	2361	ISE CHKSIM		
1772	2361	ISE CHKSIM		
1773	1361	TAD CHKSIM		
1774	3046	DCA TSTLOP		
1775	5761	JMP I CHKSIM		

1776 1514
1777 1526
0200 *200

5

0000	11110000	00000000	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	11111111
0400	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
0500	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
0600	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
0700	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
1000	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
1100	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11110000
1200	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
1300	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11110111
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	11111111

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

AC	1251	GOODPS	0100	PIODER	4430	TEST5	0413
ACTCHK	1526	GTF	0004	PIOREC	0052	TEST6	0452
ACTCK2	1300	HLT	7402	PIOSWH	1727	TEST7	0503
ACTCNT	0101	INACTV	0076	PIOXMT	0051	TEST8	0547
ACTFLG	0133	INTFLG	0041	PNQINT	0075	TEST9	0620
ACTRET	1564	INTRET	1330	PQWFAL	1441	TFL	0040
ADDTIM	1363	K0	1436	PRGENU	5440	TLS	0046
AERROR	1475	K1	0124	RECFLG	0073	TPC	0044
AERSWH	1507	K11	1471	RETADU	1437	TSF	0041
BADPAS	0077	K11	1473	RETURN	1420	TSFWAT	4431
C7	1470	K12	1474	RMP	0244	TSTCNT	0047
CAF	0007	K125	0061	RTCENA	4145	TSTGOD	0135
CAL	0103	K2	0125	RTCFLG	0074	TSTLOP	0046
CHKACT	1544	K200	0097	RTF	0005	WATKSF	1342
CHKSIM	1761	K252	0040	SAVADD	0123	WATTSF	1331
CHKSWH	1407	K2525	0063	SAVCNT	0050	WTCLSK	1353
CLCL	0136	K3	0126	SAVLOC	1440	XMTFLG	0072
CLKFLG	0042	K377	0056	SBE	0101	XORENA	0374
CLKSET	1552	K5252	0062	SIMCHK	4436		
CLKSWC	7134	K7	0064	SIMCLN	0160		
CLLE	0135	K7710	0147	SIMCNT	0067		
CLRDET	0196	KCC	0032	SIMINT	1244		
CLRSIM	0190	KCDF	0131	SIMLOD	1214		
CLSK	0137	KCF	0030	SIMWRD	1514		
CLSKWT	4425	KIE	0035	SKPCHN	1292		
CNT	0043	KJMP	0127	SKPDIV	0165		
CNT1	0044	KJMP7	1465	SKPFQ	0162		
CONTND	0055	KJMPRT	1472	SKPRDH	0157		
DATPIO	1600	KRB	0036	SKPSTR	0167		
DATSLU	1653	KRMF	0130	SLUDAT	4433		
DBCE	0576	KRS	0034	SLUDER	4434		
DBCF	0573	KRTF	0132	SLUREC	0054		
DBRD	0572	KSF	0031	SLUSWH	1754		
DBSE	0575	KSF	0031	SLUXMT	0053		
DBSK	0571	KSF	0031	SPI	0045		
DBSS	0577	KTEST	1466	SPL	0102		
DBST	0570	LINK	0071	STRFRQ	0161		
DBTD	0574	LOADSW	0151	SWHCHK	4435		
DERPIO	1711	LODFRQ	0163	SWITCH	0020		
DERSLU	1734	LODSIM	4437	TCF	0042		
DONLOP	4424	LOOPPC	4423	TEST	0045		
ENARTC	0145	LOOPSW	1237	TEST1	0040		
ENDPAS	1400	LOPDON	1221	TEST10	0063		
ERROR	4427	M10	0066	TEST11	0733		
ERRPC	1543	M144	0102	TEST12	0774		
EXPACD	0070	M4	0065	TEST13	1027		
FLGCK1	1305	ONACTL	1545	TEST14	1124		
FLGCK2	1310	OP11K1	0000	TEST15	1137		
FLGCK3	1313	OP1SEL	0021	TEST16	1155		
FLGCK4	1316	OP2SEL	0022	TEST2	0246		
FLGCK5	1321	PATCH	0103	TEST3	0304		
FLGRST	1467	PCLDOP	1200	TEST4	0337		
		PIDAT	4426				

ERRORS DETECTED: 0
LINKS GENERATED: 9
RUN-TIME: 18 SECONDS
2K CORE USED

/DKC8=AA OPTION TEST 1 MAINDEC=08=DJDKA=B=L 1K PART 2
/
/COPYRIGHT (C) 1974, 1975 DIGITAL EQUIPMENT CORPORATION
/PROGRAMMER: BRUCE HANSEN
/

////////////////////////////////////
/THE FOLLOWING LISTING WILL CORRESPOND TO THE PAPER TAPE LABELED
/MAINDEC=08=DJDKA=B=PM2, 1K VERSION 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.
////////////////////////////////////

```

/ DKC8=AA OPTION TEST 1 MAINDEC=08=DJOKA=B=L 1K PART 2
/ COPYRIGHT (C) 1974, 1975 DIGITAL EQUIPMENT CORPORATION
/ PROGRAMMER: BRUCE HANSEN
/
/ PROCESSOR INSTRUCTIONS
6007 CAF=6007 /CLEAR ALL FLAGS
6102 SPL=6102 /SKIP ON AC LOW FLIP=FLOP
6103 CAL=6103 /CLEAR AC LOW FLIP=FLOP
6101 SBE=6101 /SKIP ON BATTERY EMPTY
7402 HLT=7402
6244 RMF=6244 /RESTORE MEMORY FIELD
6005 RTF=6005
6004 GTF=6004

/ OPTION BOARD NUMBER 1 IOT'S

/ SERIAL LINE UNIT
/ RECEIVER IOTS
6030 KCF=6030 /CLEAR RECEIVE FLAG, DON'T SET READER RUN
6031 KSF=6031 /SKIP ON RECEIVE FLAG
6032 KCC=6032 /CLEAR RECEIVE FLAG AND AC, SET READER RUN
6034 KRS=6034 /READ RECEIVE BUFFER
6035 KIE=6035 /AC 11=1 SET INTERRUPT ENABLE
/AC 11=0 CLEAR INTERRUPT ENABLE
6036 KRB=6036 /CLEAR RECEIVE FLAG AND AC, SET READER RUN AND READ
/RECEIVE BUFFER

/ TRANSMIT IOTS
6040 TPL=6040 /SET TRANSMIT FLAG
6041 TSF=6041 /SKIP ON TRANSMIT FLAG
6042 TCF=6042 /CLEAR THE TRANSMIT FLAG
6044 TPC=6044 /LOAD TRANSMIT BUFFER AND TRANSMIT
6045 SPI=6045 /SKIP IF TRANSMIT OR RECEIVE FLAG SET AND INT ENA SET TO A 1
6046 TLS=6046 /LOAD TRANSMIT BUFFER, TRANSMIT AND CLEAR TRANSMIT FLAG

/ REAL TIME CRYSTAL CLOCK
6135 CLLE=6135 /AC 11=1 SET INTERRUPT ENABLE
/AC 11=0 CLEAR INTERRUPT ENABLE
6136 CLCL=6136 /CLEAR CLOCK FLAG
6137 CLSK=6137 /SKIP ON CLOCK FLAG

/ 12 BIT PARALLEL I/O
6570 DBST=6570 /SKIP ON DATA ACCEPTED, CLEAR DATA ACCEPTED AND DATA AVAILABLE
6571 DBSK=6571 /SKIP ON DATA READY FLAG
6572 DBRD=6572 /READ DATA INTO AC 0=11
6573 DBCF=6573 /CLEAR DATA READY FLAG, ISSUE DATA ACCEPTED OUT
6574 DBTD=6574 /LOAD AC 0=11 INTO BUFFER AND TRANSMIT DATA OUT
6575 DBSE=6575 /SET INTERRUPT ENABLE TO A 1
6576 DBCE=6576 /SET INTERRUPT ENABLE TO A 0

```

```

6577 DBSS=6577 /ISSUE A STROBE PULSE

/ 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

/ OPTION BOARD 1 SIMULATOR IOT'S
6150 CLRSIM=6150 /CLEAR SIMULATOR CONTROL REGISTERS
6151 LOADSH=6151 /LOAD SIMULATOR CONTROL WORD 1
6156 CLRDET=6156 /CLEAR READER RUN, STROBE, AND DATA AVAILABLE CATCHER F/F'S
6157 SKPRDR=6157 /SKIP ON READER RUN CATCHER F/F SET
6160 SIMCLR=6160 /CLEAR CONTROL REGISTERS AND MOST OF LOGIC ON SIMULATOR
6161 STRFRQ=6161 /START FREQUENCY CHECK (SLU OR RTC)
6162 SKPFRQ=6162 /SKIP ON FREQUENCY CHECK IN PROGRESS
6163 LOOFRQ=6163 /READ FREQUENCY COUNT INTO AC
6165 SKPDV=6165 /SKIP ON DATA AVAILABLE CATCHER F/F SET
6167 SKPSTR=6167 /SKIP ON STROBE CATCHER F/F SET

/ OPTION BOARD 1 SIMULATOR CONTROL WORD BIT ASSIGNMENTS
/ BIT 0 COUNTER RESET 1=ACTIVATE
/ 2=NO ACTION

/ BIT 1 PARALLEL I/O CLEAR DATA 1=TS1
/ AVAILABLE SELECT 2=DATA ACCEPTED IN

/ BIT 2 NOT USED

/ BIT 3 NOT USED

/ BIT 4 NOT USED

/ BIT 5 RTC FREQUENCY OR 1=RTC
/ SLU FREQUENCY CHECK 2=SLU BAUD RATES

/ BIT 6 REAL TIME CLOCK 1=OFF
/ 2=ON

/ BIT 7 SLU EIA/20MA SELECT 1=EIA RECEIVE DATA
/ 2=20 MA RECEIVE DATA

/ BIT 8 STOP BIT SELECT 1=1 STOP BITS
/ 2=2 STOP BIT

/ BIT 9 BAUD RATE SELECT BIT 9, 10, 11 ALL 0'S

/ BIT 10 BAUD RATE SELECT EQUALS 110 BAUD. EACH

/ BIT 11 BAUD RATE SELECT INCREASING BIT SELECTS
/ NEXT HIGHEST BAUD RATE,

```

```

0000 0000 *0
0000 0302 302 /PROGRAM REVISION LETTER=MAINDEC=08=DJDKA=B
0001 6244 RMP /RESTORE MEMORY FIELDS
0002 5403 JMP I 3 /RETURN TO INTERRUPT SERVICE ROUTINE
0003 1244 SIMINT/SKPCHN/SIMCHK/RTCLNT/SLUINT /INTERRUPT SERVICE ROUTINES

0020 *20

0020 0000 SWITCH, 0

0021 2000 OP1SEL, 2000

/BIT 0=0 USE LOCATION 20 AS A PSEUDO SWITCH REGISTER
/BIT 0=1 USE HARDWARE FRONT PANEL SWITCH REGISTER
/BIT 1=1 HAS OPTION 1
/BIT 2=1 HAS OPTION 2
/BIT 3=1 HAS 8A CPU SIMULATOR
/BIT 4=1 HAS 8A OPTION 1+2 SIMULATOR
/BIT 5=1 PROGRAM ON PDP-8A XOR(REQUIRES BIT 4 SET ALSO)
/BIT 6=1 HAS PDP-8E TYPE CPU
/BIT 7=11 MEMORY SIZE = 2^8=1K, 37=32K, MEMORY
/SIZE CAN BE INCREASED IN 1K INCREMENTS BY ADDING
/ONE TO THE NUMBER IN BITS 7 = 11
/BIT 0 IS SET FOR THE ACT LINE

0022 0000 OP2SEL, 0
4423 LOOPPC=JMS I, PCLOOP
0023 1200 DONLOP=JMS I, LOPDON
4424
0024 1221 CLSKMT=JMS I, WTCLSK
4425
0025 1353 PIODAT=JMS I, DATPIO
4426
0026 1600 ERROR=JMS I, AERROR
4427
0027 1475 PIODER=JMS I, DERPIO
4430
0030 1711 TSFWAT=JMS I, WATTSF
4431
0031 1331 KSFWAT=JMS I, WATKSF
4432
0032 1342 SLUDAT=JMS I, DATSLU
4433
0033 1653 SLUDER=JMS I, DERSLU
4434
0034 1734 SHWCHK=JMS I, CHKSHH
4435
0035 1407 SIMCHK=JMS I, CHKSIM
4436
0036 1761 LODSIM=JMS I, SIMLOD
4437
0037 1214 RTCENA=JMS ENARTC
4145

```

```

0040 5440 PRGENU=JMP I, ENDPAS
0042 1400

/LOCATIONS USED BY THE PROGRAM

0041 0000 INTFLG, 0
0042 0000 CLKFLG, 0
0043 0000 CNT, 0
0044 0000 CNT1, 0
0045 0000 TEST, 0
0046 0000 TSTLOP, 0
0047 0000 TSTCNT, 0
0050 0000 SAVCNT, 0
0051 0000 PLOXMT, 0
0052 0000 PIODREC, 0
0053 0000 SLUXMT, 0
0054 0000 SLUREC, 0
0055 0000 CONTWD, 0
0056 0377 K377, 377
0057 0200 K200, 200
0060 0252 K252, 252
0061 0125 K125, 125
0062 5252 K5252, 5252
0063 2525 K2525, 2525
0064 0007 K7, 7
0065 7774 M4, -4
0066 7770 M10, -10
0067 0000 SIMCNT, 0

0070 0000 EXPACD, 0
0071 0000 LINK, 0
0072 0000 XMTFLG, 0
0073 0000 RECFLG, 0
0074 0000 RTCLFLG, 0
0075 0000 PPOINT, 0
0076 0000 INACTV, 0
0077 6520 BADPAS, 6520 /ACT LINE ERROR RETURN TO FIELD 7
0100 6500 GOODPS, 6500 /ACT LINE GOOD RETURN TO FIELD 7
0101 7634 ACTCNT, -144
0102 7634 M144, -144

/ROUTINE TO SETUP FIELD 0 TO HANDLE INTERRUPTS FROM ANOTHER FIELD

0103 0000 PATCH, 0
0104 1503 TAO I PATCH /GET THE INTERRUPT SERVICE ADDRESS
0105 3123 DCA SAVADD /SAVE INTERRUPT ADDRESS
0106 6201 CDF /CHANGE DATA FIELD TO FIELD 0
0107 1130 TAO KRMF /GET THE INSTRUCTION RMP
0110 3524 DCA I K1 /PUT IT IN LOCATION 1 OF FIELD 0
0111 1127 TAO KJMP /GET THE INSTRUCTION JMP I 3
0112 3525 DCA I K2 /PUT IT IN LOCATION 2 OF FIELD 0
0113 1123 TAO SAVADD /GET THE INTERRUPT SERVICE ADDRESS
0114 3526 DCA I K3 /PUT IT IN LOCATION 3 IF FIELD 0

```



```

0115 6224 RIF /GET THE PROGRAM FIELD INTO THE AC
0116 1131 TAD KCDF /AND IT TO THE CDF INSTRUCTION
0117 3120 DCA ,*1 /PUT IT IN THE NEXT LOCATION
0120 7402 HLT/CDF /EXECUTE IT
0121 2103 ISZ PATCH /ADD 1 TO THE ENTRANCE
0122 5503 JMP I PATCH /RETURN

```

```

0123 0000 SAVADD, 0
0124 0001 K1, 1
0125 0002 K2, 2
0126 0003 K3, 3
0127 5403 KJMP, JMP I 3
0130 6244 KRMF, 6244
0131 6201 KCDF, CDF
0132 6005 KRTF, RTF
0133 0000 ACTFLG, 0
0134 0000 CLKSNG, 0

```

/THIS ROUTINE USED WHEN RUNNING ON THE ACT LINE TO SIGNIFY THAT NO
/ERRORS HAVE BEEN ENCOUNTERED

```

0135 2000 TSTGOD, 0
0136 1022 TAD OP2SEL /GET THE HARDWARE FLAG
0137 7700 SMA CLA /ARE WE ON THE ACT LINE?
0140 5535 JMP I TSTGOD /NO, RETURN TO THE PROGRAM
0141 6002 IOF /TURN THE INTERRUPT OFF
0142 6272 CIF 70 /CHANGE THE INSTRUCTION TO FIELD 7
0143 4500 JMS I 6000PS /GO TO PROM
0144 5535 JMP I TSTGOD /RETURN TO THE PROGRAM

```

```

0145 0000 ENARTG, 0
0146 1022 TAD OP2SEL /CHECK TO SEE IF ON ACT LINE
0147 7710 SPA CLA /IF NOT CLEAR RTC INT ENA
0150 7301 CLA CLL IAC /SET AC BIT 11
0151 6135 CLLE /LOAD BIT 11 INTO CLOCK INT ENA
0152 7200 CLA
0153 5545 JMP I ENARTG

```

0200 *200

IFDEF OP13K <PAGE>

/*
/TEST 17 = CHECKS FOR AN INCREMENTING DATA PATTERN;
/*

```

0203 6160 TEST17, SIMCLR /CLEAR THE SIMULATOR
0204 4423 LOOPPC /SET UP TEST LOOPING ADDRESS
0205 7777 -1 /SIMULATOR ITERATION COUNTER
0206 4103 JMS PATCH /GO SET UP FOR INTERRUPT RETURN
0207 1292 SKPCHN
0208 3042 DCA CLKFLG /SET INTERRUPT TO IGNORE RTC FLAGS
0209 7300 CLA CLL

```

```

0207 3050 DCA SAVCNT
0210 3047 DCA TSTCNT /CLEAR PROGRAM TEST COUNTER
0211 4436 SIMCHK /CHECK FOR SIMULATOR
0212 4000 4000 /SIMULATOR CONTROL WORD
0213 4437 LODSIM /LOAD THE SIMULATOR IF SELECTED
0214 3041 DCA INTFLG /CLEAR PROGRAM INTERRUPT FLAG
0215 1047 TAD TSTCNT /GET TEST COUNTER
0216 3051 DCA PIOXHT /SET THE WORD TO BE TRANSMITTED = TO IT
0217 4426 PIODAT /GO TRANSMIT AND COMPARE THE WORD
0220 4430 PIODER /DATA ERROR
0221 4424 DONLOP /DONE OR LOOP ON TEST IF SR2=1

```

/*
/TEST 18 = CHECKS FOR AN INCREMENTING DATA PATTERN WITH THE INTERRUPT
/ENABLE DISABLED WHICH ALLOWS FOR FASTER READING BECAUSE OF NO SKIP CHAIN
/*

```

0222 4423 TEST18, LOOPPC /SETUP TEST COUNT AND TEST LOOP ADDRESS
0223 7777 -1 /SIMULATOR ITERATION COUNTER
0224 7300 CLA CLL
0225 3050 DCA SAVCNT
0226 3047 DCA TSTCNT
0227 4436 SIMCHK /CHECK FOR THE SIMULATOR
0230 4000 4000 /SIMULATOR CONTROL WORD
0231 4437 LODSIM /LOAD SIMULATOR IF SELECTED
0232 6007 CAF /CLEAR ALL FLAGS
0233 4145 RTCENA /SET REAL TIME CLOCK INT ENA
0234 6001 ION /TURN THE INTERRUPT ON
0235 3041 DCA INTFLG /CLEAR PROGRAM INTERRUPT FLAG
0236 1047 TAD TSTCNT /GET THE TEST COUNTER
0237 3051 DCA PIOXHT /PUT IT IN THE WORD TO TRANSMIT
0240 1051 TAD PIOXHT /GET THE WORD
0241 6574 DBTD /TRANSMIT IT
0242 6571 DBSK /SKIP ON DATA READY
0243 4427 ERROR /DATA READY FLAG FAILED TO SET
0244 7240 CLA CMA /SET THE AC TO ALL ONE'S
0245 6572 DBRD /READ THE DATA BUFFER
0246 3052 DCA PIOREC /SAVE THE WORD READ
0247 6573 DBCF /CLEAR THE DATA READY FLAG
0250 6570 DBST /SKIP AND CLEAR DATA ACCEPTED AND DATA AVAIL.
0251 4427 ERROR /DRSF FAILED TO SET DATA ACCEPTED
0252 6570 DBST /CHECK THAT DATA ACCEPTED CLEARED
0253 7410 SKP
0254 4427 ERROR /DATA ACCEPTED STILL SET
0255 1051 TAD PIOXHT /COMPARE THE WORD TRANSMITTED WITH THE WORD READ
0256 7041 CIA
0257 1052 TAD PIOREC
0260 7640 SEA CLA
0261 4430 PIODER /PARALLEL I/O DATA ERROR
0262 6007 CAF /CLEAR ALL INCLUDING THE TRANSMIT BUFFER
0263 4145 RTCENA /SET REAL TIME CLOCK INT ENA
0264 6001 ION /TURN THE INTERRUPT BACK ON
0265 6572 DBRD /READ THE BUFFER
0266 7640 SEA CLA /DID INIT CLEAR THE BUFFER?

```

```

0267 4427 ERROR /NO INIT FAILED TO CLEAR BUFFER
0270 1041 TAD INTFLG /GET THE PROGRAM INTERRUPT FLAG
0271 7640 SZA CLA
0272 4427 ERROR /PROGRAM INTERRUPTED WITHOUT INT ENA SET
0273 4424 DONLOP /DONE OR REPEAT TEST IF SR=1

```

```

/*****
/TEST 19 - IS ONLY TESTED WHEN THE SIMULATOR IS SELECTED, THE TEST
/CHECKS THAT STROBE CAN BE SET BY DBSS AND TP3 AND THAT TIME STATE 1
/CAN CLEAR IT,
/*****

```

```

0274 4423 TEST19, LOOPPC /SETUP TEST COUNT AND TEST LOOP ADDRESS
0275 7777 =1 /SIMULATOR ITERATION COUNTER
0276 4436 SIMCHK /CHECK TO SEE IF SIMULATOR IS SELECTED
0277 4000 4000 /SIMULATOR CONTROL WORD
0300 4437 LODSIM /LOAD THE CONTROL WORD
0301 1021 TAD OPASEL /RECHECK THE SIMULATOR BIT
0302 0057 AND K200 /MASK OUT FOR SIMULATOR BIT
0303 7640 SZA CLA /IS IT SET
0304 5307 JMP ,+3 /YES GO CHECK THAT STROBE SETS AND CLEARS
0305 5706 JMP ,+1 /GO TO NEXT TEST
0306 0530 TEST23 /ADDRESS OF THE NEXT TEST
0307 6007 CAF /CLEAR ALL FLAGS
0310 4145 RTCENA /SET REAL TIME CLOCK INT ENA
0311 3041 DCA INTFLG /CLEAR THE PROGRAM INTERRUPT FLAG
0312 6001 ION /TURN THE INTERRUPT ON
0313 6156 CLRDET /CLEAR SIMULATOR DETECTOR F/F'S
0314 6167 SKPSTR /SKIP ON STROBE DETECTOR F/F SET
0315 7610 SKP CLA
0316 4427 ERROR /STROBE IS SET TO A ONE
0317 6577 DBSS /ISSUE A STROBE PULSE
0320 7440 SZA
0321 4427 ERROR /DBSS SKIPPED OR READ SOMETHING INTO THE AC
0322 6167 SKPSTR /SKIP ON STROBE DETECTOR F/F SET
0323 4427 ERROR /DBSS FAILED TO SET STROBE OR SIMULATOR DETECTOR F/F
0324 6156 CLRDET /CLEAR READER RUN AND STROBE DETECTOR F/F
0325 6167 SKPSTR /SKIP ON STROBE DETECTOR F/F SET
0326 7410 SKP
0327 4427 ERROR /STROBE STILL SET OR DETECTOR F/F DIDN'T CLEAR
0330 6577 DBSS /ISSUE ANOTHER STROBE PULSE
0331 6167 SKPSTR /SKIP ON STROBE DETECTOR F/F SET
0332 4427 ERROR /DBSS FAILED TO SET STROBE OR DETECTOR F/F
0333 6156 CLRDET /CLEAR READER RUN AND STROBE DETECTOR F/F
0334 6167 SKPSTR /SKIP ON STROBE DETECTOR F/F SET
0335 7410 SKP
0336 4427 ERROR /STROBE STILL SET OR DETECTOR F/F DIDN'T 0
0337 1041 TAD INTFLG /CHECK THAT THE PROGRAM DIDN'T INTERRUPT
0340 7640 SZA CLA
0341 4427 ERROR /PROGRAM INTERRUPTED
0342 6002 IOF /TURN THE INTERRUPT OFF
0343 4424 DONLOP /REPEAT TEST IF SR = 1000

```

```

/*****
/TEST 20 - IS ONLY TESTED WHEN SIMULATOR IS SELECTED, THE TESTS CHECKS
/THAT DATA AVAILABLE CAN BE SET BY DBTD AND CLEARED BY CAF,
/*****

```

```

0344 4423 TEST20, LOOPPC /SETUP TEST COUNT AND TEST LOOP ADDRESS
0345 7777 =1 /SIMULATOR ITERATION COUNTER
0346 4436 SIMCHK /CHECK TO SEE IF SIMULATOR IS SELECTED
0347 4000 4000 /SIMULATOR CONTROL WORD
0350 4437 LODSIM /LOAD THE CONTROL WORD
0351 6007 CAF /CLEAR ALL FLAGS
0352 4145 RTCENA /SET REAL TIME CLOCK INT ENA
0353 3041 DCA INTFLG /CLEAR THE PROGRAM INTERRUPT FLAG
0354 6001 ION /TURN THE INTERRUPT ON
0355 6156 CLRDET /CLEAR SIMULATOR DETECTOR F/F'S
0356 6165 SKPDV /SKIP ON DATA AVAILABLE DETECTOR F/F
0357 7610 SKP CLA
0360 4427 ERROR /CAF FAILED TO CLEAR DATA AVAIL, OR IT IS STUCK ON
0361 6574 DBTD /TRANSMIT AND SET DATA READY AND DATA AVAILABLE
0362 6571 DBSK /SKIP ON DATA READY
0363 4427 ERROR /DBTD FAILED TO SET DATA READY
0364 6165 SKPDV /SKIP ON DATA AVAILABLE DETECTOR F/F
0365 4427 ERROR /DATA AVAILABLE FAILED TO SET
0366 6156 CLRDET /CLEAR DETECTOR F/F'S
0367 6165 SKPDV /SKIP ON DATA AVAILABLE DETECTOR F/F
0370 4427 ERROR /DATA AVAILABLE GOT CLEARED
0371 6007 CAF /CLEAR ALL FLAGS
0372 4145 RTCENA /SET REAL TIME CLOCK INT ENA
0373 6001 ION /TURN THE INTERRUPT ON
0374 6156 CLRDET /CLEAR THE SIMULATOR DETECTOR F/F'S
0375 6165 SKPDV /SKIP ON DATA AVAILABLE DETECTOR F/F
0376 7610 SKP CLA
0377 4427 ERROR /INIT FAILED TO CLEAR DATA AVAILABLE
0400 6571 DBSK /SKIP ON DATA READY
0401 7610 SKP CLA
0402 4427 ERROR /INIT FAILED TO CLEAR DATA READY
0403 1041 TAD INTFLG /GET THE PROGRAM INTERRUPT FLAG
0404 7640 SZA CLA
0405 4427 ERROR /ERROR, PROGRAM INTERRUPTED
0406 4424 DONLOP /DONE, OR REPEAT TEST IF SR=1000

```

```

/*****
/TEST 21 - IS ONLY TESTED WHEN THE SIMULATOR IS SELECTED, THE TEST CHECKS
/THAT DBTD WILL SET DATA AVAILABLE AND THAT DBST WILL CLEAR IT,
/*****

```

```

0407 4423 TEST21, LOOPPC /SETUP TEST COUNT AND TEST LOOP ADDRESS
0410 7777 =1 /SIMULATOR ITERATION COUNTER
0411 4436 SIMCHK /CHECK TO SEE IF THE SIMULATOR IS SELECTED
0412 4000 4000 /SIMULATOR CONTROL WORD
0413 4437 LODSIM /LOAD THE SIMULATOR CONTROL WORD
0414 6007 CAF /CLEAR ALL FLAGS
0415 4145 RTCENA /SET REAL TIME CLOCK INT ENA
0416 3041 DCA INTFLG /CLEAR PROGRAM INTERRUPT FLAG
0417 6001 ION /TURN THE INTERRUPT ON

```

```

0420 6156 CLRDET /CLEAR SIMULATOR DETECTOR F/F'S
0421 6165 SKPDAV /SKIP ON SIMULATOR DATA AVAIL, DETECTOR F/F
0422 7610 SKP CLA
0423 4427 ERROR /DATA AVAILABLE SET AFTER INITIALIZE
0424 6574 DBTD /TRANSMIT=SET DATA AVAILABLE AND DATA READY
0425 6571 DBSK /SKIP ON DATA READY
0426 4427 ERROR /DATA READY FLAG NOT SET
0427 6165 SKPDAV /SKIP ON DATA AVAILABLE DETECTOR F/F
0430 4427 ERROR /DBTD FAILED TO SET DATA AVAILABLE
0431 6156 CLRDET /CLEAR SIMULATOR DETECTOR F/F'S
0432 6165 SKPDAV /SKIP ON DATA AVAILABLE DETECTOR F/F
0433 4427 ERROR /DATA AVAILABLE GOT CLEARED
0434 6573 DBCF /CLEAR DATA READY FLAG SET DATA ACCEPTED
0435 6571 DBSK /SKIP ON DATA READY FLAG
0436 7610 SKP CLA
0437 4427 ERROR /DBCF FAILED TO CLEAR DATA READY
0442 6156 CLRDET /CLEAR SIMULATOR DETECTOR F/F'S
0441 6165 SKPDAV /SKIP ON SIMULATOR DETECTOR F/F
0442 4427 ERROR /DATA AVAILABLE GOT CLEARED
0443 6570 DBST /SKIP ON DATA ACCEPTED, 0 DATA AVAILABLE
0444 4427 ERROR /DBCF FAILED TO SET DATA ACCEPTED
0445 6156 CLRDET /CLEAR SIMULATOR DETECTOR F/F'S
0446 6165 SKPDAV /SKIP ON DATA AVAILABLE SIMULATOR DETECTOR F/F
0447 7610 SKP CLA
0450 4427 ERROR /DBST FAILED TO CLEAR DATA AVAILABLE
0451 6570 DBST /SKIP ON DATA ACCEPTED
0452 7610 SKP CLA
0453 4427 ERROR /1ST DBST FAILED TO CLEAR DATA ACCEPTED
0454 1041 TAD INTFLG /GET THE PROGRAM INTERRUPT FLAG
0455 7640 SZA CLA
0456 4427 ERROR /PROGRAM INTERRUPTED
0457 4424 DONLOP /DONE OR REPEAT TEST IS SR = 1000

```

/*****
 /TEST 22 - IS ONLY TESTED WHEN SIMULATOR IS SELECTED, THE TEST CHECKS
 /THAT DATA AVAILABLE CAN BE SET BY DBTD AND CLEARED BY "TS1"
 /*****

```

0460 4423 TEST22, LOOPPC /SETUP TEST COUNT AND TEST LOOP ADDRESS
0461 7777 -1 /SIMULATOR ITERATION COUNTER
0462 4436 SIMCHK /CHECK FOR SIMULATOR
0463 6000 0000 /SIMULATOR CONTROL WORD
0464 4437 LOOSIM /LOAD THE CONTROL WORD
0465 6007 CAF /CLEAR ALL FLAGS
0466 4145 RTCENA /SET REAL TIME CLOCK INT ENA
0467 6001 ION /TURN THE INTERRUPT ON
0470 3041 DCA INTFLG /CLEAR PROGRAM INTERRUPT FLAG
0471 6156 CLRDET /CLEAR SIMULATOR DETECTOR F/F'S
0472 6165 SKPDAV /SKIP ON DATA AVAILABLE DETECTOR F/F
0473 7610 SKP CLA
0474 4427 ERROR /DATA AVAILABLE SET AFTER INITIALIZE
0475 6574 DBTD /TRANSMIT = SET DATA READY AND DATA AVAILABLE,
0476 6571 DBSK /SKIP ON DATA READY
0477 4427 ERROR /DBTD FAILED TO SET DATA READY
0500 6165 SKPDAV /SKIP ON DATA AVAILABLE

```

```

0501 4427 ERROR /DBTD FAILED TO TO SET DATA AVAILABLE
0502 6156 CLRDET /CLEAR SIMULATOR DETECTOR F/F'S
0503 6165 SKPDAV /SKIP ON DATA AVAILABLE DETECTOR F/F
0504 7610 SKP CLA
0505 4427 ERROR /TS1 FAILED TO CLEAR DATA AVAILABLE
0506 6007 CAF /CLEAR ALL FLAGS
0507 4145 RTCENA /SET REAL TIME CLOCK INT ENA
0510 6001 ION /TURN THE INTERRUPT BACK ON
0511 6571 DBSK /SKIP ON DATA READY
0512 7610 SKP CLA
0513 4427 ERROR /INIT FAILED TO CLEAR DATA READY
0514 6574 DBTD /TRANSMIT = SET DATA READY AND DATA AVAILABLE
0515 6165 SKPDAV /SKIP ON DATA AVAILABLE DETECTOR F/F
0516 4427 ERROR /DATA AVAILABLE FAILED TO SET
0517 6156 CLRDET /CLEAR SIMULATOR DETECTOR F/F'S
0520 6165 SKPDAV /SKIP ON DATA AVAILABLE DETECTOR F/F
0521 7610 SKP CLA
0522 4427 ERROR /TS1 FAILED TO CLEAR DATA AVAILABLE
0523 6007 CAF /CLEAR ALL FLAGS
0524 6571 DBSK /SKIP ON DATA READY
0525 7610 SKP CLA
0526 4427 ERROR /INIT FAILED TO CLEAR DATA READY
0527 4424 DONLOP /DONE OR REPEAT TEST IF SR = 1000

```

/*****
 //FIRST SECTION OF SERIAL LINE UNIT DIAGNOSTIC
 /TEST 23 - TRY TO CLEAR SLU INT ENA BY ISSUING A KIE COMMAND, THEN TEST THE SLU XMIT
 /FLAG TO SET BY TFL AND CLEAR BY TCF. THE FLAG IS CHECKED WITH TSF AND SPI. IF AN
 /INTERRUPT OCCURRED, IT MAY BE DUE TO INT ENA NOT BEING CLEARED BY KIE AND DATA BIT 11 ON A 0.
 /*****

```

0530 4103 TEST23, JMS PATCH
0531 1252 SKPCHN
0532 4423 LOOPPC /SETUP TEST COUNT AND SCOPE LOOPING ADDRESS
0533 7777 -1 /SIMULATOR ITERATION COUNTER
0534 4436 SIMCHK /CHECK TO SEE IF SIMULATOR IS SELECTED
0535 6000 0000 /CONTROL WORD FOR THE SIMULATOR
0536 4437 LOOSIM /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
/LOOP = THIS ADDRESS IF SIMULATOR SELECTED
/OTHERWISE SCOPE LOOP IS THIS ADDRESS +1
0537 3041 DCA INTFLG /CLEAR PROGRAM INTERRUPT FLAG
0540 6007 CAF /CLEAR ALL FLAGS + SET SLU INT ENA
0541 4145 RTCENA /SET REAL TIME CLOCK INT ENA
0542 6001 ION /TURN THE INTERRUPT ON
0543 6031 KSF /CHECK TO SEE IF RECEIVE FLAG IS A 0
0544 7610 SKP CLA
0545 4427 ERROR /RECEIVE FLAG SET OR KSF SKIPPED
0546 6035 KIE /CLEAR SLU INT ENA
0547 7610 SKP CLA
0550 4427 ERROR /KIE SKIPPED,
0551 1041 TAD INTFLG
0552 7640 SZA CLA
0553 4427 ERROR /PROGRAM INTERRUPTED
0554 6040 TFL /SET THE TRANSMIT FLAG
0555 7410 SKP

```

```

0556 4427 ERROR /TFL SKIPPED
0557 6041 TSP /SKIP ON XMIT FLAG
0560 4427 ERROR /TFL + TP3 FAILED TO SET XMIT FLAG OR NO SKIP OCCURRED
0561 6045 SPI /SKIP ON XMIT/RECEIVE + INT ENA ON A 1
0562 7410 SKP
0563 4427 ERROR /SPI SKIPPED OR KIE AND DATA 11 L FAILED TO CLEAR INT ENA
0564 6031 KSF /SKIP ON RECEIVE FLAG
0565 7410 SKP
0566 4427 ERROR /RECEIVE FLAG SET BY ABOVE CODE
0567 1041 TAD INTFLG /GET THE PROGRAM INTERRUPT FLAG
0570 7640 SZA CLA
0571 4427 ERROR /PROGRAM INTERRUPTED WITHOUT INT ENA SET
0572 6042 TCF /CLEAR TRANSMIT FLAG
0573 7410 SKP
0574 4427 ERROR /TCF SKIPPED
0575 6041 TSP /SKIP ON XMIT FLAG
0576 7410 SKP
0577 4427 ERROR /TCF + TP3 FAILED TO CLEAR XMIT FLAG
0580 6045 SPI /SKIP ON XMIT/RECEIVE + INT ENA ON A 1
0601 7610 SKP CLA
0602 4427 ERROR /SPI SKIPPED WITH XMIT FLAG + INT ENA A 1
0603 6031 KSF /SKIP ON RECEIVE FLAG
0604 7610 SKP CLA
0605 4427 ERROR /RECEIVE FLAG GOT SET BY ABOVE CODE
0606 1041 TAD INTFLG /GET THE PROGRAM INTERRUPT FLAG
0607 7640 SZA CLA
0610 4427 ERROR /PROGRAM INTERRUPTED WITHOUT INT ENA + FLAG
0611 4424 DONLOP /REPEAT TEST IF NOT DONE OR LOOP ON TEST IF SR2=1

```

```

/*****
/TEST 24 - CHECKS THAT CAF WILL CLEAR THE TRANSMIT FLAG, THE PROGRAM
/CHECKS THAT NO INTERRUPTS OCCURRED.
/*****

```

```

0612 4423 TEST24, LOOPPC /SETUP TEST COUNT AND SCOPE LOOPING ADDRESS
0613 7777 =1 /SIMULATOR ITERATION COUNTER
0614 4436 SIMCHK /CHECK TO SEE IF SIMULATOR IS SELECTED
0615 4000 4000 /CONTROL WORD FOR THE SIMULATOR
0616 4437 LODSIM /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
/LOOP = THIS ADDRESS IF SIMULATOR SELECTED
/OTHERWISE SCOPE LOOP IS THIS ADDRESS +1
/*****
0617 3041 DCA INTFLG /CLEAR PROGRAM INTERRUPT FLAG
0620 6007 CAF
0621 4145 RTCENA /SET REAL TIME CLOCK INT ENA
0622 6001 ION /TURN THE INTERRUPT ON
0623 6035 KIE /CLEAR SLU INT ENA
0624 6040 TFL /SET THE TRANSMIT FLAG
0625 6041 TSP /SKIP ON THE XMIT FLAG
0626 4427 ERROR /TFL AND TP3 FAILED TO SET THE XMIT FLAG
0627 6045 SPI /SKIP ON XMIT/RECEIVE + INT ENA
0630 7410 SKP
0631 4427 ERROR /SPI SKIPPED WITHOUT INT ENA SET OR KIE FAILED
0632 6007 CAF /CLEAR ALL FLAGS
0633 6041 TSP /SKIP ON THE TRANSMIT FLAG
0634 7410 SKP

```

```

0635 4427 ERROR /BBUF INIT HIGH FAILED TO CLEAR XMIT FLAG
0636 1041 TAD INTFLG /GET THE PROGRAM INTERRUPT FLAG
0637 7640 SZA CLA
0640 4427 ERROR /PROGRAM INTERRUPTED CHECK INT ENA
0641 6031 KSF /SKIP ON RECEIVE FLAG
0642 7610 SKP CLA
0643 4427 ERROR /RECEIVE FLAG SET BY ABOVE CODE
0644 4424 DONLOP /REPEAT TEST IF NOT DONE OR LOOP IF SR2=1

```

```

/*****
/TEST 25 - CHECK THAT CAF WILL SET SLU INT ENABLE AND THAT KIE
/AND DATA 11 ON A 0 WILL CLEAR IT USING XMIT FLAG TO INTERRUPT ON,
/SPI IS CHECKED TO SKIP AND NOT TO SKIP,
/*****

```

```

0645 4423 TEST25, LOOPPC /SETUP TEST COUNT AND SCOPE LOOPING ADDRESS
0646 7777 =1 /SIMULATOR ITERATION COUNTER
0647 4436 SIMCHK /CHECK TO SEE IF SIMULATOR IS SELECTED
0650 4000 4000 /CONTROL WORD FOR THE SIMULATOR
0651 4437 LODSIM /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
/LOOP = THIS ADDRESS IF SIMULATOR SELECTED
/OTHERWISE SCOPE LOOP IS THIS ADDRESS +1
/*****
0652 3041 DCA INTFLG /CLEAR PROGRAM INTERRUPT FLAG
0653 6007 CAF /CLEAR ALL FLAGS BUT SET SLU INTERRUPT ENABLE
0654 4145 RTCENA /SET REAL TIME CLOCK INT ENA
0655 6001 ION /TURN THE INTERRUPT ON
0656 6041 TSP /SKIP ON XMIT FLAG
0657 7410 SKP
0660 4427 ERROR /XMIT FLAG SET AFTER A CAF
0661 6045 SPI /SKIP ON XMIT/RECEIVE AND INT ENA ON A 1
0662 7410 SKP
0663 4427 ERROR /SPI SKIPPED WITH INT ENA SET AND NO FLAG
0664 1041 TAD INTFLG /GET THE PROGRAM INTERRUPT FLAG
0665 7640 SZA CLA
0666 4427 ERROR /PROGRAM INTERRUPTED WITHOUT XMIT FLAG
0667 6040 TFL /SET THE TRANSMIT FLAG
0670 6041 TSP /SKIP ON THE TRANSMIT FLAG
0671 4427 ERROR /TFL FAILED TO SET THE XMIT FLAG
0672 6045 SPI /SKIP ON XMIT FLAG AND INT ENA ON A 1
0673 4427 ERROR /CAF FAILED TO SET SLU INT ENA OR SPI DIDN'T SKIP
0674 2041 ISE INTFLG /DID THE PROGRAM INTERRUPT WITH XMIT + INT ENA
0675 4427 ERROR /PROGRAM FAILED TO INTERRUPT WITH XMIT + INT ENA SET
0676 7200 CLA /CLEAR THE ACCUMULATED
0677 6035 KIE /CLEAR INT ENA ON SLU
0700 3041 DCA INTFLG /CLEAR PROGRAM INTERRUPT FLAG
0701 6001 ION /TURN THE INTERRUPT BACK ON
0702 6041 TSP /SKIP ON TRANSMIT FLAG
0703 4427 ERROR /XMIT FLAG GOT CLEARED
0704 6045 SPI /SKIP ON XMIT AND INT ENA ON A 1
0705 7410 SKP
0706 4427 ERROR /KIE AND DATA 11 FAILED TO CLEAR INT ENA
0707 1041 TAD INTFLG /GET THE PROGRAM INTERRUPT FLAG
0710 7640 SZA CLA
0711 4427 ERROR /PROGRAM INTERRUPTED WITHOUT INT ENA SET
0712 6042 TCF /CLEAR XMIT FLAG

```

```

0713 6041 TSF /SKIP ON TRANSMIT FLAG
0714 7410 SKP
0715 4427 ERROR /TCF FAILED TO CLEAR XMIT FLAG
0716 6031 KSF /SKIP ON RECEIVE FLAG
0717 7410 SKP
0720 4427 ERROR /RECEIVE FLAG GOT SET BY ABOVE CODE
0721 4424 DONLOP /REPEAT TEST IF NOT DONE OR LOOP IF SR2=1

/*****
/TEST 26 = CHECKS THAT SLU INT ENA CAN BE SET AND CLEARD BY KIE
/AND DATA BIT 11 USING THE XMIT FLAG TO INTERRUPT ON,
/*****

0722 4423 TEST26, LOOPPC /SETUP TEST COUNT AND SCOPE LOOPING ADDRESS
0723 7777 =1 /SIMULATOR ITERATION COUNTER
0724 4436 SIMCHK /CHECK TO SEE IF SIMULATOR IS SELECTED
0725 4000 4000 /CONTROL WORD FOR THE SIMULATOR
0726 4437 LODSIM /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
/LOOP = THIS ADDRESS IF SIMULATOR SELECTED
/OTHERWISE SCOPE LOOP IS THIS ADDRESS +1
/CLEAR PROGRAM INTERRUPT FLAG
0727 3041 DCA INTFLG /CLEAR ALL FLAGS
0730 6007 CAF /SET REAL TIME CLOCK INT ENA
0731 4145 RTCENA /CLEAR SLU INTERRUPT ENABLE
0732 6035 KIE /TURN THE INTERRUPT ON
0733 6001 ION /SET THE TRANSMIT FLAG
0734 6040 TFL /SKIP ON TRANSMIT FLAG
0735 6041 TSF /TFL FAILED TO SET TRANSMIT FLAG
0736 4427 ERROR /SKIP ON XMIT/RECEIVE + INT ENA ON A 1
0737 6045 SPI
0740 7610 SKP CLA
0741 4427 ERROR /ERROR, INT ENA SET OR KIE FAILED TO CLEAR INT ENA
0742 1041 TAD INTFLG /GET THE PROGRAM INTERRUPT FLAG
0743 7640 SZA CLA
0744 4427 ERROR
0745 7331 CLA CLL IAC /PROGRAM INTERRUPTED WITHOUT INT ENA SET
0746 6035 KIE /SET DATA 11 TO A 1
0747 6041 TSF /SET INT ENA
0750 4427 ERROR /SKIP ON TRANSMIT FLAG
0751 6045 SPI /XMIT FLAG GOT CLEARED
0752 4427 ERROR /SKIP ON XMIT + INT ENA ON A 1
0753 7200 CLA /KIE AND DATA 11 ON A 1 FAILED TO SET INT ENA
0754 2041 ISZ INTFLG
0755 4427 ERROR /PROGRAM FAILED TO INTERRUPT WITH INT ENA + XMIT FLAG
0756 3041 DCA INTFLG
0757 6035 KIE /CLEAR INTERRUPT ENABLE
0760 6001 ION /TURN THE INTERRUPT ON
0761 6041 TSF /SKIP ON XMIT FLAG
0762 4427 ERROR /XMIT FLAG CLEARED
0763 6045 SPI /SKIP ON XMIT + INT ENA ON A 1
0764 7610 SKP CLA
0765 4427 ERROR /KIE + DATA 11 ON A 2 FAILED TO CLEAR INT ENA
0766 1041 TAD INTFLG /GET THE PROGRAM INTERRUPT FLAG
0767 7640 SZA CLA
0770 4427 ERROR /PROGRAM INTERRUPTED WITHOUT INT ENA SET
0771 6042 TCF /CLEAR THE XMIT FLAG

```

```

0772 6041 TSF /SKIP ON SLU XMIT FLAG
0773 7610 SKP CLA
0774 4427 ERROR /TCF FAILED TO CLEAR XMIT FLAG
0775 6031 KSF /SKIP ON RECEIVE FLAG
0776 7610 SKP CLA
0777 4427 ERROR /RECEIVE FLAG SET BY ABOVE CODE
1000 4424 DONLOP /REPEAT TEST IF NOT DONE OR LOOP IF SR2=1

/*****
/TEST 27 = CHECKS THAT TLS WILL CLEAR THE XMIT FLAG AND THEN SET IT WITH
/XMIT BUFF MT H, THE PROGRAM THEN CLEARS THE XMIT FLAG AND WAITS FOR
/RCV DATA AVAILABLE H TO SET RECEIVE FLAG, THE RECEIVE FLAG IS CHECKED TO
/SKIP AND INTERRUPT AND THEN TO CLEAR BY KCF,
/*****

1001 4423 TEST27, LOOPPC /SETUP TEST COUNT AND SCOPE LOOPING ADDRESS
1002 7740 =40 /SIMULATOR ITERATION COUNTER
1003 4436 SIMCHK /CHECK TO SEE IF SIMULATOR IS SELECTED
1004 4000 4000 /CONTROL WORD FOR THE SIMULATOR
1005 4437 LODSIM /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
/LOOP = THIS ADDRESS IF SIMULATOR SELECTED
/OTHERWISE SCOPE LOOP IS THIS ADDRESS +1
/CLEAR PROGRAM INTERRUPT FLAG
1006 3041 DCA INTFLG /CLEAR ALL FLAGS BUT SET SLU INT ENA
1007 6007 CAF /SET REAL TIME CLOCK INT ENA
1010 4145 RTCENA /TURN THE INTERRUPT ON
1011 6001 ION /SET THE TRANSMIT FLAG
1012 6040 TFL /SKIP ON XMIT FLAG
1013 6041 TSF /TRANSMIT FLAG FAILED TO SET BY TFL
1014 4427 ERROR /SKIP ON XMIT FLAG AND INT ENA ON A 1
1015 6045 SPI /SPI FAILED TO SKIP WITH INT ENA + FLAG SET
1016 4427 ERROR /DID THE PROGRAM INTERRUPT
1017 2041 ISZ INTFLG /PROGRAM FAILED TO INTERRUPT WITH XMIT AND INT ENA SET
1020 4427 ERROR /LOAD TRANSMIT BUFFER, TRANSMIT AND CLEAR XMIT FLAG
1021 6046 TLS
1022 7610 SKP CLA
1023 4427 ERROR /TLS SKIPPED
1024 6001 ION /TURN THE INTERRUPT ON
1025 6041 TSF /SKIP ON THE TRANSMIT FLAG
1026 7610 SKP CLA
1027 4427 ERROR /TLS FAILED TO CLEAR XMIT FLAG
1030 4431 TSFWAT /WAIT FOR TRANSMIT FLAG TO SET
1031 4427 ERROR /XMIT BUFF MT FAILED TO SET XMIT FLAG
1032 2041 ISZ INTFLG /DID THE PROGRAM INTERRUPT?
1033 4427 ERROR /ERROR, NO INTERRUPT WITH XMIT AND INT ENA SET
1034 6045 SPI /SKIP ON SLU INTERRUPT (XMIT SIDE)
1035 4427 ERROR /FAILED TO SKIP OR INT ENA OR FLAG GOT CLEARED
1036 6042 TCF /CLEAR TRANSMIT FLAG
1037 6001 ION /TURN THE INTERRUPT ON
1040 4432 KSFWAT /WAIT FOR THE RECEIVE FLAG TO SET
1041 4427 ERROR /NO SKIP, OR RECEIVE FLAG NOT SET BY RCD DATA AVAILABLE
1042 6045 SPI /SKIP ON RCV FLAG AND INT ENA
1043 4427 ERROR /0 SIDE OF RCV FLAG NOT LOW OR FAILED TO INTERRUPT
1044 2041 ISZ INTFLG /DID RCV AND INT ENA CAUSE AN INTERRUPT?
1045 4427 ERROR /NO, ERROR
1046 6030 KCF /CLEAR RECEIVE FLAG

```

1047	7610	SKP CLA	
1050	4427	ERROR	/KCF SKIPPED
1051	0001	ION	/TURN THE INTERRUPT ON
1052	0031	KSF	/SKIP ON RECEIVE FLAG
1053	7610	SKP CLA	
1054	4427	ERROR	/KCF * TP3 FAILED TO CLEAR RECEIVE FLAG
1055	1041	TAD INTFLG	/GET THE PROGRAM INTERRUPT FLAG
1056	7640	SZA CLA	
1057	4427	ERROR	/PROGRAM INTERRUPTED WITH RCV FLAG CLEARED
1060	0041	TSF	/SKIP ON XMIT FLAG
1061	7610	SKP CLA	
1062	4427	ERROR	/TRANSMIT FLAG GOT RESET BY ABOVE CODE
1063	4424	DONLOP	/REPEAT TEST IF NOT DONE OR SCOPE LOOP IF SR2=1

 /TEST 28 * CHECKS THAT TPC WILL NOT CLEAR XMIT FLAG AND THAT IT WILL
 /RESET IT, TEST 28 ALSO CHECKS THAT THE RECEIVE FLAG WILL SET AND THAT IT
 /CAN BE CLEARED BY KCC;

1064	4423	TEST28, LOOPPC	/SETUP TEST COUNT AND SCOPE LOOPING ADDRESS
1065	7740	-40	/SIMULATOR ITERATION COUNTER
1066	4436	SIMCHK	/CHECK TO SEE IF SIMULATOR IS SELECTED
1067	4000	4000	/CONTROL WORD FOR THE SIMULATOR
1070	4437	LOADSIM	/LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
			/LOOP = THIS ADDRESS IF SIMULATOR SELECTED
			/OTHERWISE SCOPE LOOP IS THIS ADDRESS +1
1071	3041	DCA INTFLG	/CLEAR PROGRAM INTERRUPT
1072	0007	CAF	/CLEAR ALL FLAGS BUT SET SLU INT ENA
1073	4145	PTCENA	/SET REAL TIME CLOCK INT ENA
1074	0001	ION	/TURN THE INTERRUPT ON
1075	0040	TFL	/SET THE TRANSMIT FLAG
1076	0041	TSF	/SKIP ON TRANSMIT FLAG
1077	4427	ERROR	/TFL FAILED TO SET XMIT FLAG
1100	2041	ISZ INTFLG	
1101	4427	ERROR	/PROGRAM FAILED TO INTERRUPT
1102	0044	TPC	/LOAD TRANSMIT BUFFER AND TRANSMIT
1103	7610	SKP CLA	
1104	4427	ERROR	/TPC SKIPPED
1105	0041	TSF	/SKIP ON XMIT FLAG
1106	4427	ERROR	/TPC CLEARED XMIT FLAG
1107	0042	TCF	/CLEAR TRANSMIT FLAG
1110	0001	ION	/TURN THE INTERRUPT BACK ON
1111	4431	TSFWAT	/WAIT FOR XMIT BUFF MT H TO SET XMIT FLAG
1112	4427	ERROR	/TPC FAILED TO SET XMIT FLAG
1113	2041	ISZ INTFLG	/CHECK TO SEE IF PROGRAM INTERRUPTED
1114	4427	ERROR	/PROGRAM FAILED TO INTERRUPT WITH XMIT FLAG + INT ENA
1115	0042	TCF	/CLEAR THE TRANSMIT FLAG
1116	0001	ION	/TURN THE INTERRUPT ON
1117	4432	KSFWAT	/WAIT FOR RECEIVE FLAG TO SET
1120	4427	ERROR	/RECEIVE FLAG FAILED TO SET BY A TPC COMMAND
1121	0045	SPT	/SKIP ON RCV FLAG AND INT ENA
1122	4427	ERROR	/FAILED TO SKIP
1123	2041	ISZ INTFLG	/DID THE PROGRAM INTERRUPT
1124	4427	ERROR	/FAILED TO INTERRUPT WITH RCV AND INT ENA SET

1125	0032	KCC	/CLEAR THE RECEIVE FLAG
1126	7610	SKP CLA	
1127	4427	ERROR	/KCC SKIPPED
1130	0001	ION	/TURN THE INTERRUPT ON
1131	0031	KSF	/SKIP ON RECEIVE FLAG
1132	7610	SKP CLA	
1133	4427	ERROR	/KCC FAILED TO CLEAR RCV FLAG
1134	1041	TAD INTFLG	/GET THE PROGRAM INTERRUPT FLAG
1135	7640	SZA CLA	
1136	4427	ERROR	/PROGRAM INTERRUPTED WITH RCV FLAG CLEARED
1137	4424	DONLOP	/REPEAT TEST IF NOT DONE OR LOOP ON TEST IF SR2=1
1140	5440	PRGEND	/END OF 2ND 1K SEGMENT

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IFDEF OP13K <PAGE>

1200 PAGE

/ROUTINE TO SETUP # OF PASSES/TEST AND TO STORE THE RETURN ADDRESS FOR SCOPE LOOPING

1200	0000	PCLOOP, 0	
1201	7340	CLA CLL CMA	
1202	1200	TAD PCLOOP	
1203	3045	DCA TEST	
1204	1600	TAD I PCLOOP	
1205	3067	DCA SIMCNT	
1206	7240	CLA CMA	
1207	3050	DCA SAVCNT	
1210	1050	TAD SAVCNT	
1211	3047	DCA TSTCNT	
1212	2200	ISZ PCLOOP	
1213	5600	JMP I PCLOOP	
1214	0000	SIMLOD, 0	
1215	1055	TAD CONTWD	/GET THE CONTROL WORD
1216	6151	LOADSM	/LOAD THE SIMULATOR CONTROL WORD
1217	7300	CLA CLL	
1220	5614	JMP I SIMLOD	
1221	0000	LOPDON, 0	
1222	2047	ISZ TSTCNT	/TEST DONE?
1223	5446	JMP I TSTLOP	/NO RETURN TO TEST
1224	1021	TAD OP1SEL	/IS THE SIMULATOR SELECTED
1225	0057	AND K200	

```

1226 7650      SNA CLA
1227 5237      JMP LOOPSW      /SIMULATOR NOT SELECTED,CHECK TEST LOOP SWITCH
1230 2067      ISZ SIMCNT      /ADD A 1 TO THE CONTROL WORD?
1231 7610      SKP CLA
1232 5237      JMP LOOPSW      /NO,CHECK TEST LOOP SWITCH
1233 2055      ISZ CONTWD      /ADD 1 TO THE CONTROL WORD FOR BAUD RATES
1234 1050      TAD SAVCNT      /GET THE TEST COUNT
1235 3047      DCA TSTCNT      /RESTORE IT FOR A NEW PASS FOR A DIFFERENT BAUD
1236 5446      JMP I TSTLOP      /RETURN FOR NEW BAUD RATE
1237 4435      LOOPSW, SWCHK      /CHECK FOR SR2=1
1240 7006      RTL
1241 7700      SMA CLA      /LOOP?
1242 5621      JMP I LOPDON      /NO,GO TO NEXT TEST
1243 5445      JMP I TEST      /YES,LOOP ON THIS TEST

```

```

1244 6132      SIMINT, SPL      /SKIP ON POWER LOW
1245 7410      SKP
1246 5777      JMP POWFAL      /POWER GOING DOWN = GO SAVE EVERYTHING
1247 3251      DCA AC      /SAVE THE AC
1250 5321      JMP FLGCK5      /RETURN TO THE PROGRAM

```

1251 0000 AC, 0

```

1252 6102      SKPCHN, SPL      /SKIP ON POWER LOW
1253 7410      SKP
1254 5777      JMP POWFAL      /POWER GOING DOWN SAVE EVERYTHING
1255 3251      DCA AC      /SAVE THE AC
1256 1042      TAD CLKFLG      /WERE WE EXPECTING A CLOCK INTERRUPT?
1257 7650      SNA CLA
1260 4776      JMS CHKACT      /GO CHECK FOR THE ACT LINE
1261 6137      CLSK      /YES = SKIP ON REAL TIME CLOCK FLAG
1262 7410      SKP
1263 5305      JMP FLGCK1      /GO CHECK THE OTHER FLAGS
1264 1133      TAD ACTFLG      /GET THE ACT FLAG
1265 7440      SZA      /DID THE PROGRAM GO TO THE PROM ?
1266 5300      JMP ACTCK2      /YES,CHECK PARALLEL I/O DATA ACCEPTED
1267 6041      TSF      /WAS IT A TRANSMIT FLAG?
1270 7610      SKP CLA
1271 5310      JMP FLGCK2      /TRANSMIT FLAG SET = CHECK THE OTHER FLAGS
1272 6031      KSF      /WAS IT A RECEIVE FLAG?
1273 7410      SKP
1274 5313      JMP FLGCK3      /YES = GO CHECK THE OTHER FLAGS
1275 6571      DBSK      /WAS THE DATA READY FLAG SET?
1276 7410      SKP
1277 5316      JMP FLGCK4      /YES = CHECK DATA ACCEPTED FLAG
1300 6570      ACTCK2, DBST      /WAS DATA ACCEPTED SET=IF SO CLEAR IT
1301 7640      SZA CLA
1302 5317      JMP FLGCK5=2      /YES,THE FLAG SHOULD BE CLEAR NOW
1303 4427      ERROR      /ILLEGAL INTERRUPT =
1304 5317      JMP FLGCK5=2      /RETURN
1305 6041      FLGCK1, TSF      /SKIP ON XMIT FLAG
1306 7410      SKP
1307 4427      ERROR      /XMIT FLAG SET

```

```

1310 6031      FLGCK2, KSF      /SKIP ON RECEIVE FLAG
1311 7410      SKP
1312 4427      ERROR      /RECEIVE FLAG SET
1313 6571      FLGCK3, DBSK      /SKIP ON P I/O DATA READY
1314 7410      SKP
1315 4427      ERROR      /DATA READY FLAG SET
1316 6570      FLGCK4, DBST      /SKIP ON DATA ACCEPTED
1317 7610      SKP CLA
1320 4427      ERROR      /DATA ACCEPTED FLAG SET
1321 3133      FLGCK5, DCA ACTFLG      /CLEAR THE ACT FLAG
1322 7240      CLA CMA
1323 3041      DCA INTFLG      /SET INTERRUPT FLAG
1324 4775      JMS RETURN
1325 1330      INTRET
1326 1251      TAD AC
1327 5730      JMP I INTRET

```

1330 0000 INTRET, 0

/ROUTINE TO WAIT FOR SERIAL LINE UNITS XMIT FLAG

```

1331 0000      WATTSF, 0
1332 7300      CLA      CLL
1333 1147      TAD      K7710
1334 3044      DCA      CNT1
1335 3043      DCA      CNT
1336 6041      TSF      /SKIP ON SLU TRANSMIT FLAG
1337 4363      JMS      ADDTIM      /GO ADD ONE TO THE COUNTER
1340 2331      ISZ      WATTSF
1341 5731      JMP I WATTSF      /RETURN TO THE PROGRAM=GOY THE FLAG

```

/ROUTINE TO WAIT FOR THE SERIAL LINE UNIT RECEIVE FLAG

```

1342 0000      WATKSF, 0
1343 7300      CLA      CLL
1344 1147      TAD      K7710
1345 3044      DCA      CNT1
1346 3043      DCA      CNT
1347 6031      KSF      /SKIP ON SLU RECEIVE FLAG
1350 4363      JMS      ADDTIM      /GO ADD A ONE TO THE COUNTER
1351 2342      ISZ      WATKSF
1352 5742      JMP I WATKSF      /RETURN TO THE PROGRAM=GOY THE FLAG

```

/ROUTINE TO WAIT FOR THE REAL TIME CLOCK FLAG

```

1353 0000      WTCCLK, 0
1354 7240      CLA      CMA
1355 3044      DCA      CNT1
1356 3043      DCA      CNT
1357 6137      CLSK      /SKIP ON THE REAL TIME CLOCK FLAG
1360 4363      JMS      ADDTIM      /GO ADD ONE TO THE COUNTER
1361 2353      ISZ      WTCCLK
1362 5753      JMP I WTCCLK      /RETURN TO THE PROGRAM=GOY THE FLAG

```


/ROUTINE TO WAIT FOR THE FLAG

```

1363 0000 ADDTIM, 0
1364 2043 ISE CNT
1365 7610 SKP CLA
1366 2044 ISE CNT1
1367 7346 CLA CLL CMA RTL
1370 7001 IAC
1371 1363 TAD ADDTIM
1372 3363 DCA ADDTIM
1373 5763 JMP I ADDTIM

```

```

1375 1420
1376 1544
1377 1441
1400 1400

```

PAGE

/THIS IS THE END OF A PROGRAM PASS; IF SR3=1 HALT; IF NOT START PROGRAM OVER

```

1400 6160 ENDPAS, SIMCLR /CLEAR THE SIMULATOR
1401 4435 SWMCHK /GO GET SWITCH REGISTER
1402 7006 RTL
1403 7004 RAL
1404 7710 SPA CLA
1405 7402 HLT /SR3=1 END OF A COMPLETE PROGRAM PASS
1406 5777 JMP 0200 /START PROGRAM OVER

```

/CHECK TO SEE IF FRONT PANEL IS AVAILABE TO DO EITHER A TAD SWITCH OR A LAS COMMAND

```

1407 0000 CHKSWH, 0
1410 7200 CLA
1411 1021 TAD OP1SEL
1412 7700 SMA CLA
1413 5216 JMP ,+3
1414 7604 LAS
1415 5607 JMP I CHKSWH
1416 1020 TAD SWITCH
1417 5607 JMP I CHKSWH

```

/THIS ROUTINE SETS UP A RETURN ADDRESS FOR INTERRUPT RETURNS FROM ANOTHER FIELD

```

1420 0000 RETURN, 0
1421 6201 CDF /CHANGE DATA FIELD TO FIELD 0
1422 1636 TAD I K0 /GET THE INTERRUPT PC
1423 3237 DCA RETADD /SAVE IT
1424 6224 RIF /READ THE PROGRAM INSTRUCTION FIELD
1425 1131 TAD KCDF /ADD A CDF INSTRUCTION TO IT
1426 3227 DCA ,+1 /SAVE IT IN THE NEXT LOCATION
1427 7402 HLT/CDF /RETURN TO THE PROGRAM DATA FIELD
1430 1620 TAD I RETURN /GET THE INTERRUPT RETURN LOCATION
1431 3240 DCA SAVLOC /SAVE IT
1432 2220 ISE RETURN

```

```

1433 1237 TAD RETADD
1434 3640 DCA I SAVLOC
1435 5620 JMP I RETURN

```

```

1436 0000 K0, 0
1437 0000 RETADD, 0
1440 0000 SAVLOC, 0

```

/POWER FAIL ROUTINE; THE PROGRAM WILL DO IT'S OWN AUTO-RESTART
/AT THE BEGINNING OF THE TEST THAT IT WAS EXECUTING UNLESS ALL POWER
/WENT AWAY, THEN THE POWER FAIL AUTO-RESTART OPTION WOULD TRY TO DO
/ A RESTART IF IT WAS SELECTED;

```

1441 7200 POWFAL, CLA CLA
1442 6201 CDF 00
1443 1205 TAD KJMP7
1444 3636 DCA I K0
1445 1045 TAD TEST
1446 3666 DCA I KTEST
1447 1267 TAD FLGRST
1448 3670 DCA I C7
1449 1132 TAD KRTF
1450 3671 DCA I K10
1451 1272 TAD KJMPRT
1452 3673 DCA I K11
1453 6004 GTF
1454 3674 DCA I K12
1455 6244 RMF
1456 6103 CAL
1457 6102 SPL
1458 7610 SKP CLA
1459 5241 JMP ,+2
1460 9445 JMP I TEST

```

```

1465 5007 KJMP7, JMP 7
1466 0045 KTEST, TEST
1467 1012 FLGRST, TAD 12
1468 0007 C7, 7
1469 0010 K10, 10
1470 5445 KJMPRT, JMP I TEST
1471 0011 K11, 11
1472 0012 K12, 12

```

/LOGIC ERROR ROUTINE = RESTART TEST IF SR1=1

```

1475 0000 AERROR, 0
1476 4326 JMS ACTCHK /GO CHECK TO SEE IF RUNNING ON ACT LINE
1477 4435 SWMCHK /CHECK SR0 TO INHIBIT ERROR HALT
1480 7710 SPA CLA
1481 5307 JMP AERSWH /SR0=1 CHECK LOOP ON LOGIC ERROR
1482 7240 CLA CMA
1483 1275 TAD AERROR
1484 7402 HLT /AC = ADDRESS WHERE ERROR WAS DETECTED
1485 4314 JMS SIMWRD /WAS THE SIMULATOR SELECTED

```



```

1506 7402 HLT /AC=SIMULATOR CONTROL WORD
1507 4435 AERSWH, SWMCHK /CHECK SR1=1 TO LOOP ON ERROR
1510 7004 RAL
1511 7700 SMA CLA
1512 5675 JMP I AERROR /RETURN WITHOUT LOOPING ON TEST
1513 5446 JMP I TSTLOP /SCOPE LOOP GO BACK TO START OF TEST SECTION

1514 0000 SIMWRD, 0
1515 7300 CLA CLL
1516 1021 TAD OP1SEL
1517 0057 AND K200
1520 7650 SMA CLA
1521 5324 JMP ,+3
1522 1055 TAD CONTWD
1523 5714 JMP I SIMWRD
1524 2314 ISZ SIMWRD
1525 5714 JMP I SIMWRD

```

/ROUTINE TO EXIT TO PROM ON AN ERROR IF RUNNING ON THE ACT LINE

```

1526 0000 ACTCHK, 0
1527 7300 CLA CLL
1530 1022 TAD OP2SEL /GET THE HARDWARE CONTROL WORD
1531 7700 SMA CLA /IS THE PROGRAM RUNNING ON THE ACT LINE?
1532 5726 JMP I ACTCHK /NO, RETURN TO ERROR ROUTINE
1533 5002 IOP /TURN THE INTERRUPT OFF
1534 7344 CLA CLL CMA RAL
1535 1326 TAD ACTCHK
1536 3343 DCA ERRPC
1537 7240 CLA CMA
1540 1743 TAD I ERRPC /GET THE LOCATION WHERE THE ERROR WAS DETECTED
1541 6272 CIF 70 /CHANGE INSTRUCTION FIELD TO FIELD 7
1542 5477 JMP I BADPAS /GO TO THE PROM

1543 0000 ERRPC, 0

```

```

1544 0000 CHKACT, 0
1545 6137 CLSK /WAS THE CLOCK FLAG SET
1546 7410 SKP /NO-RETURN TO INT SERVICE ROUTINE
1547 5352 JMP CLKSET /YES-CLEAR THE FLAG
1550 2344 ISZ CHKACT /ADD 1 TO THE INCOMING PC
1551 5744 JMP I CHKACT /RETURN TO SKIP CHAIN
1552 6136 CLKSET, CLCL /CLEAR THE CLOCK FLAG
1553 1022 TAD OP2SEL /GET THE ACT LINE BIT
1554 7710 SPA CLA /IS THE PROGRAM RUNNING ON ACT LINE
1555 5365 JMP DNACTL /YES,CHECK FOR # OF CLOCK TICKS

```

```

1556 5350 JMP CHKACT+4/RETURN TO INTERRUPT ROUTINE
1557 4220 JMS RETURN /NO,RETURN TO THE PROGRAM
1560 1564 ACTRET
1561 1776 TAD AC
1562 6001 ION /TURN THE INTERRUPT ON
1563 5764 JMP I ACTRET /RETURN TO THE PROGRAM
1564 0000 ACTRET, 0
1565 2101 DNACTL, ISZ ACTCNT /100 CLOCK TICKS YET?
1566 5357 JMP CLKSET+5/NO RETURN TO PROGRAM
1567 1102 TAD M144 /RESET ACT TIME COUNTER
1570 3101 DCA ACTCNT /SAVE THE NUMBER
1571 6272 CIF 70 /CHANGE INSTRUCTION FIELD TO 7
1572 4500 JMS I GOODPS /SIGNAL FROM THAT PROGRAM STILLS PAS
1573 7240 CLA CMA
1574 3133 DCA ACTFLG /SET THE ACT LINE FLAG TO ONES
1575 5357 JMP CLKSET+5/RETURN TO THE PROGRAM

```

1576 1251
1577 0200
1600

PAGE

/ROUTINE FOR TRANSMITTING, READING AND COMPARING DATA FOR PARALLEL I/O

```

1600 0000 DATPIO, 0
1601 6007 CAF /CLEAR ALL
1602 4145 RTCENA /SET REAL TIME CLOCK INT ENA
1603 6001 ION /TURN THE INTERRUPT ON
1604 6575 DBSE /SET PARALLEL I/O INT ENA
1605 1051 TAD PIOXMT /GET THE WORD TO BE LOADED INTO PARALLEL I/O
1606 6574 DBTD /LOAD AND TRANSMIT THE WORD
1607 7200 CLA
1610 6571 DBSK /SKIP ON DATA READY
1611 4427 ERROR /ERROR, DATA READY FLAG FAILED TO SET BY DBTD
1612 2041 ISZ INTFLG /GET PROGRAM INTERRUPT FLAG
1613 4427 ERROR /PROGRAM FAILED TO INTERRUPT WITH INT ENA + FLAG SET
1614 3041 DCA INTFLG /CLEAR PROGRAM INTERRUPT FLAG
1615 6572 DBRD /READ THE 12 BIT PARALLEL I/O BUFFER
1616 3052 DCA PIOREC /SAVE THE WORD READ
1617 6571 DBSK /SKIP ON DATA READY FLAG
1620 4427 ERROR /DBRD CLEARED DATA READY FLAG
1621 6573 DBCF /CLEAR DATA READY FLAG
1622 6001 ION /TURN INTERRUPT BACK ON
1623 7000 NOP /SHOULD INTERRUPT HERE FOR DATA ACCEPT FLAG
1624 6570 DBST /SKIP ON DATA ACCEPT
1625 7610 SKP CLA
1626 4427 ERROR /DATA ACCEPT FAILED TO CLEAR IN INTERRUPT ROUTINE
1627 2041 ISZ INTFLG /CHECK TO SEE IF IT INTERRUPTED
1630 4427 ERROR /DATA ACPTY FLAG FAILED TO INTERRUPT
1631 6001 ION /TURN THE INTERRUPT BACK ON
1632 7000 NOP
1633 1041 TAD INTFLG /GET PROGRAM INTERRUPT FLAG
1634 7640 SZA CLA /DID IT INTERRUPT?
1635 4427 ERROR /PROGRAM INTERRUPTED WITHOUT DATA READY SET
1636 1051 TAD PIOXMT /GET THE WORD TRANSMITTED
1637 7041 CIA

```

```

1640 1052 TAD PIOREC /GET THE WORD READ
1641 7640 SZA CLA /ARE THEY EQUAL?
1642 5600 JMP I DATPIO /DATA ERROR RETURN TO REPORT ERROR
1643 6007 CAF /CLEAR ALL FLAGS AND P I/O BUFFER
1644 4145 RTCEA
1645 6001 ION /TURN THE INTERRUPT ON
1646 6572 DBRD /READ THE 12 BIT P I/O BUFFER
1647 7640 SZA CLA
1650 4427 ERROR /CAF FAILED TO CLEAR THE 12 BIT DATA BUFFER
1651 2200 ISZ DATPIO /BUMP RETURN ADDRESS POINTER BY 1
1652 5600 JMP I DATPIO /RETURN TO TEST

```

/ROUTINE FOR TRANSMITTING, READING AND COMPARING DATA FOR SLU

```

1653 0000 DATSLU, 0
1654 6007 CAF /CLEAR ALL FLAGS BUT SET INT ENA ON SLU
1655 4145 RTCEA /SET REAL TIME CLOCK INT ENA
1656 6001 ION /TURN THE INTERRUPT ON
1657 3041 DCA INTFLG /CLEAR THE PROGRAM INTERRUPT FLAG
1660 1053 TAD SLUXMT /GET THE WORD TO BE TRANSMITTED
1661 6046 TIS /LOAD AND TRANSMIT IT AND CLEAR THE FLAG
1662 4431 TSWAT /WAIT FOR THE TRANSMIT FLAG
1663 4427 ERROR /XMIT FLAG FAILED TO SET
1664 2041 ISZ INTFLG /DID THE PROGRAM INTERRUPT?
1665 4427 ERROR /PROGRAM FAILED TO INTERRUPT
1666 6042 TCF /CLEAR THE XMIT FLAG
1667 6001 ION /TURN THE INTERRUPT BACK ON
1670 4432 KSWAT /WAIT FOR THE RECEIVE FLAG TO SET
1671 4427 ERROR /RECEIVE FLAG FAILED TO SET
1672 2041 ISZ INTFLG /DID THE RECEIVE FLAG CAUSE A INTERRUPT?
1673 4427 ERROR /RECEIVE FLAG FAILED TO CAUSE A INTERRUPT
1674 6036 KRB /CLEAR THE AC AND RCV FLAG AND READ BUFFER
1675 3054 DCA SLUREC /SAVE THE WORD READ BACK
1676 6001 ION /TURN THE INTERRUPT BACK ON
1677 1041 TAD INTFLG /CHECK THAT KRB CLEARED THE RCV FLAG
1700 7640 SZA CLA
1701 4427 ERROR /KRB FAILED TO CLEAR RCV FLAG OR INTERRUPTED
1702 1053 TAD SLUXMT /GET THE WORD TRANSMITTED
1703 7041 CIA
1704 1054 TAD SLUREC /GET THE WORD READ BACK
1705 7640 SZA CLA
1706 5653 JMP I DATSLU /DATA ERROR-RETURN TO REPORT THE ERROR
1707 2253 ISZ DATSLU /BUMP RETURN ADDRESS POINTER BY ONE
1710 5653 JMP I DATSLU /RETURN TO TEST

```

/DATA ERROR ROUTINE FOR PARALLEL I/O

```

1711 0000 DERPIO, 0
1712 4777 JMS ACTCHK /CHECK TO SEE IF RUNNING ON ACT LINE
1713 4435 SWCHK /CHECK SR0 TO INHIBIT ERROR HALT
1714 7710 SPA CLA /IS SR0 SET?
1715 5327 JMP PIOSWH /YES, GO CHECK SR1 TO LOOP ON ERROR
1716 7240 CLA CHA

```

```

1717 1311 TAD DERPIO
1720 7402 HLT /AC = ADDRESS WHERE ERROR WAS DETECTED
1721 7200 CLA
1722 1051 TAD PIOXMT /GET THE WORD TRANSMITTED
1723 7402 HLT /AC = THE GOOD WORD
1724 7200 CLA
1725 1052 TAD PIOREC /GET THE WORD READ
1726 7402 HLT /AC = THE BAD WORD = WORD READ
1727 4435 PIOSWH, SWCHK /LOOP ON DATA ERROR IF SR1=1
1730 7004 RAL
1731 7700 SMA CLA /LOOP?
1732 5711 JMP I DERPIO /NO, RETURN TO TEST
1733 5446 JMP I TSTLOP /RETURN AND DO SAME PATTERN(S)

```

/DATA ERROR ROUTINE FOR SERIAL LINE UNIT

```

1734 0000 DERSLU, 0
1735 4777 JMS ACTCHK /CHECK TO SEE IF RUNNING ON THE ACT LINE
1736 4435 SWCHK /CHECK SR0=1 TO INHIBIT ERROR HALT
1737 7710 SPA CLA
1740 5354 JMP SLUSWH /GO CHECK SR1=1 TO LOOP ON ERROR
1741 7240 CLA CMA
1742 1334 TAD DERSLU /
1743 7402 HLT /AC=ADDRESS WHERE ERROR WAS DETECTED
1744 7200 CLA
1745 1053 TAD SLUXMT /GET THE WORD TRANSMITTED
1746 7402 HLT /AC=GOOD WORD=THE WORD TRANSMITTED
1747 7200 CLA
1750 1054 TAD SLUREC /GET THE WORD READ
1751 7402 HLT /AC=THE BAD WORD=THE WORD READ
1752 4776 JMS SIMWRD /WAS THE SIMULATOR SELECTED
1753 7402 HLT /AC=THE SIMULATOR CONTROL WORD
1754 4435 SLUSWH, SWCHK /LOOP ON DATA ERROR IF SR1=1
1755 7004 RAL
1756 7700 SMA CLA /LOOP?
1757 5734 JMP I DERSLU /NO, RETURN TO TEST
1760 5446 JMP I TSTLOP

```

```

1761 0000 CHKSIM, 0
1762 1021 TAD CPISL /CHECK FOR SIMULATOR
1763 0057 AND K200
1764 7650 SMA CLA
1765 5371 JMP ,+4 /NO
1766 1761 TAD I CHKSIM /GET THE CONTROL WORD
1767 3255 DCA CONTWD /SAVE IT
1770 7410 SKP
1771 2361 ISZ CHKSIM
1772 2361 ISZ CHKSIM
1773 1361 TAD CHKSIM
1774 3046 DCA TSTLOP
1775 5761 JMP I CHKSIM

```

1776 1514
1777 1526
0200

•200

5

0000	11110000	00000000	11111111	11111111	11111111	11111111	11111111	11111111	11111111
0100	11111111	11111111	11111111	11111111	11111111	11111111	11111111	00000000	00000000
0200	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
0300	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
0400	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
0500	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
0600	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
0700	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
1000	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
1100	11111111	11111111	11111111	11111111	11111111	10000000	00000000	00000000	00000000
1200	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
1300	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
1400	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
1500	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
1600	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
1700	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111

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

AC	1251	GOODPS	0100	PIODEN	4430	TEST28	1064
ACTCHK	1526	GTF	6084	PIOREC	0052	TFL	6040
ACTCK2	1300	HLT	7402	PIOSWH	1727	TLS	6046
ACTCNT	0101	INACTV	0076	PIOXMT	0051	TPC	6044
ACTFLG	0133	INTFLG	0041	PNOJNT	0075	TSF	6041
ACTRET	1544	INTRET	1330	POMFAL	1441	TSFWAT	4431
ADDTIM	1363	K0	1436	PRGEN0	5440	TSTCNT	0047
AERROR	1475	K1	0124	RECFLG	0073	TSTGOD	0135
AERSWH	1507	K10	1471	RETADD	1437	TSTLOP	0046
BADPAS	0077	K11	1473	RETURN	1420	WATKSF	1342
C7	1470	K12	1474	RMF	6244	WATTSF	1331
CAF	0007	K125	0061	RTCENA	4145	WTCLSK	1393
CAL	6103	K2	0125	RTCFGL	0074	XMTFLG	0072
CHKACT	1544	K200	0057	RTF	6005		
CHKSIM	1761	K252	0060	SAVADD	0123		
CHKSWH	1407	K2525	0063	SAVCNT	0050		
CLCL	6136	K3	0126	SAVLOC	1440		
CLKFLG	0042	K377	0056	SBE	6101		
CLKSET	1552	K5252	0062	SIMCHK	4436		
CLKSNO	0134	K7	0064	SIMCLR	6160		
CLLE	6135	K7710	0147	SIMCNT	0067		
CLROET	6156	KCC	6032	SIMINT	1244		
CLRSIM	6150	KCDF	0131	SIMLOD	1214		
CLSK	6137	KCF	6030	SIMWRD	1514		
CLSKWT	4425	KIE	6035	SKPCHN	1292		
CNT	0043	KJMP	0127	SKPDAV	6165		
CNT1	0044	KJMP7	1465	SKPFRQ	6162		
CNTUD	0055	KJMPRT	1472	SKPRDR	6157		
DATPIO	1600	KRB	6036	SKPSTR	6167		
DATSLU	1653	KRMF	0130	SLUDAT	4433		
DBCE	6576	KRS	6034	SLUDER	4434		
DBCF	6573	KRTF	0132	SLUREC	0054		
DBRD	6572	KSF	6031	SLUSWH	1754		
DBSE	6575	KSFNAT	4432	SLUXMT	0053		
DBSK	6571	KTEST	1466	SPI	6045		
DBSS	6577	LINK	0071	SPL	6102		
DBST	6570	LOADSM	6151	STRFRQ	6161		
DBTD	6574	LODFRQ	6163	SWHCHK	4435		
DERPIO	1711	LOADSIM	4437	SWITCH	0020		
DERSLU	1734	LOPPPC	4423	TCP	6042		
ENRLOP	4424	LOOPSW	1237	TEST	0045		
ENARTC	0145	LOPDON	1221	TEST17	0201		
ENDPAS	1400	M10	0066	TEST18	0222		
ERROR	4427	M144	0102	TEST19	0274		
ERRPC	1543	M4	0065	TEST20	0344		
EXPACD	0070	ONACTL	1545	TEST21	0407		
FLGCK1	1305	OP11K2	0000	TEST22	0460		
FLGCK2	1310	OP1SEL	0021	TEST23	0530		
FLGCK3	1313	OP2SEL	0022	TEST24	0612		
FLGCK4	1316	PATCH	0103	TEST25	0645		
FLGCK5	1321	PCLDOP	1200	TEST26	0722		
FLGRST	1467	PIODAT	4426	TEST27	1001		

ERRORS DETECTED: 0
LINKS GENERATED: 9
RUN-TIME: 19 SECONDS
2K CORE USED

/DKC8=AA OPTION TEST 1 MAINDEC=08=DJDKA-B=L 1K PART 3
/
/COPYRIGHT (C) 1974, 1975 DIGITAL EQUIPMENT CORPORATION
/PROGRAMMER: BRUCE HANSEN
/

////////////////////////////////////
/THE FOLLOWING LISTING WILL CORRESPOND TO THE PAPER TAPE LABELED
/MAINDEC=08=DJDKA-B=PM3, 1K VERSION 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.
////////////////////////////////////

```

/DC8=AA OPTION TEST 1 MAINDEC=08=DJDKA=B=L 1K PART 3
/
/COPYRIGHT (C) 1974, 1975 DIGITAL EQUIPMENT CORPORATION
/
/PROGRAMMER: BRUCE HANSEN
/

/PROCESSOR INSTRUCTIONS
6007 CAF=6007 /CLEAR ALL FLAGS
6102 SPL=6102 /SKIP ON AC LOW FLIP=FLOP
6103 CAL=6103 /CLEAR AC LOW FLIP=FLOP
6101 SBE=6101 /SKIP ON BATTERY EMPTY
7402 HLT=7402
6244 RMF=6244 /RESTORE MEMORY FIELD
6005 RTF=6005
6004 GTF=6004

/OPTION BOARD NUMBER 1 IOT'S

//SERIAL LINE UNIT
/RECEIVER IOTS
6030 KCF=6030 /CLEAR RECEIVE FLAG, DON'T SET READER RUN
6031 KSF=6031 /SKIP ON RECEIVE FLAG
6032 KCC=6032 /CLEAR RECEIVE FLAG AND AC, SET READER RUN
6034 KRS=6034 /READ RECEIVE BUFFER
6035 KIE=6035 /AC 11=1 SET INTERRUPT ENABLE
/AC 11=0 CLEAR INTERRUPT ENABLE
/AC 11=0 CLEAR INTERRUPT ENABLE
6036 KRB=6036 /CLEAR RECEIVE FLAG AND AC, SET READER RUN AND READ
/RECEIVE BUFFER

/TRANSMIT IOTS
6040 TFL=6040 /SET TRANSMIT FLAG
6041 TSF=6041 /SKIP ON TRANSMIT FLAG
6042 TCF=6042 /CLEAR THE TRANSMIT FLAG
6044 TPC=6044 /LOAD TRANSMIT BUFFER AND TRANSMIT
6045 SPI=6045 /SKIP IF TRANSMIT OR RECEIVE FLAG SET AND INT ENA SET TO A 1
6046 TLS=6046 /LOAD TRANSMIT BUFFER, TRANSMIT AND CLEAR TRANSMIT FLAG

/REAL TIME CRYSTAL CLOCK
6135 CLLE=6135 /AC 11=1 SET INTERRUPT ENABLE
/AC 11=0 CLEAR INTERRUPT ENABLE
6136 CLCL=6136 /CLEAR CLOCK FLAG
6137 CLSK=6137 /SKIP ON CLOCK FLAG

/12 BIT PARALLEL I/O
6570 DBST=6570 /SKIP ON DATA ACCEPTED, CLEAR DATA ACCEPTED AND DATA AVAILABLE
6571 DBSK=6571 /SKIP ON DATA READY FLAG
6572 DBRD=6572 /READ DATA INTO AC 0=11
6573 DBCF=6573 /CLEAR DATA READY FLAG, ISSUE DATA ACCEPTED OUT
6574 DBTD=6574 /LOAD AC 0=11 INTO BUFFER AND TRANSMIT DATA OUT
6575 DBSE=6575 /SET INTERRUPT ENABLE TO A 1
6576 DBCE=6576 /SET INTERRUPT ENABLE TO A 0

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6577 DBSS=6577 /ISSUE A STROBE PULSE

/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

/OPTION BOARD 1 SIMULATOR IOT'S
6150 CLRSIM=6150 /CLEAR SIMULATOR CONTROL REGISTERS
6151 LDAUSM=6151 /LOAD SIMULATOR CONTROL WORD 1
6156 CLROET=6156 /CLEAR READER RUN, STROBE, AND DATA AVAILABLE CATCHER F/F'S
6157 SKPHQR=6157 /SKIP ON READER RUN CATCHER F/F SET
6160 SIMULR=6160 /CLEAR CONTROL REGISTERS AND MOST OF LOGIC ON SIMULATOR
6161 STRFRQ=6161 /START FREQUENCY CHECK (SLU OR RTC)
6162 SKPFRQ=6162 /SKIP ON FREQUENCY CHECK IN PROGRESS
6163 LODFRQ=6163 /READ FREQUENCY COUNT INTO AC
6165 SKPUAV=6165 /SKIP ON DATA AVAILABLE CATCHER F/F SET
6167 SKPSTR=6167 /SKIP ON STROBE CATCHER F/F SET

/OPTION BOARD 1 SIMULATOR CONTROL WORD BIT ASSIGNMENTS
/BIT 0 COUNTER RESET 1=ACTIVATE
/ 2=NO ACTION

/BIT 1 PARALLEL I/O CLEAR DATA 1=TS1
/ AVAILABLE SELECT 2=DATA ACCEPTED IN

/BIT 2 NOT USED
/BIT 3 NOT USED
/BIT 4 NOT USED
/BIT 5 RTC FREQUENCY OR 1=RTC
/ SLU FREQUENCY CHECK 2=SLU BAUD RATES

/BIT 6 REAL TIME CLOCK 1=OFF
/ 2=ON

/BIT 7 SLU EIA/20MA SELECT 1=EIA RECEIVE DATA
/ 2=20 MA RECEIVE DATA

/BIT 8 STOP BIT SELECT 1=1 STOP BITS
/ 2=2 STOP BIT

/BIT 9 BAUD RATE SELECT BIT 9, 10, 11 ALL 0'S
/BIT 10 BAUD RATE SELECT EQUALS 110 BAUD, EACH
/BIT 11 BAUD RATE SELECT INCREASING BIT SELECTS
/ NEXT HIGHEST BAUD RATE,

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```

0000 0000 *0
0000 0302 302 /PROGRAM REVISION LETTER=MAINDEC=08=DJDKA=B
0001 6244 RMF /RESTORE MEMORY FIELDS
0002 5403 JMP I 3 /RETURN TO INTERRUPT SERVICE ROUTINE
0003 1044 SIMINT/SKPPCHN/SIMCHK/RTGINT/SLUINT /INTERRUPT SERVICE ROUTINES

0020 *20
0020 0000 SWITCH, 0
0021 2000 OP1SEL, 2000

/BIT 0=0 USE LOCATION 20 AS A PSEUDO SWITCH REGISTER
/BIT 0=1 USE HARDWARE FRONT PANEL SWITCH REGISTER
/BIT 1=1 HAS OPTION 1
/BIT 2=1 HAS OPTION 2
/BIT 3=1 HAS 8A CPU SIMULATOR
/BIT 4=1 HAS 8A OPTION 1+2 SIMULATOR
/BIT 5=1 PROGRAM ON PDP-8A XOR(REQUIRES BIT 4 SET ALSO)
/BIT 6=1 HAS PDP-8E TYPE CPU
/BIT 7=11 MEMORY SIZE = 2/5=1K, 37=32K, MEMORY
/SIZE CAN BE INCREASED IN 1K INCREMENTS BY ADDING
/ONE TO THE NUMBER IN BITS 7 = 11
/BIT 0 IS SET FOR THE ACT LINE

0022 0000 OP2SEL, 0
4423 LOOPPC=JMS I,
0023 1000 PCLOOP
4424 DONLOP=JMS I,
0024 1021 LOPDON
4425 CLSKWT=JMS I,
0025 1193 WTCLSK
4426 P1ODAT=JMS I,
0026 1400 DATP10
4427 ERROR=JMS I,
0027 1275 AERROR
4430 P1ODER=JMS I,
0030 1511 DERP10
4431 TSFWAT=JMS I,
0031 1131 WATTSP
4432 KSFWAT=JMS I,
0032 1142 WATKSF
4433 SLUDAT=JMS I,
0033 1493 DATSLU
4434 SLUDER=JMS I,
0034 1534 DERSLU
4435 SHHCHK=JMS I,
0035 1207 CHKSWH
4436 SIMCHK=JMS I,
0036 1561 CHKSIM
4437 LOOSIM=JMS I,
0037 1014 SIMLOD
4145 RTCENA=JMS ENARTC

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```

0040 5440 PRGEND=JMP I,
0042 1200 ENDPAS

/LOCATIONS USED BY THE PROGRAM

0041 0000 INTFLG, 0
0042 0000 CLKFLG, 0
0043 0000 CIT, 0
0044 0000 CIT1, 0
0045 0000 TEST, 0
0046 0000 TSTLOP, 0
0047 0000 TSTCNT, 0
0050 0000 SAVCNT, 0
0051 0000 P1OXMT, 0
0052 0000 P1OHEC, 0
0053 0000 SLUXMT, 0
0054 0000 SLUREC, 0
0055 0000 CONTWD, 0
0056 0377 K377, 377
0057 0200 K200, 200
0062 0252 K252, 252
0061 0125 K125, 125
0062 0252 K252, 252
0063 0252 K252, 252
0064 0007 K7, 7
0065 7774 M4, -4
0066 7770 M10, -10
0067 0000 SIMCNT, 0

0070 0000 EXPACD, 0
0071 0000 LINK, 0
0072 0000 XMTFLG, 0
0073 0000 RECFLG, 0
0074 0000 RTGFLG, 0
0075 0000 PHOINT, 0
0076 0000 I1ACTV, 0
0077 6520 RADPAS, 6520 /ACT LINE ERROR RETURN TO FIELD 7
0100 6500 GOODPS, 6500 /ACT LINE GOOD RETURN TO FIELD 7
0101 7634 ACTCNT, -144
0102 7634 M144, -144

/ROUTINE TO SETUP FIELD 0 TO HANDLE INTERRUPTS FROM ANOTHER FIELD

0103 0000 PATCH, 0
0104 1503 TAD I PATCH /GET THE INTERRUPT SERVICE ADDRESS
0105 3123 DCA SAVADD /SAVE INTERRUPT ADDRESS
0106 6201 CDF /CHANGE DATA FIELD TO FIELD 0
0107 1130 TAD KRMF /GET THE INSTRUCTION RMF
0110 3524 DCA I K1 /PUT IT IN LOCATION 1 OF FIELD 0
0111 1127 TAD KJMP /GET THE INSTRUCTION JMP I 3
0112 3525 DCA I K2 /PUT IT IN LOCATION 2 OF FIELD 0
0113 1123 TAD SAVADD /GET THE INTERRUPT SERVICE ADDRESS
0114 3526 DCA I K3 /PUT IT IN LOCATION 3 OF FIELD 0

```

```

0115 0224 RIF /GET THE PROGRAM FIELD INTO THE AC
0116 1131 TAD KCDF /AND IT TO THE CDF INSTRUCTION
0117 3120 DCA ,+1 /PUT IT IN THE NEXT LOCATION
0120 7402 HLT/CDF /EXECUTE IT
0121 2103 ISZ PATCH /ADD 1 TO THE ENTRANCE
0122 5503 JMP I PATCH /RETURN

0123 0000 SAVADD, 0
0124 0001 K1, 1
0125 0002 K2, 2
0126 0003 K3, 3
0127 5403 KJMP, JMP I 3
0130 6244 KRMF, 6244
0131 6201 KCDF, CDF
0132 6005 KRTF, RTF
0133 0000 ACTFLG, 0
0134 0000 CLKSNC, 0

```

/THIS ROUTINE USED WHEN RUNNING ON THE ACT LINE TO SIGNIFY THAT NO
/ERRORS HAVE BEEN ENCOUNTERED

```

0135 0000 TSTGOD, 0
0136 1022 TAD OP2SEL /GET THE HARDWARE FLAG
0137 7700 SMA CLA /ARE WE ON THE ACT LINE?
0140 5535 JMP I TSTGOD /NO, RETURN TO THE PROGRAM
0141 6002 IOF /TURN THE INTERRUPT OFF
0142 6272 CIF 70 /CHANGE THE INSTRUCTION TO FIELD 7
0143 4500 JMS I GOODPS /GO TO PROM
0144 5535 JMP I TSTGOD /RETURN TO THE PROGRAM

```

```

0145 0000 ENARTC, 0
0146 1022 TAD OP2SEL /CHECK TO SEE IF ON ACT LINE
0147 7710 SPA CLA /IF NOT CLEAR RTC INT ENA
0150 7301 CLA CLL IAC /SET AC BIT 11
0151 6135 CLLE /LOAD BIT 11 INTO CLOCK INT ENA
0152 7200 CLA
0153 5545 JMP I ENARTC

```

0200 *200

IFDEF OP13K <PAGE>

IFDEF OP13K <PAGE>

/*****
/TEST 29 = CHECKS THAT KRB WILL CLEAR THE RCV FLAG; THE RCV FLAG
/IS SET BY ISSUING TLS COMMAND;
/*****/

```

0200 6160 SIMCLR
0201 4423 TEST29, LOOPPC /SETUP TEST COUNT AND SCOPE LOOPING ADDRESS

```

```

0202 7775 =3 /SIMULATOR ITERATION COUNTER
0203 4103 JMS PATCH /SET UP SKIP CHAIN
0204 1052 SKPCHN
0205 3042 DCA CLKFLG /SET INTERRUPT TO IGNORE RTC
0206 4436 SIMCHK /CHECK TO SEE IF SIMULATOR IS SELECTED
0207 4017 4017 /CONTROL WORD FOR THE SIMULATOR
0210 4437 LODSIM /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
/LOOP = THIS ADDRESS IF SIMULATOR SELECTED
/OTHERWISE SCOPE LOOP IS THIS ADDRESS +1

0211 3041 DCA INTFLG /CLEAR PROGRAM INTERRUPT FLAG
0212 6007 CAF /CLEAR ALL FLAGS AND SET SLU INT ENA
0213 4145 RTCENA /SET REAL TIME CLOCK INT ENA
0214 6001 ION /TURN THE INTERRUPT ON
0215 6046 TLS /TRANSMIT AND CLEAR THE FLAG
0216 4431 TSPWAT /WAIT FOR THE XMIT FLAG TO SET
0217 4427 ERROR /XMIT FLAG FAILED TO SET BY TLS
0220 2041 ISZ INTFLG /DID THE PROGRAM INTERRUPT
0221 4427 ERROR /FAILED TO INTERRUPT WITH INT ENA AND XMIT FLAG
0222 6042 TCF /CLEAR XMIT FLAG
0223 6001 ION /TURN THE INTERRUPT ON
0224 4432 KSPWAT /WAIT FOR THE RCV FLAG TO SET
0225 4427 ERROR /RECEIVE FLAG FAILED TO SET
0226 6034 KRS /READ THE RECEIVE BUFFER
0227 7610 SKP CLA
0230 4427 ERROR /KRS SKIPPED
0231 6031 KSF /SKIP ON RECEIVE FLAG
0232 4427 ERROR /KRS CLEARED THE RCV FLAG
0233 2041 ISZ INTFLG /DID THE PROGRAM INTERRUPT
0234 4427 ERROR /FAILED TO INTERRUPT WITH INT ENA + RCV FLAG
0235 6036 KRB /CLEAR RECEIVE FLAG
0236 7610 SKP CLA
0237 4427 ERROR /KRB SKIPPED
0240 6001 ION /TURN THE INTERRUPT BACK ON
0241 6031 KSF /SKIP ON RECEIVE FLAG
0242 7610 SKP CLA
0243 4427 ERROR /KRB FAILED TO CLEAR RECEIVE FLAG
0244 1041 TAD INTFLG /GET THE PROGRAM INTERRUPT FLAG
0245 7640 SZA CLA
0246 4427 ERROR /PROGRAM INTERRUPTED WITHOUT RCV FLAG SET
0247 4424 DONLOP /REPEAT TEST IF NOT DONE OR LOOP IF SR2=1

```

/*****
/TEST 30 = CHECKS THAT CAF WILL CLEAR RCV FLAG
/*****/

```

0250 4423 TEST30, LOOPPC /SETUP TEST COUNT AND SCOPE LOOPING ADDRESS
0251 7775 =3 /SIMULATOR ITERATION COUNTER
0252 4436 SIMCHK /CHECK TO SEE IF SIMULATOR IS SELECTED
0253 4017 4017 /CONTROL WORD FOR THE SIMULATOR
0254 4437 LODSIM /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
/LOOP = THIS ADDRESS IF SIMULATOR SELECTED
/OTHERWISE SCOPE LOOP IS THIS ADDRESS +1

0255 3041 DCA INTFLG /CLEAR PROGRAM INTERRUPT FLAG
0256 6007 CAF /CLEAR ALL FLAGS
0257 4145 RTCENA /SET REAL TIME CLOCK INT ENA

```


0260	6001	ION	/TURN THE INTERRUPT ON
0261	6046	TLS	/TRANSMIT AND CLEAR THE XMIT FLAG
0262	4431	TSFWAT	/WAIT FOR XMIT FLAG
0263	4427	ERROR	/XMIT FLAG FAILED TO SET
0264	2041	ISZ INTFLG	/DID THE PROGRAM INTERRUPT?
0265	4427	ERROR	/PROGRAM FAILED TO INTERRUPT
0266	6042	TCF	/CLEAR TRANSMIT FLAG
0267	6001	ION	
0270	4432	KSPWAT	/WAIT FOR RECEIVE FLAG
0271	4427	ERROR	/RECEIVE FLAG FAILED TO SET
0272	2041	ISZ INTFLG	/DID THE PROGRAM INTERRUPT?
0273	4427	ERROR	/PROGRAM FAILED TO INTERRUPT
0274	6037	CAF	/CLEAR ALL FLAGS
0275	6001	ION	/TURN THE INTERRUPT BACK ON
0276	6031	KSF	/SKIP ON RECEIVE FLAG
0277	7610	SKP CLA	
0300	4427	ERROR	/INITIALIZE FAILED TO CLEAR RECEIVE FLAG
0301	4424	DONLOP	/REPEAT TEST IF NOT DONE OR LOOP IF SR2=1

 /TEST 31 = CHECKS THE EFFECT OF THE SLU IOT'S UPON THE AC

0302	4423	TEST31, LOOPPC	/SETUP TEST COUNT AND SCOPE LOOPING ADDRESS
0303	7777	=1	/SIMULATOR ITERATION COUNTER
0304	4436	SIMCHK	/CHECK TO SEE IF SIMULATOR IS SELECTED
0305	4007	4007	/CONTROL WORD FOR THE SIMULATOR
0306	4437	LOADSIM	/LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
			/LOOP = THIS ADDRESS IF SIMULATOR SELECTED
			/OTHERWISE SCOPE LOOP IS THIS ADDRESS *1
			/CLEAR PROGRAM INTERRUPT FLAG
0307	3041	DCA INTFLG	/CLEAR ALL FLAGS
0310	6007	CAF	/SET REAL TIME CLOCK INT ENA
0311	4145	RTCEVA	/TURN THE INTERRUPT ON
0312	6001	ION	/SET THE AC TO -2
0313	7344	CLA CLL CMA RAL	/CLEAR SLU INTERRUPT ENABLE
0314	6035	KIE	
0315	7050	CMA RAR	
0316	7620	SNL CLA	
0317	4427	ERROR	/KIE CHANGED THE AC
0320	7240	CLA CMA	
0321	6032	KCC	/CLEAR RECEIVE FLAG AND AC
0322	7640	SZA CLA	
0323	4427	ERROR	/KCC FAILED TO CLEAR THE AC
0324	7240	CLA CMA	
0325	6036	KRB	/READ RECEIVE FLAG, CLEAR AC AND READ RECEIVE BUFFER
0326	7510	SPA	
0327	4427	ERROR	/KRB FAILED TO CLEAR AC
0330	7240	CLA CMA	
0331	6034	KRS	/READ RECEIVE BUFFER = INCLUSIVE OR WITH AC
0332	7040	CMA	/SET THE AC BACK TO 0
0333	7640	SZA CLA	
0334	4427	ERROR	/KRS CHANGED THE AC
0335	7340	CLA CLL CMA	
0336	6031	KSF	/SKIP ON RECEIVE FLAG
0337	7040	CMA	

0340	7640	SZA CLA	
0341	4427	ERROR	/KSF CHANGED THE AC
0342	7240	CLA CMA	
0343	6030	KCF	/CLEAR RECEIVE FLAG
0344	7040	CMA	
0345	7640	SZA CLA	
0346	4427	ERROR	/KCF CHANGED THE AC
0347	7240	CLA CMA	
0350	6040	TFL	/SET TRANSMIT FLAG
0351	7040	CMA	
0352	7640	SZA CLA	
0353	4427	ERROR	/TFL CHANGED THE AC
0354	7240	CLA CMA	
0355	6042	TCF	/CLEAR THE TRANSMIT FLAG
0356	7040	CMA	
0357	7640	SZA CLA	
0360	4427	ERROR	/TCF CHANGED THE AC
0361	7240	CLA CMA	
0362	6041	TSF	/SKIP ON TRANSMIT FLAG
0363	7040	CMA	
0364	7640	SZA CLA	
0365	4427	ERROR	/TSF CHANGED THE AC
0366	7240	CLA CMA	
0367	6044	TPC	/LOAD TRANSMIT BUFFER AND TRANSMIT
0370	7040	CMA	
0371	7640	SZA CLA	
0372	4427	ERROR	/TPC CHANGED THE AC
0373	4431	TSFWAT	/WAIT FOR THE TRANSMIT FLAG
0374	4427	ERROR	/TRANSMIT FLAG FAILED TO SET
0375	4432	KSPWAT	/WAIT FOR THE RECEIVE FLAG
0376	4427	ERROR	/RECEIVE FLAG FAILED TO SET
0377	6042	TCF	/CLEAR THE XMIT FLAG
0400	6030	KCF	/CLEAR THE RECEIVE FLAG
0401	7240	CLA CMA	
0402	6045	SPI	/SKIP IF XMIT/RCV FLAG SET AND INT ENA SET
0403	7040	CMA	
0404	7640	SZA CLA	
0405	4427	ERROR	/SPI CHANGED THE AC
0406	7240	CLA CMA	
0407	6046	TLS	/LOAD TRANSMIT BUFFER, TRANSMIT + CLEAR FLAG
0410	7040	CMA	
0411	7640	SZA CLA	
0412	4427	ERROR	/TLS CHANGED THE AC
0413	4431	TSFWAT	/WAIT FOR THE TRANSMIT FLAG
0414	4427	ERROR	/TRANSMIT FLAG FAILED TO SET
0415	4432	KSPWAT	/WAIT FOR THE RECEIVE FLAG TO SET
0416	4427	ERROR	/RECEIVE FLAG FAILED TO SET
0417	6042	TCF	/CLEAR THE TRANSMIT FLAG
0420	6032	KCC	/CLEAR AC AND RECEIVE FLAG
0421	1041	TAD INTFLG	/DID THE PROGRAM INTERRUPT?
0422	7640	SZA CLA	
0423	4427	ERROR	/PROGRAM INTERRUPTED WITHOUT INT ENA SET
0424	4424	DONLOP	/REPEAT TEST IF NOT DONE OR LOOP IF SR2=1

/TEST 32 = CHECKS THAT ALL ZEROES CAN BE TRANSMITTED AND READ BACK IN
/*****

0425	4423	TEST32, LOOPPC	/SETUP TEST COUNT AND SCOPE LOOP ADDRESS
0426	7775	=3	/SIMULATOR ITERATION COUNTER
0427	4436	SIMCHK	/CHECK TO SEE IF SIMULATOR IS SELECTED
0430	4017	4017	/CONTROL WORD FOR THE SIMULATOR
0431	4437	LOADSIM	/LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
			/LOOP = THIS ADDRESS IF SIMULATOR SELECTED
			/OTHERWISE SCOPE LOOP IS THIS ADDRESS +1
0432	3041	DCA INTFLG	/CLEAR PROGRAM INTERRUPT FLAG
0433	3053	DCA SLUXMT	/CLEAR THE WORD TO BE TRANSMITTED
0434	4433	SLUDAT	/GO TRANSMIT, READ AND COMPARE THE WORD
0435	4434	SLUDER	/DATA ERROR=WORD WAS NON ZERO BEING READ BACK
0436	4424	DONLOP	/REPEAT TEST IF NOT DONE OR LOOP IF SR2=1

/*****
/TEST 33 = CHECKS THAT ALL ONES CAN BE TRANSMITTED AND READ BACK
/*****

0437	4423	TEST33, LOOPPC	/SETUP TEST COUNT AND SCOPE LOOP ADDRESS
0440	7775	=3	/SIMULATOR ITERATION COUNTER
0441	4436	SIMCHK	/CHECK TO SEE IF SIMULATOR IS SELECTED
0442	4017	4017	/CONTROL WORD FOR THE SIMULATOR
0443	4437	LOADSIM	/LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
			/LOOP = THIS ADDRESS IF SIMULATOR SELECTED
			/OTHERWISE SCOPE LOOP IS THIS ADDRESS +1
			/CLEAR PROGRAM INTERRUPT FLAG
0444	3041	DCA INTFLG	
0445	1056	TAD K377	
0446	3053	DCA SLUXMT	/SET THE WORD TO BE TRANSMITTED TO ALL ONE'S
0447	4433	SLUDAT	/GO TRANSMIT, READ AND COMPARE
0450	4434	SLUDER	/DATA ERROR = WORDS DO NOT COMPARE
0451	4424	DONLOP	/REPEAT TEST IF NOT DONE OR LOOP IF SR2=1

/*****
/TEST 34 = CHECKS THAT A COMPLEMENTING PATTERN (000=377) CAN BE
/TRANSMITTED AND READ BACK,
/*****

0452	4423	TEST34, LOOPPC	/SETUP TEST COUNT AND SCOPE LOOPING ADDRESS
0453	7775	=3	/SIMULATOR ITERATION COUNTER
0454	4436	SIMCHK	/CHECK TO SEE IF SIMULATOR IS SELECTED
0455	4017	4017	/CONTROL WORD FOR THE SIMULATOR
0456	4437	LOADSIM	/LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
			/LOOP = THIS ADDRESS IF SIMULATOR SELECTED
			/OTHERWISE SCOPE LOOP IS THIS ADDRESS +1
			/CLEAR PROGRAM INTERRUPT FLAG
0457	3041	DCA INTFLG	
0460	3053	DCA SLUXMT	/CLEAR THE WORD TO BE TRANSMITTED
0461	4433	SLUDAT	/GO TRANSMIT READ AND COMPARE THE WORD
0462	4434	SLUDER	/DATA ERROR = TRANSMITTING ZEROES
0463	1056	TAD K377	
0464	3053	DCA SLUXMT	/SET THE WORD TO TRANSMIT EQUAL TO 377
0465	4433	SLUDAT	/TRANSMIT, READ AND COMPARE THE WORD
0466	4434	SLUDER	/DATA ERROR = WHILE TRANSMITTING 377

0467	4424	DONLOP	/REPEAT TEST IF NOT DONE OR LOOP IF SR2=1
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/*****
/TEST 35 = CHECKS THAT A COMPLEMENTING PATTERN (252=125) CAN BE
/TRANSMITTED AND READ BACK,
/*****

0470	4423	TEST35, LOOPPC	/SETUP TEST COUNT AND SCOPE LOOPING ADDRESS
0471	7775	=3	/SIMULATOR ITERATION COUNTER
0472	4436	SIMCHK	/CHECK TO SEE IF SIMULATOR IS SELECTED
0473	4007	4007	/CONTROL WORD FOR THE SIMULATOR
0474	4437	LOADSIM	/LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
			/LOOP = THIS ADDRESS IF SIMULATOR SELECTED
			/OTHERWISE SCOPE LOOP IS THIS ADDRESS +1
			/CLEAR PROGRAM INTERRUPT FLAG
0475	3041	DCA INTFLG	
0476	1060	TAD K252	
0477	3053	DCA SLUXMT	/SET THE TRANSMIT WORD TO 252
0500	4433	SLUDAT	/TRANSMIT, READ AND COMPARE THE WORD
0501	4434	SLUDER	/DATA ERROR = TRANSMITTED A 252
0502	1061	TAD K125	
0503	3053	DCA SLUXMT	/SET TRANSMIT WORD TO 125
0504	4433	SLUDAT	/TRANSMIT, READ AND COMPARE THE WORD
0505	4434	SLUDER	/DATA ERROR = TRANSMITTED A 125
0506	4424	DONLOP	/REPEAT TEST IF NOT DONE OR LOOP IF SR2=1

/*****
/TEST 36 = CHECKS FOR LOADING AND READING A BINARY COUNT PATTERN,
/*****

0507	4423	TEST36, LOOPPC	/SETUP TEST LOOP ADDRESS
0510	7777	=1	/SIMULATOR ITERATION COUNTER
0511	1056	TAD K377	
0512	7041	CIA	
0513	3050	DCA SAVCNT	/SETUP COUNTER TO TRANSMIT 377 TIMES
0514	1050	TAD SAVCNT	
0515	3047	DCA TSTCNT	
0516	4436	SIMCHK	/CHECK FOR THE SIMULATOR
0517	4007	4007	/CONTROL WORD FOR THE SIMULATOR
0520	4437	LOADSIM	/LOAD THE SIMULATOR IF SELECTED
0521	1047	TAD TSTCNT	/GET THE WORD TO BE TRANSMITTED
0522	0056	AND K377	/MASK OFF THE 8 BITS
0523	3053	DCA SLUXMT	/SET TRANSMIT WORD TO THIS NUMBER
0524	4433	SLUDAT	/TRANSMIT READ AND COMPARE THE WORD
0525	4434	SLUDER	/DATA ERROR=
0526	4424	DONLOP	/REPEAT TEST IF NOT DONE OR LOOP IF SR2=1

/*****
/TEST 37 = CHECKS FOR LOADING AND READING A BINARY COUNT PATTERN WITHOUT
/THE SLU INTERRUPT ENABLE SET TO SAVE TIME IN SKIP CHAIN SO THAT THE
/WORD CAN BE READ FASTER
/*****

0527	4423	TEST37, LOOPPC	/SET UP TEST COUNT AN TEST LOOP ADDRESS
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0530 7777      =1      /SIMULATOR ITERATION COUNTER
0531 1056      TAD      K377 /SETUP COUNTER TO TRANSMIT 377 TIMES
0532 7041      CIA
0533 3050      DCA      SAVCNT
0534 1050      TAD      SAVCNT
0535 3047      DCA      TSTCNT
0536 4436      SIMCHK    /CHECK TO SEE IF SIMULATOR IS SELECTED
0537 4017      4000    /SIMULATOR CONTROL WORD
0540 4437      LODSIM    /LOAD THE SIMULATOR CONTROL WORD
0541 6007      CAF      /CLEAR ALL FLAGS
0542 4145      RTCENA    /SET REAL TIME CLOCK INT ENA
0543 6001      ION      /TURN THE INTERRUPT ON
0544 3041      DCA      INTFLG /CLEAR PROGRAM INTERRUPT FLAG
0545 6035      KIE      /CLEAR SLU INT ENABLE
0546 1047      TAD      TSTCNT /GET THE TEST COUNT NUMBER
0547 3056      AND      K377 /MASK OUT FOR 8 BITS
0550 3053      DCA      SLUXMT /SAVE THE WORD TO BE TRANSMITTED
0551 1053      TAD      SLUXMT /GET THE WORD
0552 6046      TIS      /TRANSMIT IT
0553 4431      TSWAT     /WAIT FOR THE TRANSMIT FLAG TO SET
0554 4427      ERROR    /TRANSMIT FLAG FAILED TO SET
0555 6042      TCF      /CLEAR THE TRANSMIT FLAG
0556 4432      KSWAT     /WAIT FOR THE RECEIVE FLAG TO SET
0557 4427      ERROR    /RECEIVE FLAG FAILED TO SET
0560 7240      CLA      CMA   /SET THE AC TO ALL ONES
0561 6036      KRB      /READ THE WORD
0562 3054      DCA      SLUREC /SAVE THE WORD READ
0563 1053      TAD      SLUXMT /COMPARE THE WORD TRANSMITTED WITH THE WORD READ
0564 7041      CIA
0565 1054      TAD      SLUREC
0566 7640      SZA      CLA   /ARE THEY EQUAL?
0567 4434      SLUDER    /NO DATA ERROR ON SERIAL LINE UNIT
0570 1041      TAD      INTFLG /GET THE PROGRAM INTERRUPT FLAG
0571 7640      SZA      CLA
0572 4427      ERROR    /PROGRAM INTERRUPTED WITHOUT INT ENA
0573 4424      DONLOP    /DONE? OR REPEAT TEST IF SR2=1
0574 7000      NOP
0575 7000      NOP

0576 1021      TAD      OPISL  /GET THE HARDWARE CONFIGURATION
0577 3057      AND      K200   /CHECK FOR THE SIMULATOR
0580 7650      SNA      CLA   /IS IT SELECTED
0601 5440      PRGEND    /NO END OF PROGRAM IF NO SIMULATOR
0602 7204      JMP      TEST38 /YES, GO DO SIMULATOR TEST
0603 7000      NOP

```

/*****
 /THIS TEST IS ENTERED WHEN SIMULATOR IS SELECTED.
 /TEST 38 - CHECKS THAT READER RUN CAN BE SET BY KCC AND KRB AND
 /CLEARED BY INITIALIZE, THE SIMULATOR IS USED TO CHECK THAT READER
 /RUN SETS AND CLEARS.
 /*****

0604 4423 TEST38, LOOPPC /SETUP TEST COUNT AND TEST LOOP ADDRESS

```

0605 7777      =1      /SIMULATOR ITERATION COUNT
0606 4436      SIMCHK    /CHECK FOR SIMULATOR
0607 4000      4000    /SIMULATOR CONTROL WORD
0610 4437      LODSIM    /LOAD THE SIMULATOR CONTROL WORD
0611 6007      CAF      /CLEAR ALL
0612 4145      RTCENA    /SET REAL TIME CLOCK INT ENA
0613 3041      DCA      INTFLG /CLEAR THE PROGRAM INTERRUPT FLAG
0614 4103      JMS      PATCH
0615 1052      SKPCHN    /TURN THE INTERRUPT ON
0616 6001      ION      /CLEAR READER RUN DETECTOR FLIP-FLOP
0617 6156      CLRDET    /SKIP ON READER RUN F/F SET
0620 6157      SKPRDR    /SKIP ON READER RUN F/F SET
0621 7610      SKP      CLA
0622 4427      ERROR    /READER RUN IS SET AFTER A INITIALIZE
0623 6032      KCC      /CLEAR RECEIVE FLAG AND SET READER RUN
0624 6157      SKPRDR    /SKIP ON READER RUN SET
0625 4427      ERROR    /KCC FAILED TO SET READER RUN
0626 6007      CAF      /CLEAR ALL INCLUDING READER RUN F/F
0627 4145      RTCENA    /SET REAL TIME CLOCK INT ENA
0630 6001      ION      /TURN THE INTERRUPT BACK ON
0631 6156      CLRDET    /CLEAR READER RUN DETECTOR F/F
0632 4157      SKPRDR    /SKIP ON READER RUN SET
0633 7410      SKP
0634 4427      ERROR    /INITIALIZE FAILED TO CLEAR READER RUN
0635 6036      KRB      /CLEAR AC AND RECEIVE FLAG AND SET READER RUN
0636 7300      CLA      CLL
0637 6157      SKPRDR    /SKIP ON READER RUN DETECTOR F/F SET
0640 4427      ERROR    /KRB FAILED TO SET READER RUN
0641 6007      CAF      /CLEAR ALL INCLUDING READER RUN F/F
0642 4145      RTCENA    /SET REAL TIME CLOCK INT ENA
0643 6001      ION      /TURN THE INTERRUPT ON
0644 6156      CLRDET    /CLEAR READER RUN DETECTOR F/F
0645 6157      SKPRDR    /SKIP ON READER RUN F/F SET
0646 7610      SKP      CLA
0647 4427      ERROR    /INITIALIZE FAILED TO CLEAR READER RUN
0650 1041      TAD      INTFLG /GET THE PROGRAM INTERRUPT FLAG
0651 7640      SZA      CLA
0652 4427      ERROR    /PROGRAM INTERRUPTED
0653 4424      DONLOP    /DONE OR REPEAT TEST IF SR2=1

```

/*****
 /THIS TEST IS ENTERED WHEN SIMULATOR IS SELECTED.
 /TEST 39 - CHECKS THAT READER RUN WILL CLEAR AFTER A WORD HAS BEEN TRANSMITTED
 /AND DATA LOOPS BACK INTO THE RECEIVE BUFFERS USING THE 20 MA CURRENT
 /LOOP FOR 110 BAUD TO 9600 BAUD.
 /*****

0654 4423 TEST39, LOOPPC /SETUP TEST COUNT AND TEST LOOP ADDRESS

```

0655 7771      =7      /SIMULATOR ITERATION COUNTER
0656 4436      SIMCHK    /CHECK FOR SIMULATOR
0657 4000      4000    /SIMULATOR CONTROL WORD
0660 4437      LODSIM    /LOAD THE SIMULATOR
0661 6007      CAF      /CLEAR ALL FLAGS
0662 4145      RTCENA    /SET REAL TIME CLOCK INT ENA

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```

0663 6001      ION          /TURN THE INTERRUPT ON
0664 6035      KIE          /DISABLE SLU INT ENABLE
0665 6156      CLRDDET      /CLEAR READER RUN
0666 6157      SKPRDR      /SKIP ON READER DETECTOR F/F SET
0667 7610      SKP          /
0670 4427      ERROR        /READER RUN FAILED TO CLEAR BY INIT
0671 6032      KCC          /SET READER RUN
0672 6157      SKPRDR      /SKIP ON READER RUN DETECTOR F/F SET
0673 4427      ERROR        /KCC FAILED TO SET READER RUN
0674 6046      TLS          /TRANSMIT
0675 4431      TSFWAT       /WAIT FOR THE TRANSMIT FLAG
0676 4427      ERROR        /TRANSMIT FLAG FAILED TO SET
0677 6042      TCF          /CLEAR THE TRANSMIT FLAG
0700 4432      KSFHAT       /WAIT FOR THE RECEIVE FLAG
0701 4427      ERROR        /RECEIVE FLAG FAILED TO SET
0702 6156      CLRDDET      /CLEAR READER RUN DETECTOR F/F
0703 6157      SKPRDR      /SKIP ON READER RUN DETECTOR F/F SET
0704 7610      SKP          /
0705 4427      ERROR        /CLOCK PULSE TO READER RUN FAILED TO CLEAR READER RUN
0706 4424      DONLOP      /REPEAT TEST FOR NEXT BAUD RATE
0707 5440      PRGEND       /END 3RD 1K SEGMENT

```

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/ROUTINE TO SETUP # OF PASSES/TEST AND TO STORE THE RETURN ADDRESS FOR SCOPE LOOPING

```

1000 0000      PCLOOP, 0
1001 7340      CLA CLL CMA
1002 1200      TAD PCLOOP
1003 3045      DCA TEST
1004 1600      TAD I PCLOOP
1005 3067      DCA SIMCNT
1006 7240      CLA CMA
1007 3050      DCA SAVCNT
1008 1050      TAD SAVCNT
1009 3047      DCA TSTCNT
1010 2200      ISZ PCLOOP
1011 5600      JMP I PCLOOP
1014 0000      SIMLOD, 0
1015 1055      TAD CONTWD    /GET THE CONTROL WORD
1016 6151      LOADSM        /LOAD THE SIMULATOR CONTROL WORD
1017 7300      CLA CLL
1018 5614      JMP I SIMLOD

```

```

1021 0000      LOPDON, 0
1022 2047      ISZ TSTCNT    /TEST DONE?
1023 5446      JMP I TSTLOP  /NO RETURN TO TEST
1024 1021      TAD OP1SEL    /IS THE SIMULATOR SELECTED
1025 0057      AND K200
1026 7650      SNA CLA
1027 5237      JMP LOOPSW    /SIMULATOR NOT SELECTED,CHECK TEST LOOP SWITCH
1028 2067      ISZ SIMCNT    /ADD A 1 TO THE CONTROL WORD?
1029 7610      SKP CLA
1030 5237      JMP LOOPSW    /NO,CHECK TEST LOOP SWITCH
1031 2055      ISZ CONTWD    /ADD 1 TO THE CONTROL WORD FOR BAUD RATES
1032 1050      TAD SAVCNT    /GET THE TEST COUNT
1033 3047      DCA TSTCNT    /RESTORE IT FOR A NEW PASS FOR A DIFFERENT BAUD
1034 5446      JMP I TSTLOP  /RETURN FOR NEW BAUD RATE
1035 4435      LOOPSW, SWCHK /CHECK FOR SR2=1
1036 7006      RTL
1037 7700      SNA CLA
1038 5621      JMP I LOPDON   /LOOP?
1039 5445      JMP I TEST     /NO,GO TO NEXT TEST
1040 5445      /YES,LOOP ON THIS TEST

```

```

1044 6102      SIMINT, SPL   /SKIP ON POWER LOW
1045 7410      SKP
1046 5777      JMP POWFAL    /POWER GOING DOWN = GO SAVE EVERYTHING
1047 3251      DCA AC
1048 5321      JMP FLGCK5     /SAVE THE AC
1049 5321      /RETURN TO THE PROGRAM

```

```

1051 0000      AQ, 0
1052 6102      SKPCHN, SPL   /SKIP ON POWER LOW
1053 7410      SKP
1054 5777      JMP POWFAL    /POWER GOING DOWN SAVE EVERYTHING
1055 3251      DCA AC
1056 1042      TAD CLKFLG    /SAVE THE AC
1057 7650      SNA CLA
1058 4776      JMS CHKACT    /WERE WE EXPECTING A CLOCK INTERRUPT?
1059 6137      CLSK
1060 7410      SKP
1061 5305      JMP FLGCK1    /GO CHECK FOR THE ACT LINE
1062 1133      TAD ACTFLG    /YES = SKIP ON REAL TIME CLOCK FLAG
1063 7440      SZA
1064 5305      JMP ACTCK2    /GO CHECK THE OTHER FLAGS
1065 4041      TSF
1066 7610      SKP CLA
1067 5310      JMP FLGCK2    /GET THE ACT FLAG
1068 6031      KSF
1069 7410      SKP
1070 5313      JMP FLGCK3    /DID THE PROGRAM GO TO THE PROM ?
1071 6571      DBSK
1072 7410      SKP
1073 5316      JMP FLGCK4    /YES,CHECK PARALLEL I/O DATA ACCEPTED
1074 5316      ACTCK2, DBST  /HAS IT A TRANSMIT FLAG?
1075 7640      SZA CLA
1076 5317      JMP FLGCK5=2  /TRANSMIT FLAG SET = CHECK THE OTHER FLAGS
1077 5317      /HAS IT A RECEIVE FLAG?
1078 5317      /YES = GO CHECK THE OTHER FLAGS
1079 5317      /HAS THE DATA READY FLAG SET?
1080 5317      /YES = CHECK DATA ACCEPTED FLAG
1081 5317      /HAS DATA ACCEPTED SET=IF SO CLEAR IT
1082 5317      /YES,THE FLAG SHOULD BE CLEAR NOW

```

```

1103      4427          ERROR          /ILLEGAL INTERRUPT =
1104      5317          JMP FLGCK5=2    /RETURN
1105      6041          FLGCK1,        TSF          /SKIP ON XMIT FLAG
1106      7410          SKP
1107      4427          ERROR          /XMIT FLAG SET
1110      6031          FLGCK2,        KSF          /SKIP ON RECEIVE FLAG
1111      7410          SKP
1112      4427          ERROR          /RECEIVE FLAG SET
1113      6571          FLGCK3,        DBS          /SKIP ON P I/O DATA READY
1114      7410          SKP
1115      4427          ERROR          /DATA READY FLAG SET
1116      6570          FLGCK4,        DBST         /SKIP ON DATA ACCEPTED
1117      7610          SKP CLA
1120      4427          ERROR          /DATA ACCEPTED FLAG SET
1121      3133          FLGCK5,        DCA ACTFLG   /CLEAR THE ACT FLAG
1122      7240          CLA CMA
1123      3041          DCA INTFLG          /SET INTERRUPT FLAG
1124      4775          JMS RETURN
1125      1130          INTRET
1126      1251          TAD AC
1127      5730          JMP I INTRET

1130      0000          INTRET, 0

/ROUTINE TO WAIT FOR SERIAL LINE UNITS XMIT FLAG

1131      0000          WATTSF, 0
1132      7300          CLA          CLL
1133      1147          TAD          K7710
1134      3044          DCA          CNT1
1135      3043          DCA          CNT
1136      6041          TSF          /SKIP ON SLU TRANSMIT FLAG
1137      4363          JMS          ADDTIM        /GO ADD ONE TO THE COUNTER
1140      2331          ISZ          WATTSF
1141      5731          JMP          I WATTSF        /RETURN TO THE PROGRAM=GOY THE FLAG

/ROUTINE TO WAIT FOR THE SERIAL LINE UNIT RECEIVE FLAG

1142      0000          WATKSF, 0
1143      7300          CLA          CLL
1144      1147          TAD          K7710
1145      3044          DCA          CNT1
1146      3043          DCA          CNT
1147      6031          KSF          /SKIP ON SLU RECEIVE FLAG
1150      4363          JMS          ADDTIM        /GO ADD A ONE TO THE COUNTER
1151      2342          ISZ          WATKSF
1152      5742          JMP          I WATKSF        /RETURN TO THE PROGRAM=GOY THE FLAG

/ROUTINE TO WAIT FOR THE REAL TIME CLOCK FLAG

1153      0000          WTCLSK, 0
1154      7240          CLA          CMA
1155      3044          DCA          CNT1
1156      3043          DCA          CNT

```

```

1157 6137 CLSK /SKIP ON THE REAL TIME CLOCK FLAG
1162 4363 JMS /GO ADD ONE TO THE COUNTER
1161 2393 ISZ WTCLSK
1162 5793 JMP I WTCLSK /RETURN TO THE PROGRAM-GOT THE FLAG

/ROUTINE TO WAIT FOR THE FLAG

1163 0000 ADDTIM, 0
1164 2043 ISZ CNT
1165 7610 SKP CLA
1166 2044 ISZ CNT1
1167 7346 CLA CLL CMA RTL
1170 7001 IAC
1171 1363 TAD ADDTIM
1172 3363 DCA ADDTIM
1173 5763 JMP I ADDTIM

1175 1220
1176 1344
1177 1241
1200 1200 PAGE

/THIS IS THE END OF A PROGRAM PASS; IF SR3=1 HALT, IF NOT START PROGRAM OVER

1200 6160 ENDPAS, SIMCLR /CLEAR THE SIMULATOR
1201 4435 SWCHCK /GO GET SWITCH REGISTER
1202 7006 RTL
1203 7004 RAL
1204 7710 SPA CLA
1205 7402 HLT /SR3=1 END OF A COMPLETE PROGRAM PASS
1206 5777 JMP 0200 /START PROGRAM OVER

/CHECK TO SEE IF FRONT PANEL IS AVAILARE TO DO EITHER A TAD SWITCH OR A LAS COMMAND

1207 0000 CHKSWH, 0
1210 7200 CLA
1211 1021 TAD OPSEL
1212 7700 SMA CLA
1213 9216 JMP ,+3
1214 7604 LAS
1215 5607 JMP I CHKSWH
1216 1020 TAD SWITCH
1217 5607 JMP I CHKSWH
/

/THIS ROUTINE SETS UP A RETURN ADDRESS FOR INTERRUPT RETURNS FROM ANOTHER FIELD

1220 0000 RETURN, 0
1221 6201 CDF /CHANGE DATA FIELD TO FIELD 2
1222 1636 TAD I K0 /GET THE INTERRUPT PC
1223 3237 DCA RETADD /SAVE IT
1224 6224 RIF /READ THE PROGRAM INSTRUCTION FIELD
1225 1131 TAD KCDF /ADD A CDF INSTRUCTION TO IT

```

```

1226 3227 DCA ,+1 /SAVE IT IN THE NEXT LOCATION
1227 7402 HLT/CDP /RETURN TO THE PROGRAM DATA FIELD
1230 1620 TAD I RETURN /GET THE INTERRUPT RETURN LOCATION
1231 3240 DCA SAVLOC /SAVE IT
1232 2220 ISZ RETURN
1233 1237 TAD RETADD
1234 3640 DCA I SAVLOC
1235 5620 JMP I RETURN

1236 0000 K0, 0
1237 0000 RETADD, 0
1240 0000 SAVLOC, 0

```

/POWER FAIL ROUTINE, THE PROGRAM WILL DO IT'S OWN AUTO-RESTART
 /AT THE BEGINNING OF THE TEST THAT IT WAS EXECUTING UNLESS ALL POWER
 /WENT AWAY, THEN THE POWER FAIL AUTO-RESTART OPTION WOULD TRY TO DO
 /A RESTART IF IT WAS SELECTED,

```

1241 7200 POWFAL, CLA CLA
1242 6201 CDF 00
1243 1265 TAD KJMP7
1244 3636 DCA I K0
1245 1045 TAD TEST
1246 3666 DCA I KTEST
1247 1267 TAD FLGRST
1250 3670 DCA I C7
1251 1132 TAD KRTF
1252 3671 DCA I K10
1253 1272 TAD KJMPRT
1254 3673 DCA I K11
1255 6004 GTF
1256 3674 DCA I K12
1257 6244 PMF
1260 6103 CAL
1261 6102 SPL
1262 7610 SKP CLA
1263 5261 JMP ,=2
1264 5445 JMP I TEST

```

```

1265 5007 KJMP7, JMP 7
1266 0045 KTEST, TEST
1267 1012 FLGRST, TAD 12
1270 3007 C7, 7
1271 2010 K10, 10
1272 5445 KJMPRT, JMP I TEST
1273 0011 K11, 11
1274 0012 K12, 12

```

/LOGIC ERROR ROUTINE = RESTART TEST IF SR1=1

```

1275 0000 AERROR, 0
1276 4326 JMS ACTCHK /GO CHECK TO SEE IF RUNNING ON ACT LINE
1277 4435 SHMCHK /CHECK SR0 TO INHIBIT ERROR HALT
1300 7710 SPA CLA

```

```

1301 5307 JMP AERSWH /SR0=1 CHECK LOOP ON LOGIC ERROR
1302 7240 CLA CMA
1303 1275 TAD AERROR
1304 7402 HLT
1305 4314 JMS SIMWRD /AC = ADDRESS WHERE ERROR WAS DETECTED
1306 7402 HLT /WAS THE SIMULATOR SELECTED
1307 4435 AERSWH, SHMCHK /AC=SIMULATOR CONTROL WORD
1310 7004 RAL /CHECK SR1=1 TO LOOP ON ERROR
1311 7700 SMA CLA
1312 5675 JMP I AERROR /RETURN WITHOUT LOOPING ON TEST
1313 5446 JMP I TSTLOP /SCOPE LOOP GO BACK TO START OF TEST SECTION

```

```

1314 1000 SIMWRD, 0
1315 7300 CLA CLL
1316 1021 TAD OPSEL
1317 1057 AND K200
1320 7650 SNA CLA
1321 5324 JMP ,+3
1322 1055 TAD CONTWD
1323 5714 JMP I SIMWRD
1324 2314 ISZ SIMWRD
1325 5714 JMP I SIMWRD

```

/ROUTINE TO EXIT TO PROM ON AN ERROR IF RUNNING ON THE ACT LINE

```

1326 0000 ACTCHK, 0
1327 7300 CLA CLL
1330 1022 TAD OPSEL /GET THE HARDWARE CONTROL WORD
1331 7700 SMA CLA /IS THE PROGRAM RUNNING ON THE ACT LINE?
1332 5726 JMP I ACTCHK /NO, RETURN TO ERROR ROUTINE
1333 4002 IOF /TURN THE INTERRUPT OFF
1334 7344 CLA CLL CMA RAL
1335 1326 TAD ACTCHK
1336 3343 DCA ERRPC
1337 7240 CLA CMA
1340 1743 TAD I ERRPC /GET THE LOCATION WHERE THE ERROR WAS DETECTED
1341 6272 CIF 70 /CHANGE INSTRUCTION FIELD TO FIELD 7
1342 5477 JMP I BADPAS /GO TO THE PROM

1343 0000 ERRPC, 0

```

```

1344 0000 CHKACT, 0
1345 6137 CLSK /WAS THE CLOCK FLAG SET
1346 7410 SKP /NO-RETURN TO INT SERVICE ROUTINE
1347 5352 JMP CLKSET /YES-CLEAR THE FLAG
1350 2344 ISZ CHKACT /ADD 1 TO THE INCOMING PC

```

```

1351 5744      JMP I CHKACT /RETURN TO SKIP CHAIN
1352 6136      CLKSET, CLCL /CLEAR THE CLOCK FLAG
1353 1022      TAD OP2SEL /GET THE ACT LINE BIT
1354 7710      SPA CLA /IS THE PROGRAM RUNNING ON ACT LINE
1355 5365      JMP ONACTL /YES,CHECK FOR # OF CLOCK TICKS
1356 5390      JMP CHKACT+4/RETURN TO INTERRUPT ROUTINE
1357 4220      JMS RETURN /NO,RETURN TO THE PROGRAM
1360 1364      ACTRET
1361 1776      TAD AC
1362 6001      ION /TURN THE INTERRUPT ON
1363 5764      JMP I ACTRET /RETURN TO THE PROGRAM
1364 2000      ACTRET, 0
1365 2101      ONACTL, ISZ ACTCNT /100 CLOCK TICKS YET?
1366 5397      JMP CLKSET+5/NO RETURN TO PROGRAM
1367 1192      TAD M144 /RESET ACT TIME COUNTER
1370 3101      DCA ACTCNT /SAVE THE NUMBER
1371 6272      CIF 70 /CHANGE INSTRUCTION FIELD TO 7
1372 4500      JMS I GOODPS /SIGNAL PROM THAT PROGRAM STILL PAS
1373 7240      CLA CMA
1374 3133      DCA ACTFLG /SET THE ACT LINE FLAG TO ONES
1375 5357      JMP CLKSET+5/RETURN TO THE PROGRAM

1376 1051
1377 0200
1400

```

PAGE

/ROUTINE FOR TRANSMITTING, READING AND COMPARING DATA FOR PARALLEL I/O

```

1400 0000      DATPIO, 0
1401 6007      CAF /CLEAR ALL
1402 4145      RTCENA /SET REAL TIME CLOCK INT ENA
1403 6001      ION /TURN THE INTERRUPT ON
1404 6575      DBSE /SET PARALLEL I/O INT ENA
1405 1051      TAD PIOXMT /GET THE WORD TO BE LOADED INTO PARALLEL I/O
1406 6574      DBTD /LOAD AND TRANSMIT THE WORD
1407 7200      CLA
1410 6571      DBSK /SKIP ON DATA READY
1411 4427      ERROR /ERROR, DATA READY FLAG FAILED TO SET BY DBTD
1412 2041      ISZ INTFLG /GET PROGRAM INTERRUPT FLAG
1413 4427      ERROR /PROGRAM FAILED TO INTERRUPT WITH INT ENA + FLAG SET
1414 3041      DCA INTFLG /CLEAR PROGRAM INTERRUPT FLAG
1415 6572      DBRD /READ THE 12 BIT PARALLEL I/O BUFFER
1416 3052      DCA PIOREC /SAVE THE WORD READ
1417 6571      DBSK /SKIP ON DATA READY FLAG
1420 4427      ERROR /DBRD CLEARED DATA READY FLAG
1421 6573      DBCF /CLEAR DATA READY FLAG
1422 6001      ION /TURN INTERRUPT BACK ON
1423 7000      NOP /SHOULD INTERRUPT HERE FOR DATA ACCEPT FLAG
1424 6570      DBST /SKIP ON DATA ACCEPT
1425 7610      SKP CLA
1426 4427      ERROR /DATA ACCEPT FAILED TO CLEAR IN INTERRUPT ROUTINE
1427 2041      ISZ INTFLG /CHECK TO SEE IT IS INTERRUPTED
1432 4427      ERROR /DATA ACCEPT FLAG FAILED TO INTERRUPT
1431 6001      ION /TURN THE INTERRUPT BACK ON
1432 7000      NOP

```

```

1433 1041      TAD INTFLG /GET PROGRAM INTERRUPT FLAG
1434 7640      SZA CLA /DID IT INTERRUPT?
1435 4427      ERROR /PROGRAM INTERRUPTED WITHOUT DATA READY SET
1436 1051      TAD PIOXMT /GET THE WORD TRANSMITTED
1437 7041      CIA
1440 1052      TAD PIOREC /GET THE WORD READ
1441 7640      SZA CLA /ARE THEY EQUAL?
1442 5600      JMP I DATPIO /DATA ERROR RETURN TO REPORT ERROR
1443 6007      CAF /CLEAR ALL FLAGS AND P I/O BUFFER
1444 4145      RTCENA
1445 6001      ION /TURN THE INTERRUPT ON
1446 6572      DBRD /READ THE 12 BIT P I/O BUFFER
1447 7640      SZA CLA
1448 4427      ERROR /CAF FAILED TO CLEAR THE 12 BIT DATA BUFFER
1450 4427      ISZ DATPIO /BUMP RETURN ADDRESS POINTER BY 1
1451 2200      JMP I DATPIO /RETURN TO TEST
1452 5600

```

/ROUTINE FOR TRANSMITTING, READING AND COMPARING DATA FOR SLU

```

1453 0000      DATSLU, 0
1454 6007      CAF /CLEAR ALL FLAGS BUT SET INT ENA ON SLU
1455 4145      RTCENA /SET REAL TIME CLOCK INT ENA
1456 6001      ION /TURN THE INTERRUPT ON
1457 3041      DCA INTFLG /CLEAR THE PROGRAM INTERRUPT FLAG
1460 1053      TAD SLUXMT /GET THE WORD TO BE TRANSMITTED
1461 6046      TLS /LOAD AND TRANSMIT IT AND CLEAR THE FLAG
1462 4431      TSWAT /WAIT FOR THE TRANSMIT FLAG
1463 4427      ERROR /XMIT FLAG FAILED TO SET
1464 2041      ISZ INTFLG /DID THE PROGRAM INTERRUPT?
1465 4427      ERROR /PROGRAM FAILED TO INTERRUPT
1466 6042      TCF /CLEAR THE XMIT FLAG
1467 6001      ION /TURN THE INTERRUPT BACK ON
1472 4432      KSWAT /WAIT FOR THE RECEIVE FLAG TO SET
1473 4427      ERROR /RECEIVE FLAG FAILED TO SET
1474 6036      KRB /DID THE RECEIVE FLAG CAUSE A INTERRUPT
1475 3054      DCA SLUREC /RECEIVE FLAG FAILED TO CAUSE A INTERRUPT
1476 6001      ION /CLEAR THE AC AND RCV FLAG AND READ BUFFER
1477 1041      TAD INTFLG /SAVE THE WORD READ BACK
1480 7640      SZA CLA /TURN THE INTERRUPT BACK ON
1481 4427      ERROR /CHECK THAT KRB CLEARED THE RCV FLAG
1482 1053      TAD SLUXMT /GET THE WORD TRANSMITTED
1483 7041      CIA
1484 1054      TAD SLUREC /GET THE WORD READ BACK
1485 7640      SZA CLA
1486 5653      JMP I DATSLU /DATA ERROR-RETURN TO REPORT THE ERROR
1487 2253      ISZ DATSLU /BUMP RETURN ADDRESS POINTER BY ONE
1490 5653      JMP I DATSLU /RETURN TO TEST

```

/DATA ERROR ROUTINE FOR PARALLEL I/O

1511 0000 DERPIO, 0

```

1512 4777' JMS ACTCHK /CHECK TO SEE IF RUNNING ON ACT LINE
1513 4435 SWHCHK /CHECK SR0 TO INHIBIT ERROR HALT
1514 7710 SPA CLA /IS SR0 SET?
1515 5327 JMP PIOSWH /YES, GO CHECK SR1 TO LOOP ON ERROR
1516 7240 CLA CMA
1517 1311 TAD DERPIO
1518 7402 HLT /AC = ADDRESS WHERE ERROR WAS DETECTED
1519 7200 CLA
1520 1051 TAD PIOXMT /GET THE WORD TRANSMITTED
1521 7402 HLT /AC = THE GOOD WORD
1522 7200 CLA
1523 1052 TAD PIOREC /GET THE WORD READ
1524 7402 HLT /AC = THE BAD WORD = WORD READ
1525 4435 PIOSWH, SWHCHK /LOOP ON DATA ERROR IF SR1=1
1526 7004 RAL
1527 7700 SNA CLA /LOOP?
1528 5711 JMP I DERPIO /NO, RETURN TO TEST
1529 5446 JMP I TSTLOP /RETURN AND DO SAME PATTERN(S)

```

/DATA ERROR ROUTINE FOR SERIAL LINE UNIT

```

1534 0000 DERSLU, 0
1535 4777' JMS ACTCHK /CHECK TO SEE IF RUNNING ON THE ACT LINE
1536 4435 SWHCHK /CHECK SR0=1 TO INHIBIT ERROR HALT
1537 7710 SPA CLA
1538 5354 JMP SLUSWH /GO CHECK SR1=1 TO LOOP ON ERROR
1539 7240 CLA CMA
1540 1334 TAD DERSLU /
1541 7402 HLT /AC=ADDRESS WHERE ERROR WAS DETECTED
1542 7200 CLA
1543 1053 TAD SLUXMT /GET THE WORD TRANSMITTED
1544 7402 HLT /AC=GOOD WORD=THE WORD TRANSMITTED
1545 7200 CLA
1546 1054 TAD SLUREC /GET THE WORD READ
1547 7402 HLT /AC=THE BAD WORD=THE WORD READ
1548 4776' JMS SIMWRD /WAS THE SIMULATOR SELECTED
1549 7402 HLT /AC=THE SIMULATOR CONTROL WORD
1550 4435 SLUSWH, SWHCHK /LOOP ON DATA ERROR IF SR1=1
1551 7004 RAL
1552 7700 SNA CLA /LOOP?
1553 5734 JMP I DERSLU /NO, RETURN TO TEST
1554 5446 JMP I TSTLOP

```

```

1561 0000 CHKSIM, 0
1562 1021 TAD OPISEL /CHECK FOR SIMULATOR
1563 0057 AND K200
1564 7650 SNA CLA
1565 5371 JMP ,+4 /NO
1566 1741 TAD I CHKSIM /GET THE CONTROL WORD
1567 3055 DCA CONTND /SAVE IT
1568 7410 SKP

```

```

1571 2361 ISZ CHKSIM
1572 2361 ISZ CHKSIM
1573 1361 TAD CHKSIM
1574 3046 DCA TSTLOP
1575 5761 JMP I CHKSIM

```

```

1576 1314
1577 1326
0200 *200

```


0000	11110000	00000000	11111111	11111111	11111111	11111111	11111111	11111111	11111111
0100	11111111	11111111	11111111	11111111	11111111	11111111	11110000	00000000	00000000
0200	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
0300	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
0400	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
0500	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
0600	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
0700	11111111	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
1000	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
1100	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11110111
1200	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
1300	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
1400	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
1500	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
1600									
1700									
2000									
2100									
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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

AC	1051	GOODPS	0100	PIODER	4430	YFL	6040
ACTCHK	1326	GTF	6004	PIOREC	0092	YLS	6046
ACTCK2	1100	HLT	7402	PIOSWH	1527	YPC	6044
ACTCNT	0101	INACTV	0076	PIOMY	0091	YTF	6041
ACTFLG	0135	INTFLG	0041	PNOINT	0075	YTFWAT	4431
ACTRET	1364	INTHET	1130	PONFAL	1241	YTCNT	0047
ADDTIM	1163	K0	1236	PRGEND	5440	YTGOD	0135
AERROR	1275	K1	0124	RECFLG	0073	YSTOP	0046
AERSWH	1307	K10	1271	RETADD	1237	WATKSF	1142
ADDPAS	0077	K11	1273	RETURN	1220	WATTSF	1131
AT	1270	K12	1274	RMF	6244	WTCLSK	1153
CAF	0007	K125	0061	RTCENA	4145	XMTFLG	0072
CAL	0103	K2	0125	RTCPFG	0074		
CHKACT	1344	K200	0057	RTF	6005		
CHKSIH	1561	K252	0060	SAVADD	0123		
CHKSHH	1207	K2525	0063	SAVCNT	0050		
CLCL	0136	K3	0126	SAVLOC	1240		
CLKFLG	0042	K377	0056	SBE	6101		
CLKSET	1352	K5252	0062	SIMCHK	4436		
CLKSHC	0134	K7	0064	SIMCLR	6100		
CLLE	0135	K7710	0147	SIMCNT	0067		
CLRDET	0156	KCC	0032	SIMINT	1044		
CLRSIH	0150	KCDF	0131	SIMLOD	1014		
CLSK	0137	KCF	0030	SIMHRD	1314		
CLSKWT	4425	KIE	0035	SKPCHN	1052		
CNT	0043	KJWP	0127	SKPDV	6145		
CNT1	0044	KJWP7	1245	SKPRQ	6162		
CONTWD	0055	KJWPRT	1272	SKPRDH	6157		
DATPIO	1400	KRB	0036	SKPSTR	6167		
DATSLU	1453	KRMF	0130	SLUDAT	4433		
DBCE	0576	KRS	0034	SLUDER	4434		
DBCF	0573	KRTF	0132	SLUREC	0054		
DBRD	0572	KSF	0031	SLUSHH	1554		
DBSE	0575	KSFHAT	4432	SLUXMT	0053		
DBSK	0571	KTEST	1246	SP!	6045		
DBSS	0577	LINK	0071	SPL	6102		
DBST	0570	LOADSH	6151	STRFRQ	6161		
DBTD	0574	LODFRQ	6163	SWCHK	4435		
DERPIO	1511	LOADSIH	4437	SWITCH	0020		
DERSLU	1534	LOPPPC	4423	TCF	0042		
DNLOP	4424	LOPPSW	1037	TEST	0045		
ENARTC	1145	LOPDON	1021	TEST29	0201		
ENDPAS	1200	M10	0066	TEST30	0250		
ERROR	4427	M144	0102	TEST31	0302		
ERRPC	1343	M4	0065	TEST32	0425		
EXPACO	0070	ONACTL	1365	TEST33	0437		
FLGCK1	1105	OP11K3	0000	TEST34	0452		
FLGCK2	1110	OP1SEL	0021	TEST35	0470		
FLGCK3	1113	OP2SEL	0022	TEST36	0507		
FLGCK4	1116	PATCH	0103	TEST37	0527		
FLGCK5	1121	PCLDOP	1000	TEST38	0604		
FLGRST	1267	PIODAT	4426	TEST39	0654		

ERRORS DETECTED: 0
 LINKS GENERATED: 9
 RUN-TIME: 17 SECONDS
 2K CORE USED

/DKCB=BA OPTION TEST 1 MAINDEC=08=DJDKA=B=L 1K PART 4
/
/COPYRIGHT (C) 1974, 1975 DIGITAL EQUIPMENT CORPORATION
/
/PROGRAMMER: BRUCE HANSEN
/

////////////////////////////////////
/THE FOLLOWING LISTING WILL CORRESPOND TO THE PAPER TAPE LABELED
/MAINDEC=08=DJDKA=B=PM4, 1K VERSION 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.
////////////////////////////////////

/DKCB=AA OPTION TEST 1 MAINDEC=08=DJDKA=B=L 1K PART 4
/
/COPYRIGHT (C) 1974, 1975 DIGITAL EQUIPMENT CORPORATION
/
/PROGRAMMER: BRUCE HANSEN
/

/PROCESSOR INSTRUCTIONS
6007 CAF=6007 /CLEAR ALL FLAGS
6102 SPL=6102 /SKIP ON AC LOW FLIP=FLOP
6103 CAL=6103 /CLEAR AC LOW FLIP=FLOP
6101 SBE=6101 /SKIP ON BATTERY EMPTY
7402 HLT=7402
6244 RHF=6244 /RESTORE MEMORY FIELD
6075 RTF=6075
6004 GTF=6004

/OPTION BOARD NUMBER 1 IOTS

//SERIAL LINE UNIT
/RECEIVER IOTS
6030 KCF=6030 /CLEAR RECEIVE FLAG, DON'T SET READER RUN
6031 KSF=6031 /SKIP ON RECEIVE FLAG
6032 KCC=6032 /CLEAR RECEIVE FLAG AND AC, SET READER RUN
6034 KRS=6034 /READ RECEIVE BUFFER
6035 KIE=6035 /AC 11=1 SET INTERRUPT ENABLE
6036 KRB=6036 /AC 11=0 CLEAR INTERRUPT ENABLE
/CLEAR RECEIVE FLAG AND AC, SET READER RUN AND READ
/RECEIVE BUFFER

/TRANSMIT IOTS
6040 TPL=6040 /SET TRANSMIT FLAG
6041 TSF=6041 /SKIP ON TRANSMIT FLAG
6042 TCF=6042 /CLEAR THE TRANSMIT FLAG
6044 TPC=6044 /LOAD TRANSMIT BUFFER AND TRANSMIT
6045 SPI=6045 /SKIP IF TRANSMIT OR RECEIVE FLAG SET AND INT ENA SET TO A 1
6046 TLS=6046 /LOAD TRANSMIT BUFFER, TRANSMIT AND CLEAR TRANSMIT FLAG

/REAL TIME CRYSTAL CLOCK
6135 CLLE=6135 /AC 11=1 SET INTERRUPT ENABLE
6136 CLCL=6136 /AC 11=0 CLEAR INTERRUPT ENABLE
6137 CLSK=6137 /CLEAR CLOCK FLAG
/SKIP ON CLOCK FLAG

/12 BIT PARALLEL I/O
6570 DBST=6570 /SKIP ON DATA ACCEPTED, CLEAR DATA ACCEPTED AND DATA AVAILABLE
6571 DBSK=6571 /SKIP ON DATA READY FLAG
6572 DBRU=6572 /READ DATA INTO AC 0=11
6573 DBCF=6573 /CLEAR DATA READY FLAG, ISSUE DATA ACCEPTED OUT
6574 DBTU=6574 /LOAD AC 0=11 INTO BUFFER AND TRANSMIT DATA OUT
6575 DBSE=6575 /SET INTERRUPT ENABLE TO A 1
6576 DBCE=6576 /SET INTERRUPT ENABLE TO A 0

```

6577 DBSS=6577 /ISSUE A STROBE PULSE

/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

/OPTION BOARD 1 SIMULATOR I/O'S
6150 CLRSH=6150 /CLEAR SIMULATOR CONTROL REGISTERS
6151 LOADSH=6151 /LOAD SIMULATOR CONTROL WORD 1
6156 CLRDET=6156 /CLEAR READER RUN, STROBE, AND DATA AVAILABLE CATCHER F/F'S
6157 SKPRDR=6157 /SKIP ON READER RUN CATCHER F/F SET
6160 SIMCLR=6160 /CLEAR CONTROL REGISTERS AND MOST OF LOGIC ON SIMULATOR
6161 STPRFRQ=6161 /START FREQUENCY CHECK (SLU OR RTC)
6162 SKPRFRQ=6162 /SKIP ON FREQUENCY CHECK IN PROGRESS
6163 LODFRQ=6163 /READ FREQUENCY COUNT INTO AC
6165 SKPDAT=6165 /SKIP ON DATA AVAILABLE CATCHER F/F SET
6167 SKPSTR=6167 /SKIP ON STROBE CATCHER F/F SET

/OPTION BOARD 1 SIMULATOR CONTROL WORD BIT ASSIGNMENTS
/BIT 0 COUNTER RESET 1=ACTIVATE
/ 2=NO ACTION

/BIT 1 PARALLEL I/O CLEAR DATA 1=TS1
/ AVAILABLE SELECT 2=DATA ACCEPTED IN

/BIT 2 NOT USED
/BIT 3 NOT USED
/BIT 4 NOT USED
/BIT 5 RTC FREQUENCY OR 1=RTC
/ SLU FREQUENCY CHECK 2=SLU BAUD RATES

/BIT 6 REAL TIME CLOCK 1=OFF
/ 2=ON
/BIT 7 SLU EIA/20MA SELECT 1=EIA RECEIVE DATA
/ 2=20 MA RECEIVE DATA
/BIT 8 STOP BIT SELECT 1=1 STOP BITS
/ 2=2 STOP BIT
/BIT 9 BAUD RATE SELECT BIT 9, 10, 11 ALL 0'S
/BIT 10 BAUD RATE SELECT EQUALS 110 BAUD, EACH
/BIT 11 BAUD RATE SELECT INCREASING BIT SELECTS
/ NEXT HIGHEST BAUD RATE,

```

```

0000 *0
0003 0302 302 /PROGRAM REVISION LETTER=MAINDEC=08=DJDKA=B
0001 6244 RHF /RESTORE MEMORY FIELDS
0002 5403 JMP I 3 /RETURN TO INTERRUPT SERVICE ROUTINE
0003 2444 SIMINT/SKPCNH/SIMCHK/RTICNT/SLUINT /INTERRUPT SERVICE ROUTINES

0020 *20
0020 0000 SWITCH, 0
0021 2000 OP1SEL, 2000

/BIT 0=0 USE LOCATION 20 AS A PSEUDO SWITCH REGISTER
/BIT 0=1 USE HARDWARE FRONT PANEL SWITCH REGISTER
/BIT 1=1 HAS OPTION 1
/BIT 2=1 HAS OPTION 2
/BIT 3=1 HAS 8A CPU SIMULATOR
/BIT 4=1 HAS 8A OPTION 1+2 SIMULATOR
/BIT 5=1 PROGRAM ON POP=8A XOR(REQUIRES BIT 4 SET ALSO)
/BIT 6=1 HAS POP=8E TYPE CPU
/BIT 7=11 MEMORY SIZE = 8'S=1K, 37=32K, MEMORY
/ SIZE CAN BE INCREASED IN 1K INCREMENTS BY ADDING
/ ONE TO THE NUMBER IN BITS 7 = 11
/BIT 0 IS SET FOR THE ACT LINE

0022 0000 OP2SEL, 0
4423 LOOPPC=JMS I,
0023 0400 PCLOOP
4424 DONLOP=JMS I,
0024 0421 LOPDON
4425 CLSKWT=JMS I,
0025 0553 WTCLSK
4426 PIODAT=JMS I,
0026 1000 DATPIO
4427 ERROR=JMS I,
0027 0675 AERROR
4430 PIODER=JMS I,
0030 1111 DERPIO
4431 TSFWAT=JMS I,
0031 0531 WATTSP
4432 KSFHAT=JMS I,
0032 0542 WATKSP
4433 SLUDAT=JMS I,
0033 1053 DATSLU
4434 SLUDER=JMS I,
0034 1134 DERSLU
4435 SHWCHK=JMS I,
0035 0607 CHKSWH
4436 SIMCHK=JMS I,
0036 1141 CHKSIM
4437 LODSIM=JMS I,
0037 0414 SIMLOD
4146 RTCENA=JMS ENARTC

```

0040 5440 PRGEND=JMP I,
0600 ENDPAS

/LOCATIONS USED BY THE PROGRAM

0041 0000 INTFLG, 0
0042 0000 CLKFLG, 0
0043 0000 CNT, 0
0044 0000 CNT1, 0
0045 0000 TEST, 0
0046 0000 TSTLOP, 0
0047 0000 TSTCNT, 0
0050 0000 SAVCNT, 0
0051 0000 PIOXMT, 2
0052 0000 PIOREQ, 1
0053 0000 SLUXMT, 0
0054 0000 SLUREQ, 0
0055 0000 CONTHD, 0
0056 0377 K377, 377
0057 0230 K200, 200
0060 0252 K252, 252
0061 0125 K125, 125
0062 0252 K525, 525
0063 0252 K2525, 2525
0064 0007 K7, 7
0065 7774 H4, -4
0066 7770 H10, -10
0067 0000 SIMCNT, 0

0070 1360 DELAYR, DELAY
0071 0000 EXPACQ, 0
0072 0000 LINK, 0
0073 0000 XMTFLG, 0
0074 0000 REOFLG, 0
0075 0000 RTCFLG, 0
0076 0000 PHOINT, 0
0077 0000 INACTV, 0
0100 6520 BADPAS, 6520
0101 6500 GOODPS, 6500
0102 7634 ACTCNT, -144
0103 7634 H144, -144

/ACT LINE ERROR RETURN TO FIELD 7
/ACT LINE GOOD RETURN TO FIELD 7

/ROUTINE TO SETUP FIELD 3 TO HANDLE INTERRUPTS FROM ANOTHER FIELD

0104 0000 PATCH, 0
0105 1504 TAD I PATCH /GET THE INTERRUPT SERVICE ADDRESS
0106 3124 DCA SAVADD /SAVE INTERRUPT ADDRESS
0107 6201 CDF /CHANGE DATA FIELD TO FIELD 0
0110 1131 TAD KRMF /GET THE INSTRUCTION RMF
0111 3525 DCA I K1 /PUT IT IN LOCATION 1 OF FIELD 0
0112 1130 TAD KJMP /GET THE INSTRUCTION JMP I 3
0113 3526 DCA I K2 /PUT IT IN LOCATION 2 OF FIELD 0
0114 1124 TAD SAVADD /GET THE INTERRUPT SERVICE ADDRESS

0115 3527 DCA I K3 /PUT IT IN LOCATION 3 IF FIELD 0
0116 6224 RIF /GET THE PROGRAM FIELD INTO THE AC
0117 1132 TAD KCDF /AND IT TO THE CDF INSTRUCTION
0120 3121 DCA ,+1 /PUT IT IN THE NEXT LOCATION
0121 7402 HLT/CDF /EXECUTE IT
0122 2104 ISZ PATCH /ADD 1 TO THE ENTRANCE
0123 5504 JMP I PATCH /RETURN

0124 0000 SAVADD, 0
0125 0001 K1, 1
0126 0002 K2, 2
0127 0003 K3, 3
0130 5403 KJMP, JMP I 3
0131 6244 KRMF, 6244
0132 6201 KCDF, CDF
0133 6005 KRTF, RTF
0134 0000 ACTFLG, 0
0135 0000 CLKSNQ, 0

/THIS ROUTINE USED WHEN RUNNING ON THE ACT LINE TO SIGNIFY THAT NO
/ERRORS HAVE BEEN ENCOUNTERED

0136 0000 TSTGOD, 0
0137 1022 TAD OP2SEL /GET THE HARDWARE FLAG
0140 7700 SMA CLA /ARE WE ON THE ACT LINE?
0141 5536 JMP I TSTGOD /NO, RETURN TO THE PROGRAM
0142 6002 IOF /TURN THE INTERRUPT OFF
0143 6272 CIF 70 /CHANGE THE INSTRUCTION TO FIELD 7
0144 4501 JMS I GOODPS /GO TO PROM
0145 5536 JMP I TSTGOD /RETURN TO THE PROGRAM

0146 0000 ENARTC, 0
0147 1022 TAD OP2SEL /CHECK TO SEE IF ON ACT LINE
0150 7710 SPA CLA /IF NOT CLEAR RTC INT ENA
0151 7301 CLA CLL IAC /SET AC BIT 11
0152 6135 CLLE /LOAD BIT 11 INTO CLOCK INT ENA
0153 7200 CLA
0154 5546 JMP I ENARTC

*200

IFDEF OP13K <PAGE>

IFDEF OP13K <PAGE>

IFDEF OP13K <PAGE>

/*****
/THIS TEST IS ENTERED WHEN SIMULATOR IS SELECTED.
/TEST 40 - USES THE SIMULATOR TO TEST THE RTC FREQUENCY.
/*****/

```

0200 6160 SIMCLR
0201 1021 TAD OP1SEL /GET HARDWARE CONFIGURATION
0202 0057 AND K200 /MASK OUT SIMULATOR BIT
0203 7650 SNA CLA /IS IT SELECTED ?
0204 5331 JMP TEST42 /NO, DO INTERACTION TEST

0205 4423 TEST40, LOOPPC /SETUP TEST COUNT AND TEST LOOP ADDRESS
0206 7777 =1 /SIMULATOR ITERATION COUNTER
0207 4104 JMS PATCH /SETUP INTERRUPT SKIP CHAIN
0210 7452 SKPCHN
0211 3042 DCA CLKFLG /SET INTERRUPT TO IGNORE RTC
0212 4436 SIMCHK /CHECK FOR SIMULATOR
0213 4100 4100 /CONTROL WORD FOR THE SIMULATOR
0214 4437 LOOSIM /LOAD THE SIMULATOR CONTROL WORD
0215 1377 TAD (=20
0216 3043 DCA CNT
0217 6007 CAF /CLEAR ALL
0220 4146 RTCENA /SET REAL TIME CLOCK INT ENA
0221 6001 ION /TURN THE INTERRUPT ON
0222 6161 STRFRQ /START A FREQUENCY COUNT
0223 6162 SKPFRQ /SKIP ON FREQUENCY COUNT IN PROGRESS
0224 7610 SKP CLA /FREQUENCY COUNT ENDED GO READ IT
0225 7223 JMP =2 /WAIT FOR A FREQUENCY COUNT ENDED
0226 6163 LOOPFRQ /LOAD THE FREQUENCY COUNT IN TO THE AC
0227 3250 DCA FRQCNT /SAVE THE FREQUENCY COUNT READ
0230 1251 TAD RTCFRQ /GET THE NEGATIVE VALUE OF MAX TOLERANCE
0231 1250 TAD FRQCNT /GET THE COUNT READ
0232 7450 SNA /ARE THEY EQUAL?
0233 5246 JMP RTIMOK /YES-CHECK FOR LOOP ON TEST
0234 7001 IAC /ADD 1 TO THE NUMBER
0235 7450 SNA /ARE THEY EQUAL?
0236 5246 JMP RTIMOK /YES-CHECK FOR LOOP ON TEST
0237 2043 ISZ CNT
0240 5234 JMP =4 /GO BACK FOR NEXT ALLOWED NUMBER
0241 4427 ERROR /RTC TIMING ERROR PRESS "CONT" FOR
/REPEAT TEST
/SIMULATOR CONTROL WORD
/CHECK SR1 TO LOOP ON ERROR
/PUT IT IN BIT 0

0242 4435 SWHCHK
0243 7004 RAL
0244 7710 SPA CLA
0245 5446 JMP I TSTLOP /REPEAT TEST
0246 4424 RTIMOK, DONLOP /DONE OR REPEAT TEST IF SR2=1
0247 5252 JMP TEST41 /GO TO NEXT TEST

0250 0000 FRQCNT, 0
0251 3062 RTCFRQ, =4716 /RTC FREQUENCY COUNT 2500 + 0R = 10

```

 /THIS TEST IS ENTERED WHEN SIMULATOR IS SELECTED,
 /TEST 41 = USES THE SIMULATOR TO CHECK THE TIMING OF THE SERIAL LINE UNIT
 /FROM 110 BAUD TO 9600 BAUD USING THE 20MA CURRENT LOOP

0252 4423 TEST41, LOOPPC /SETUP TEST COUNT AND TEST LOOP ADDRESS

```

0253 7740 =40 /SIMULATOR ITERATION COUNTER
0254 4436 SIMCHK /CHECK FOR THE SIMULATOR
0255 4000 4000 /SIMULATOR CONTROL WORD
0256 4437 LOOSIM /LOAD THE SIMULATOR CONTROL WORD
0257 1377 TAD (=20
0260 3043 DCA CNT /CLEAR ALL FLAGS
0261 6007 CAF /SET REAL TIME CLOCK INT ENA
0262 4146 RTCENA /CLEAR SLU INTERRUPT ENABLE
0263 6001 ION /TURN THE INTERRUPT ON
0264 6161 STRFRQ /START A FREQUENCY COUNT
0265 6162 SKPFRQ /SKIP ON FREQUENCY COUNT IN PROGRESS
0266 7610 SKP CLA /FREQUENCY COUNT ENDED GO READ IT
0267 5266 JMP =2 /WAIT FOR FREQUENCY COUNT ENDED
0271 6163 LOOPFRQ /LOAD FREQUENCY COUNT INTO AC
0272 3250 DCA FRQCNT /SAVE THE WORD READ
0273 1055 TAD CONTWO /GET THE CONTROL WORD
0274 7064 AND K7 /MASK OUT THE BAUD RATE
0275 1376 TAD (FRQTAB /GET THE ADDRESS OF FREQUENCY TABLE
0276 3300 DCA TABFRQ /SAVE THE ADDRESS
0277 7410 SKP
0300 7402 TABFRQ, HLT /POINTER ADDRESS TO FREQUENCY TABLE
0301 1700 TAD I TABFRQ /GET THE NEG MAXIMUM FREQUENCY COUNT
0302 1250 TAD FRQCNT /GET THE COUNT READ
0303 7450 SNA /ARE THEY EQUAL
0304 5317 JMP SLUTOK /YES, SLU TIMING IS OK
0305 7001 IAC /ADD ONE TO THE NUMBER
0306 7450 SNA /ARE THEY EQUAL?
0307 5317 JMP SLUTOK /YES SLU TIMING IS OK
0310 2043 ISZ CNT /BUMP SLU TIMING CHECK COUNTER
0311 5325 JMP =4 /RETURN TO ADD A 1 TO THE NUMBER
0312 4427 ERROR /SLU TIMING ERROR-PRESS "CONTINUE" FOR
/SIMULATOR CONTROL WORD
/CHECK FOR LOOP ON ERROR

0313 4435 SWHCHK
0314 7004 RAL
0315 7710 SPA CLA /LOOP?
0316 5446 JMP I TSTLOP /YES DO SAME BAUD RATE
0317 4424 SLUTOK, DONLOP /DONE OR REPEAT TEST IF SR2=1
0320 5331 JMP TEST42 /GO TO THE INTERACTION TEST

```

/FREQUENCY COUNT TABLE FOR SLU SIMULATOR TIMING TEST (MAXIMUM COUNTS)

```

0321 2335 FRQTAB, =5443 /110 BAUD = 2841 + 0R = 10
0322 3723 =4055 /150 BAUD = 2783 + 0R = 10
0323 3723 =4055 /300 BAUD = 2883 + 0R = 10
0324 3723 =4055 /600 BAUD = 2883 + 0R = 10
0325 5744 =2034 /1200 BAUD = 1842 + 0R = 10
0326 6755 =1023 /2400 BAUD = 0521 + 0R = 10
0327 7362 =0416 /4800 BAUD = 0762 + 0R = 10
0330 7564 =0214 /9600 BAUD = 0130 + 0R = 10

```

 /TEST 42 * IS AN INTERACTION TEST, THE TEST CHECKS THAT THE RTC, THE
 /SLU AND THE 12 BIT PARALLEL I/O CAN RUN TOGETHER, THE AC AND LINK
 /IS LOADED WITH SOME RANDOM DATA BEFORE THE INTERRUPT IS TURNED ON;
 /THE PROGRAM CHECKS THAT THE AC AND LINK DON'T CHANGE AND THAT DATA
 /CAN BE TRANSMITTED AND READ BACK CORRECTLY;

0331	4423	TEST42, LOOPPC	/SETUP TEST COUNT AND SCOPE LOOPING ADDRESS
0332	7777	-1	/SIMULATOR ITERATION COUNTER
0333	4436	SIMCHK	/CHECK TO SEE IF SIMULATOR IS SELECTED
0334	4017	4017	/CONTROL WORD FOR THE SIMULATOR
0335	4437	LOADSIM	/LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
			/LOOP = THIS ADDRESS IF SIMULATOR SELECTED
			/OTHERWISE SCOPE LOOP IS THIS ADDRESS +1
0336	6002	IOF	/TURN THE INTERRUPT OFF
0337	4470	JMS I DELAYR	/DELAY FOR APPROXIMATELY 200MS TO
			/ALLOW FLAGS TO SETTLE
0340	6007	CAF	/CLEAR ALL FLAGS BUT SET SLU INT ENA
0341	4146	RTCENA	/SET REAL TIME CLOCK INT ENA
0342	4104	JMS PATCH	/SETUP INTERRUPT SERVICE
0343	1400	INTSKP	
0344	3071	DCA EXPACD	/CLEAR THE EXPECTED AC DATA
0345	3072	DCA LINK	/CLEAR THE LINK BIT
0346	3053	DCA SLUXMT	/SET INITIAL AC DATA TO 0
0347	3051	DCA PLOXMT	/SET PIO INITIAL DATA TO 0
0350	7240	CLA CMA	
0351	3073	DCA XMTFLG	/SET SLU XMT FLAG TO INACTIVE
0352	7240	CLA CMA	
0353	3074	DCA RECFLG	/SET SLU RCV FLAG TO INACTIVE
0354	7240	CLA CMA	
0355	3075	DCA RTCFLG	/SET RTC FLAG TO INACTIVE
0356	1066	TAD M10	
0357	3076	DCA PNOINT	/SETUP A COUNT FOR NO INT'S ON P I/O
0360	1374	TAD M40	/SET DEVICE INACTIVE COUNTER TO -40
0361	3077	DCA INACTV	/
0362	7352	CLA CLL CMA RTR	/SETUP TEST COUNT
0363	3047	DCA TSTCNT	/SAVE IT
0364	7301	CLA CLL IAC	/SET DATA BIT 11
0365	6135	CLLE	/SET RTC INT ENA
0366	7200	CLA	
0367	6575	DBSE	/SET 12 BIT PARALLEL I/O INT ENA
0370	4046	TLS	/LOAD AND TRANSMIT ON SLU
0371	6574	DBTD	/TRANSMIT ALL 0'S ON P I/O
0372	6001	ION	/TURN THE INTERRUPT ON
0373	5373	JMP	/GO BABY GO!!!
0374	7740	M40, -40	
0376	7321		
0377	7760		

0400 PAGE

/ROUTINE TO SETUP # OF PASSES/TEST AND TO STORE THE RETURN ADDRESS FOR SCOPE LOOPING

0400	0000	PCLOOP, *	
0401	7340	CLA CLL CMA	
0402	1200	TAD PCLOOP	
0403	3045	DCA TEST	
0404	1600	TAD I PCLOOP	
0405	3067	DCA SIMCNT	
0406	7240	CLA CMA	
0407	3050	DCA SAVCNT	
0410	1050	TAD SAVCNT	
0411	3047	DCA TSTCNT	
0412	2200	ISZ PCLOOP	
0413	5600	JMP I PCLOOP	
0414	0000	SIMLOD, *	
0415	1055	TAD CONTWD	/GET THE CONTROL WORD
0416	6151	LOADSM	/LOAD THE SIMULATOR CONTROL WORD
0417	7300	CLA CLL	
0420	5614	JMP I SIMLOD	
0421	0000	LOPDON, *	
0422	2047	ISZ TSTCNT	/TEST DONE?
0423	5446	JMP I TSTLOP	/NO RETURN TO TEST
0424	1021	TAD OPSEL	/IS THE SIMULATOR SELECTED
0425	0057	AND K200	
0426	7650	SNA CLA	
0427	5237	JMP LOOPSW	/SIMULATOR NOT SELECTED, CHECK TEST LOOP SWITCH
0430	2067	ISZ SIMCNT	/ADD A 1 TO THE CONTROL WORD?
0431	7610	SKP CLA	
0432	5237	JMP LOOPSW	/NO, CHECK TEST LOOP SWITCH
0433	2055	ISZ CONTWD	/ADD 1 TO THE CONTROL WORD FOR BAUD RATES
0434	1050	TAD SAVCNT	/GET THE TEST COUNT
0435	3047	DCA TSTCNT	/RESTORE IT FOR A NEW PASS FOR A DIFFERENT BAUD
0436	5446	JMP I TSTLOP	/RETURN FOR NEW BAUD RATE
0437	4435	LOGPSW, SIMCHK	/CHECK FOR SR2=1
0440	7006	RTL	
0441	7700	SMA CLA	/LOOP?
0442	5621	JMP I LOPDON	/NO, GO TO NEXT TEST
0443	5445	JMP I TEST	/YES, LOOP ON THIS TEST
0444	6102	SIMINT, SPL	/SKIP ON POWER LOW
0445	7410	SKP	
0446	5777	JMP POWFAL	/POWER GOING DOWN - GO SAVE EVERYTHING
0447	3251	DCA AC	/SAVE THE AC
0450	5321	JMP FLOCK5	/RETURN TO THE PROGRAM

```

0491 0000 AC, 0

0452 6102 SKPCHN, SPL /SKIP ON POWER LOW
0453 7410 SKP
0454 5777 JMP POWFAL /POWER GOING DOWN SAVE EVERYTHING
0455 3251 DCA AC /SAVE THE AC
0456 1042 TAD CLKFLG /WERE WE EXPECTING A CLOCK INTERRUPT?
0457 7650 SNA CLA
0460 4776 JMS CHKACT /GO CHECK FOR THE ACT LINE
0461 6137 CLSK /YES = SKIP ON REAL TIME CLOCK FLAG
0462 7410 SKP
0463 5305 JMP FLGCK1 /GO CHECK THE OTHER FLAGS
0464 1134 TAD ACTFLG /GET THE ACT FLAG
0465 7440 SZA /DID THE PROGRAM GO TO THE PROM ?
0466 5300 JMP ACTCK2 /YES, CHECK PARALLEL I/O DATA ACCEPTED
0467 6041 TSF /WAS IT A TRANSMIT FLAG?
0470 7610 SKP CLA
0471 5310 JMP FLGCK2 /TRANSMIT FLAG SET = CHECK THE OTHER FLAGS
0472 6031 KSF /WAS IT A RECEIVE FLAG?
0473 7410 SKP
0474 5313 JMP FLGCK3 /YES = GO CHECK THE OTHER FLAGS
0475 6571 DBSK /WAS THE DATA READY FLAG SET?
0476 7410 SKP
0477 5316 JMP FLGCK4 /YES = CHECK DATA ACCEPTED FLAG
0500 6570 ACTCK2, DBST /WAS DATA ACCEPTED SET=IF SO CLEAR IT
0501 7640 SZA CLA
0502 5317 JMP FLGCK5=2 /YES, THE FLAG SHOULD BE CLEAR NOW
0503 4427 ERROR /ILLEGAL INTERRUPT =
0504 5317 JMP FLGCK5=2 /RETURN
0505 6041 FLGCK1, TSF /SKIP ON XMIT FLAG
0506 7410 SKP
0507 4427 ERROR /XMIT FLAG SET
0510 6031 FLGCK2, KSF /SKIP ON RECEIVE FLAG
0511 7410 SKP
0512 4427 ERROR /RECEIVE FLAG SET
0513 6571 FLGCK3, DBSK /SKIP ON P I/O DATA READY
0514 7410 SKP
0515 4427 ERROR /DATA READY FLAG SET
0516 6570 FLGCK4, DBST /SKIP ON DATA ACCEPTED
0517 7610 SKP CLA
0520 4427 ERROR /DATA ACCEPTED FLAG SET
0521 3134 FLGCK5, DCA ACTFLG /CLEAR THE ACT FLAG
0522 7240 CLA CMA
0523 3041 DCA INTFLG /SET INTERRUPT FLAG
0524 4775 JMS RETURN
0525 2530 INTRET
0526 1251 TAD AC
0527 5730 JMP I INTRET

0530 0000 INTRET, 0

```

/ROUTINE TO WAIT FOR SERIAL LINE UNITS XMIT FLAG

```

0531 0000 WATTSF, 0
0532 7300 CLA CLL
0533 1150 TAD K7710
0534 3044 DCA CNT1
0535 3043 DCA CNT
0536 6041 TSF /SKIP ON SLU TRANSMIT FLAG
0537 4363 JMS ADDTIM /GO ADD ONE TO THE COUNTER
0540 2331 ISZ WATTSF
0541 5731 JMP I WATTSF /RETURN TO THE PROGRAM=GET THE FLAG

```

/ROUTINE TO WAIT FOR THE SERIAL LINE UNIT RECEIVE FLAG

```

0542 0000 WATKSF, 0
0543 7300 CLA CLL
0544 1150 TAD K7710
0545 3044 DCA CNT1
0546 3043 DCA CNT
0547 6031 KSF /SKIP ON SLU RECEIVE FLAG
0548 4363 JMS ADDTIM /GO ADD A ONE TO THE COUNTER
0551 2342 ISZ WATKSF
0552 5742 JMP I WATKSF /RETURN TO THE PROGRAM=GET THE FLAG

```

/ROUTINE TO WAIT FOR THE REAL TIME CLOCK FLAG

```

0553 0000 WTCLSK, 0
0554 7240 CLA CMA
0555 3044 DCA CNT1
0556 3043 DCA CNT
0557 6137 CLSK /SKIP ON THE REAL TIME CLOCK FLAG
0560 4363 JMS ADDTIM /GO ADD ONE TO THE COUNTER
0561 2353 ISZ WTCLSK
0562 5753 JMP I WTCLSK /RETURN TO THE PROGRAM=GET THE FLAG

```

/ROUTINE TO WAIT FOR THE FLAG

```

0563 0000 ADDTIM, 0
0564 2043 ISZ CNT
0565 7610 SKP CLA
0566 2044 ISZ CNT1
0567 7346 CLA CLL CMA RTL
0570 7001 JAC
0571 1363 TAD ADDTIM
0572 3363 DCA ADDTIM
0573 5763 JMP I ADDTIM

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0575 0620
0576 0744
0577 0641
0600

```

PAGE

/THIS IS THE END OF A PROGRAM PASS; IF SR3=1 HALT; IF NOT START PROGRAM OVER

```

0600 6160 ENDPAS, SIMCLR /CLEAR THE SIMULATOR

```



```

0601 4435 SWHCHK /GO GET SWITCH REGISTER
0602 7006 RTL
0603 7004 RAL
0604 7710 SPA CLA
0605 7402 HLT /SR3=1 END OF A COMPLETE PROGRAM PASS
0606 5777 JMP 0200 /START PROGRAM OVER

/CHECK TO SEE IF FRONT PANEL IS AVAILABE TO DO EITHER A TAD SWITCH OR A LAS COMMAND

0607 0000 CHKSWH, 0
0610 7200 CLA
0611 1021 TAD OP1SEL
0612 7700 SWA CLA
0613 5216 JMP ,+3
0614 7604 LAS
0615 5607 JMP I CHKSWH
0616 1020 TAD SWITCH
0617 5607 JMP I CHKSWH

/
/THIS ROUTINE SETS UP A RETURN ADDRESS FOR INTERRUPT RETURNS FROM ANOTHER FIELD

0620 0000 RETURN, 0
0621 6201 CDF /CHANGE DATA FIELD TO FIELD 0
0622 1636 TAD I K0 /GET THE INTERRUPT PC
0623 3237 DCA RETADD /SAVE IT
0624 6224 RIF /READ THE PROGRAM INSTRUCTION FIELD
0625 1132 TAD KCDF /ADD A CDF INSTRUCTION TO IT
0626 3227 DCA ,+1 /SAVE IT IN THE NEXT LOCATION
0627 7402 HLT/CDF /RETURN TO THE PROGRAM DATA FIELD
0630 1620 TAD I RETURN /GET THE INTERRUPT RETURN LOCATION
0631 3240 DCA SAVLOC /SAVE IT
0632 2220 ISZ RETURN
0633 1237 TAD RETADD
0634 3640 DCA I SAVLOC
0635 5620 JMP I RETURN

0636 0000 K0, 0
0637 0000 RETADD, 0
0640 0000 SAVLOC, 0

/POWER FAIL ROUTINE, THE PROGRAM WILL DO IT'S OWN AUTO=RESTART
/AT THE BEGINNING OF THE TEST THAT IT WAS EXECUTING UNLESS ALL POWER
/MENT AWAY, THEN THE POWER FAIL AUTO=RESTART OPTION WOULD TRY TO DO
/A RESTART IF IT WAS SELECTED.

0641 7200 POWFAL, CLA CLA
0642 6201 CDF 00
0643 1265 TAD KJMP7
0644 3636 DCA I K0
0645 1045 TAD TEST
0646 3666 DCA I KTEST
0647 1267 TAD FLGRST
0650 3670 DCA I C7
0651 1133 TAD KRTF

```

```

0652 3671 DCA I K10
0653 1272 TAD KJMPRT
0654 3673 DCA I K11
0655 6004 GTF
0656 3674 DCA I K12
0657 6244 RMF
0660 6103 CAL
0661 6102 SPL
0662 7610 SKP CLA
0663 5261 JMP ,+2
0664 5445 JMP I TEST

0665 5007 KJMP7, JMP 7
0666 7045 KTEST, TEST
0667 1012 FLGRST, TAD 12
0670 7007 C7, 7
0671 0010 K10, 10
0672 5445 KJMPRT, JMP I TEST
0673 0011 K11, 11
0674 0012 K12, 12

/LOGIC ERROR ROUTINE = RESTART TEST IF SR1=1

0675 0000 AERROR, 0
0676 4326 JMS ACTCHK /GO CHECK TO SEE IF RUNNING ON ACT LINE
0677 4435 SWHCHK /CHECK SR0 TO INHIBIT ERROR HALT
0678 7710 SPA CLA
0679 5307 JMP AERSWH /SR0=1 CHECK LOOP ON LOGIC ERROR
0680 7240 CLA CMA
0683 1275 TAD AERROR
0684 7402 HLT
0685 4314 JMS SIMWRD /AC = ADDRESS WHERE ERROR WAS DETECTED
0686 7402 HLT /WAS THE SIMULATOR SELECTED
0687 4435 AERSWH, SWHCHK /AC=SIMULATOR CONTROL WORD
0688 7004 RAL /CHECK SR1=1 TO LOOP ON ERROR
0689 7700 SWA CLA
0692 5675 JMP I AERROR /RETURN WITHOUT LOOPING ON TEST
0693 5446 JMP I TSTLOP /SCOPE LOOP GO BACK TO START OF TEST SECTION

0714 0000 SIMWRD, 0
0715 7300 CLA CLL
0716 1021 TAD OP1SEL
0717 0057 AND K200
0720 7650 SWA CLA
0721 5324 JMP ,+3
0722 1055 TAD CONTND
0723 5714 JMP I SIMWRD
0724 2314 ISZ SIMWRD
0725 5714 JMP I SIMWRD

```

```

0726 0000 ACTCHK, 0
0727 7300 CLA CLL
0730 1022 TAD DP2SEL /GET THE HARDWARE CONTROL WORD
0731 7700 SMA CLA /IS THE PROGRAM RUNNING ON THE ACT LINE?
0732 5726 JMP I ACTCHK /NO, RETURN TO ERROR ROUTINE
0733 6002 IOF /TURN THE INTERRUPT OFF
0734 7344 CLA CLL CMA RAL
0735 1326 TAD ACTCHK
0736 3343 DCA ERRPC
0737 7240 CLA CMA
0740 1743 TAD I ERRPC /GET THE LOCATION WHERE THE ERROR WAS DETECTED
0741 6272 CIF 70 /CHANGE INSTRUCTION FIELD TO FIELD 7
0742 5500 JMP I BADPAS /GO TO THE PROM

0743 0000 ERRPC, 0

```

```

0744 0000 CHKACT, 0
0745 6137 CLSK /WAS THE CLOCK FLAG SET
0746 7410 SKP /NO-RETURN TO INT SERVICE ROUTINE
0747 5352 JMP CLKSET /YES-CLEAR THE FLAG
0750 2344 ISZ CHKACT /ADD 1 TO THE INCOMING PC
0751 5744 JMP I CHKACT /RETURN TO SKIP CHAIN
0752 6136 CLCL /CLEAR THE CLOCK FLAG
0753 1022 TAD DP2SEL /GET THE ACT LINE BIT
0754 7710 SPA CLA /IS THE PROGRAM RUNNING ON ACT LINE
0755 5365 JMP ONACTL /YES,CHECK FOR # OF CLOCK TICKS
0756 5350 JMP CHKACT+4 /RETURN TO INTERRUPT ROUTINE
0757 4220 JMS RETURN /NO,RETURN TO THE PROGRAM
0760 0764 ACTRET
0761 1776 TAD AC
0762 6001 ION /TURN THE INTERRUPT ON
0763 5764 JMP I ACTRET /RETURN TO THE PROGRAM

0764 0000 ACTRET, 0
0765 2102 ONACTL, ISZ ACTCNT /120 CLOCK TICKS YET?
0766 5357 JMP CLKSET+5 /NO RETURN TO PROGRAM
0767 1103 TAD M144 /RESET ACT TIME COUNTER
0770 3102 DCA ACTCNT /SAVE THE NUMBER
0771 6272 CIF 70 /CHANGE INSTRUCTION FIELD TO 7
0772 4501 JMS I GOODPS /SIGNAL PROM THAT PROGRAM STILL PAS
0773 7240 CLA CMA
0774 3134 DCA ACTFLG /SET THE ACT LINE FLAG TO ONES
0775 5357 JMP CLKSET+5 /RETURN TO THE PROGRAM

0776 451
0777 0200
1000

```

PAGE

/ROUTINE FOR TRANSMITTING, READING AND COMPARING DATA FOR PARALLEL I/O

```

1000 0000 DATPIO, 0
1001 6007 CAF /CLEAR ALL
1002 4146 RTCENA /SET REAL TIME CLOCK INT ENA
1003 6001 ION /TURN THE INTERRUPT ON
1004 6575 DBSE /SET PARALLEL I/O INT ENA
1005 1051 TAD PIOXMT /GET THE WORD TO BE LOADED INTO PARALLEL I/O
1006 6574 DBTD /LOAD AND TRANSMIT THE WORD
1007 7200 CLA
1010 6571 DBSK /SKIP ON DATA READY
1011 4427 ERROR /ERROR, DATA READY FLAG FAILED TO SET BY DBTD
1012 2041 ISZ INTFLG /GET PROGRAM INTERRUPT FLAG
1013 4427 ERROR /PROGRAM FAILED TO INTERRUPT WITH INT ENA + FLAG SET
1014 3041 DCA INTFLG /CLEAR PROGRAM INTERRUPT FLAG
1015 6572 DBRD /READ THE 12 BIT PARALLEL I/O BUFFER
1016 3052 DCA PIOREC /SAVE THE WORD READ
1017 6571 DBSK /SKIP ON DATA READY FLAG
1020 4427 ERROR /DBRD CLEARED DATA READY FLAG
1021 6573 DBCF /CLEAR DATA READY FLAG
1022 6001 ION /TURN INTERRUPT BACK ON
1023 7000 NOP /SHOULD INTERRUPT HERE FOR DATA ACCEPT FLAG
1024 6570 DBST /SKIP ON DATA ACCEPT
1025 7610 SKP CLA
1026 4427 ERROR /DATA ACCEPT FAILED TO CLEAR IN INTERRUPT ROUTINE
1027 2041 ISZ INTFLG /CHECK TO SEE IF IT INTERRUPTED
1030 4427 ERROR /DATA ACCEPT FLAG FAILED TO INTERRUPT
1031 6001 ION /TURN THE INTERRUPT BACK ON
1032 7000 NOP
1033 1041 TAD INTFLG /GET PROGRAM INTERRUPT FLAG
1034 7640 SZA CLA /DID IT INTERRUPT?
1035 4427 ERROR /PROGRAM INTERRUPTED WITHOUT DATA READY SET
1036 1051 TAD PIOXMT /GET THE WORD TRANSMITTED
1037 7041 CIA
1040 1052 TAD PIOREC /GET THE WORD READ
1041 7640 SZA CLA /ARE THEY EQUAL?
1042 5600 JMP I DATPIO /DATA ERROR RETURN TO REPORT ERROR
1043 6007 CAF /CLEAR ALL FLAGS AND P I/O BUFFER
1044 4146 RTCENA
1045 6001 ION /TURN THE INTERRUPT ON
1046 6572 DBRD /READ THE 12 BIT P I/O BUFFER
1047 7640 SZA CLA
1050 4427 ERROR /CAF FAILED TO CLEAR THE 12 BIT DATA BUFFER
1051 2200 ISZ DATPIO /BUMP RETURN ADDRESS POINTER BY 1
1052 5600 JMP I DATPIO /RETURN TO TEST

```

/ROUTINE FOR TRANSMITTING, READING AND COMPARING DATA FOR SLU

```

1053 0000 DATSLU, 0
1054 6007 CAF /CLEAR ALL FLAGS BUT SET INT ENA ON SLU
1055 4146 RTCENA /SET REAL TIME CLOCK INT ENA
1056 6001 ION /TURN THE INTERRUPT ON
1057 3041 DCA INTFLG /CLEAR THE PROGRAM INTERRUPT FLAG
1060 1053 TAD SLUXMT /GET THE WORD TO BE TRANSMITTED
1061 6046 TLS /LOAD AND TRANSMIT IT AND CLEAR THE FLAG
1062 4431 TSFWAT /WAIT FOR THE TRANSMIT FLAG

```

```

1063 4427      ERROR      /XMIT FLAG FAILED TO SET
1064 2041      ISZ         INTFLG  /DID THE PROGRAM INTERRUPT?
1065 4427      ERROR      /PROGRAM FAILED TO INTERRUPT
1066 6042      TCF         /CLEAR THE XMIT FLAG
1067 6001      TON         /TURN THE INTERRUPT BACK ON
1070 4432      KSPWAT      /WAIT FOR THE RECEIVE FLAG TO SET
1071 4427      ERROR      /RECEIVE FLAG FAILED TO SET
1072 2041      ISZ         INTFLG  /DID THE RECEIVE FLAG CAUSE A INTERRUPT?
1073 4427      ERROR      /RECEIVE FLAG FAILED TO CAUSE A INTERRUPT
1074 6036      KRB         /CLEAR THE AC AND RCV FLAG AND READ BUFFER
1075 3094      DCA         SLUREC   /SAVE THE WORD READ BACK
1076 6001      TON         /TURN THE INTERRUPT BACK ON
1077 1041      TAD         INTFLG  /CHECK THAT KRB CLEARED THE RCV FLAG
1100 7640      SZA         CLA      /KRB FAILED TO CLEAR RCV FLAG OR INTERRUPTED
1101 4427      ERROR      /GET THE WORD TRANSMITTED
1102 1053      TAD         SLUXMT
1103 7041      CIA         /GET THE WORD READ BACK
1104 1054      TAD         SLUREC
1105 7640      SZA         CLA
1106 5653      JMP I DATSLU /DATA ERROR=RETURN TO REPORT THE ERROR
1107 2253      ISZ         DATSLU  /BUMP RETURN ADDRESS POINTER BY ONE
1110 5653      JMP I DATSLU /RETURN TO TEST

```

/DATA ERROR ROUTINE FOR PARALLEL I/O

```

1111 0000      DERPIO, 0
1112 4777      JMS         ACTCHK   /CHECK TO SEE IF RUNNING ON ACT LINE
1113 4435      SWHCHK      /CHECK SR0 TO INHIBIT ERROR WALT
1114 7710      SPA        CLA      /IS SR0 SET?
1115 5327      JMP PIOSWH  /YES, GO CHECK SR1 TO LOOP ON ERROR
1116 7240      CLA        CMA
1117 1311      TAD DERPIO
1118 7402      HLT         /AC = ADDRESS WHERE ERROR WAS DETECTED
1119 7200      CLA
1120 1051      TAD PIOXMT  /GET THE WORD TRANSMITTED
1121 7402      HLT         /AC = THE GOOD WORD
1122 7200      CLA
1123 1052      TAD PIOREC  /GET THE WORD READ
1124 7402      HLT         /AC = THE BAD WORD - WORD READ
1125 4435      PIOSWH, SWHCHK /LOOP ON DATA ERROR IF SR1=1
1126 7004      RAL
1127 7700      SMA        CLA      /LOOP?
1128 5711      JMP I DERPIO /NO, RETURN TO TEST
1129 5446      JMP I TSTLOP /RETURN AND DO SAME PATTERN(S)

```

/DATA ERROR ROUTINE FOR SERIAL LINE UNIT

```

1134 0000      DERSLU, 0
1135 4777      JMS         ACTCHK   /CHECK TO SEE IF RUNNING ON THE ACT LINE
1136 4435      SWHCHK      /CHECK SR0=1 TO INHIBIT ERROR WALT
1137 7710      SPA        CLA
1138 5354      JMP SLUSWH  /GO CHECK SR1=1 TO LOOP ON ERROR
1139 7240      CLA        CMA

```

```

1142 1334      TAD        DERSLU  /
1143 7402      HLT         /AC=ADDRESS WHERE ERROR WAS DETECTED
1144 7200      CLA
1145 1053      TAD        SLUXMT  /GET THE WORD TRANSMITTED
1146 7402      HLT         /AC=GOOD WORD=THE WORD TRANSMITTED
1147 7200      CLA
1148 1054      TAD        SLUREC  /GET THE WORD READ
1149 7402      HLT         /AC=THE BAD WORD=THE WORD READ
1150 4776      JMS        SIMWRD  /WAS THE SIMULATOR SELECTED
1151 7402      HLT         /AC=THE SIMULATOR CONTROL WORD
1152 4435      SLUSWH, SWHCHK /LOOP ON DATA ERROR IF SR1=1
1153 7004      RAL
1154 7700      SMA        CLA      /LOOP?
1155 5734      JMP I DERSLU /NO, RETURN TO TEST
1156 5446      JMP I TSTLOP

```

```

1161 0000      CHKSIM, 0
1162 1021      TAD OPISL  /CHECK FOR SIMULATOR
1163 0057      AND        K200
1164 7650      SNA        CLA
1165 5371      JMP ,+4      /NO
1166 1761      TAD I CHKSIM /GET THE CONTROL WORD
1167 3055      DCA CONTWD /SAVE IT
1168 7410      SKP
1169 2361      ISZ CHKSIM
1170 2361      ISZ CHKSIM
1171 1361      TAD CHKSIM
1172 3046      DCA TSTLOP
1173 5761      JMP I CHKSIM

```

```

1176 0714
1177 0726
1200

```

PAGE

```

/*****
/REAL TIME CLOCK TIMING TEST
/*****

```

```

1200 6160      RTCTIM, SIMCLR
1201 4104      JMS        PATCH    /SETUP INTERRUPT SERVICE
1202 1215      RTCTIM
1203 1377      TAD        (=5667   /SET UP A COUNT FOR 2000 CLOCK TICKS
1204 3047      DCA        TSTCNT   /SAVE CLOCK TICK COUNTER
1205 4007      CAF         /CLEAR ALL FLAGS
1206 6137      CLSK        /WAIT FOR THE FIRST CLOCK FLAG
1207 5206      JMP        ,=1
1210 6136      CLCL        /CLEAR THE CLOCK FLAG

```

```

1211 7301      CLA CLL IAC
1212 6135      CLLE
1213 6001      ION
1214 5214      JMP
1215 6136      RTCTIM, CLCL
1216 7300      CLA CLL
1217 2047      ISZ TSTCNT
1220 5213      JMP RTCTIM=2
1221 7602      HLT CLA
1222 5200      JMP RTCTIM /DO TEST OVER OR DO ANOTHER TEST

```

/*****
/SERIAL LINE UNIT TIMING TEST
/*****/

```

1223 6160      SLUTIM, SIMCLR
1224 4124      JMS PATCH
1225 1271      SLUINT
1226 7402      HLT
1227 4435      SWHCHK
1230 0376      AND (17
1231 3304      DCA BAUDWD
1232 1304      TAD BAUDWD
1233 0064      AND K7
1234 3305      DCA BAUDRT
1235 1304      TAD BAUDWD
1236 0375      AND (10
1237 7640      SEA CLA
1240 7326      CLA CLL CML RTL
1241 3306      DCA STPBIT
1242 1305      TAD BAUDRT
1243 1374      TAD (BAUDTB
1244 3307      DCA BDPNTR
1245 1707      TAD I BDPNTR
1246 1306      TAD STPBIT
1247 3307      DCA BDPNTR
1250 1307      SLUSTR, TAD BDPNTR
1251 3047      DCA TSTCNT
1252 1447      TAD I TSTCNT
1253 3043      DCA CNT
1254 2047      ISZ TSTCNT
1255 1447      TAD I TSTCNT
1256 3044      DCA CNT1
1257 6007      CAF
1260 6046      TLS
1261 6041      TSF
1262 5261      JMP
1263 5266      JMP
1264 6036      INTON, KRB
1265 7610      SKP CLA
1266 6046      TLS
1267 6001      ION
1270 5270      JMP

```

```

/SETUP INTERRUPT SERVICE
/SET THE SR IF SELECTED OR LOCATION 20
/TO THE BAUD RATE AND # OF STOP BITS
/TO BE TESTED
/GO GET LOCATION 20 OR THE SR
/MASK OUT THE BAUD RATE AND STOP BIT
/SAVE THE BAUD RATE AND STOP BIT
/GET THE WORD
/MASK OUT THE BAUD RATE
/SAVE IT
/CHECK FOR THE NUMBER OF STOP BITS
/1 OR 2 STOP BITS
/STOP BITS EQUAL 2
/SAVE THE STOP BITS
/GET THE BAUD RATE (2 = 7)
/GET THE ADDRESS OF THE BAUD RATE TABLE
/SAVE THE TABLE POINTER ADDRESS
/GET THE ADDRESS OF THE CONSTANTS
/ADD 0 FOR 1 SR OR 2 FOR 2 SR
/SAVE THE POINTER TO THE CONSTANTS
/ACTUAL TEST STARTS HERE
/SAVE THE POINTER IN TEST COUNT
/GET THE FIRST CONSTANT
/SAVE IT
/ADD 1 TO THE WORKING POINTER
/GET THE SECOND CONSTANT
/DECA CNT1
/CLEAR ALL FLAGS
/LOAD AND TRANSMIT THE FIRST CHARACTER
/THE FIRST FLAG COMES UP WITHIN USEC'S
/GO AND CLEAR FLAG AND TRANSMIT AGAIN
/CLEAR THE RECEIVE FLAG
/LOAD AND TRANSMIT AND CLEAR FLAG
/TURN THE INTERRUPT ON

```

```

1271 6031      SLUINT, KSF
1272 7610      SKP CLA
1273 5264      JMP INTON
1274 6041      TSF
1275 4427      ERROR
1276 2043      ISZ CNT
1277 5266      JMP INTON+2
1300 2044      ISZ CNT1
1301 5266      JMP INTON+2
1302 7602      HLT CLA
1303 5223      JMP SLUTIM

```

```

/SKIP ON THE RECEIVE FLAG
/CLEAR THE RECEIVE FLAG AND TURN INT ON
/SKIP IF TRANSMIT FLAG SET
/ILLEGAL INTERRUPT
/ADD ONE TO THE FIRST COUNTER
/OVERFLOWED FIRST COUNT ADD 1 TO SECOND
/GO DO ANOTHER 4095 INTERRUPTS
/WAS IT 30 SECONDS ???
/GO DO IT AGAIN OR START ANOTHER TEST

```

```

1304 0000      BAUDWD, 0
1305 0000      BAUDRT, 0
1306 0000      STPBIT, 0
1307 0000      BDPNTR, 0

```

/POINTERS TO BAUD RATE TABLES

```

1310 1320      BAUDTB, BR110
1311 1324      BR150
1312 1330      BR300
1313 1334      BR600
1314 1340      BR1200
1315 1344      BR2400
1316 1350      BR4800
1317 1354      BR9600

```

/BAUD RATE CONSTANTS FOR 110 BAUD

```

1320 7266      BR110, =512
1321 7777      =1
1322 7324      =454
1323 7777      =1

```

```

/10 BITS AT 11 CHAR/SEC=330 CHAR/30 SEC
/11 BITS AT 10 CHAR/SEC=300 CHAR/30 SEC

```

/BAUD RATE CONSTANTS FOR 150 BAUD

```

1324 7076      BR150, =702
1325 7777      =1
1326 7147      =631
1327 7777      =1

```

```

/10 BITS AT 15 CHAR/SEC=450 CHAR/30 SEC
/11 BITS AT 13,64 CHAR/SEC=409 CHAR/30 SEC

```

/BAUD RATE CONSTANTS FOR 300 BAUD

```

1330 6174      BR300, =1604
1331 7777      =1
1332 6316      =1462
1333 7777      =1

```

```

/10 BITS AT 30 CHAR/SEC=900 CHAR/30 SEC
/11 BITS AT 27,27 CHAR/SEC=810 CHAR/30 SEC

```

/BAUD RATE CONSTANTS FOR 600 BAUD

```

1334 4370      BR600, =3410
1335 7777      =1
1336 4633      =3145

```

```

/10 BITS AT 60 CHAR/SEC=1800 CHAR/30 SEC
/11 BITS AT 54,45 CHAR/SEC=1637 CHAR/30 SEC

```

```

1337 7777      =1
              /BAUD RATE CONSTANTS FOR 1200 BAUD

1340 0760      BR1200, =7020      /10 BITS AT 120 CHAR/SEC=3600 CHAR/30 SEC
1341 7777      =1
1342 1467      =6311      /11 BITS AT 109.09 CHAR/SEC=3273 CHAR/30 SEC
1343 7777      =1

              /BAUD RATE CONSTANTS FOR 2400 BAUD

1344 1737      BR2400, =6041      /10 BIT AT 240 CHAR/SEC=7200 CHAR/30 SEC
1345 7776      =2
1346 3156      =4622      /11 BITS AT 218.18 CHAR/SEC=6545 CHAR/30 SEC
1347 7776      =2

              /BAUD RATE CONSTANTS FOR 4800 BAUD

1350 3675      BR4800, =4103      /10 BITS AT 480 CHAR/SEC=14,400 CHAR/30 SEC
1351 7774      =4
1352 6332      =1446      /11 BITS AT 436.36 CHAR/SEC=13,291 CHAR/30 SEC
1353 7774      =4

              /BAUD RATE CONSTANTS FOR 9600 BAUD

1354 7571      BR9600, =207      /10 BITS AT 960 CHAR/SEC=28,800 CHAR/30 SEC
1355 7770      =10
1356 4664      =3114      /11 BITS AT 872.73 CHAR/SEC=26,182 CHAR/30 SEC
1357 7771      =7

```

```

              /THIS ROUTINE WILL WAIT FOR APPROXIMATELY 255MS BEFORE EXITING TO ALLOW FLAGS TO SETTLE.

1360 0000      DELAY, 0
1361 1371      TAD      M15
1362 3044      DCA      CNT1
1363 3043      DCA      CNT
1364 2043      ISZ      CNT
1365 5364      JMP      ,=1
1366 2044      ISZ      CNT1
1367 5364      JMP      ,=3
1370 5760      JMP      I DELAY
1371 7763      M15,    =15

1374 1310
1375 0010
1376 0017
1377 2111
              1400
              PAGE

```

```

              /INTERACTIVE SKIP CHAIN FOR SLU,RTC, AND P1/O TEST 42

1400 3325      INTSKP, DCA      ACDET      /SAVE THE AC
1401 7010      RAR

```

```

1402 3326      DCA      LINKRT      /SAVE THE LINK
1403 6102      SPL      /SKIP ON POWER LOW FLAG
1404 7610      SKP      CLA
1405 5777'     JMP      POWFAL      /POWER GOING DOWN
1406 6041      TSF      /SKIP ON SLU XMIT FLAG
1407 7610      SKP      CLA
1410 5327      JMP      XMTSER      /XMIT FLAG SET GO SERVICE IT
1411 6031      KSF      /SKIP ON RECEIVE FLAG
1412 7610      SKP      CLA
1413 5776'     JMP      RECSESR      /SERVICE THE RECEIVE FLAG AND COMPARE DATA
1414 6137      CLSK      /SKIP ON REAL TIME CLOCK FLAG
1415 7610      SKP      CLA
1416 5333      JMP      RTCSER      /GO SERVICE THE RTC FLAG
1417 6571      DBSK      /SKIP ON P I/O DATA READY FLAG
1420 7610      SKP      CLA
1421 5224      JMP      PIOSER      /GO SERVICE THE PARALLEL I/O FLAG
1422 4427      ERROR     /ILLEGAL INTERRUPT
1423 5445      JMP      I TEST      /RESTART THE TEST

```

```

              /12 BIT PARALLEL I/O INTERACTIVE SERVICE ROUTINE TEST 42

1424 1066      PIOSER, TAD      M10      /SET UP A COUNTER OF M10 FOR
1425 3076      DCA      PNOINT      /PARALLEL I/O NO INTERRUPT ERROR
1426 6572      DBRD      /READ THE 12 BIT P I/O DATA WORD
1427 6573      DBCF      /CLEAR THE DATA READY FLAG
1430 3052      DCA      PIOREC      /SAVE THE WORD READ
1431 6570      DBST      /SKIP AND CLEAR DATA ACCEPTED + DATA AVAIL,
1432 4427      ERROR     /DBCF FAILED TO SET DATA ACCEPTED
1433 6570      DBST      /SKIP ON DATA ACCEPTED
1434 7610      SKP      CLA
1435 4427      FRROR      /DBST FAILED TO CLEAR DATA ACCEPTED
1436 4775'     JMS      CMPACL      /COMPARE THE AC DATA AND LINK
1437 1051      TAD      PIOXMT      /COMPARE THE XMITTED WITH WORD READ
1440 7041      CIA
1441 1052      TAD      PIOREC
1442 7640      SZA      CLA
1443 4774'     JMS      PIOERR      /ARE THEY EQUAL?
1444 7301      CLA      IAC      /NO DATA ERROR
1445 1323      TAD      RAN1      /GENERATE A RANDOM AC DATA WORD
1446 1324      TAD      RAN2
1447 7106      CLL      RTL
1450 3323      DCA      RAN1
1451 1324      TAD      RAN2
1452 7012      RTR
1453 1323      TAD      RAN1
1454 3324      DCA      RAN2
1455 1324      TAD      RAN2
1456 3071      DCA      EXPACD      /SAVE THE EXPECTED AC DATA WORD
1457 7010      RAR
1460 3072      DCA      LINK
1461 2051      ISZ      PIOXMT      /SAVE THE EXPECTED LINK
1462 1051      TAD      PIOXMT      /ADD ONE TO THE WORD TO BE TRANSMITTED
1463 6574      DBTD      /GET THE WORD
1464 7300      CLA      /LOAD AND TRANSMIT IT
1465 5306      JMP      AGLION      /GO GET THE AC DATA WORD AND L ,ION

```

```

1466 1073 RTCSLU, TAD XMTFLG /CHECK ALL DEVICES TO BE INTERRUPTING
1467 1074 TAD RECFLG /
1470 1075 TAD RTCFLG /
1471 7650 SNA CLA /ARE THEY?
1472 5276 JMP RESET /YES RESET FLAGS TO INACTIVE
1473 2077 ISZ INACTV /BUMP DEVICE INACTIVE COUNTER
1474 5306 JMP ACLION /CONTINUE THE TEST
1475 4773 JMS INACDV /ERROR A DEVICE IS INACTIVE
1476 7340 RESET, CLA CLL CMA
1477 3073 DCA XMTFLG /SET SLU XMIT FLAG TO INACTIVE
1500 7240 CLA CMA
1501 3074 DCA RECFLG /SET SLU REC FLAG TO INACTIVE
1502 7240 CLA CMA
1503 3075 DCA RTCFLG /SET RTC FLAG TO INACTIVE
1504 1372 TAD (-40 /RESET DEVICE INACTIVE COUNTER
1505 3077 DCA INACTV /TO -40
1506 4771 ACLION, JMS RETURN /SETUP INTERRUPT RETURN
1507 1522 INTERA
1510 7300 CLA CLL /SETUP AC AND LINK AND TURN INTERRUPT ON
1511 1072 TAD LINK /GET THE LINK
1512 7004 RAL
1513 1071 TAD EXPACD /GET THE AC DATA WORD
1514 6001 ION /TURN THE INTERRUPT ON
1515 2076 ISZ PNOINT /ADD 1 TO P I/O NO INTERRUPT COUNTER
1516 5722 JMP I INTERA /RETURN TO PROGRAM
1517 7300 CLA CLL
1520 4427 ERROR /ERROR PARALLEL I/O FAILED TO INTERRUPT
1521 5445 JMP I TEST /RESTART THE TEST

1522 0000 INTERA, 0
1523 1234 RAN1, 1234
1524 5670 RAN2, 5670
1525 0000 ACDRET, 0
1526 0000 LINKRT, 0

```

/SERIAL LINE UNIT INTERACTIVE TRANSMITTER SERVICE ROUTINE TEST 42

```

1527 3073 XMTSER, DCA XMTFLG /SET TRANSMITTER ACTIVE FLAG
1530 6042 TCF /CLEAR THE TRANSMIT FLAG
1531 4775 JMS CMPACL /COMPARE THE AC DATA WORD AND LINK
1532 5266 JMP RTCSLU /GO CHECK FOR ACTIVE DEVICES

```

/REAL TIME CLOCK INTERACTIVE CLOCK SERVICE ROUTINE TEST 42

```

1533 3075 RTCSER, DCA RTCFLG /SET CLOCK ACTIVE FLAG
1534 6136 CLCL /CLEAR THE CLOCK FLAG
1535 4775 JMS CMPACL /COMPARE THE AC AND LINK
1536 1022 TAD OP2SEL /CHECK TO SEE IF RUNNING ON ACT LINE
1537 7700 SMA CLA /IS IT?
1540 5346 JMP +6 /NO
1541 2102 ISZ ACTCNT /1 SECOND YET?
1542 5346 JMP +4
1543 1103 TAD M144 /RESET ACT COUNTER

```

```

1544 3102 DCA ACTCNT /SAVE IT
1545 4136 JMS TSTGOD /GOOD PAS SO FAR
1546 2047 ISZ TSTCNT /INCREMENT PROGRAM TEST COUNTER
1547 5266 JMP RTCSLU /GO CHECK FOR ACTIVE DEVICES
1550 4470 JMS I DELAYR /DELAY FOR 200MS TO ALLOW FLAGS TO SETTLE
1551 6007 CAF /CLEAR ALL FLAGS BUT SET SLU INT ENA
1552 4136 JMS TSTGOD /GOOD AGAIN!!!
1553 4435 /CHECK SR2=1 TO LOOP ON TEST
1554 7006 RTL
1555 7710 SPA CLA /LOOP?
1556 5445 JMP I TEST /YES, DO TEST OVER
1557 5440 PRGEND /NO, END OF TEST

1571 1620
1572 7740
1573 1670
1574 1742
1575 1621
1576 1600
1577 1641
1600 PAGE

```

/SERIAL LINE UNIT INTERACTIVE RECEIVER SERVICE ROUTINE TEST 42

```

1600 3074 RECSER, DCA RECFLG /SET RECEIVE FLAG TO ACTIVE
1601 6036 KRB /CLEAR AC AND FLAG AND READ BUFFER
1602 3054 DCA SLUREC /SAVE THE WORD READ
1603 4221 JMS CMPACL /COMPARE THE AC AND LINK
1604 1053 TAD SLUXMT /COMPARE THE WORD TRANSMITTED WITH WORD READ
1605 7041 CIA
1606 1054 TAD SLUREC
1607 7640 SZA CLA /ARE THEY EQUAL?
1610 4317 JMS SLUERR /NO, DATA ERROR
1611 1053 TAD SLUXMT /ADD ONE TO THE WORD TO BE TRANSMITTED
1612 7001 IAC /
1613 2056 AND K377 /MASK OUT FOR THE EIGHT BITS
1614 3053 DCA SLUXMT /SAVE THE NEW WORD
1615 1053 TAD SLUXMT /GET THE WORD AND TRANSMIT IT
1616 6046 TLS /LOAD AND TRANSMIT THE WORD
1617 7300 CLA CLL
1620 5777 JMP RTCSLU /GO CHECK FOR ACTIVE DEVICES AND RESET THE AC

```

/ROUTINE TO CHECK THAT THE AC AND LINK DIDN'T CHANGE DURING INTERACTION TEST 42

```

1621 0000 CMPACL, 0
1622 1071 TAD EXPACD /GET THE EXPECTED AC DATA
1623 7041 CIA
1624 1776 TAD ACDRET /GET THE DATA RETURNED
1625 7640 SZA CLA /ARE THEY EQUAL
1626 5234 JMP ACLERR /NO, ERROR

```

```

1627 1072 TAD LINK /GET EXPECTED LINK
1630 7041 CIA
1631 1775 TAD LINKRT /GET THE RETURN LINK
1632 7650 SNA CLA /ARE THEY EQUAL?
1633 5621 JMP I CMPACL /YES, RETURN TO TEST
1634 1221 ACLERR, TAD CMPACL
1635 3237 DCA ,+2
1636 7610 SKP CLA
1637 7402 HLT/CMPACL
1640 4774 JMS ACTCHK /CHECK TO SEE IF RUNNING ON ACT LINE
1641 4435 SHHCHK /CHECK SR0=1 TO INHIBIT ERROR HALT
1642 7710 SPA CLA
1643 5263 JMP ACLLOP /INHIBIT ERROR HALT, GO CHECK LOOP SWITCH
1644 7240 CLA CMA
1645 1221 TAD CMPACL
1646 7402 HLT
1647 7200 CLA /AC CONTAINS ADDRESS WHERE THE ERROR WAS DETECTED
1650 1071 TAD EXPACD
1651 7402 HLT
1652 7200 CLA /THE AC CONTAINS AC DATA BEFORE INTERRUPT
1653 1776 TAD ACORET /
1654 7402 HLT /THE AC CONTAINS AC DATA AFTER INTERRUPT
1655 7200 CLA /
1656 1072 TAD LINK /THE AC CONTAINS THE LINK BEFORE INTERRUPT
1657 7402 HLT
1660 7200 CLA
1661 1775 TAD LINKRT /THE AC CONTAINS LINK AFTER INTERRUPT
1662 7402 HLT /CHECK SR 1 TO LOOP ON ERROR
1663 4435 ACLLOP, SHHCHK
1664 7004 RAL
1665 7710 SPA CLA
1666 5446 JMP I TSTLOP /SCOPE LOOP
1667 5621 JMP I CMPACL /RETURN TO TEST

```

/INACTIVE DEVICE ERROR

```

1670 0000 INACDV, 0
1671 4774 JMS ACTCHK /CHECK TO SEE IF RUNNING ON THE ACT LINE
1672 4435 SHHCHK /INHIBIT ERROR HALT?
1673 7710 SPA CLA
1674 5312 JMP INACLP /YES CHECK LOOP SWITCH
1675 7240 CLA CMA
1676 1270 TAD INACDV
1677 7402 HLT
1680 7300 CLA CLL /AC = ADDRESS WHERE ERROR WAS DETECTED
1681 1073 TAD XMTFLG
1682 7640 SZA CLA
1683 7402 HLT
1684 1074 TAD RECFLG /SLU XMIT FLAG IS INACTIVE
1685 7640 SZA CLA
1686 7402 HLT
1687 1075 TAD RECFLG /SLU RECEIVE FLAG IS INACTIVE
1688 7640 SZA CLA
1689 7402 HLT
1690 4435 INACLP, SHHCHK /RTC FLAG IS INACTIVE
1691 4435 /CHECK SR1=1 TO LOOP ON ERROR

```

```

1713 7004 RAL
1714 7710 SPA CLA
1715 5446 JMP I TSTLOP /SCOPE LOOP
1716 5670 JMP I INACDV /RETURN TO THE TEST

/SLU DATA ERROR DURING INTERACTION TEST 42

1717 0000 SLUERR, 0
1720 4774 JMS ACTCHK /CHECK TO SEE IF RUNNING ON ACT LINE
1721 4435 SHHCHK
1722 7710 SPA CLA
1723 5335 JMP SLULOP /SR=1 INHIBIT ERROR HALT=CHECK LOOP SW
1724 7240 CLA CMA
1725 1317 TAD SLUERR
1726 7402 HLT
1727 7200 CLA /AC = ADDRESS WHERE ERROR WAS DETECTED
1730 1053 TAD SLUXMT
1731 7402 HLT
1732 7200 CLA /AC = WORD TRANSMITTED
1733 1054 TAD SLUREC
1734 7402 HLT
1735 4435 SLULOP, SHHCHK /AC = WORD THAT WAS READ
1736 7004 RAL /CHECK SR1=1 TO LOOP ON ERROR
1737 7710 SPA CLA
1740 5446 JMP I TSTLOP /SCOPE LOOP
1741 5717 JMP I SLUERR /RETURN TO TEST

```

/PARALLEL I/O DATA ERROR DURING INTERACTION TEST 42

```

1742 0000 PIOERR, 0
1743 4774 JMS ACTCHK /CHECK TO SEE IF RUNNING ON ACT LINE
1744 4435 SHHCHK
1745 7710 SPA CLA /INHIBIT ERROR HALT?
1746 5360 JMP PIOLOP /YES, CHECK LOOP SWITCH
1747 7240 CLA CMA
1750 1342 TAD PIOERR
1751 7402 HLT
1752 7200 CLA /AC = ADDRESS WHERE ERROR WAS DETECTED
1753 1051 TAD PIOXMT
1754 7402 HLT
1755 7200 CLA /AC = THE WORD TRANSMITTED
1756 1052 TAD PIOREC
1757 7402 HLT
1760 4435 PIOLOP, SHHCHK /AC = THE WORD READ FROM P I/O
1761 7004 RAL /LOOP ON ERROR IF SR1=1
1762 7710 SPA CLA
1763 5446 JMP I TSTLOP /SCOPE LOOP
1764 5742 JMP I PIOERR /RETURN TO TEST

```

```

1774 0726
1775 1926
1776 1525
1777 1466

```

0200

0200

5

0000	11110000	00000000	11111111	11111111	11111111	11111111	11111111	11111111	11111111
0100	11111111	11111111	11111111	11111111	11111111	11111111	11111111	00000000	00000000
0200	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
0300	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
0400	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
0500	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
0600	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
0700	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
1000	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
1100	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
1200	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
1300	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11001111
1400	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
1500	11111111	11111111	11111111	11111111	11111111	11111111	11111111	00000000	11111111
1600	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
1700	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	00001111

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

AC 0431	DBSS 6577	KJMP7 0665
ACDRET 1525	DBST 6570	KJMPRT 0672
ACLEPR 1634	DBTD 6574	KRB 0036
ACLION 1506	DELAY 1360	KRMF 0131
ACLOP 1663	DELAYR 0070	KRS 0034
ACTCHK 0726	DEPTIO 1111	KRTF 0133
ACTCK2 0500	DESLU 1134	KSF 0031
ACTCNT 0102	DONLOP 4424	KSPWAT 4432
ACTFLG 0134	ENARTC 0146	KTEST 0666
ACTRET 0744	ENDPAS 0600	LINK 0072
ADDTIM 0563	ERROR 4427	LINKRT 1526
AERROR 0675	ERRPC 0743	LOADSM 6151
AERSWH 0707	EXPACD 0071	LODFRQ 6163
BADPAS 0100	FLGCK1 0505	LODSIM 4437
BAUDRT 1305	FLGCK2 0510	LOPPU 4423
BAUDTB 1310	FLGCK3 0513	LOPPSW 0437
BAUDWD 1304	FLGCK4 0516	LOPSON 0421
BDPNTN 1307	FLGCK5 0521	M10 0066
BR110 1320	FLGRST 0667	M144 0103
BR1200 1340	FRGENT 0250	M15 1371
BR150 1324	FROTAB 0321	M4 0065
BR2400 1344	GOODPS 0101	M40 0374
BR300 1330	GTF 6004	ONACTL 0765
BR4000 1350	HLT 7402	OP11K4 0000
BR600 1334	INACDV 1670	OP1SEL 0021
BR9600 1354	INACLP 1712	OP2SEL 0022
C7 0670	INACTV 0077	PATCH 0104
CAF 0007	INTERA 1522	PCLOOP 0400
CAL 6103	INTFLG 0041	PIODAT 4426
CHKACT 0744	INTON 1264	PIODEN 4430
CHKSIM 1161	INTRET 0530	PIODRN 1742
CHKSWH 0607	INTSKP 1400	PIOLOP 1760
CLCL 6136	K0 0636	PIOREC 0092
CLKFLG 0042	K1 0125	PIOSER 1424
CLKSET 0752	K10 0671	PIOSWH 1127
CLKSNC 0135	K11 0673	PIOXMT 0031
CLLE 6135	K12 0674	PPOINT 0076
CLRDST 6156	K125 0061	PUPFAL 0641
CLRSIM 6150	K2 0126	PRGENU 5440
CLSK 6137	K200 0057	RAN1 1923
CLSKWT 4425	K252 0060	RAN2 1924
CHPAOL 1621	K2525 0063	RECFLG 0074
CNT 0043	K3 0127	RECSEH 1640
CNT1 0044	K377 0056	RESET 1476
CONTWD 0055	K5252 0062	RETAUD 0637
DATPIO 1000	K7 0064	RETURN 0620
DATSLU 1033	K7710 0150	RMP 6244
DBCE 6576	K0 0032	RTCENA 4146
DBCF 6573	K0DF 0132	RTCFLG 0075
DBRD 6572	KCF 0030	RTCFRQ 0251
DBSE 6575	KIE 0035	RTCINT 1215
DBSK 6571	KJMP 0130	RTCSER 1933

RTCSLU 1466
 RTCTIM 1200
 RTF 6005
 RTIMOK 0246
 SAVADD 0124
 SAVCNT 0050
 SAVLOC 0640
 SBE 6101
 SIMCHK 4436
 SIMCLR 6160
 SIMCNT 0067
 SIMINT 0444
 SIMLSD 0414
 SIMWRD 0714
 SKPCHN 0452
 SKPDAV 6165
 SKPFRQ 6162
 SKPRDR 6157
 SKPSTR 6167
 SLUDAT 4433
 SLUDER 4434
 SLUERR 1717
 SLUINT 1271
 SLULOP 1735
 SLUREC 0054
 SLUSYR 1250
 SLUSWH 1154
 SLUTIM 1223
 SLUTOK 0317
 SLUXMT 0053
 SPI 6045
 SPL 6102
 STPBIT 1306
 STRFRQ 6161
 SWHCHK 4435
 SWITCH 0020
 TABFRQ 0300
 TCF 6042
 TEST 0045
 TEST40 0205
 TEST41 0252
 TEST42 0331
 TFL 6040
 TLS 6046
 TPC 6044
 TSF 6041
 TSFWAT 4431
 TSTCNT 0047
 TSTGOD 0136
 TSTLOP 0046
 WATKSF 0542
 WATTSF 0531

WTOLSK 0553
XHTFLG 0073
XHTSER 1527

ERRORS DETECTED: 0

LINKS GENERATED: 26

RUN=TIME: 18 SECONDS

2K CORE USED