

IDENTIFICATION

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MAINTAINER: DIAGNOSTIC ENGINEERING  
AUTHOR: BRUCE HANSEN  
SUPERCEDES: MAINDEC-08-DJDKA-A

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1.0

## ABSTRACT

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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 TERMI-POINT JUMPERS
5. ONE QUAD EXTENDER,

SPECIAL I

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 I.C 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 DK08-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 DK08-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 CONSECATIVELY 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 0 THIS
42. CHECK ADDRESS EQUAL 0200 AND CONTENT EQUAL 7402
43. PRESS THE NUMBERS 7004 - 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 MQ 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 4540  
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 DKCB-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

LOW SPEED READER

| ADDRESS | CONTENT |
|---------|---------|
| 0156    | 6014    |
| 0157    | 6011    |
| 0160    | 5357    |
| 0161    | 6016    |
| 0162    | 7106    |
| 0163    | 7006    |
| 0164    | 7310    |
| 0165    | 5374    |
| 0166    | 7006    |
| 0167    | 6011    |
| 0170    | 5367    |
| 0171    | 6016    |
| 0172    | 7420    |
| 0173    | 3776    |
| 0174    | 3376    |
| 0175    | 5357    |

| ADDRESS | CONTENT |
|---------|---------|
| 0156    | 6032    |
| 0157    | 6031    |
| 0160    | 5357    |
| 0161    | 6036    |
| 0162    | 7106    |
| 0163    | 7006    |
| 0164    | 7310    |
| 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 JUMBERS, 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 JUMBERS, 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 (DJDKA-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<br>--- | SR9<br>--- | SR10<br>---- | SR11<br>---- |                         |
|------------|------------|--------------|--------------|-------------------------|
| 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 DRSE 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

DBCF 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 P/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  
/  
/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,  
////////////////////////////////////





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/DNCS-AA OPTION TEST 1 MAINDEC=08=DJDKA=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=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 KRB=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 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 TFS=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 DBRD=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 LOADSM=6151 /LOAD SIMULATOR CONTROL WORD 1
6156 CLRODT=6156 /CLEAR READER RUN, STROBE, AND DATA AVAILABLE CATCHER F/F'S
6157 SKPRDR=6157 /SKIP ON READER RUN CATCHER F/F SET
6160 SINCLR=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 SKPDAY=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 0=9, 10, 11 ALL 0'S
/BIT 10 BAUD RATE SELECT EQUALS 10 BAUD, EACH
/BIT 11 BAUD RATE SELECT INCREASING BIT SELECTS
/ NEXT HIGHEST BAUD RATE;
    
```

```

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

0000 *0
0002 0302 302 /PROGRAM REVISION LETTER=MAINDEC=08=DJDKA=B
0001 0244 RHF /RESTORE MEMORY FIELDS
0002 5403 JMP I 3 /RETURN TO INTERRUPT SERVICE ROUTINE
0003 3244 SIMINT/SKPCHN/SIMCHK/RTCINT/SLUINT /INTERRUPT SERVICE ROUTINES

0020 *20
0020 0000 SWITCH, 0
0021 2003 DP1SEL, 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=64K, 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 DP2SEL, 0
4423 LOOPPC=JMS I, PCLOOP
0023 3200 OONLDP=JMS I, LOPDON
4424 3221 CLSKWT=JMS I, WTCLSK
4425 3352 PIDDAT=JMS I, DATPID
4426 3600 ERROR=JMS I, AERROR
0027 3475 PIDDER=JMS I, DERPID
4430 3711 TSPWAT=JMS I, WATTSF
4431 3327 KSPWAT=JMS I, WATKSF
0032 3341 SLUDAT=JMS I, DATSLU
4433 3653 SLUDER=JMS I, DERSLU
0033 4434 SWCHK=JMS I, CHKSWH
4435 3407

```

```

4436 SIMCHK=JMS I, CHKSIM
0036 3761 LODSIM=JMS I, SIMLOD
4437 3214 RTCENA=JMS ENARTC
0037 4146

5440 PRGEND=JMP I, ENDPAS
0040 3400

/LOCATIONS USED BY THE PROGRAM

0041 0000 INTFLG, 0
0042 0000 CLKPLG, 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 PIOXHT, 0
0052 0000 PIOREC, 0
0053 0000 SLUXHT, 0
0054 0000 SLUREC, 0
0055 0000 CNTWD, 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 H4, -4
0066 7770 H10, -10
0067 0000 SIMCNT, 0

0070 4160 DELAYR, DELAY
0071 0000 EXPACD, 0
0072 0000 LINK, 0
0073 0000 XMYFLG, 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 H144, =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

```

```

0106 3124 DCA SAVADD /SAVE INTERRUPT ADDRESS
0107 6201 CDF /CHANGE DATA FIELD TO FIELD 8
0110 1131 TAD KRMP /GET THE INSTRUCTION RMP
0111 3525 DCA I K1 /PUT IT IN LOCATION 1 OF FIELD 8
0112 1130 TAD KJMP /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 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 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 KRMP, RMP
0134 0000 ACTFLG, 0
0135 2000 CLKSNG, 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 9536 JMP I TSTGOD /NO, RETURN TO THE PROGRAM
0142 6002 IOF /TURN THE INTERRUPT OFF
0143 6272 CIF 78 /CHANGE THE INSTRUCTION TO FIELD 7
0144 4501 JMS I GOODPS /GO TO PROM
0145 9536 JMP I TSTGOD /RETURN TO THE PROGRAM

```

```

0146 0000 ENARTC, 0
0147 1022 TAD OP2SEL /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 ZEROES, 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 /SETUP INTERRUPT SERVICE
0201 4104 JMS PATCH
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 TSP /SKIP ON TRANSMIT FLAG
0217 7410 SKP
0220 4427 FRROR /TRANSMIT FLAG SET OR TSP SKIPPED
0221 6045 SPI /SKIP ON XMIT/RECEIVE + INT ENA
0222 7410 SKP
0223 4427 ERROR /B 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 8 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 192 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 4104 TEST2, JMS PATCH /SETUP INTERRUPT SERVICE
0247 3252 SKPCHN
0250 7240 CLA CMA
0251 3042 DCA CLKFLG /SET INTERRUPT CHAIN TO ACKNOWLEDGE CLOCK INTERRUPTS,

```

```

0292 4423      LOOPPC      /SETUP TEST COUNT AND SCOPE LOOPING ADDRESS
0293 7777      =1          /SIMULATOR ITERATION COUNTER
0294 4436      SIMCHK      /CHECK TO SEE IF SIMULATOR IS SELECTED
0295 4888      4888      /CONTROL WORD FOR THE SIMULATOR
0296 4437      LODSIM      /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
                   /LOOP = THIS ADDRESS IF SIMULATOR SELECTED
                   /OTHERWISE SCOPE LOOP IS THIS ADDRESS *1
0297 7344      CLA CLL CMA RAL /SETUP A PROGRAM LOOP TO LOOK AT 2 CLOCK FLAGS
0298 3139      DCA CLKSNC  /TO SYNC THE REAL TIME CLOCK
0299 3841      DCA INTFLG  /CLEAR PROGRAM INTERRUPT FLAG
0300 6887      CAF        /CLEAR ALL FLAGS BUT SET INT ENA ON SLU
0301 6881      ION        /TURN THE INTERRUPT ON
0302 4429      CLSKWT     /WAIT FOR THE CLOCK FLAG TO SET
0303 4427      ERROR     /CLK FLAG FAILED TO SET OR NO KLKL TICK PULSE
0304 1841      TAD INTFLG  /GET THE PROGRAM INTERRUPT FLAG
0305 7648      SEA CLA   /DID IT INTERRUPT?
0306 4427      ERROR     /PROGRAM INTERRUPTED WITHOUT CLK INT ENA
0307 2139      ISE CLKSNC /2ND FLAG SET?
0308 3261      JMP ,=11    /NO, GO AND TRY TO CLEAR CLK FLAG WITH CAF
0309 6887      CAF        /CLEAR ALL FLAGS BUT SET SLU'S INT ENA
0310 6881      ION        /TURN THE INTERRUPT BACK ON
0311 6137      CLSK      /SKIP ON THE CLOCK FLAG
0312 7618      SKP CLA   /CAF FAILED TO CLEAR CLK FLAG OR CLSK SKIPPED,
0313 4427      ERROR     /GET THE PROGRAM INTERRUPT FLAG
0314 1841      TAD INTFLG  /GET THE PROGRAM INTERRUPT FLAG
0315 7648      SEA CLA   /PROGRAM INTERRUPTED WITHOUT CLK INT ENA + CLK FLAG
0316 4427      ERROR     /REPEAT TEST IF NOT DONE OR LOOP ON TEST IF SR2=1
0317 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;  
 \*\*\*\*\*

```

0318 4423      TEST3, LOOPPC      /SETUP TEST COUNT AND SCOPE LOOPING ADDRESS
0319 7777      =1          /SIMULATOR ITERATION COUNTER
0320 4436      SIMCHK      /CHECK TO SEE IF SIMULATOR IS SELECTED
0321 4888      4888      /CONTROL WORD FOR THE SIMULATOR
0322 4437      LODSIM      /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
                   /LOOP = THIS ADDRESS IF SIMULATOR SELECTED
                   /OTHERWISE SCOPE LOOP IS THIS ADDRESS *1
0323 7344      CLA CLL CMA RAL /SETUP A PROGRAM LOOP TO LOOK AT 2 CLK FLAGS TO
0324 3139      DCA CLKSNC  /SYNC THE REAL TIME CLOCK
0325 3841      DCA INTFLG  /CLEAR PROGRAM INTERRUPT FLAG
0326 6887      CAF        /CLEAR ALL FLAGS BUT SET INT ENA ON SLU
0327 6881      ION        /TURN INTERRUPT ON
0328 4429      CLSKWT     /WAIT FOR CLK FLAG
0329 4427      ERROR     /CLOCK FLAG FAILED TO SET
0330 1841      TAD INTFLG  /GET THE PROGRAM INTERRUPT FLAG
0331 7648      SEA CLA   /DID IT INTERRUPT?
0332 4427      ERROR     /PROGRAM INTERRUPTED WITH CLK INT ENA,
0333 2139      ISE CLKSNC /2ND FLAG SET?
0334 5313      JMP ,=11    /NO, GO CLEAR THE FLAG WITH CAF AND WAIT FOR NEXT ONE
0335 6136      CLCL      /CLEAR THE CLK FLAG
0336 7618      SKP CLA

```

```

0337 4427      ERROR     /CLCL SKIPPED
0338 6137      CLSK      /SKIP ON CLOCK FLAG
0339 7618      SKP CLA   /CLCL FAILED TO CLEAR CLK FLAG
0340 4427      ERROR     /GET THE PROGRAM INTERRUPT FLAG
0341 1841      TAD INTFLG  /GET THE PROGRAM INTERRUPT?
0342 7648      SEA CLA   /PROGRAM INTERRUPTED, COULD BE CLCL SHORTED TO CLLE
0343 4427      ERROR     /REPEAT TEST IF NOT DONE OR LOOP ON TEST IF SR2=1
0344 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  
 \*\*\*\*\*

```

0345 4423      TEST4, LOOPPC      /SETUP TEST COUNT AND SCOPE LOOPING ADDRESS
0346 7777      =1          /SIMULATOR ITERATION COUNTER
0347 4436      SIMCHK      /CHECK TO SEE IF SIMULATOR IS SELECTED
0348 4888      4888      /CONTROL WORD FOR THE SIMULATOR
0349 4437      LODSIM      /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
                   /LOOP = THIS ADDRESS IF SIMULATOR SELECTED
                   /OTHERWISE SCOPE LOOP IS THIS ADDRESS *1
0350 7344      CLA CLL CMA RAL /SETUP A PROGRAM LOOP TO LOOK AT 2 CLK FLAGS
0351 3139      DCA CLKSNC  /TO SYNC UP THE REAL TIME CLOCK
0352 3841      DCA INTFLG  /CLEAR PROGRAM INTERRUPT FLAG
0353 6887      CAF        /CLEAR ALL FLAGS BUT SET INT ENA ON SLU
0354 6881      ION        /TURN THE INTERRUPT ON
0355 4429      CLSKWT     /WAIT FOR THE CLK FLAG
0356 4427      ERROR     /CLK FLAG FAILED TO SET
0357 1841      TAD INTFLG  /GET THE PROGRAM INTERRUPT FLAG
0358 7648      SEA CLA   /DID THE PROGRAM INTERRUPT?
0359 4427      ERROR     /FLAG INTERRUPTED WITHOUT CLK INT ENA
0360 2139      ISE CLKSNC /2ND FLAG SET?
0361 5344      JMP ,=11    /NO, GO CLEAR FLAG WITH CAF AND WAIT FOR NEXT FLAG
0362 6136      CLCL      /CLEAR THE CLOCK FLAG
0363 6137      CLSK      /SKIP ON CLOCK FLAG
0364 7618      SKP CLA   /CLCL FAILED TO CLEAR CLK FLAG
0365 4427      ERROR     /SET DATA BIT 11 TO A ONE
0366 7301      CLA CLL IAC  /TRY AND SET CLK INT ENA
0367 6135      CLLE      /CLLE SKIPPED,
0368 7618      SKP CLA   /GET THE PROGRAM INTERRUPT FLAG
0369 4427      ERROR     /PROGRAM INTERRUPTED WITHOUT CLK FLAG SET
0370 4429      CLSKWT     /WAIT FOR NEXT CLK FLAG
0371 4427      ERROR     /CLK FLAG FAILED TO SET
0372 2941      ISE INTFLG /DID THE PROGRAM INTERRUPT
0373 4427      ERROR     /CLLE FAILED TO SET CLK INT ENA OR FAILED TO INT
0374 3841      DCA INTFLG  /CLEAR THE PROGRAM INTERRUPT FLAG
0375 6135      CLLE      /CLEAR CLK INT ENA
0376 6881      ION        /TURN THE INTERRUPT ON
0377 7380      CLA CLL   /
0378 1841      TAD INTFLG  /GET THE PROGRAM INTERRUPT FLAG
0379 7648      SEA CLA   /DID IT INTERRUPT?
0380 4427      ERROR     /YES, CLLE FAILED TO CLEAR CLK INT ENA

```

```

0486 6136 CLCL /CLEAR THE CLOCK FLAG
0487 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 SEA CLA
0431 4427 ERROR /PROGRAM INTERRUPTED WITHOUT CLK INT ENA
0432 2135 ISE CLKSNC /2ND FLAG SET?
0433 3222 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 3041 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 SEA CLA /DID IT INTERRUPT
0447 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 IUT'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 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 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 3292 SKPCHN
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 SEA CLA /CHECK THAT DBSK DIDN'T READ ANYTHING INTO AC
    
```

```

0521 4427 ERROR /INIT FAILED TO 8 DATA READY, DBSK SKIPPED OR
0522 6578 DBST /READ SOMETHING INTO THE AC
0523 7648 SEA /SKIP ON DATA ACCEPTED, 8 DATA ACCEPTED AND DATA AVAILABLE
0524 4427 ERROR /INIT FAILED TO 8 DATA ACCEPTED, DBST SKIPPED OR
0525 1841 TAD INTFLG /DBST READ SOMETHING INTO THE AC
0526 7648 SEA CLA /GET THE PROGRAM INTERRUPT FLAG
0527 4427 ERROR /PROGRAM INTERRUPTED WITHOUT INT ENA AND FLAG SET
0530 6573 DBCF CLA /CLEAR DATA READY SET DATA ACCEPTED
0531 7648 SEA CLA
0532 4427 ERROR /DBCF SKIPPED OR READ SOMETHING INTO AC
0533 6571 DBSK CLA /SKIP ON DATA READY
0534 7618 SKP CLA
0535 4427 ERROR /DATA READY FLAG GOT SET BY DBST OR DBCF
0536 6578 DBST /SKIP ON DATA ACCEPTED AND CLEAR IT
0537 4427 ERROR /DATA ACCEPTED NOT SET OR DBST FAILED TO SKIP
0540 6578 DBST /SKIP ON DATA ACCEPTED TO CHECK THAT IT CLEARED
0541 7618 SKP CLA
0542 4427 ERROR /DBST AND TP4 FAILED TO CLEAR DATA ACCEPTED F/P
0543 1841 TAD INTFLG /GET THE PROGRAM INTERRUPT FLAG
0544 7648 SEA CLA
0545 4427 ERROR /PROGRAM INTERRUPTED WITHOUT INT ENA SET
0546 4424 DONLOP /REPEAT TEST IF SR EQUAL TO 1888
    
```

```

/*****
/TEST 8 - CHECKS THAT THE DATA READY FLAG CAN BE SET AND CLEARED, TO
/SET THE DATA READY FLAG, THE PROGRAM ISSUES THE IOT DBST TO TRANSMIT
/AND SET DATA AVAILABLE F/P, THE SETTING OF DATA AVAILABLE F/P IN LOOP
/BACK MODE SETS THE DATA READY F/P; 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,
/THE DATA READY FLAG IS CHECKED TO BE CLEARED BY ISSUING A DBSK AND
/DATA ACCEPTED F/P IS CHECKED TO BE SET BY ISSUING A DBST, THE DATA
/ACCEPT F/P 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 4888 4888 /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 6887 CAF /CLEAR ALL FLAGS
0555 4146 RTCENA /SET REAL TIME CLOCK INT ENA
0556 3841 DCA INTFLG /CLEAR PROGRAM INTERRUPT FLAG
0557 6881 ION /TURN THE INTERRUPT ON
0560 6571 DBSK CLA /SKIP ON DATA READY FLAG
0561 7618 SKP CLA
0562 4427 ERROR /DATA READY FLAG SET OR DBSK SKIPPED
0563 6578 DBST /SKIP ON DATA ACCEPTED, 8 DATA ACCEPTED AND DATA AVAILABLE
0564 7618 SKP CLA
0565 4427 ERROR /DATA ACCEPTED SET OR DBST SKIPPED
0566 6574 DBTD /TRANSMIT AND SET DATA AVAILABLE AND DATA READY
    
```

```

0567 7648 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 6578 DBST CLA /SKIP ON DATA ACCEPTED, 8 DATA AVAILABLE AND DATA ACCEPTED
0574 7618 SKP CLA
0575 4427 ERROR /DATA ACCEPTED SET BEFORE DBCF WAS ISSUED
0576 6571 DBSK /SKIP ON DATA READY
0577 4427 ERROR /DATA READY FLAG CLEARED
0600 1841 TAD INTFLG /GET THE PROGRAM INTERRUPT FLAG
0601 7648 SEA CLA
0602 4427 ERROR /PROGRAM INTERRUPTED WITHOUT SETTING INT ENA
0603 6573 DBCF /CLEAR DATA READY SET DATA ACCEPTED
0604 6571 DBSK /SKIP ON DATA READY
0605 7410 SKP
0606 4427 ERROR /DBCF FAILED TO CLEAR DATA READY
0607 6578 DBST /SKIP ON DATA ACCEPTED AND CLEAR IT AND DATA AVAIL,
0610 4427 ERROR /DBCF FAILED TO SET DATA ACCEPTED OR DBST FAILED TO SKIP
0611 6578 DBST /SKIP ON DATA ACCEPTED
0612 7410 SKP
0613 4427 ERROR /THE FIRST DBST FAILED TO CLEAR DATA ACCEPTED
0614 1841 TAD INTFLG /GET THE PROGRAM INTERRUPT FLAG
0615 7648 SEA CLA
0616 4427 ERROR /PROGRAM INTERRUPTED WITHOUT INT ENA SET
0617 4424 DONLOP /REPEAT TEST IF SR = 1888
    
```

```

/*****
/TEST 9 - CHECKS THAT CAF WILL CLEAR THE DATA READY FLAG AND THE
/DATA ACCEPTED FLAG,
/*****
    
```

```

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 4888 4888 /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 6887 CAF /CLEAR ALL FLAGS
0626 4146 RTCENA /SET REAL TIME CLOCK INT ENA
0627 3841 DCA INTFLG /CLEAR PROGRAM INTERRUPT FLAG
0630 6881 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 6578 DBST /SKIP ON DATA ACCEPTED AND CLEAR IT
0635 7410 SKP
0636 4427 ERROR /DATA ACCEPTED GOT SET BEFORE A DBCF WAS ISSUED
0637 1841 TAD INTFLG /GET THE PROGRAM INTERRUPT FLAG
0640 7648 SEA CLA
0641 4427 ERROR /PROGRAM INTERRUPTED WITHOUT INT ENA SET
0642 6887 CAF /CLEAR DATA READY FLAG
0643 4146 RTCENA /SET REAL TIME CLOCK INT ENA
0644 6571 DBSK /SKIP ON DATA READY FLAG
0645 7618 SKP CLA
    
```

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 RTCENA /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
0661 4427 ERROR /PROGRAM INTERRUPTED WITHOUT INT ENA SET
0662 4424 DONLDP /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 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 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 RTCENA /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
0709 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

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 DONLDP /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 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 RTCENA /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 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
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 DONLDP /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 4888 4888 /SIMULATOR CONTROL WORD
1002 4437 LODSIM /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
/LOOP = THIS ADDRESS IF SIMULATOR SELECTED
/OTHERWISE SCOPE LOOP IS NEXT ADDRESS

1001 6887 CAP /CLEAR ALL FLAGS
1002 4146 RTCENA /SET REAL TIME CLOCK INT ENA
1003 3841 DCA INTFLG /CLEAR PROGRAM INTERRUPT FLAG
1004 6881 ION /TURN THE INTERRUPT ON
1005 6373 DBCF /CLEAR DATA READY SET DATA ACCEPTED
1006 7888 NOP /SHOULDN'T INTERRUPT HERE
1007 1841 TAD INTFLG /GET THE PROGRAM INTERRUPT FLAG
1010 7648 SEA CLA
1011 4427 ERROR /PROGRAM INTERRUPTED WITHOUT INT ENA SET
1012 6375 DBSE /SET INTERRUPT ENABLE
1013 7888 NOP /SHOULD INTERRUPT HERE WITH INT ENA AND FLAG SET
1014 2841 ISE INTFLG /DID THE PROGRAM INTERRUPT
1015 4427 ERROR /NO, FAILED TO INTERRUPT WITH INT ENA AND DATA ACCEPTED SET
1016 6881 ION /TURN THE INTERRUPT BACK ON
1017 6378 DBST /CHECK THAT DATA ACCEPTED GOT CLEARED BY 1ST DBST IN SKIP CHAIN
1020 7618 SKP CLA
1021 4427 ERROR /DATA ACCEPTED DIDN'T CLEAR IN INTERRUPT SKIP CHAIN
1022 1841 TAD INTFLG /GET THE PROGRAM INTERRUPT FLAG
1023 7648 SEA CLA
1024 4427 ERROR /PROGRAM INTERRUPTED WITH DATA ACCEPTED CLEARED
1025 6376 DBCE /CLEAR INTERRUPT ENABLE
1026 4424 DONLOP /REPEAT TEST IF SR = 188R

```

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

```

1227 4423 TEST13, LOOPPC /STORE THE TEST LOOPING ADDRESS AND SETUP TEST COUNT
1228 7777 =1 /SIMULATOR ITERATION COUNTER
1231 4436 SIMCHK /CHECK TO SEE IF SIMULATOR IS SELECTED
1232 4888 4888 /CONTROL WORD FOR THE SIMULATOR
1233 4437 LODSIM /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
/LOOP = THIS ADDRESS IF SIMULATOR SELECTED
/OTHERWISE SCOPE LOOP IS THIS ADDRESS +1

1234 3841 DCA INTFLG /CLEAR PROGRAM INTERRUPT FLAG
1235 6887 CAP /CLEAR ALL FLAGS
1236 4146 RTCENA /SET REAL TIME CLOCK INT ENA
1237 6881 ION /TURN INTERRUPT ON
1240 7248 CLA CHA /SET THE AC TO ALL ONES
1241 6374 DBTD /TRANSMIT DATA
1242 7881 IAC
1243 7648 SEA CLA
1244 4427 ERROR /DBTD CHANGED THE AC
1245 6887 CAP /CLEAR ALL
1246 4146 RTCENA /SET REAL TIME CLOCK INT ENA
1247 6881 ION /TURN INTERRUPT BACK ON
1250 7248 CLA CHA /SET THE AC TO ALL ONES

```

```

1051 6372 DBRD /READ THE 12 BIT PARALLEL I/O
1052 7648 SEA CLA
1053 4427 ERROR /DBRD FAILED TO READ OR CAP FAILED TO CLEAR XMIT BUFFERS
1054 7248 CLA CHA /SET AC TO ALL ONES
1055 6371 DBSK /SKIP ON DATA READY
1056 7881 IAC
1057 7648 SEA CLA
1060 4427 ERROR /DBSK CHANGED THE AC
1061 6882 IOP
1062 7248 CLA CHA /SET THE AC TO ALL ONES
1063 6373 DBCF /CLEAR DATA READY FLAG SET DATA ACCEPT FLAG
1064 7881 IAC
1065 7648 SEA CLA
1066 4427 ERROR /DBCF CHANGED THE AC
1067 6887 CAP /CLEAR ALL FLAGS
1070 4146 RTCENA /SET REAL TIME CLOCK INT ENA
1071 6881 ION /SET INTERRUPT ENABLE
1072 7248 CLA CHA
1073 6378 DBST /SKIP AND CLEAR DATA ACCEPTED AND DATA AVAILABLE
1074 7881 IAC
1075 7648 SEA CLA
1076 4427 ERROR /DBST SKIPPED OR CHANGED THE AC
1077 7248 CLA CHA
1082 6375 DBSE /SET PARALLEL INTERRUPT ENABLE
1081 7881 IAC
1082 7648 SEA CLA
1083 4427 ERROR /DBSE CHANGED THE AC
1084 7248 CLA CHA
1085 6376 DBCE /CLEAR INTERRUPT ENABLE
1086 7881 IAC
1087 7648 SEA CLA
1088 4427 ERROR /DBCE CHANGED THE AC
1089 7248 CLA CHA /SET THE AC TO ALL ONES
1092 6397 DBSS /ISSUE A STROBE PULSE
1093 7418 SKP
1094 4427 ERROR /DBSS SKIPPED
1095 7881 IAC
1096 7648 SEA CLA
1097 4427 ERROR /DBSS CHANGED THE AC
1098 1841 TAD INTFLG /DID THE PROGRAM INTERRUPT
1099 7648 SEA CLA
1102 4427 ERROR /PROGRAM INTERRUPTED
1103 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 4888 4888 /CONTROL WORD FOR THE SIMULATOR
1130 4437 LODSIM /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
/LOOP = THIS ADDRESS IF SIMULATOR SELECTED

```



```

1131 3041          DCA INTFLG          /OTHERWISE SCOPE LOOP IS THIS ADDRESS +1
1132 7240          CLA CHA              /CLEAR PROGRAM INTERRUPT FLAG
1133 3051          DCA P10XMT          /SET THE WORD TO BE TRANSMITTED TO ALL ONES
1134 4426          P10DAT              /GO TRANSMIT AND COMPARE THE WORD
1135 4430          P10DER              /DATA ERROR = WORD DIDN'T COMPARE IN ROUTINE P10DAT
1136 4424          DONL0P              /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          4000                /CONTROL WORD FOR THE SIMULATOR
1143 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 CHA              /SET THE FIRST WORD TO ALL ONES
1146 3051          DCA P10XMT          /SAVE IT
1147 4426          P10DAT              /GO TRANSMIT AND COMPARE THE WORD
1150 4430          P10DER              /DATA ERROR = WORD DIDN'T COMPARE IN ROUTINE P10DAT
1151 3051          DCA P10XMT          /SET THE WORD TO 0
1152 4426          P10DAT              /GO TRANSMIT AND COMPARE THE WORD
1153 4430          P10DER              /DATA ERROR= FAILED TO READ ZEROES BACK
1154 4424          DONL0P              /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
1160 4000          4000                /CONTROL WORD FOR THE SIMULATOR
1161 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            /SET THE FIRST WORD TO TRANSMIT=5252
1164 3051          DCA P10XMT          /GO TRANSMIT AND COMPARE THE DATA WORD
1165 4426          P10DAT              /DATA ERROR = WORD DIDN'T COMPARE
1166 4430          P10DER              /SET THE SECOND WORD TO TRANSMIT = 2925
1167 1063          TAD K2925            /GO TRANSMIT AND COMPARE THE WORD
1170 3051          DCA P10XMT          /DATA ERROR=THE WORD DIDN'T COMPARE
1171 4426          P10DAT              /REPEAT THE TEST IF NOT DONE OR LOOP ON TEST IF SR2=1
1172 4430          P10DER
1173 4424          DONL0P

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          /CLEAR PROGRAM TEST COUNTER
1207 3047          DCA TSTCNT          /CHECK FOR SIMULATOR
1210 4436          SIMCHK              /SIMULATOR CONTROL WORD
1211 4000          4000                /LOAD THE SIMULATOR IF SELECTED
1212 4437          LODSIM              /CLEAR PROGRAM INTERRUPT FLAG
1213 3041          DCA INTFLG          /GET TEST COUNTER
1214 1047          TAD TSTCNT          /SET THE WORD TO BE TRANSMITTED = TO IT
1215 3051          DCA P10XMT          /GO TRANSMIT AND COMPARE THE WORD
1216 4426          P10DAT              /DATA ERROR
1217 4430          P10DER              /DONE OR LOOP ON TEST IF SR2=1
1220 4424          DONL0P

/*****
/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          /CHECK FOR THE SIMULATOR
1225 3047          DCA TSTCNT          /SIMULATOR CONTROL WORD
1226 4436          SIMCHK              /LOAD SIMULATOR IF SELECTED
1227 4000          4000                /CLEAR ALL FLAGS
1230 4437          LODSIM              /CLEAR REAL TIME CLOCK INT ENA
1231 6007          CAF                /TURN THE INTERRUPT ON
1232 4146          RTCENA              /CLEAR PROGRAM INTERRUPT FLAG
1233 6001          ION
1234 3041          DCA INTFLG          /GET THE TEST COUNTER
1235 1047          TAD TSTCNT          /CLEAR PROGRAM INTERRUPT FLAG
1236 3051          DCA P10XMT          /PUT IT IN THE WORD TO TRANSMIT
1237 1051          TAD P10XMT          /GET THE WORD
1240 6574          DBTD                /TRANSMIT IT
1241 6571          DBSK                /SKIP ON DATA READY
1242 4427          ERROR              /DATA READY FLAG FAILED TO SET
1243 7240          CLA CHA              /SET THE AC TO ALL ONE'S
1244 6572          DBRD                /READ THE DATA BUFFER
1245 3052          DCA P10REC          /SAVE THE WORD READ
1246 6573          DBCF                /CLEAR THE DATA READY FLAG
1247 6570          DBST                /SKIP AND CLEAR DATA ACCEPTED AND DATA AVAIL,
1250 4427          ERROR              /DBSF FAILED TO SET DATA ACCEPTED
1251 6570          DBST                /CHECK THAT DATA ACCEPTED CLEARED

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```

1292 7410 SKP
1293 4427 ERROR /DATA ACCEPTED STILL SET
1294 1851 TAD P10XHT /COMPARE THE WORD TRANSMITTED WITH THE WORD READ
1295 7841 CIA
1296 1852 TAD P10REC
1297 7640 SEA CLA
1298 4438 PIDDER /PARALLEL I/O DATA ERROR
1299 6807 CAF /CLEAR ALL INCLUDING THE TRANSMIT BUFFER
1300 4146 RTCCNA /SET REAL TIME CLOCK INT ENA
1301 6801 ION /TURN THE INTERRUPT BACK ON
1302 6872 DBRD /READ THE BUFFER
1303 7640 SEA CLA /DID INIT CLEAR THE BUFFER?
1304 4427 ERROR /NO, INIT FAILED TO CLEAR BUFFER
1305 1841 TAD INTFLG /GET THE PROGRAM INTERRUPT FLAG
1306 7640 SEA CLA
1307 4427 ERROR /PROGRAM INTERRUPTED WITHOUT INT ENA SET
1308 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 TFS 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 4438 SIMCHK /CHECK TO SEE IF SIMULATOR IS SELECTED
1276 4800 4800 /SIMULATOR CONTROL WORD
1277 4437 LODSIM /LOAD THE CONTROL WORD
1300 1821 TAD OP1SEL /RECHECK THE SIMULATOR BIT
1301 2857 AND K200 /MASK OUT FOR SIMULATOR BIT
1302 7640 SEA 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 6807 CAF /CLEAR ALL FLAGS
1307 4146 RTCCNA /SET REAL TIME CLOCK INT ENA
1308 3041 DCA INTFLG /CLEAR THE PROGRAM INTERRUPT FLAG
1309 6801 ION /TURN THE INTERRUPT ON
1310 6156 CLRDET /CLEAR SIMULATOR DETECTOR F/F'S
1311 6167 SKPSTR /SKIP ON STROBE DETECTOR F/F SET
1312 7610 SKP CLA
1313 4427 ERROR /STROBE IS SET TO A ONE
1314 6577 DBSS /ISSUE A STROBE PULSE
1315 7440 SEA
1316 4427 ERROR /DBSS SKIPPED OR READ SOMETHING INTO THE AC
1317 6167 SKPSTR /SKIP ON STROBE DETECTOR F/F SET
1318 4427 ERROR /DBSS FAILED TO SET STROBE OR SIMULATOR DETECTOR F/F
1319 6156 CLRDET /CLEAR READER RUN AND STROBE DETECTOR F/F
1320 6167 SKPSTR /SKIP ON STROBE DETECTOR F/F SET
1321 7410 SKP
1322 4427 ERROR /STROBE STILL SET OR DETECTOR F/F DIDN'T CLEAR
1323 6577 DBSS /ISSUE ANOTHER STROBE PULSE
1324 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 1841 TAD INTFLG /CHECK THAT THE PROGRAM DIDN'T INTERRUPT
1337 7640 SEA CLA
1338 4427 ERROR /PROGRAM INTERRUPTED
1339 6802 IOF /TURN THE INTERRUPT OFF
1340 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 4438 SIMCHK /CHECK TO SEE IF SIMULATOR IS SELECTED
1346 4800 4800 /SIMULATOR CONTROL WORD
1347 4437 LODSIM /LOAD THE CONTROL WORD
1348 6807 CAF /CLEAR ALL FLAGS
1349 4146 RTCCNA /SET REAL TIME CLOCK INT ENA
1350 3041 DCA INTFLG /CLEAR THE PROGRAM INTERRUPT FLAG
1351 6801 ION /TURN THE INTERRUPT ON
1352 6156 CLRDET /CLEAR SIMULATOR DETECTOR F/F'S
1353 6165 SKPDAV /SKIP ON DATA AVAILABLE DETECTOR F/F
1354 7610 SKP CLA
1355 4427 ERROR /CAF FAILED TO CLEAR DATA AVAIL, OR IT IS STUCK ON
1356 6574 DBTD /TRANSMIT AND SET DATA READY AND DATA AVAILABLE
1357 6571 DBSK /SKIP ON DATA READY
1358 4427 ERROR /DBTD FAILED TO SET DATA READY
1359 6165 SKPDAV /SKIP ON DATA AVAILABLE DETECTOR F/F
1360 4427 ERROR /DATA AVAILABLE FAILED TO SET
1361 6156 CLRDET /CLEAR DETECTOR F/F'S
1362 6165 SKPDAV /SKIP ON DATA AVAILABLE DETECTOR F/F
1363 4427 ERROR /DATA AVAILABLE GOT CLEARED
1364 6807 CAF /CLEAR ALL FLAGS
1365 4146 RTCCNA /SET REAL TIME CLOCK INT ENA
1366 6801 ION /TURN THE INTERRUPT ON
1367 6156 CLRDET /CLEAR THE SIMULATOR DETECTOR F/F'S
1368 6165 SKPDAV /SKIP ON DATA AVAILABLE DETECTOR F/F
1369 7610 SKP CLA
1370 4427 ERROR /INIT FAILED TO CLEAR DATA AVAILABLE
1371 6571 DBSK /SKIP ON DATA READY
1372 7610 SKP CLA
1373 4427 ERROR /INIT FAILED TO CLEAR DATA READY
1374 1841 TAD INTFLG /GET THE PROGRAM INTERRUPT FLAG
1375 7640 SEA CLA
1376 4427 ERROR /ERROR, PROGRAM INTERRUPTED
1377 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.  
/\*\*\*\*\*

```

1486 4423 TEST21, LOOPPC /SETUP TEST COUNT AND TEST LOOP ADDRESS
1487 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 8001 ION /TURN THE INTERRUPT ON
1417 6156 CLRDET /CLEAR SIMULATOR DETECTOR F/F/S
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 AVILABLE DETECTOR F/F
1427 4427 ERROR /DBTD FAILED TO SET DATA AVAILABLE
1430 6156 CLRDET /CLEAR SIMULATOR DETECTOR F/F/S
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/F/S
1440 6165 SKPDAV /SKIP ON SIMULATOR DETECTOR F/F
1441 4427 ERROR /DATA AVAILABLE GOT CLEARED
1442 6570 DBST /SKIP ON DATA ACCEPTED, 2 DATA AVAILABLE
1443 4427 ERROR /DBCF FAILED TO SET DATA ACCEPTED
1444 6156 CLRDET /CLEAR SIMULATOR DETECTOR F/F/S
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 TAD INTFLG /GET THE PROGRAM INTERRUPT FLAG
1454 7640 SZA CLA
1455 4427 ERROR /PROGRAM INTERRUPTED
1456 4424 DONLDP /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",  
/\*\*\*\*\*

```

1497 4423 TEST22, LOOPPC /SETUP TEST COUNT AND TEST LOOP ADDRESS
1460 7777 =1 /SIMULATOR ITERATION COUNTER
1461 4436 SIMCHK /CHECK FOR SIMULATOR
1462 4000 4000 /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/F/S
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
1500 4427 ERROR /DBTD FAILED TO TO SET DATA AVAILABLE
1501 6156 CLRDET /CLEAR SIMULATOR DETECTOR F/F/S
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 AVILABLE DETECTOR F/F
1515 4427 ERROR /DATA AVILABLE FAILED TO SET
1516 6156 CLRDET /CLEAR SIMULATOR DETECTOR F/F/S
1517 6165 SKPDAV /SKIP ON DATA AVILABLE 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 DONLDP /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
1540 4146 RTCENA /SET REAL TIME CLOCK INT ENA
    
```

```

1541 6001 ION /TURN THE INTERRUPT ON
1542 6031 KSF /CHECK TO SEE IF RECEIVE FLAG IS A 0
1543 7610 SKP CLA
1544 4427 ERROR /RECEIVE FLAG SET OR KSF SKIPPED
1545 6039 KIE /CLEAR SLU INT ENA
1546 7610 SKP CLA
1547 4427 ERROR /KIE SKIPPED;
1550 1041 TAD INTFLG
1551 7640 SEA CLA
1552 4427 ERROR /PROGRAM INTERRUPTED
1553 6040 TFL /SET THE TRANSMIT FLAG
1554 7410 SKP
1555 4427 ERROR /TFL SKIPPED
1556 6041 TSP /SKIP ON XMIT FLAG
1557 4427 ERROR /TFL * TFS FAILED TO SET XMIT FLAG OR NO SKIP OCCURRED
1560 6049 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 6031 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 SEA CLA
1570 4427 ERROR /PROGRAM INTERRUPTED WITHOUT INT ENA SET
1571 6042 TCF /CLEAR TRANSMIT FLAG
1572 7410 SKP
1573 4427 ERROR /TCF SKIPPED
1574 6041 TSP /SKIP ON XMIT FLAG
1575 7410 SKP
1576 4427 ERROR /TCF * TFS FAILED TO CLEAR XMIT FLAG
1577 6049 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 6031 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 SEA CLA
1607 4427 ERROR /PROGRAM INTERRUPTED WITHOUT INT ENA * FLAG
1610 4424 DONLDP /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 LODSIM /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
/LOOP = THIS ADDRESS IF SIMULATOR SELECTED
/OTHERWISE SCOPE LOOP IS THIS ADDRESS *1
1616 3041 DCA INTFLG /CLEAR PROGRAM INTERRUPT FLAG
1617 6007 CAF

```

```

1620 4146 RTCENA /SET REAL TIME CLOCK INT ENA
1621 6001 ION /TURN THE INTERRUPT ON
1622 6039 KIE /CLEAR SLU INT ENA
1623 6040 TFL /SET THE TRANSMIT FLAG
1624 6041 TSP /SKIP ON THE XMIT FLAG
1625 4427 ERROR /TFL AND TFS FAILED TO SET THE XMIT FLAG
1626 6049 SPI /SKIP ON XMIT/RECEIVE * INT ENA
1627 7410 SKP
1630 4427 ERROR /SPI SKIPPED WITHOUT INT ENA SET OR KIE FAILED
1631 6007 CAF /CLEAR ALL FLAGS
1632 6041 TSP /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 SEA CLA
1637 4427 ERROR /PROGRAM INTERRUPTED CHECK INT ENA;
1640 6031 KSF /SKIP ON RECEIVE FLAG
1641 7610 SKP CLA
1642 4427 ERROR /RECEIVE FLAG SET BY ABOVE CODE
1643 4424 DONLDP /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 LODSIM /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
/LOOP = THIS ADDRESS IF SIMULATOR SELECTED
/OTHERWISE SCOPE LOOP IS THIS ADDRESS *1
1651 3041 DCA INTFLG /CLEAR PROGRAM INTERRUPT FLAG
1652 6007 CAF /CLEAR ALL FLAGS BUT SET SLU INTERRUPT ENABLE
1653 4146 RTCENA /SET REAL TIME CLOCK INT ENA
1654 6001 ION /TURN THE INTERRUPT ON
1655 6041 TSP /SKIP ON XMIT FLAG
1656 7410 SKP
1657 4427 ERROR /XMIT FLAG SET AFTER A CAF
1660 6049 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 SEA CLA
1665 4427 ERROR /PROGRAM INTERRUPTED WITHOUT XMIT FLAG
1666 6040 TFL /SET THE TRANSMIT FLAG
1667 6041 TSP /SKIP ON THE TRANSMIT FLAG
1670 4427 ERROR /TFL FAILED TO SET THE XMIT FLAG
1671 6049 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 2041 ISE INTFLG /DID 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 TFS WILL CLEAR THE XMIT FLAG AND THEN SET IT WITH
/XMIT BUFF HT 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 7772 =6 /SIMULATOR ITERATION COUNTER
2006 4436 SIMCHK /CHECK TO SEE IF SIMULATOR SELECTED,
2007 4030 /CONTROL WORD FOR SIMULATOR
2008 4437 LODSIM /LOAD SIMULATOR=MUST BE SET FOR XOR
2010 5217 JMP TEST27+5 /START TEST
2011 5217 TEST27, LOOPPC /SETUP TEST COUNT AND SCOPE LOOPING ADDRESS
2012 4423 =40 /SIMULATOR ITERATION COUNTER
2013 7740 /CHECK TO SEE IF SIMULATOR IS SELECTED
2014 4436 SIMCHK /CONTROL WORD FOR THE SIMULATOR
2015 4000 /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
2016 4437 LODSIM /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

```

```

2032 6046      TLS
2033 7610      SKP CLA
2034 4427      ERROR
2035 6001      ION
2036 6041      TSP
2037 7610      SKP CLA
2040 4427      ERROR
2041 4431      TSPHAT
2042 4427      ERROR
2043 2041      ISE INTFLG
2044 4427      ERROR
2045 6045      SPI
2046 4427      ERROR
2047 6042      TCF
2050 6001      ION
2051 4432      KSFHAT
2052 4427      ERROR
2053 6045      SPI
2054 4427      ERROR
2055 2041      ISE INTFLG
2056 4427      ERROR
2057 6030      KCF
2060 7610      SKP CLA
2061 4427      ERROR
2062 6001      ION
2063 6031      KSF
2064 7610      SKP CLA
2065 4427      ERROR
2066 1041      TAD INTFLG
2067 7640      SEA CLA
2070 4427      ERROR
2071 6041      TSP
2072 7610      SKP CLA
2073 4427      ERROR
2074 4424      DONL0P

```

```

/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 RCV DATA AVAILABLE
/SKIP ON RCV FLAG AND INT ENA
/0 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 20 = CHECKS THAT TPC WILL NOT CLEAR XMIT FLAG AND THAT IT WILL  
 /RESET IT, TEST 20 ALSO CHECKS THAT THE RECEIVE FLAG WILL SET AND THAT IT  
 /CAN BE CLEARED BY KCC;  
 .....

```

2075 1021      TAD      OP1SEL
2076 0377      AND      1100
2077 7650      SNA      CLA
2100 5307      JMP      TEST20
2101 4423      LOOPPC
2102 7772      =6
2103 4436      SIMCHK
2104 4010      4010
2105 4437      LODSIH
2106 5314      JMP      TEST20+5
2107 4423      TEST20, LOOPPC
2110 7740      =40
2111 4436      SIMCHK

```

```

/GET THE HARDWARE CONFIGURATION
/MASK OUT THE XOR BIT
/IS THE XOR SELECTED
/NO, DO THE NORMAL TEST
/YES=SETUP TEST COUNT AND SCOPE LOOP
/SIMULATOR ITERATION COUNTER
/CHECK TO SEE IF SIMULATOR SELECTED
/CONTROL WORD FOR SIMULATOR
/LOAD SIMULATOR CONTROL WORD
/START THE TEST
/SETUP TEST COUNT AND SCOPE LOOPING ADDRESS
/SIMULATOR ITERATION COUNTER
/CHECK TO SEE IF SIMULATOR IS SELECTED

```

```

2112 4000      4000
2113 4437      LODSIH

```

```

2114 3041      DCA INTFLG
2115 6007      CAF
2116 4146      RTCEA
2117 6001      ION
2120 6040      TFL
2121 6041      TSP
2122 4427      ERROR
2123 2041      ISE INTFLG
2124 4427      ERROR
2125 6044      TPC
2126 7610      SKP CLA
2127 4427      ERROR
2130 6041      TSP
2131 4427      ERROR
2132 6042      TCF
2133 6001      ION
2134 4431      TSPHAT
2135 4427      ERROR
2136 2041      ISE INTFLG
2137 4427      ERROR
2140 6042      TCF
2141 6001      ION
2142 4432      KSFHAT
2143 4427      ERROR
2144 6045      SPI
2145 4427      ERROR
2146 2041      ISE INTFLG
2147 4427      ERROR
2150 6032      KCC
2151 7610      SKP CLA
2152 4427      ERROR
2153 6001      ION
2154 6031      KSF
2155 7610      SKP CLA
2156 4427      ERROR
2157 1041      TAD INTFLG
2160 7640      SEA CLA
2161 4427      ERROR
2162 4424      DONL0P

```

```

2163 5776      JMP      TEST29
2176 2200
2177 2100
2200

```

```

/CONTROL WORD FOR THE SIMULATOR
/LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
/LOOP = THIS ADDRESS IF SIMULATOR SELECTED
/OTHERWISE SCOPE LOOP IS THIS ADDRESS +1
/CLEAR PROGRAM INTERRUPT
/CLEAR ALL FLAGS BUT SET SLU INT ENA
/SET REAL TIME CLOCK INT ENA
/TURN THE INTERRUPT ON
/SET THE TRANSMIT FLAG
/SKIP ON TRANSMIT FLAG
/TFL FAILED TO SET XMIT FLAG
/PROGRAM FAILED TO INTERRUPT
/LOAD TRANSMIT BUFFER AND TRANSMIT
/TPC SKIPPED
/SKIP ON XMIT FLAG
/TPC CLEARED XMIT FLAG
/CLEAR TRANSMIT FLAG
/TURN THE INTERRUPT BACK ON
/WAIT FOR XMIT BUFF MT H TO SET XMIT FLAG
/TPC FAILED TO SET XMIT FLAG
/CHECK TO SEE IF PROGRAM INTERRUPTED
/PROGRAM FAILED TO INTERRUPT WITH XMIT FLAG + INT ENA
/CLEAR THE TRANSMIT FLAG
/TURN THE INTERRUPT ON
/WAIT FOR RECEIVE FLAG TO SET
/RECEIVE FLAG FAILED TO SET BY A TPC COMMAND
/SKIP ON RCV FLAG AND INT ENA
/FAILED TO SKIP
/DID THE PROGRAM INTERRUPT
/FAILED TO INTERRUPT WITH RCV AND INT ENA SET
/CLEAR THE RECEIVE FLAG
/KCC SKIPPED
/TURN THE INTERRUPT ON
/SKIP ON RECEIVE FLAG
/KCC FAILED TO CLEAR RCV FLAG
/GET THE PROGRAM INTERRUPT FLAG
/PROGRAM INTERRUPTED WITH RCV FLAG CLEARED
/REPEAT TEST IF NOT DONE OR LOOP ON TEST IF SR2=1

```

IFDEF OP13K <PAGE>

.....  
 /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 3292 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 TFS /TRANSMIT AND CLEAR THE FLAG
2215 4431 TSWAT /WAIT FOR THE XMIT FLAG TO SET
2216 4427 ERROR /XMIT FLAG FAILED TO SET BY TFS
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 KSWAT /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 SEA 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
2260 6046 TFS /TRANSMIT AND CLEAR THE XMIT FLAG
2261 4431 TSWAT /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 KSWAT /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
2280 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 CHA 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 CHA
2320 6032 KCC /CLEAR RECEIVE FLAG AND AC
2321 7640 SEA CLA
2322 4427 ERROR /KCC FAILED TO CLEAR THE AC
2323 7240 CLA CHA
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 CHA
2330 6034 KRS /READ RECEIVE BUFFER = INCLUSIVE OR WITH AC
2331 7040 CHA /SET THE AC BACK TO 2
2332 7640 SEA CLA
2333 4427 ERROR /KRS CHANGED THE AC

```

```

2334 7340          CLA CLL CMA
2335 8831          KSF
2336 7840          CMA
2337 7640          SEA CLA
2340 4427          ERROR
2341 7240          CLA CMA
2342 8830          KCF
2343 7840          CMA
2344 7640          SEA CLA
2345 4427          ERROR
2346 7240          CLA CMA
2347 8840          TFL
2350 7840          CMA
2351 7640          SEA CLA
2352 4427          ERROR
2353 7240          CLA CMA
2354 8842          TCF
2355 7840          CMA
2356 7640          SEA CLA
2357 4427          ERROR
2360 7240          CLA CMA
2361 8841          TSF
2362 7840          CMA
2363 7640          SEA CLA
2364 4427          ERROR
2365 7240          CLA CMA
2366 8844          TPC
2367 7840          CMA
2370 7640          SEA CLA
2371 4427          ERROR
2372 4431          TSFAT
2373 4427          ERROR
2374 4432          KSFHAT
2375 4427          ERROR
2376 8842          TCF
2377 8830          KCF
2400 7240          CLA CMA
2401 8845          SPI
2402 7840          CMA
2403 7640          SEA CLA
2404 4427          ERROR
2405 7240          CLA CMA
2406 8846          TLS
2407 7840          CMA
2410 7640          SEA CLA
2411 4427          ERROR
2412 4431          TSFAT
2413 4427          ERROR
2414 4432          KSFHAT
2415 4427          ERROR
2416 8842          TCF
2417 8832          KCF
2420 1041         TAD INTFLG
2421 7640          SEA CLA
2422 4427          ERROR

```

```

2423 4424          DONLDP

```

/REPEAT TEST IF NOT DONE OR LOOP IF SR2=1

```

/*****
/TEST 32 = CHECKS THAT ALL ZEROS CAN BE TRANSMITTED AND READ BACK IN
/*****
2424 4423          TEST32, LOOPPC
2425 7775          +3
2426 4436          SIMCHK
2427 4817          4817
2430 4437          LODSIM

```

/SETUP TEST COUNT AND SCOPE LOOP ADDRESS  
/SIMULATOR ITERATION COUNTER  
/CHECK TO SEE IF SIMULATOR IS SELECTED  
/CONTROL WORD FOR THE SIMULATOR  
/LOAD SIMULATOR IF SELECTED ALSO SET SCOPE  
/LOOP = THIS ADDRESS IF SIMULATOR SELECTED  
/OTHERWISE SCOPE LOOP IS THIS ADDRESS +1  
/CLEAR PROGRAM INTERRUPT FLAG  
/CLEAR THE WORD TO BE TRANSMITTED  
/GO TRANSMIT, READ AND COMPARE THE WORD  
/GO ERROR=WORD WAS NON ZERO BEING READ BACK  
/REPEAT TEST IF NOT DONE OR LOOP IF SR2=1

```

/*****
/TEST 33 = CHECKS THAT ALL ONES CAN BE TRANSMITTED AND READ BACK
/*****
2436 4423          TEST33, LOOPPC
2437 7775          +3
2440 4436          SIMCHK
2441 4817          4817
2442 4437          LODSIM

```

/SETUP TEST COUNT AND SCOPE LOOP ADDRESS  
/SIMULATOR ITERATION COUNTER  
/CHECK TO SEE IF SIMULATOR IS SELECTED  
/CONTROL WORD FOR THE SIMULATOR  
/LOAD SIMULATOR IF SELECTED ALSO SET SCOPE  
/LOOP = THIS ADDRESS IF SIMULATOR SELECTED  
/OTHERWISE SCOPE LOOP IS THIS ADDRESS +1  
/CLEAR PROGRAM INTERRUPT FLAG  
/SET THE WORD TO BE TRANSMITTED TO ALL ONE'S  
/GO TRANSMIT, READ AND COMPARE  
/GO ERROR = WORDS DO NOT COMPARE  
/REPEAT TEST IF NOT DONE OR LOOP IF SR2=1

```

/*****
/TEST 34 = CHECKS THAT A COMPLEMENTING PATTERN (700=377) CAN BE
/TRANSMITTED AND READ BACK;
/*****
2451 4423          TEST34, LOOPPC
2452 7775          +3
2453 4436          SIMCHK
2454 4817          4817
2455 4437          LODSIM

```

/SETUP TEST COUNT AND SCOPE LOOPING ADDRESS  
/SIMULATOR ITERATION COUNTER  
/CHECK TO SEE IF SIMULATOR IS SELECTED  
/CONTROL WORD FOR THE SIMULATOR  
/LOAD SIMULATOR IF SELECTED ALSO SET SCOPE  
/LOOP = THIS ADDRESS IF SIMULATOR SELECTED  
/OTHERWISE SCOPE LOOP IS THIS ADDRESS +1  
/CLEAR PROGRAM INTERRUPT FLAG  
/CLEAR THE WORD TO BE TRANSMITTED  
/GO TRANSMIT READ AND COMPARE THE WORD  
/GO ERROR = TRANSMITTING ZEROS

```

2456 3841          DCA INTFLG
2457 3853          DCA SLUXHT
2460 4433          SLUDAT
2461 4434          SLUDER
2462 1056          TAD K377

```



```

2463 3053      DCA SLUXHT      /SET THE WORD TO TRANSMIT EQUAL TO 377
2464 4433      SLUDAT          /TRANSMIT, READ AND COMPARE THE WORD
2465 4434      SLUDER          /DATA ERROR = WHILE TRANSMITTING 377
2466 4424      DONLDP          /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      TEST35, 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      L0DSIM          /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 3053      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 3053      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      DONLDP          /REPEAT TEST IF NOT DONE OR LOOP IF SR2=1

```

```

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

2506 4423      TEST36, LOOPPC      /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      L0DSIM          /LOAD THE SIMULATOR IF SELECTED
2520 1047      TAD TSTCNT      /GET THE WORD TO BE TRANSMITTED
2521 1056      AND K377        /MASK OFF THE 8 BITS
2522 3053      DCA SLUXHT      /SET TRANSMIT WORD TO THIS NUMBER
2523 4433      SLUDAT          /TRANSMIT, READ AND COMPARE THE WORD
2524 4434      SLUDER          /DATA ERROR=
2525 4424      DONLDP          /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
/*****

```

```

/*****
2526 4423      TEST37, LOOPPC      /SET UP TEST COUNT AN TEST LOOP ADDRESS
2527 7777      -1              /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      L0DSIM          /LOAD THE SIMULATOR CONTROL WORD
2540 6007      CAF          /CLEAR ALL FLAGS
2541 4146      RTGENA        /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 1056      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      TIS          /TRANSMIT IT
2552 4431      TSWAT          /WAIT FOR THE TRANSMIT FLAG TO SET
2553 4427      ERROR          /TRANSMIT FLAG FAILED TO SET
2554 6042      TCF          /CLEAR THE TRANSMIT FLAG
2555 4432      KSWAT          /WAIT FOR THE RECEIVE FLAG TO SET
2556 4427      ERROR          /RECEIVE FLAG FAILED TO SET
2557 7240      CLA          /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          /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          /PROGRAM INTERRUPTED WITHOUT INT ENA
2571 4427      ERROR          /DONE? OR REPEAT TEST IF SR2=1
2572 4424      DONLDP
2573 7000      NOP
2574 7000      NOP

2575 1021      TAD OP1SEL      /GET THE HARDWARE CONFIGURATION
2576 1057      AND K200        /CHECK FOR THE SIMULATOR
2577 7650      SNA          /IS IT SELECTED
2602 5602      JMP I          /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,
/*****

```

```

/*****
2683 4423 TEST38, LOOPPC /SETUP TEST COUNT AND TEST LOOP ADDRESS
2684 7777 =1 /SIMULATOR ITERATION COUNT
2685 4436 SIMCHK /CHECK FOR SIMULATOR
2686 4000 4888 /SIMULATOR CONTROL WORD
2687 4437 LODSIM /LOAD THE SIMULATOR CONTROL WORD
2688 6007 CAF /CLEAR ALL
2689 4146 RTCENA /SET REAL TIME CLOCK INT ENA
2690 3041 DCA INTFLG /CLEAR THE PROGRAM INTERRUPT FLAG
2691 4104 JMS PATCH
2692 3252 SKPCHN
2693 6001 ION /TURN THE INTERRUPT ON
2694 6156 CLRDET /CLEAR READER RUN DETECTOR FLIP=FLOP
2695 6157 SKPRDR /SKIP ON READER RUN F/F SET
2696 7610 SKP CLA
2697 4427 ERROR /READER RUN IS SET AFTER A INITIALIZE
2698 6032 KCC /CLEAR RECEIVE FLAG AND SET READER RUN
2699 6157 SKPRDR /SKIP ON READER RUN SET
2700 4427 ERROR /KCC FAILED TO SET READER RUN
2701 6007 CAF /CLEAR ALL INCLUDING READER RUN F/F
2702 4146 RTCENA /SET REAL TIME CLOCK INT ENA
2703 6001 ION /TURN THE INTERRUPT BACK ON
2704 6156 CLRDET /CLEAR READER RUN DETECTOR F/F
2705 6157 SKPRDR /SKIP ON READER RUN SET
2706 7410 SKP
2707 4427 ERROR /INITIALIZE FAILED TO CLEAR READER RUN
2708 6036 KRB CLA /CLEAN AC AND RECEIVE FLAG AND SET READER RUN
2709 7300 SKPRDR CLL
2710 6157 ERROR /SKIP ON READER RUN DETECTOR F/F SET
2711 4427 SKPRDR /KRB FAILED TO SET READER RUN
2712 6007 CAF /CLEAR ALL INCLUDING READER RUN F/F
2713 4146 RTCENA /SET REAL TIME CLOCK INT ENA
2714 6001 ION /TURN THE INTERRUPT ON
2715 6156 CLRDET /CLEAR READER RUN DETECTOR F/F
2716 6157 SKPRDR /SKIP ON READER RUN F/F SET
2717 7610 SKP CLA
2718 4427 ERROR /INITIALIZE FAILED TO CLEAR READER RUN
2719 1041 TAD INTFLG /GET THE PROGRAM INTERRUPT FLAG
2720 7640 SZA CLA
2721 4427 ERROR /PROGRAM INTERRUPTED
2722 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 4888 /SIMULATOR CONTROL WORD

```

```

2697 4437 LODSIM /LOAD THE SIMULATOR
2698 6007 CAF /CLEAR ALL FLAGS
2699 4146 RTCENA /SET REAL TIME CLOCK INT ENA
2700 6001 ION /TURN THE INTERRUPT ON
2701 6035 KIE /DISABLE SLU INT ENABLE
2702 6156 CLRDET /CLEAR READER RUN
2703 6157 SKPRDR /SKIP ON READER DETECTOR F/F SET
2704 7610 SKP CLA
2705 4427 ERROR /READER RUN FAILED TO CLEAR BY INIT
2706 6032 KCC /SET READER RUN
2707 6157 SKPRDR /SKIP ON READER RUN DETECTOR F/F SET
2708 4427 ERROR /KCC FAILED TO SET READER RUN
2709 6046 TFS /TRANSMIT
2710 4431 TSPHAT /WAIT FOR THE TRANSMIT FLAG
2711 4427 ERDR /TRANSMIT FLAG FAILED TO SET
2712 6042 TCF /CLEAR THE TRANSMIT FLAG
2713 4432 KSPHAT /WAIT FOR THE RECEIVE FLAG
2714 4427 ERROR /RECEIVE FLAG FAILED TO SET
2715 6156 CLRDET /CLEAR READER RUN DETECTOR F/F
2716 6157 SKPRDR /SKIP ON READER RUN DETECTOR F/F SET
2717 6150 SKP CLA
2718 4427 ERROR /CLOCK PULSE TO READER RUN FAILED TO CLEAR READER RUN
2719 4424 DONLOP /REPEAT TEST FOR NEXT BAUD RATE
2720 1021 TAD OP1SEL /GET THE HARDWARE CONFIGURATION
2721 0377 AND (100 /MASK OUT THE XOR BIT
2722 7650 SNA CLA /IS THE XOR SELECTED
2723 2776 JMP TEST40 /NO, GO TO THE NEXT TEST
2724 5440 PRGEND /YES, END THE THE PROGRAM THEN
2776 3000
2777 0100
3000 IFDEF OP13K <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 436 DCA CLKFLG /SET INTERRUPT TO IGNORE RTC
3005 436 SIMCHK /CHECK FOR SIMULATOR
3006 4100 4100 /CONTROL WORD FOR THE SIMULATOR
3007 4437 LODSIM /LOAD THE SIMULATOR CONTROL WORD
3008 1377 TAD (=20
3009 3043 DCA CNT
3010 6007 CAF /CLEAR ALL
3011 3043 RTCENA /SET REAL TIME CLOCK INT ENA
3012 6001 ION /TURN THE INTERRUPT ON
3013 6141 STRFRQ /START A FREQUENCY COUNT
3014 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
3033 5227 JMP ,=4 /GO BACK FOR NEXT ALLOWED NUMBER
3034 4427 ERROR /RTC TIMING ERROR PRESS "CONT" FOR
 /SIMULATOR CONTROL WORD
3035 4435 SHMCHK /CHECK SR1 TO LOOP ON ERROR
3036 7004 RAL /PUT IT IN BIT 0
3037 7710 SPA CLA
3040 5446 JMP I TSTLOP /REPEAT TEST
3041 4424 RTIMOK, DONLOP /DONE OR REPEAT TEST IF SR2=1
3042 5245 JMP TEST41 /GO TO NEXT TEST

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 SHMCHK /CHECK FOR THE SIMULATOR
3050 4000 4000 /SIMULATOR CONTROL WORD
3051 4437 LOSSIM /LOAD THE SIMULATOR CONTROL WORD
3052 1377 TAD (=20
3053 3043 DCA CNT
3054 4007 CAF
3055 4146 RTCEA /CLEAR ALL FLAGS
3056 6035 KIE /SET REAL TIME CLOCK INT ENA
3057 6001 ION /CLEAR SLU INTERRUPT ENABLE
3060 6161 STRFRQ /TURN THE INTERRUPT ON
3061 6162 SKPFRQ /START A FREQUENCY COUNT
3062 7610 SKP CLA /SKIP ON FREQUENCY COUNT IN PROGRESS
3063 5251 JMP ,=2 /FREQUENCY COUNT ENDED GO READ IT
3064 6163 LODFRQ /WAIT FOR FREQUENCY COUNT ENDED
3065 3243 DCA FROCNT /LOAD FREQUENCY COUNT INTO AC
3066 1055 TAD CONTD /SAVE THE WORD READ
3067 0064 AND K7 /GET THE CONTROL WORD
3070 1376 TAD (FROTAB /MASK OUT THE BAUD RATE
3071 3273 DCA TABFRQ /GET THE ADDRESS OF FREQUENCY TABLE
3072 7410 SKP /SAVE THE ADDRESS
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 /LOOP?
3111 5446 JMP I TSTLOP /YES DO SAME BAUD RATE
3112 4424 SLUTOK, DONLOP /DONE OR REPEAT TEST IF SR2=1
3113 5324 JMP TEST42 /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 = 2003 + OR = 10
3116 3723 =4055 /300 BAUD = 2003 + OR = 10
3117 3723 =4055 /600 BAUD = 2003 + OR = 10
3120 5744 =2034 /1200 BAUD = 1042 + OR = 10
3121 6755 =1023 /2400 BAUD = 0521 + OR = 10
3122 7302 =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 SHMCHK /CHECK TO SEE IF SIMULATOR IS SELECTED
3127 4017 4017 /CONTROL WORD FOR THE SIMULATOR
3130 4437 LOSSIM /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 RTCEA /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 P10XMT /SET P10 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 RTCF LG /SET RTC FLAG TO INACTIVE
3151 1066 TAD H10
3152 3076 DCA PNBINT /SETUP A COUNT FOR NO INT'S ON P 1/0
3153 1367 TAD M40 /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 RTC INT ENA
3161 7200 CLA
3162 6575 DBSE /SET 12 BIT PARALLEL I/O INT ENA
3163 6046 T15 /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 M40, =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 7348 CLA CLL CMA
3202 1200 TAD PCLOOP
3203 3045 DCA TEST
3204 1400 TAD I PCLOOP
3205 3067 DCA SIMCNT
3206 7240 CLA CMA
3207 3050 DCA SAVCNT
3208 1050 TAD SAVCNT
3209 3047 DCA TSTCNT
3210 2200 ISE PCLOOP
3211 5600 JMP I PCLOOP

```

```

3214 0000 SIMLOD, 0
3215 1055 TAD CONTWD /GET THE CONTROL WORD
3216 6151 LOADSM /LOAD THE SIMULATOR CONTROL WORD
3217 7300 CLA CLL
3220 5614 JMP I SIMLOD

3221 0000 LOPDON, 0
3222 4623 JMS I ,+1 /GO CHECK TO SEE IF XOR ERROR
3223 4626 D0NDNE
3224 1021 TAD OP1SEL /IS THE SIMULATOR SELECTED
3225 1057 AND X200
3226 7650 SNA CLA
3227 5237 JMP LOOPSW /SIMULATOR NOT SELECTED,CHECK TEST LOOP SWITCH
3230 2067 ISE SIMCNT /ADD A 1 TO THE CONTROL WORD?
3231 7610 SKP CLA
3232 5237 JMP LOOPSW /NO,CHECK TEST LOOP SWITCH
3233 2055 ISE CONTWD /ADD 1 TO THE CONTROL WORD FOR BAUD RATES
3234 1050 TAD SAVCNT /GET THE TEST COUNT
3235 3047 DCA TSTLTP /RESTORE IT FOR A NEW PASS FOR A DIFFERENT BAUD
3236 5446 JMP I TSTLTP /RETURN FOR NEW BAUD RATE
3237 4435 LOOPSW, SWCHK /CHECK FOR SR2=1
3240 7006 RTI
3241 7700 SNA CLA /LOOP?
3242 5621 JMP I LOPDON /NO,GO TO NEXT TEST
3243 5445 JMP I TEST /YES,LOOP ON THIS TEST

```

```

3244 6102 SIMINT, SPL /SKIP ON POWER LOW
3245 7410 SKP
3246 5777 JMP POWFAL /POWER GOING DOWN = GO SAVE EVERYTHING
3247 3251 DCA AC /SAVE THE AC
3250 5317 JMP FLGCK5 /RETURN TO THE PROGRAM

```

```

3251 0000 AC, 0

3252 6102 SKPCHN, SPL /SKIP ON POWER LOW
3253 7410 SKP
3254 5777 JMP POWFAL /POWER GOING DOWN SAVE EVERYTHING
3255 3251 DCA AC /SAVE THE AC
3256 1042 TAD CLKFLG /HERE WE EXPECTING A CLOCK INTERRUPT?
3257 7650 SNA CLA
3260 4776 JMS CHKACT /GO CHECK FOR THE ACT LINE
3261 6137 CLSK /YES = SKIP ON REAL TIME CLOCK FLAG
3262 7410 SKP
3263 9303 JMP FLGCK1 /GO CHECK THE OTHER FLAGS
3264 1134 TAD ACTFLG /GET THE ACT FLAG
3265 7440 SZA /DID THE PROGRAM GO TO THE PROM ?
3266 5276 JMP ACTCK2 /YES,CHECK PARALLEL I/O DATA ACCEPTED
3267 4775 JMS INTXDR /GO CHECK FOR THE XOR BIT AND TSP FLAG
3270 6031 KSF /WAS IT A RECEIVE FLAG?
3271 7410 SKP
3272 5311 JMP FLGCK3 /YES = GO CHECK THE OTHER FLAGS
3273 6571 DBSK /WAS THE DATA READY FLAG SET?
3274 7410 SKP

```

```

3275 5314      JMP FLGCK4      /YES = CHECK DATA ACCEPTED FLAG
3276 6578      ACTCK2, DBST      /HAS DATA ACCEPTED SET=IF SO CLEAR IT
3277 7648      SEA 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
3310 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      DCA 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      CLL      /CLEAR INTERRUPT ENABLE P/F
3332 1150      TAD      K7710
3333 3044      DCA      CNT1
3334 3043      DCA      CNT
3335 4773      JMS      TSFXOR      /GO CHECK FOR XDR AND XMIT FLAG
3336 4362      JMS      ADDTIM      /GO ADD ONE TO THE COUNTER
3337 2327      ISZ
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
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      SWCHK      /GO GET SWITCH REGISTER
3402 7006      RTL
3403 7004      RAL
3404 4605      JMS I ,+1
3405 4600      PASSED
3406 5777      JMP      0200      /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 DP1SEL
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 00 /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 1269 TAD KJMP7
3444 3636 DCA I K0
3445 1045 TAD TEST
3446 3686 DCA I KTEST
3447 1267 TAD FLGRST
3448 3670 DCA I C7
3449 1133 TAD KRTF
3450 3671 DCA I K10
3451 1272 TAD KJMPT
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 FLGRST, TAD 12
3470 0007 C7, 7
3471 0010 K10, 10
3472 5445 KJMPT, 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 SWHCHK /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 /AC = ADDRESS WHERE ERROR WAS DETECTED
3505 4314 JMS SIMWRD /WAS THE SIMULATOR SELECTED
3506 7402 HLT /AC=SIMULATOR CONTROL WORD
3507 4435 AERSWH, SWHCHK /CHECK SR1=1 TO LOOP ON ERROR
3510 7804 RAL
3511 7700 SMA CLA
3512 5675 JMP I AERROR /RETURN WITHOUT LOOPING ON TEST
3513 5446 JMP I TSTL0P /SCOPE LOOP GO BACK TO START OF TEST SECTION

3514 0000 SIMWRD, 0
3515 7300 CLA CLL
3516 1021 TAD OP2SEL
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 5900 JMP I BADPAS /GO TO THE PROM

3543 0000 ERRPC, 0

```

```

3544 0000  CHKACT, 0
3545 6137  CLSK /HAS 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 OP2SEL /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 5390  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 0800  /RETURN TO THE PROGRAM
3565 2102  ACTRET, 0
3566 5357  ONACTL, ISZ ACTCNT /100 CLOCK TICKS YET?
3567 1103  JMP CLKSET+9 /NO RETURN TO PROGRAM
3568 1103  TAD M144 /RESET ACT TIME COUNTER
3569 3102  DCA ACTCNT /SAVE THE NUMBER
3570 4272  CIF 70 /CHANGE INSTRUCTION FIELD TO 7
3571 4501  JMS I GOODPS /SIGNAL PROM THAT PROGRAM STILL PAS
3572 7240  CLA CHA
3573 3134  DCA ACTFLG /SET THE ACT LINE FLAG TO ONES
3574 5357  JMP CLKSET+5 /RETURN TO THE PROGRAM

3576 3251
3577 2200
3600
PAGE

```

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

```

3600 0000  DATPIO, 0
3601 6007  CAF /CLEAR ALL
3602 4146  RTCENA /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  OBSK /SKIP ON DATA READY
3611 4427  ERROR /ERROR, DATA HEADY FLAG FAILED TO SET SY DBTD
3612 2041  ISZ INTFLG /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 3052  DCA PIOREC /SAVE THE WORD READ
3617 6571  OBSK /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 ACCEPY
3625 7610  SKP CLA
3626 4427  ERROR /DATA ACCEPT FAILED TO CLEAR IN INTERRUPT ROUTINE
3627 2041  ISZ INTFLG /CHECK TO SEE IT IF INTERRUPTED
3630 4427  ERROR /DATA ACCEPY 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  RTCENA
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  RTCENA /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  TSWAT /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  KSWAT /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 RCY 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 RCY FLAG
3700 7640  SZA CLA
3701 4427  ERROR /KRB FAILED TO CLEAR RCY FLAG OR INTERRUPTED
3702 1053  TAD SLUXMT /GET THE WORD TRANSMITTED
3703 7041  CIA
3704 1054  TAD SLUREC /GET THE WORD READ BACK
3705 7640  SZA CLA
3706 5653  JMP I DATSLU /DATA ERROR-RETURN TO REPORT THE ERROR
3707 2253  ISZ DATSLU /BUMP RETURN ADDRESS POINTER BY ONE

```

3710 5653 JMP I 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 PIOSWH /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 PIDXMT /GET THE WORD TRANSMITTED
3723 7402 HLT /AC = THE GOOD WORD
3724 7200 CLA
3725 1052 TAD PIOREC /GET THE WORD READ
3726 7402 HLT /AC = THE BAD WORD = WORD READ
3727 4435 PIOSWH, SHMCHK /LOOP ON DATA ERROR IF SR1=1
3730 7004 RAL
3731 7700 SMA CLA /LOOP?
3732 5711 JMP I DERPIO /NO, RETURN TO TEST
3733 5446 JMP I 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 I DERSLU /NO, RETURN TO TEST
3760 5446 JMP I 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 1781 TAD I CHKSIM /GET THE CONTROL WORD
3767 3055 DCA CONTWD /SAVE IT
3770 7410 SKP
3771 0361 ISZ CHKSIM
3772 0361 ISZ CHKSIM
3773 1361 TAD CHKSIM
3774 3046 DCA TSTLOP
3775 5761 JMP I 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 RTCINT
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 RTCINT, CLCL /CLEAR THE CLOCK FLAG
4016 7300 CLA /CLEAR THE AC AND LINK
4017 2047 ISZ TSTCNT /DONE YET ?
4020 5213 JMP RTCINT=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 (17 /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
SLUSTR, DCA TSTCNT /SAVE THE POINTER IN TEST COUNT
4051 3047 TAD I TSTCNT /GET THE FIRST CONSTANT
4052 1447 DCA CNT /SAVE IT
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, KRB /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
SLUINT, KSF /SKIP ON THE RECEIVE FLAG
4071 0031 SKP CLA
4072 7610 JMP INTON /CLEAR THE RECEIVE FLAG AND TURN INT ON
4073 5264 TSF /SKIP IF TRANSMIT FLAG SET
4074 0041 ERROR /ILLEGAL INTERRUPT
4075 4427 ISZ CNT /ADD ONE TO THE FIRST COUNTER
4076 2043 JMP INTON+2
4077 5266 ISZ CNT1 /OVERFLOWED FIRST COUNT ADD 1 TO SECOND
4100 2044 JMP INTON+2 /GO DO ANOTHER 4095 INTERRUPTS
4101 5266 JMP CLA /WAS IT 30 SECONDS ???
4102 7602 JMP SLUIM /GO NO IT AGAIN OR START ANOTHER TEST
4103 5223

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=409 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 109,79 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 3156 =-4622 /11 BITS AT 218,18 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=26,102 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      ISZ     CNT
4165 5364      JMP      ,=1
4166 2044      ISZ     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
4202 3326      DCA      LINKRT      /SAVE THE LINK
4203 6102      SPL
4204 7610      SKP      CLA          /SKIP ON POWER LOW FLAG
4205 5777      JMP      POWFAL      /POWER GOING DOWN
4206 6041      TSF
4207 7610      SKP      CLA          /SKIP ON SLU XMIT FLAG
4210 5327      JMP      XMTSER      /XMIT FLAG SET GO SERVICE IT
4211 6031      KSF
4212 7610      SKP      CLA          /SKIP ON RECEIVE FLAG
4213 5776      JMP      RECOSER      /SERVICE THE RECEIVE FLAG AND COMPARE DATA
4214 6137      CLSK
4215 7610      SKP      CLA          /SKIP ON REAL TIME CLOCK FLAG
4216 5333      JMP      RTCOSER      /GO SERVICE THE RTC FLAG
4217 6571      DBSK
4220 7610      SKP      CLA          /SKIP ON P I/O DATA READY FLAG
4221 5224      JMP      PIOSER      /GO SERVICE THE PARALLEL I/O FLAG
4222 4427      ERROR
4223 5445      JMP      I TEST      /RESTART THE TEST
    
```

/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
4227 6573      DBCF
4230 3052      DCA      PIOREC      /READ THE 12 BIT P I/O DATA WORD
4231 6570      DBST
4232 4427      ERROR
4233 6570      DBST
4234 7610      SKP      CLA          /CLEAR THE DATA READY FLAG
4235 4427      ERROR
4236 4775      JMS      CHPACL      /SAVE THE WORD READ
4237 1051      TAD      PIOXMT      /SKIP AND CLEAR DATA ACCEPTED & DATA AVAIL.
4240 7041      CIA
4241 1052      TAD      PIOREC
4242 7640      SEA      CLA          /DBCF FAILED TO SET DATA ACCEPTED
4243 4774      JMS      PIDERR      /SKIP ON DATA ACCEPTED
4244 7301      CLA      CLL IAC      /DBST FAILED TO CLEAR DATA ACCEPTED
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      /COMPARE THE AC DATA AND LINK
4257 7010      RAR
4260 3072      DCA      LINK
4261 2051      ISZ     PIOXMT      /COMPARE THE XMITTED WITH WORD READ
4262 1051      TAD      PIOXMT
4263 6574      OBTD
4264 7300      CLA      CLL
4265 5306      JMP      ACLION      /ARE THEY EQUAL?
4266 1073      RTOSLU, TAD      XMTFLG      /NO DATA ERROR
4267 1074      TAD      RECFLG      /GENERATE A RANDOM AC DATA WORD
4270 1075      TAD      RTCFLG
4271 7650      SNA      CLA
4272 5276      JMP      RESET
4273 2077      ISZ     INACTV
4274 5306      JMP      ACLION
4275 4773      JMS      INACDV
4276 7340      RESET, CLA      CLL CMA
4277 3073      DCA      XMTFLG
4280 7240      CLA      CMA
4281 3074      DCA      RECFLG
4282 7240      CLA      CMA
4283 3075      DCA      RTCFLG
4284 1372      TAD      (=40
4285 3077      DCA      INACTV
4286 4771      ACLION, JMS      RETURN
4287 4322      INTERA
4288 7300      CLA      CLL
4289 1072      TAD      LINK
4290 1072      TAD      LINK
    
```

```

4312 7084      RAL
4313 1071      TAD      EXPACD      /GET THE AC DATA WORD
4314 6081      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 7308      CLA      CLL
4320 4427      ERROR
4321 5445      JMP I  TEST      /ERROR PARALLEL I/O FAILED TO INTERRUPT
                                   /RESTART THE TEST

4322 0000      INTERA, 0
4323 1234      RAN1,  1234
4324 5670      RAN2,  5670
4325 0000      ACDRET, 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      RTCFLO      /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
4344 3102      DCA      ACTCNT      /RESET ACT COUNTER
4345 4136      JMS      TSTGOD      /SAVE IT
4346 2047      ISZ      TSTCNT      /GOOD PAS SO FAR
4347 5266      JMP      RTCSLU      /INCREMENT PROGRAM TEST COUNTER
4350 4470      JMS I  DELAYR      /GO CHECK FOR ACTIVE DEVICES
4351 6007      CAF              /DELAY FOR 200MS TO ALLOW FLAGS TO SETTLE
4352 4136      JMS      TSTGOD      /CLEAN ALL FLAGS BUT SET SLU INT ENA
4353 4435      SHHCHK      /GOOD AGAIN!!!!
4354 7006      RTL              /CHECK SR2=1 TO LOOP ON TEST
4355 7710      SPA      CLA      /LOOP?
4356 5445      JMP I  TEST      /YES, DO TEST OVER
4357 5440      PRCEAD      /NO, END OF TEST

4371 3420
4372 7740
4373 4470
4374 4542
4375 4421
4376 4400
4377 3441
4420
    
```

PAGE

/SERIAL LINE UNIT INTERACTIVE RECEIVER SERVICE ROUTINE TEST 42

```

4400 3074      RECSEr, 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
4414 3053      DCA      SLUXMT      /MASK OUT FOR THE EIGHT BITS
4415 1053      TAD      SLUXMT      /SAVE THE NEW WORD
4416 6046      TLS              /GET THE WORD AND TRANSMIT IT
4417 7300      CLA      CLL      /LOAD AND TRANSMIT THE WORD
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      ACDRET      /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      /AC CONTAINS ADDRESS WHERE THE ERROR WAS DETECTED
4450 1071      TAD
4451 7402      HLT      EXPACD
4452 7200      CLA
4453 1776      TAD      ACDRET      /THE AC CONTAINS AC DATA BEFORE INTERRUPT
    
```

```

4454 7402      HLT                /THE AC CONTAINS AC DATA AFTER INTERRUPT
4455 7200      CLA
4456 1072     TAD                LINK
4457 7402     HLT                /THE AC CONTAINS THE LINK BEFORE INTERRUPT
4460 7200     CLA
4461 1779     TAD                LINKRT
4462 7402     HLT                /THE AC CONTAINS LINK AFTER INTERRUPT
4463 4435     ACDLOP, SWCHK      /CHECK SR 1 TO LOOP ON ERROR
4464 7004     RAL
4465 7710     SPA                CLA
4466 5446     JMP I          TSTLOP      /SCOPE LOOP
4467 5621     JMP I          CMPACL      /RETURN TO TEST

/INACTIVE DEVICE ERROR

4470 0000     INAGDV, 0
4471 4774     JMS                ACTCHK      /CHECK TO SEE IF RUNNING ON THE ACT LINE
4472 4435     SWCHK
4473 7710     SPA                CLA
4474 5312     JMP                INACLP      /INHIBIT ERROR HALT?
4475 7240     CLA                CMA
4476 1270     TAD                INACDV      /YES CHECK LOOP SWITCH
4477 7402     HLT
4480 7300     CLA                CLL
4481 1073     TAD                XMTFLG
4482 7640     SZA                CLA
4483 7402     HLT                /AC = ADDRESS WHERE ERROR WAS DETECTED
4484 1074     TAD                RECFLG
4485 7640     SZA                CLA
4486 7402     HLT                /SLU XMIT FLAG IS INACTIVE
4487 1075     TAD                RYCFLG
4488 7640     SZA                CLA
4489 7402     HLT                /SLU RECEIVE FLAG IS INACTIVE
4491 4435     INACLP, SWCHK      /RYC FLAG IS INACTIVE
4492 7004     RAL                /CHECK SR1=1 TO LOOP ON ERROR
4493 7710     SPA                CLA
4494 5446     JMP I          TSTLOP      /SCOPE LOOP
4495 5670     JMP I          INACDV      /RETURN TO THE TEST

/SLU DATA ERROR DURING INTERACTION TEST 42

4517 0000     SLUERR, 0
4522 4774     JMS                ACTCHK      /CHECK TO SEE IF RUNNING ON ACT LINE
4521 4435     SWCHK
4522 7710     SPA                CLA
4523 5335     JMP                SLULOP      /SR=1 INHIBIT ERROR HALT=CHECK LOOP SW
4524 7240     CLA                CMA
4525 1317     TAD                SLUERR
4526 7402     HLT                /AC = ADDRESS WHERE ERROR WAS DETECTED
4527 7200     CLA
4528 1053     TAD                SLUXMT
4529 7402     HLT                /AC = WORD TRANSMITTED
4532 7200     CLA
4533 1054     TAD                SLUREC
4534 7402     HLT                /AC = WORD THAT WAS READ

```

```

4535 4435     SLULOP, SWCHK      /CHECK SR1=1 TO LOOP ON ERROR
4536 7004     RAL
4537 7710     SPA                CLA
4540 5446     JMP I          TSTLOP      /SCOPE LOOP
4541 5717     JMP I          SLUERR      /RETURN TO TEST

/PARALLEL I/O DATA ERROR DURING INTERACTION TEST 42

4542 0000     PIOERR, 0
4543 4774     JMS                ACTCHK      /CHECK TO SEE IF RUNNING ON ACT LINE
4544 4435     SWCHK
4545 7710     SPA                CLA
4546 5360     JMP                PIOLOP      /INHIBIT ERROR HALT?
4547 7240     CLA                CMA
4548 1342     TAD                PIOERR
4549 7402     HLT                /YES, CHECK LOOP SWITCH
4552 7200     CLA
4553 1051     TAD                PIOXMT
4554 7402     HLT                /AC = ADDRESS WHERE ERROR WAS DETECTED
4555 7200     CLA
4556 1052     TAD                PIOREC
4557 7402     HLT                /AC = THE WORD TRANSMITTED
4560 4435     PIOLOP, SWCHK      /AC = THE WORD READ FROM P I/O
4561 7004     RAL                /LOOP ON ERROR IF SR1=1
4562 7710     SPA                CLA
4563 5446     JMP I          TSTLOP      /SCOPE LOOP
4564 5742     JMP I          PIOERR      /RETURN TO TEST

4574 3526
4575 4326
4576 4325
4577 4266
4600      PAGE

4602 1000     PASSED, 0
4601 7710     SPA                CLA
4602 7402     HLT
4603 1021     TAD                OP1SEL      /SR3=1 END OF A COMPLETE PROGRAM PASS
4604 1377     AND                (100
4605 7650     CLA                SNA
4606 5224     JMP                STNPAS      /GET THE HARDWARE CONFIGURATION
4607 6007     CAF                CAF
4608 5173     STIP               /MASK OUT XOR BIT
4609 7410     SKP                SKP
4610 5216     JMP                ,+4        /IS IT SET ?
4611 6007     CAF                CAF
4612 6170     XRON               /NO RETURN
4613 5224     JMP                STNPAS      /CLEAR ALL FLAGS
4614 6170     XRON               /SKIP IF MUT POWER ON AND 1ST XRON
4615 5224     JMP                STNPAS      /START INITIALIZATION OF MUX
4616 6160     SIMCLR            /RETURN TO PROGRAM
4617 6007     CAF                CAF
4618 6171     SKXR               /CLEAR THE SIMULATOR
4619 6170     XRON               /CLEAR ALL FLAGS
4620 6170     XRON               /SKIP IF ERROR 1 FLOP SET
4621 6007     CAF                CAF
4622 6007     JMP                STNPAS      /START ACTUAL TEST AND ENABLE ALL ERRORS
4623 5224     JMP                STNPAS      /CLEAR ALL FLAGS
4624 5224     JMP                STNPAS      /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, IOP /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 HERE 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 XIE /ENABLE OR DISABLE SLU INT ENA
4701 7200 CLA /CLEAR THE AC BIT IF SET
4702 5667 JMP I OFONKI /RETURN
    
```

```

4703 0000 TEHP, 0
DECIMAL
4704 5664 X1100, -1100 /110MS
4705 6340 X1200, -800 /80MS
4706 7160 X3000, +400 /40MS
4707 7470 X6000, -200 /20MS
4710 7634 X12000, -100 /10MS
4711 7716 X24000, +50 /5MS
4712 7747 X48000, -25 /2.5MS
4713 7763 X96000, -13 /1.3MS
DCTAL

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 NDELAY
4726 1347 TAD NDELAY
4727 3350 DCA DELAYN
4730 1351 DELLOP, TAD CON100
4731 3352 DCA US100
4732 2352 ISZ US100
4733 5332 JMP ,+1
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 8137 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     HTCLSK
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

```

0177 4753

```

0000 11110000 00000000 11111111 11111111 11111111 11111111 11111111 11111111
0100 11111111 11111111 11111111 11111111 11111111 11111111 00000000 00000001

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 11111001

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 00000011

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 00000011

3000 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
3100 11111111 11111111 11111111 11111111 11111111 11111111 11111111 00000011

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

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```

4000 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
4100 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111

4200 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
4300 11111111 11111111 11111111 11111111 11111111 11111111 00000000 71111111

4400 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
4500 11111111 11111111 11111111 11111111 11111111 11111111 11111000 70001111

4600 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
4700 11111111 11111111 11111111 11111111 11111111 11111111 11110000 21111111

5000 11111111 11111111 11100000 00000000 00000000 00000000 00000000 00000000
5100 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

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
ACORET 4325 DBSK 6571 K7710 0190 RESET 4276
ACLERR 4434 DBSS 6577 KCC 0032 RETADD 3437
ACLION 4306 DBST 6572 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 RTCFLG 0075
ACTCNT 0102 DELAYR 4750 KJMP7 3465 RTCFRQ 3044
ACTFLG 0134 DELLYN 0070 KHB 0036 RTCINT 4015
ACTRET 3564 DELLOP 4730 KRMF 0131 RTCSLU 4266
ADDTIM 3362 DERPLD 3711 KRS 0034 RTCTIM 4000
AERROR 3475 DERSLU 3734 KRTF 0133 RTF 6005
AERSWH 3507 DONLDP 4424 KSF 0031 RTIMOK 3041
ADDPAS 0100 DONONE 4626 KSFHAT 4432 SAVADD 0124
AUDRT 4105 ENARTC 0146 KTEST 3466 SAVCNT 0050
AUDTDB 4110 ENDPAS 3400 LINK 0072 SAVLOC 3440
AUDWD 4104 ERROR 4427 LINKRT 4320 SBE 6101
BDPNTR 4107 ERRPC 3543 LOADSM 6151 SIMCCK 4436
BR110 4120 EXPACD 0071 LODFRQ 6163 SIMCLR 6160
BR1200 4140 FLGCK1 3303 LODSIM 4437 SIMCNT 0067
BR190 4124 FLGCK2 3306 LOOPPC 4423 SIMINT 3244
BR2400 4144 FLGCK3 3314 LOOPSW 3237 SIMLOD 3214
BR300 4130 FLGCK4 3314 LOPDON 3221 SIMWRD 3514
BR4000 4150 FLGCK5 3317 M10 0066 SKPCWN 3252
BR600 4134 FLGRST 3467 M144 0103 SKPDAV 6165
BR9000 4154 FRGTAB 3114 M15 4171 SKPFRQ 6162
C7 3470 GOODPS 0101 M4 0065 SKPRDR 6157
CAF 6007 HLT 6004 M40 3167 SKPSTR 6167
CAL 0133 INT 7402 NDELAY 4747 SKXR 6171
CHKACT 3544 INACTV 0077 OFONKI 4667 SLUDAT 4433
CHKSIH 3761 INACOV 4470 ONACTL 3545 SLUDER 4434
CHKSWH 3407 INACTP 4512 OP13K 0000 SLUERR 4517
CLCL 6136 INACTV 0077 OP1SEL 0021 SLUINT 4071
CLKFLG 0042 INTERA 4322 OP2SEL 0022 SLULOP 4535
CLKSET 3592 INTFLG 0041 PASSED 4600 SLUREC 0054
CLKSNC 2135 INTON 4064 PATCH 0174 SLUSTR 4050
CLKXOR 4793 INTRT 3326 PCLOOP 3200 SLUSWH 3754
CLE 6135 INTSKP 4200 PIDDAT 4426 SLUTIM 4023
CLRDET 6156 INTXDR 4714 PIDDER 4430 SLUTOK 3112
CLRSIH 6150 K0 3436 PIOERN 4542 SLUXMT 0053
CLKS 6137 K1 0125 PIOLDP 4500 SPI 6045
CLKSWT 4425 K10 3471 PINEG 0052 SPL 6102
CMPACL 4421 K11 3473 PIOSEH 4224 STIP 6173
CNT 0043 K12 3474 PINSWH 3727 STNPAS 4624
CNT1 0044 K125 0061 PINDMT 0051 STPBIT 4106
CON100 4751 K2 0126 POWFAL 3441 STRFRQ 6161
CONTRD 0055 K200 0057 PRGEND 5440 SWHCWK 4435
DATPID 3600 K252 0060 PAN1 4323 SXRC 6175
DATSLU 3653 K2525 0063 PAN2 4324 TABFRQ 3073
DBCE 6576 K3 0127 RECFLG 0074 TCF 6042
DBCF 6573 K377 0056
DBRD 6572 K5252 0062
    
```

|        |      |        |      |
|--------|------|--------|------|
| 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 | X300B  | 4706 |
| TEST18 | 1221 | X4800B | 4712 |
| TEST19 | 1273 | X600B  | 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 | XRC1   | 6172 |
| TEST26 | 1721 | XRON   | 6170 |
| TEST27 | 2012 | XRS1   | 6174 |
| TEST28 | 2107 | XRTO   | 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 |        |      |
| TSP    | 6041 |        |      |
| TSPRET | 4647 |        |      |
| TSPWAT | 4431 |        |      |
| TSPXOR | 4637 |        |      |
| TSTCNT | 0047 |        |      |

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



/DKCB=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,  
////////////////////////////////////

/DKCB=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  
6025 RTF=6025  
6024 GTF=6024  
  
/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 LOADSM=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 SIMCLR=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 SKPDAY=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 0=DATA ACCEPTED IN
AVAILABLE SELECT
/
/BIT 2 NOT USED
/BIT 3 NOT USED
/BIT 4 NOT USED
/BIT 5 RTC FREQUENCY OR 1=RTC 0=SLU BAUD RATES
SLU FREQUENCY CHECK
/
/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
    
```

```

0000 *0
0000 0302 302 /PROGRAM REVISION LETTER=MAINDEC=08-DJDKA=0
0001 6244 RMF /RESTORE MEMORY FIELDS
0002 9403 JMP I 3 /RETURN TO INTERRUPT SERVICE ROUTINE
0003 1244 SIMINT/SKPCHN/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 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 CLSKHT=JMS I,
0025 1393 WTCLSK
4426 P10DAT=JMS I,
0026 1600 DATPIO
4427 ERROR=JMS I,
0027 1475 AERROR
4430 PIDDER=JMS I,
0030 1711 DERPIO
4431 TSFWAT=JMS I,
0031 1331 WATTSF
4432 KSFWAT=JMS I,
0032 1342 WATKSF
4433 SLUDAT=JMS I,
0033 1693 DATSLU
4434 SLUDER=JMS I,
0034 1734 DERSLU
4435 SHWCHK=JMS I,
0035 1407 CHKSWH
4436 SIMCHK=JMS I,
0036 1761 CMKSIM
4437 LODSIM=JMS I,
0037 1214 SINLOD
4145 RTCEA=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 PLOXHT, 0
0052 0000 PLOREC, 0
0053 0000 SLUXHT, 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 0252 K5252, 5252
0063 0252 K2525, 2525
0064 0007 K7, 7
0065 7774 M4, -4
0066 7770 M10, -10
0067 0000 SIMCNT, 0

0072 0000 EXPACD, 0
0071 0000 LINK, 0
0072 0000 XNTFLG, 0
0073 0000 RECFLG, 0
0074 0000 RTCFLG, 0
0075 0000 PHOINT, 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 CLKSNG, 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

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
    
```

/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

/CHECK TO SEE IF ON ACT LINE  
/IF NOT CLEAR RTC INT ENA  
/SET AC BIT 11  
/LOAD BIT 11 INTO CLOCK INT ENA

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.  
\*\*\*\*\*

```

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 6031 KSF /SKIP ON RECEIVE FLAG
0214 7410 SKP
0215 4427 ERROR /RECEIVE FLAG SET OR KSF SKIPPED
0216 6041 TSP /SKIP ON TRANSMIT FLAG
0217 7410 SKP
0220 4427 ERROR /TRANSMIT FLAG SET OR TSP 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 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 152 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 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 SZA CLA /DID IT INTERRUPT?
0270 4427 ERROR /PROGRAM INTERRUPTED WITHOUT CLK INT ENA
0271 2134 ISZ 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 SZA 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 SZA CLA /DID IT INTERRUPT
0322 4427 ERROR /PROGRAM INTERRUPTED WITH CLK INT ENA,
0323 2134 ISZ 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 SZA 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 /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 CLKSNC /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 CLKSNC /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
0363 4427 ERROR /CLCL FAILED TO CLEAR CLK FLAG
0364 7301 CLA CLL IAC /SET DATA BIT 11 TO A ONE
0365 6135 CLLE /TRY AND SET CLK INT ENA
0366 7610 SKP CLA
0367 4427 ERROR /CLLE SKIPPED,
0370 1041 TAD INTFLG /GET THE PROGRAM INTERRUPT FLAG
0371 7640 SZA CLA
0372 4427 ERROR /PROGRAM INTERRUPTED WITHOUT CLK FLAG SET
0373 4425 CLSKWT /WAIT FOR NEXT CLK FLAG
0374 4427 ERROR /CLK FLAG FAILED TO SET
XORENA, 0375 2041 ISZ INTFLG /DID THE PROGRAM INTERRUPT
0376 4427 ERROR /CLLE FAILED TO SET CLK INT ENA OR FAILED TO INT
0377 3041 DCA INTFLG /CLEAR THE PROGRAM INTERRUPT FLAG
0400 6135 CLLE /CLEAR CLK INT ENA
0401 6001 ION /TURN THE INTERRUPT ON
0402 7300 CLA CLL /
0403 1041 TAD INTFLG /GET THE PROGRAM INTERRUPT FLAG
0404 7640 SZA CLA /DID IT INTERRUPT?
0405 4427 ERROR /YES, CLLE FAILED TO CLEAR CLK INT ENA
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 /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 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 /PROGRAM INTERRUPTED WITHOUT CLK INT ENA
0431 4427 ERROR /2ND FLAG SET?
0432 2134 ISZ CLKSNC /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 /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 /DID IT INTERRUPT
0447 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 /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
0458 6001 ION
0461 7344 CLA CLL CMA RAL /CLEAR CLK INT ENABLE
0462 6135 CLLE
0463 1125 TAD K2

```

```

0464 7640 SEA CLA
0465 4427 ERROR /CLIE CHANGED THE AC
0466 7240 CLA CHA
0467 6136 CLCL /CLEAR CLOCK FLAG
0470 7001 IAC
0471 7640 SEA CLA
0472 4427 ERROR /CLCL CHANGED THE AC
0473 7240 CLA CHA
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 DONLDP /CHECK TO SEE IF DONE OR LOOP ON TEST.
0502 4135 JMS TSTGDD /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 4103 TEST7, JMS PATCH
0504 1252 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 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 SEA CLA /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 5570 DBST CLA
0523 7640 SEA CLA
0524 4427 ERROR /INIT FAILED TO 0 DATA ACCEPTED, DBST SKIPPED OR
/DBST READ SOMETHING INTO THE AC
0525 1041 YAD 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 YAD INTFLG /GET THE PROGRAM INTERRUPT FLAG
0544 7640 SEA CLA
0545 4427 ERROR /PROGRAM INTERRUPTED WITHOUT INT ENA SET
0546 4424 DONLDP /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 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,
/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,
/CLEAR ALL FLAGS
0554 6007 CAF /CLEAR ALL FLAGS
0555 4145 RTCENA /SET REAL TIME CLOCK INT ENA
0556 3041 DCA INTFLG /CLEAR PROGRAM INTERRUPT FLAG
0557 6001 ION /TURN THE INTERRUPT ON
0560 6571 DBSK /SKIP ON DATA READY FLAG
0561 7610 SKP CLA
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 4427 ERROR /DATA READY FLAG CLEARED
0600 1041 TAD INTFLG /GET THE PROGRAM INTERRUPT FLAG
0601 7640 SZA CLA
0602 4427 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 4427 ERROR /DBCF FAILED TO CLEAR DATA READY
0607 0570 DBST /SKIP ON DATA ACCEPTED AND CLEAR IT AND DATA AVAIL,
0610 4427 ERROR /DBCF FAILED TO SET DATA ACCEPTED OR DBST FAILED TO SKIP
0611 0570 DBST /SKIP ON DATA ACCEPTED
0612 7410 SKP
0613 4427 ERROR /THE FIRST DBST FAILED TO CLEAR DATA ACCEPTED
0614 1041 TAD INTFLG /GET THE PROGRAM INTERRUPT FLAG
0615 7640 SZA CLA
0616 4427 ERROR /PROGRAM INTERRUPTED WITHOUT INT ENA SET
0617 4424 DONLDP /REPEAT TEST IF SR = 1000

```

\*\*\*\*\*  
 /TEST 9 = CHECKS THAT CAF WILL CLEAR THE DATA READY FLAG AND THE  
 /DATA ACCEPTED FLAG,  
 \*\*\*\*\*

```

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 0000 4000 /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 ADDRESS
0625 0007 CAF /CLEAR ALL FLAGS
0626 4145 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 4427 ERROR /DBTD FAILED TO SET DATA READY
0634 0570 DBST /SKIP ON DATA ACCEPTED AND CLEAR IT
0635 7410 SKP
0636 4427 ERROR /DATA ACCEPTED GOT SET BEFORE A DBCF WAS ISSUED
0637 1041 TAD INTFLG /GET THE PROGRAM INTERRUPT FLAG
0640 7640 SZA CLA
0641 4427 ERROR /PROGRAM INTERRUPTED WITHOUT INT ENA SET
0642 0007 CAF /CLEAR DATA READY FLAG
0643 4145 RTCENA /SET REAL TIME CLOCK INT ENA
0644 0571 DBSK /SKIP ON DATA READY FLAG
0645 7610 SKP CLA
0646 4427 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 4145 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 4427 ERROR /INIT FAILED TO CLEAR DATA ACCEPTED
0657 1041 TAD INTFLG /GET THE PROGRAM INTERRUPT FLAG
0660 7640 SZA CLA
0661 4427 ERROR /PROGRAM INTERRUPTED WITHOUT INT ENA SET
0662 4424 DONLDP /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 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 0000 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 0007 CAF /CLEAR ALL FLAGS
0671 4145 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 4427 ERROR /DATA READY FLAGS SET FOLLOWING INIT
0677 0570 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 0575 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 0574 DBTD /TRANSMIT AND SET DATA READY
0714 0571 DBSK /SKIP ON DATA READY FLAG
0715 4427 ERROR /DBTD FAILED TO SET DATA READY
0716 0041 ISZ INTFLG /DID THE PROGRAM INTERRUPT?
0717 4427 ERROR /PROGRAM FAILED TO INTERRUPT OR INT ENA NOT SET
0720 0576 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 0001 ION /TURN THE INTERRUPT ON
0724 0571 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 0007 CAF /CLEAR ALL FLAGS

```

```

0732 4424      DONLOP      /REPEAT TEST IF SR = 1000
/*****
/TEST 11 = CHECKS THAT INITIALISE 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      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          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      ISZ          INTFLG /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        /DBTD FAILED TO SET DATA READY FLAG
0763 4427      ERROR      /GET THE PROGRAM INTERRUPT FLAG
0764 1041      TAD          INTFLG
0765 7640      SZA          CLA
0766 4427      ERROR      /PROGRAM INTERRUPTED= INIT FAILED TO
                        /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

```

```

1001 6007      CAF                /CLEAR ALL FLAGS
1002 4145      RTCENA      /SET REAL TIME CLOCK INT ENA
1003 3041      DCA          INTFLG /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          INTFLG /GET THE PROGRAM INTERRUPT FLAG
1010 7640      SZA          CLA
1011 4427      ERROR      /PROGRAM INTERRUPTED WITHOUT INT ENA SET
1012 6575      DBSE        /SET INTERRUPT ENABLE
1013 7000      NOP          /SHOULD INTERRUPT HERE WITH INT ENA AND FLAG SET
1014 2041      ISZ          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 6570      DBST        /CHECK THAT DATA ACCEPTED GOT CLEARED BY 1ST DBST IN SKIP CHAIN
1020 7610      SKP          CLA
1021 4427      ERROR      /DATA ACCEPTED DIDN'T CLEAR IN INTERRUPT SKIP CHAIN
1022 1041      TAD          INTFLG /GET THE PROGRAM INTERRUPT FLAG
1023 7640      SZA          CLA
1024 4427      ERROR      /PROGRAM INTERRUPTED WITH DATA ACCEPTED CLEARED
1025 6576      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      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      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
1043 7640      SZA          CLA
1044 4427      ERROR      /DBTD CHANGED THE AC
1045 6007      CAF                /CLEAR ALL
1046 4145      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 6572      DBRD        /READ THE 12 BIT PARALLEL I/O
1052 7640      SZA          CLA
1053 4427      ERROR      /DBRD FAILED TO READ OR CAF FAILED TO CLEAR XMIT BUFFERS
1054 7240      CLA CMA      /SET AC TO ALL ONES
1055 6571      DBSK        /SKIP ON DATA READY
1056 7001      IAC
1057 7640      SZA          CLA

```



```

1060 4427 ERROR /DBSK CHANGED THE AC
1061 6002 IOP
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
1100 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 4000 /CONTROL WORD FOR THE SIMULATOR
1130 4437 LOOSIM /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
/LOOP = THIS ADDRESS IF SIMULATOR SELECTED
/OTHERWISE SCOPE LOOP IS THIS ADDRESS +1
1131 3041 DCA INTFLG /CLEAR PROGRAM INTERRUPT FLAG
1132 7240 CLA CMA
1133 3051 DCA P10XMT /SET THE WORD TO BE TRANSMITTED TO ALL ONES
1134 4426 P10DAT /GO TRANSMIT AND COMPARE THE WORD
1135 4430 P10DER /DATA ERROR = WORD DIDN'T COMPARE IN ROUTINE P10DAT
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 4000 /CONTROL WORD FOR THE SIMULATOR
1143 4437 LOOSIM /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
1150 4430 P10DER /DATA ERROR = WORD DIDN'T COMPARE IN ROUTINE P10DAT
1151 3051 DCA P10XMT /SET THE WORD TO 0
1152 4426 P10DAT /GO TRANSMIT AND COMPARE THE WORD
1153 4430 P10DER /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 4000 /CONTROL WORD FOR THE SIMULATOR
1161 4437 LOOSIM /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 1262 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 1263 TAD K2525
1170 3051 DCA P10XMT /SET THE SECOND WORD TO TRANSMIT = 2525
1171 4426 P10DAT /GO TRANSMIT AND COMPARE THE WORD
1172 4430 P10DER /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 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 CONTND /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 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 CONTND /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 6102 SIMINT, SPL /SKIP ON POWER LOW
1245 7410 SKP
1246 5777 JMP POWFAL /POWER GOING DOWN = GO SAVE EVERYTHING
    
```

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1247 3251 DCA AC /SAVE THE AC
1248 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 TSP /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, TSP /SKIP ON XMIT FLAG
1306 7410 SKP
1307 4427 ERROR
1310 6031 FLGCK2, KSF /XMIT FLAG SET
1311 7410 SKP /SKIP ON RECEIVE FLAG
1312 4427 ERROR
1313 6571 FLGCK3, DBSK /RECEIVE FLAG SET
1314 7410 SKP /SKIP ON P I/O DATA READY
1315 4427 ERROR
1316 6570 FLGCK4, DBST /DATA READY FLAG SET
1317 7610 SKP CLA /SKIP ON DATA ACCEPTED
1320 4427 ERROR
1321 3133 FLGCK5, DCA ACTFLG /DATA ACCEPTED FLAG SET
1322 7240 CLA CMA /CLEAR THE ACT FLAG
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 WTCLSK, 0
1354 7240 CLA CHA
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 WTCLSK
1362 5753 JMP I WTCLSK /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 4363 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 SHCHK /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 9777 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 ISZ 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 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 5103 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 SHMCHK /CHECK SR0 TO INHIBIT ERROR WALT
1500 7710 SPA CLA /SR0=1 CHECK LOOP ON LOGIC ERROR
1501 5307 JMP AERSWH
1502 7240 CLA CMA
1503 1275 TAD AERROR
1504 7402 HLT /AC = ADDRESS WHERE ERROR WAS DETECTED
1505 4314 JMS SIMWRD /HAS THE SIMULATOR SELECTED
1506 7402 HLT /AC=SIMULATOR CONTROL WORD
1507 4435 AERSWH, SHMCHK /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 OPISEL
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 DLL
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 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 0137 CLSK /HAS 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 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 1564 ACTRET
1561 1776 TAD AC
1562 5001 IDN
1563 5764 JMP I ACTRET /RETURN TO THE PROGRAM
1564 0000 ACTRET, 0
1565 2101 ONACTL, ISZ ACTCNT /100 CLOCK TICKS YET?
1566 5357 JMP CLKSET+5 /NO RETURN TO PROGRAM
1567 1102 TAD H144 /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 PIOXHT /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 ISE 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 7010 SKP CLA
1626 4427 ERROR /DATA ACCEPT FAILED TO CLEAR IN INTERRUPT ROUTINE
1627 2041 ISE INTFLG /CHECK TO SEE IF IT INTERRUPTED
1630 4427 ERROR /DATA ACCEPT FLAG FAILED TO INTERRUPT
1631 6001 ION /TURN THE INTERRUPT BACK ON
1632 7000 NOP
1633 2041 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 PIOXHT /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 RTCENA
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 ISE 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 RTCENA /SET REAL TIME CLOCK INT ENA
1656 6001 ION /TURN THE INTERRUPT ON
1657 3041 DCA INTFLG /CLEAR THE PROGRAM INTERRUPT FLAG

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1660 1053 TAD SLUXHT /GET THE WORD TO BE TRANSMITTED
1661 6046 TLS /LOAD AND TRANSMIT IT AND CLEAR THE FLAG
1662 4431 KSFWAT /WAIT FOR THE TRANSMIT FLAG
1663 4427 ERROR /XMIT FLAG FAILED TO SET
1664 2041 ISE 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 KSFWAT /WAIT FOR THE RECEIVE FLAG TO SET
1671 4427 ERROR /RECEIVE FLAG FAILED TO SET
1672 2041 ISE 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 SLUXHT /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 ISE 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 SWNCHK /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 DERP10
1720 7402 WLT /AC = ADDRESS WHERE ERROR WAS DETECTED
1721 7200 CLA
1722 1051 TAD PIOXHT /GET THE WORD TRANSMITTED
1723 7402 WLT /AC = THE GOOD WORD
1724 7200 CLA
1725 1052 TAD PIOREC /GET THE WORD READ
1726 7402 WLT /AC = THE BAD WORD = WORD READ
1727 4435 PIOSWH, SWNCHK /LOOP ON DATA ERROR IF SR1=1
1730 7004 RAL
1731 7700 SMA CLA /LOOP?
1732 5711 JMP I DERP10 /NO, RETURN TO TEST
1733 5446 JMP I TSTL0P /RETURN AND DO SAME PATTERN(S)

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/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 SWNCHK /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 1050 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 READ WORD=THE WORD READ
1752 4776 JMS SIMNRD /WAS 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 DERSLU /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 2301 ISE CHKSIM
1772 2301 ISE CHKSIM
1773 1301 TAD CHKSIM
1774 3046 DCA TSTLOP
1775 5701 JMP I CHKSIM
    
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1776 1514
1777 1526
0200 *200
    
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S

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|--------|------|--------|------|--------|------|--------|------|
| AC     | 1291 | 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 | PNOINT | 0075 | TEST9  | 0620 |
| ACTRET | 1564 | INTRET | 1330 | POWFAL | 1441 | TFL    | 0040 |
| ADDTIN | 1363 | K0     | 1436 | PRGEND | 5440 | TLS    | 0046 |
| AERROR | 1475 | K1     | 0124 | RECFLG | 0073 | TPC    | 0044 |
| AERSWH | 1507 | K10    | 1471 | RETADD | 1437 | YSF    | 0041 |
| BADPAS | 0077 | K11    | 1473 | RETURN | 1420 | YSFWAT | 4431 |
| C7     | 1470 | K12    | 1474 | RHF    | 6244 | YTCNT  | 0047 |
| CAF    | 0007 | K125   | 0061 | RTCENA | 4145 | YSTG00 | 0135 |
| CAL    | 0103 | K2     | 0125 | RTCFLG | 0074 | YSTLOP | 0046 |
| CHKACT | 1544 | K200   | 0057 | RTF    | 0005 | WATKSF | 1342 |
| CHKSIM | 1761 | K252   | 0060 | 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 |        |      |
| CLKSNC | 7134 | K7     | 0064 | SIMCLM | 0160 |        |      |
| CLLE   | 0135 | K7710  | 0147 | SIMCNT | 0067 |        |      |
| CLRDEY | 0156 | KCC    | 0032 | SIMINT | 1244 |        |      |
| CLRSIM | 0150 | KCDF   | 0131 | SIMLOD | 1214 |        |      |
| CLSK   | 0137 | KCF    | 0030 | SIMWRD | 1514 |        |      |
| CLSKWT | 4425 | KIE    | 0035 | SKPCHN | 1252 |        |      |
| CHT    | 0043 | KJMP   | 0127 | SKPDAV | 0165 |        |      |
| CHT1   | 0044 | KJMP7  | 1465 | SKPFRQ | 0162 |        |      |
| CONTND | 0055 | KJMPRT | 1472 | SKPRDN | 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 | KSFWAT | 4432 | SLUXMT | 0053 |        |      |
| DBSK   | 0571 | KTEST  | 1466 | SPI    | 0045 |        |      |
| DBSS   | 0577 | LINK   | 0071 | SPL    | 0102 |        |      |
| DBST   | 0570 | LOADSW | 0151 | STRFRQ | 0161 |        |      |
| DBTD   | 0574 | LODFRQ | 0163 | SWCHK  | 4435 |        |      |
| DERPIO | 1711 | LODSIN | 4437 | SWITCH | 0020 |        |      |
| TERSLO | 1734 | LODFPC | 4423 | TOP    | 0042 |        |      |
| DONLOP | 4424 | LODFSW | 1237 | TEST   | 0045 |        |      |
| ENARTC | 0145 | LOPDON | 1221 | TEST1  | 0200 |        |      |
| ENDPAS | 1400 | K10    | 0066 | TEST10 | 0663 |        |      |
| ERROR  | 4427 | K144   | 0102 | TEST11 | 0733 |        |      |
| ERRPC  | 1543 | K4     | 0065 | TEST12 | 0774 |        |      |
| EXPACO | 0070 | ONACTL | 1565 | TEST13 | 1027 |        |      |
| FLGCK1 | 1305 | OP11K1 | 0000 | TEST14 | 1124 |        |      |
| FLGCK2 | 1310 | OP1SEL | 0021 | TEST15 | 1137 |        |      |
| FLGCK3 | 1313 | OP2SEL | 0022 | TEST16 | 1155 |        |      |
| FLGCK4 | 1316 | PATCH  | 0103 | TEST2  | 0246 |        |      |
| FLGCK5 | 1321 | PCLoop | 1200 | TEST3  | 0304 |        |      |
| FLGRST | 1467 | PIODAT | 4426 | TEST4  | 0337 |        |      |

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

/DKCB=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-DJDKA=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
7492 HLT=7492
6244 RHF=6244
6005 RTF=6005 /RESTORE MEMORY FIELD
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
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 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 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
/ NEXT HIGHEST BAUD RATE,
    
```

```

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/RTCINT/SLUINT /INTERRUPT SERVICE ROUTINES

0020 *20
0020 0000 SWITCH, 0
0021 2000 DP1SEL, 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 KOR(REQUIRES BIT 4 SET ALSO)
                                /BIT 6=1 HAS PDP-8E TYPE CPU
                                /BIT 7=11 MEMORY SIZE = 0'8=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 DP2SEL, 0
4423 LOOPPC=JMS I,
0023 1200 PCLOOP
4424 DONLDP=JMS I,
0024 1221 LOPDON
4425 CLSKNT=JMS I,
0025 1353 WTCLSK
4426 PIDDAT=JMS I,
0026 1600 DATPID
4427 ERROR=JMS I,
0027 1475 AERROR
4430 PIDDER=JMS I,
0030 1711 DERPID
4431 TSFVAT=JMS I,
0031 1331 WATTSP
4432 KSFVAT=JMS I,
0032 1342 WATKSP
4433 SLUDAT=JMS I,
0033 1653 DATSLU
4434 SLUDER=JMS I,
0034 1734 DERSLU
4435 SHNCHK=JMS I,
0035 1427 CHKSHH
4436 SIMCHK=JMS I,
0036 1761 CHKSHH
4437 LODSIN=JMS I,
0037 1214 SIMLOD
4145 RTCENA=JMS ENARTO

```

```

0040 5440 PRGEND=JMP I,
0040 1400 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 TSTLDP, 0
0047 0000 TSTCNT, 0
0050 0000 SAVCNT, 0
0051 0000 PIDXMT, 0
0052 0000 PIDREC, 0
0053 0000 SLUXMT, 0
0054 0000 SLUREC, 0
0055 0000 CNTWD, 0
0056 0377 K377, 377
0057 0200 K200, 200
0060 0252 K252, 252
0061 0125 K125, 125
0062 0252 K5252, 5252
0063 0252 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 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 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 RMP
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 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 2133 ISE PATCH /ADD 1 TO THE ENTRANCE
0122 5503 JMP I PATCH /RETURN

0123 0000 SAVADD, R
0124 0001 K1, 1
0125 0002 K2, 2
0126 0003 K3, 3
0127 5403 KJMP, JMP I 3
0130 6244 KRHF, 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 7000 TSTGDD, 0
0136 1022 TAD OP2SEL /GET THE HARDWARE FLAG
0137 7700 SMA CLA /ARE WE ON THE ACT LINE?
0140 5535 JMP I TSTGDD /NO, RETURN TO THE PROGRAM
0141 0002 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 TSTGDD /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

```

\*200

IFDEF OP13K <PAGE>

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

```

0200 6160 TEST17, SIMCLR /CLEAR THE SIMULATOR
0201 4423 LOOPPC /SET UP TEST LOOPING ADDRESS
0202 7777 -1 /SIMULATOR ITERATION COUNTER
0203 4103 JMS PATCH /GO SET UP FOR INTERRUPT RETURN
0204 1292 SKPCHN
0205 3042 DCA CLKFLG /SET INTERRUPT TO IGNORE RTC FLAGS
0206 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 P10XHT /SET THE WORD TO BE TRANSMITTED = TO IT
0217 4426 PIDDAT /GO TRANSMIT AND COMPARE THE WORD
0220 4430 PIDDER /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 P10XHT /PUT IT IN THE WORD TO TRANSMIT
0240 1051 TAD P10XHT /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 P10REC /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 /DBSF 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 P10XHT /COMPARE THE WORD TRANSMITTED WITH THE WORD READ
0256 7041 CIA
0257 1052 TAD P10REC
0260 7640 SZA CLA
0261 4430 P10DER /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 1841 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 4808 4808 /SIMULATOR CONTROL WORD
0300 4437 LODSIM /LOAD THE CONTROL WORD
0301 1821 TAD OPASEL /RECHECK THE SIMULATOR BIT
0302 0857 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 5736 JMP I ,+1 /GO TO NEXT TEST
0306 0530 TEST23 /ADDRESS OF THE NEXT TEST
0307 6807 CAF /CLEAR ALL FLAGS
0310 4145 RTCENA /SET REAL TIME CLOCK INT ENA
0311 3841 DCA INTFLG /CLEAR THE PROGRAM INTERRUPT FLAG
0312 6801 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 1841 TAD INTFLG /CHECK THAT THE PROGRAM DIDN'T INTERRUPT
0340 7640 SZA CLA
0341 4427 ERROR /PROGRAM INTERRUPTED
0342 6802 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 4808 4808 /SIMULATOR CONTROL WORD
0350 4437 LODSIM /LOAD THE CONTROL WORD
0351 6807 CAF /CLEAR ALL FLAGS
0352 4145 RTCENA /SET REAL TIME CLOCK INT ENA
0353 3841 DCA INTFLG /CLEAR THE PROGRAM INTERRUPT FLAG
0354 6801 ION /TURN THE INTERRUPT ON
0355 6156 CLRDET /CLEAR SIMULATOR DETECTOR F/F'S
0356 6165 SKPDAV /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 6374 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 SKPDAV /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 SKPDAV /SKIP ON DATA AVAILABLE DETECTOR F/F
0370 4427 ERROR /DATA AVAILABLE GOT CLEARED
0371 6807 CAF /CLEAR ALL FLAGS
0372 4145 RTCENA /SET REAL TIME CLOCK INT ENA
0373 6801 ION /TURN THE INTERRUPT ON
0374 6156 CLRDET /CLEAR THE SIMULATOR DETECTOR F/F'S
0375 6165 SKPDAV /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 1841 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 DBSY 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 4808 4808 /SIMULATOR CONTROL WORD
0413 4437 LODSIM /LOAD THE SIMULATOR CONTROL WORD
0414 6807 CAF /CLEAR ALL FLAGS
0415 4145 RTCENA /SET REAL TIME CLOCK INT ENA
0416 3841 DCA INTFLG /CLEAR PROGRAM INTERRUPT FLAG
0417 6801 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 AVILABLE 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
0440 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 DONLDP /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 6000 /SIMULATOR CONTROL WORD
0464 4437 LODSIM /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 DONLDP /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 4000 /CONTROL WORD FOR THE SIMULATOR
0536 4437 LODSIM /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 ISZ 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 0041 TSF /SKIP ON TRANSMIT FLAG
0714 7410 SKP
0715 4427 ERROR /TCF FAILED TO CLEAR XMIT FLAG
0716 0031 KSF /SKIP ON RECEIVE FLAG
0717 7410 SKP
0720 4427 ERROR /RECEIVE FLAG NOT 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 0007 CAF /SET REAL TIME CLOCK INT ENA
0731 4145 RTCENA /CLEAR SLU INTERRUPT ENABLE
0732 0035 KIE /TURN THE INTERRUPT ON
0733 0001 ION /SET THE TRANSMIT FLAG
0734 0040 TFL /SKIP ON TRANSMIT FLAG
0735 0041 TSF /TFL FAILED TO SET TRANSMIT FLAG
0736 4427 ERROR /SKIP ON XMIT/RECEIVE + INT ENA ON A 1
0737 0045 SPI
0740 7610 SKP CLA /ERROR, INT ENA SET OR KIE FAILED TO CLEAR INT ENA
0741 4427 ERROR /GET THE PROGRAM INTERRUPT FLAG
0742 1041 TAD INTFLG
0743 7640 SZA CLA
0744 4427 ERROR /PROGRAM INTERRUPTED WITHOUT INT ENA SET
0745 7331 CLA CLL IAC /SET DATA 11 TO A 1
0746 0035 KIE /SET INT ENA
0747 0041 TSF /SKIP ON TRANSMIT FLAG
0750 4427 ERROR /XMIT FLAG GOT CLEARED
0751 0045 SPI /SKIP ON XMIT + INT ENA ON A 1
0752 4427 ERROR /KIE AND DATA 11 ON A 1 FAILED TO SET INT ENA
0753 7200 CLA
0754 2041 ISZ INTFLG
0755 4427 ERROR /PROGRAM FAILED TO INTERRUPT WITH INT ENA + XMIT FLAG
0756 3041 DCA INTFLG
0757 0035 KIE /CLEAR INTERRUPT ENABLE
0760 0001 ION /TURN THE INTERRUPT ON
0761 0041 TSF /SKIP ON XMIT FLAG
0762 4427 ERROR /XMIT FLAG CLEARED
0763 0045 SPI /SKIP ON XMIT + INT ENA ON A 1
0764 7610 SKP CLA
0765 4427 ERROR /KIE + DATA 11 ON A 0 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 0042 TCF /CLEAR THE XMIT FLAG

```

```

0772 0041 TSF /SKIP ON SLU XMIT FLAG
0773 7610 SKP CLA
0774 4427 ERROR /TCF FAILED TO CLEAR XMIT FLAG
0775 0031 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, LODPPC /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 0007 CAF /SET REAL TIME CLOCK INT ENA
1010 4145 RTCENA /TURN THE INTERRUPT ON
1011 0001 ION /SET THE TRANSMIT FLAG
1012 0040 TFL /SKIP ON XMIT FLAG
1013 0041 TSF /TRANSMIT FLAG FAILED TO SET BY TFL
1014 4427 ERROR /SKIP ON XMIT FLAG AND INT ENA ON A 1
1015 0045 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 0046 TLS
1022 7610 SKP CLA
1023 4427 ERROR /TLS SKIPPED
1024 0001 ION /TURN THE INTERRUPT ON
1025 0041 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 0045 SPI /SKIP ON SLU INTERRUPT (XMIT SIDE)
1035 4427 ERROR /FAILED TO SKIP OR INT ENA OR FLAG GOT CLEARED
1036 0042 TCF /CLEAR TRANSMIT FLAG
1037 0001 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 0045 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 0030 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 * TPC 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
1062 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 20 * CHECKS THAT TPC WILL NOT CLEAR XMIT FLAG AND THAT IT WILL
/RESET IT, TEST 20 ALSO CHECKS THAT THE RECEIVE FLAG WILL SET AND THAT IT
/ CAN BE CLEARED BY KCC;
/*****

```

```

1064 4423 TEST20, 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 0000 4000 /CONTROL WORD FOR THE SIMULATOR
1070 4437 LODSIM /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 DAF /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
1080 0041 ISZ INTFLG
1081 4427 ERROR /PROGRAM FAILED TO INTERRUPT
1082 0044 TPC /LOAD TRANSMIT BUFFER AND TRANSMIT
1083 7610 SKP CLA
1084 4427 ERROR /TPC SKIPPED
1085 0041 TSF /SKIP ON XMIT FLAG
1086 4427 ERROR /TPC CLEARED XMIT FLAG
1087 0042 TCF /CLEAR TRANSMIT FLAG
1088 0001 ION /TURN THE INTERRUPT BACK ON
1089 4431 TSFWAT /WAIT FOR XMIT BUFF MT H TO SET XMIT FLAG
1090 4427 ERROR /TPC FAILED TO SET XMIT FLAG
1091 0041 ISZ INTFLG /CHECK TO SEE IF PROGRAM INTERRUPTED
1092 4427 ERROR /PROGRAM FAILED TO INTERRUPT WITH XMIT FLAG + INT ENA
1093 0042 TCF /CLEAR THE TRANSMIT FLAG
1094 0001 ION /TURN THE INTERRUPT ON
1095 0001 KSFWAT /WAIT FOR RECEIVE FLAG TO SET
1096 4427 ERROR /RECEIVE FLAG FAILED TO SET BY A TPC COMMAND
1097 0045 SPI /SKIP ON RCV FLAG AND INT ENA
1098 4427 ERROR /FAILED TO SKIP
1099 0041 ISZ INTFLG /DID THE PROGRAM INTERRUPT
1100 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

```

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 3067 DCA SIMCNT
1206 7240 CLA CMA
1207 3050 DCA SAVCNT
1208 1050 TAD SAVCNT
1209 3047 DCA TSTCNT
1210 2200 ISZ PCLoop
1211 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
1222 5614 JMP I SIMLOD
1221 0000 LOPDON, 0
1222 0047 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 SIMUNT   /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?
1273 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 4041      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=GO 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=GO THE FLAG
    
```

/ROUTINE TO WAIT FOR THE REAL TIME CLOCK FLAG

```

1353 0000      WTCLSK, 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     WTCLSK
1362 5753      JMP     I WTCLSK  /RETURN TO THE PROGRAM=GO 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
    
```

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
1406 5777 JMP 0200 /SR3=1 END OF A COMPLETE PROGRAM PASS
    /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 DP1SEL
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 4201 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
1432 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 1265 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 KRFF
1450 3671 DCA I K10
1451 1272 TAD KJMPRT
1452 3673 DCA I K11
1453 6004 CTF
1454 3674 DCA I K12
1455 6244 RMF
1456 6103 CAL
1457 6102 SPL
1458 7610 SKP CLA
1459 5241 JMP ,+2
1464 9445 JMP I TEST
    
```

```

1465 5007 KJMP7, JMP 7
1466 0045 KTEST, TEST
1467 1012 FLGRST, 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 HALT
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
    /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 OP2SEL
1517 0057 AND K200
1520 7650 SNA 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 4002 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 4272 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 /HAS 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 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 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 /DRRD 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 1252 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 RTCENA
1645 6001 ION /TURN THE INTERRUPT ON
1646 4572 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 RTCENA /SET REAL TIME CLOCK INT ENA
1656 6001 ION /TURN THE INTERRUPT ON
1657 3041 DCA INTFLG /CLEAR THE PROGRAM INTERRUPT FLAG
1660 1253 TAD SLUXMT /GET THE WORD TO BE TRANSMITTED
1661 4046 TLA /LOAD AND TRANSMIT IT AND CLEAR THE FLAG
1662 4431 TSPWAT /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 KSPWAT /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 DERPID, 0
1712 4777 JMS ACTCHK /CHECK TO SEE IF RUNNING ON ACT LINE
1713 4435 SHMCHK /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 DERPID
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, SHMCHK /LOOP ON DATA ERROR IF SR1=1
1730 7004 RAL
1731 7700 SNA CLA /LOOP?
1732 4911 JMP I DERPID /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 SHMCHK /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, SHMCHK /LOOP ON DATA ERROR IF SR1=1
1755 7004 RAL
1756 7700 SNA CLA /LOOP?
1757 5734 JMP I DERSLU /NO, RETURN TO TEST
1760 5446 JMP I TSTLOP
    
```

```

1761 0000 CHKSIM, 0
1762 1021 TAD CPISEL /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 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

S

|      |          |          |          |          |          |          |          |          |          |
|------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 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 | 11111111 | 11111111 | 11111111 | 11111111 | 11111111 | 11111111 | 11111111 | 11111111 |
| 1000 | 11111111 | 11111111 | 11111111 | 11111111 | 11111111 | 11111111 | 11111111 | 11111111 | 11111111 |
| 1100 | 11111111 | 11111111 | 11111111 | 11111111 | 10700000 | 00000000 | 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 | COODPS | 0100 | PIODEN | 4430 | TEST28 | 1064 |
| ACTCHK | 1926 | CTF    | 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 | TSFNAT | 4431 |
| ADDTIM | 1363 | K0     | 1436 | PRGENU | 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 | RNF    | 6244 | WATYSF | 1331 |
| CAF    | 0007 | K125   | 0061 | RTCENA | 4145 | WTCLSK | 1393 |
| CAL    | 6103 | K2     | 0125 | RYCFLG | 0074 | XMTFLG | 0072 |
| CHKACT | 1544 | K200   | 0057 | RTF    | 6005 |        |      |
| CHKSIM | 1761 | K252   | 0060 | SAVADD | 0183 |        |      |
| CHKSWH | 1407 | K2525  | 0063 | SAVCNT | 0050 |        |      |
| CLCL   | 6136 | K3     | 0126 | SAVLOC | 1440 |        |      |
| CLKFLG | 0042 | K377   | 0056 | SBE    | 6101 |        |      |
| CLKSET | 1552 | K5252  | 0062 | SIMCHK | 4430 |        |      |
| CLKSNG | 0134 | K7     | 0064 | SIMCLR | 6160 |        |      |
| CLLE   | 4135 | K7710  | 0147 | SIMCNT | 0067 |        |      |
| CLROET | 6156 | KCC    | 6030 | SIMINT | 1244 |        |      |
| CLRSIM | 6150 | KCDF   | 0131 | SIMLOD | 1214 |        |      |
| CLSK   | 6137 | KCF    | 6030 | SIMWRD | 1514 |        |      |
| CLSKWT | 4425 | KIE    | 6035 | SKPCHN | 1202 |        |      |
| CNT    | 0043 | KJMP   | 0127 | SKPDAV | 6165 |        |      |
| CNT1   | 0044 | KJMP7  | 1465 | SKPFRQ | 6162 |        |      |
| CONTUD | 0055 | KJMPRT | 1472 | SKPRDR | 6157 |        |      |
| DATPIO | 1600 | KRB    | 6030 | SKPSTR | 6167 |        |      |
| DATSLU | 1693 | KRMF   | 0130 | SLUDAT | 4433 |        |      |
| DBCE   | 6076 | KRS    | 6034 | SLUDER | 4434 |        |      |
| DBCF   | 6073 | KRTF   | 0132 | SLUREC | 0094 |        |      |
| DBRD   | 6072 | KSF    | 6031 | SLUSWH | 1794 |        |      |
| DBSE   | 6075 | KSFNAT | 4432 | SLUXMT | 0093 |        |      |
| DBSK   | 6071 | KTEST  | 1466 | SPI    | 6045 |        |      |
| DBSS   | 6077 | LINK   | 0071 | SPL    | 6102 |        |      |
| DBST   | 6070 | LOADSM | 6151 | STRFRQ | 6161 |        |      |
| DBTD   | 6074 | LODFRQ | 6163 | SWMCHK | 4435 |        |      |
| DERPIO | 1711 | LOOSIM | 4437 | SWITCH | 0020 |        |      |
| DERSLU | 1734 | LOOPPC | 4423 | TOP    | 6042 |        |      |
| DNONLP | 4424 | LOOPSW | 1237 | TEST   | 0045 |        |      |
| ENARTC | 0145 | LDPDON | 1221 | TEST17 | 0201 |        |      |
| ENDPAS | 1400 | M10    | 0066 | TEST18 | 0222 |        |      |
| FRROR  | 4427 | M144   | 0102 | TEST19 | 0274 |        |      |
| FRRPC  | 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 | PCLoop | 1200 | TEST26 | 0722 |        |      |
| FLORST | 1467 | PIODAT | 4426 | TEST27 | 1001 |        |      |

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

/DKC8=AA OPTION TEST 1 HAINDEC=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  
/HAINDEC=08=DJDKA=B=PH3, 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.  
////////////////////////////////////

```

/DKCB=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 SGE=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 TFS=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 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 SKPRFR=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
/ ?=NO ACTION

/BIT 1 PARALLEL I/O CLEAR DATA 1=YES
/ AVAILABLE SELECT ?=DATA ACCEPTED IN

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

/BIT 5 RTC FREQUENCY ON 1=RTC
/ SLU FREQUENCY CHECK ?=SLU BAUD RATES

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

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

/BIT 8 STOP BIT SELECT 1=1 STOP BITS
/ ?=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      *0
0000 0302      302          /PROGRAM REVISION LETTER=MAINDEC=88=DJDKA=B
0001 6244      RHF          /RESTORE MEMORY FIELDS
0002 5403      JMP I 3      /RETURN TO INTERRUPT SERVICE ROUTINE
0003 1044      SIMINT/SKPCNN/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 = 2'S=1K, 37=32K, MEMORY
                                /SIZE CAN BE INCREASED IN 1K INCREMENTS BY ADDING
                                /ONE TO THE NUMBER IN BITS 7 = 11
                                /BIT 8 IS SET FOR THE ACT LINE
0022 0000      DP2SEL, 0
0023 4423      LOOPPC=JMS I, PCLOOP
0023 1000      DONLOP=JMS I, LOPDON
0024 4424      CLSKWT=JMS I, WTCLSK
0025 1193      P1ODAT=JMS I, DATP10
0026 4426      ERROR=JMS I, AERROR
0027 1275      P1ODER=JMS I, DERP10
0030 1511      TSPWAT=JMS I, WATTSP
0031 4431      KSPWAT=JMS I, WATKSP
0032 1142      SLUDAT=JMS I, DATSLU
0033 4433      SLUDER=JMS I, DERSLU
0034 1534      SWHCHK=JMS I, CHKSWH
0035 4435      SIMCHK=JMS I, CHKSIM
0036 1561      LODSIM=JMS I, SIMLOD
0037 4437      RTCENA=JMS ENARTC
4145

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0040 5440      PRGEND=JMP I, ENDPAS
0042 1200

/LOCATIONS USED BY THE PROGRAM

0041 0000      INTPLG, 0
0042 0000      CLKPLG, 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      P10XMT, 0
0052 0000      P10HEC, 0
0053 0000      SLUXMT, 0
0054 0000      SLUREG, 0
0055 0000      CONTWD, 0
0056 0377      K377, 377
0057 0200      K200, 200
0060 0252      K252, 252
0061 0125      K125, 125
0062 0252      K5252, 5252
0063 0252      K2525, 2525
0064 0007      K7, 7
0065 0774      K4, -4
0066 0770      K10, -10
0067 0000      SIMCNT, 0

0070 0000      EXPACD, 0
0071 0000      LINK, 0
0072 0000      XMTPLG, 0
0073 0000      RECPLG, 0
0074 0000      RTCPLG, 0
0075 0000      PNOINT, 0
0076 0000      I1ACTV, 0
0077 6520      BADPAS, 6520 /ACT LINE ERROR RETURN TO FIELD 7
0100 4500      GOODPS, 4500 /ACT LINE GOOD RETURN TO FIELD 7
0101 7634      ACTCNT, -144
0102 7634      *144, -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 IF FIELD 0

```

```

0115 0224 RIF /GET THE PROGRAM FIELD INTO THE AC
0116 1131 TAD KODF /AND IT TO THE CDF INSTRUCTION
0117 3120 DCA ,+4 /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 KRHF, 6244
0131 6201 KODF, 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

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/\*\*\*\*\*  
/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 TSWAT /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 KSWAT /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      TIS          /TRANSMIT AND CLEAR THE XMIT FLAG
0262 4431      TSWAT        /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      KSWAT        /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 6031      ION
0276 6031      KSF          /TURN THE INTERRUPT BACK ON
0277 7610      SKP CLA      /SKIP ON RECEIVE FLAG
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      LOOSIM      /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      RTGENA      /TURN THE INTERRUPT ON
0312 6001      ION
0313 7344      CLA CLL CMA RAL /SET THE AC TO -2
0314 6035      KIE         /CLEAR SLU INTERRUPT ENABLE
0315 7050      CMA RAR
0316 7620      SNO CLA
0317 4427      ERROR       /KIE CHANGED THE AC
0320 7240      CLA CMA
0321 6032      KCC         /CLEAR RECEIVE FLAG AND AC
0322 7640      SEA 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
0333 7640      SEA CLA
0334 4427      ERROR       /SET THE AC BACK TO 0
0335 7340      ERROR       /KRS CHANGED THE AC
0336 6031      CLA CLL CMA
0337 7040      KSF         /SKIP ON RECEIVE FLAG
                                CMA
    
```

```

0340 7640      SEA CLA
0341 4427      ERROR       /KSF CHANGED THE AC
0342 7240      CLA CMA
0343 6030      KCF         /CLEAR RECEIVE FLAG
0344 7040      CMA
0345 7640      SEA CLA
0346 4427      ERROR       /KCF CHANGED THE AC
0347 7240      CLA CMA
0350 6040      TFL         /SET TRANSMIT FLAG
0351 7040      CMA
0352 7640      SEA CLA
0353 4427      ERROR       /TFL CHANGED THE AC
0354 7240      CLA CMA
0355 6042      TCF         /CLEAR THE TRANSMIT FLAG
0356 7040      CMA
0357 7640      SEA CLA
0360 4427      ERROR       /TCF CHANGED THE AC
0361 7240      CLA CMA
0362 6041      TSF         /SKIP ON TRANSMIT FLAG
0363 7040      CMA
0364 7640      SEA 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      SEA CLA
0372 4427      ERROR       /TPC CHANGED THE AC
0373 4431      TSWAT        /WAIT FOR THE TRANSMIT FLAG
0374 4427      ERROR       /TRANSMIT FLAG FAILED TO SET
0375 4432      KSWAT        /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      SEA CLA
0405 4427      ERROR       /SPI CHANGED THE AC
0406 7240      CLA CMA
0407 6046      TIS         /LOAD TRANSMIT BUFFER, TRANSMIT + CLEAR FLAG
0410 7040      CMA
0411 7640      SEA CLA
0412 4427      ERROR       /TIS CHANGED THE AC
0413 4431      TSWAT        /WAIT FOR THE TRANSMIT FLAG
0414 4427      ERROR       /TRANSMIT FLAG FAILED TO SET
0415 4432      KSWAT        /WAIT FOR THE RECEIVE FLAG TO SET
0416 4427      ERROR       /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      SEA 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 LDDSIM /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 LDDSIM /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
 /LOOP = THIS ADDRESS IF SIMULATOR SELECTED
 /OTHERWISE SCOPE LOOP IS THIS ADDRESS #1
0444 3041 DCA INTFLG /CLEAR PROGRAM INTERRUPT FLAG
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
0448 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 (300=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 LDDSIM /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
 /LOOP = THIS ADDRESS IF SIMULATOR SELECTED
 /OTHERWISE SCOPE LOOP IS THIS ADDRESS #1
0457 3041 DCA INTFLG /CLEAR PROGRAM INTERRUPT FLAG
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

```

```

/*****
/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 4017 4017 /CONTROL WORD FOR THE SIMULATOR
0474 4437 LDDSIM /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
 /LOOP = THIS ADDRESS IF SIMULATOR SELECTED
 /OTHERWISE SCOPE LOOP IS THIS ADDRESS #1
0475 3041 DCA INTFLG /CLEAR PROGRAM INTERRUPT FLAG
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 /SETUP COUNTER TO TRANSMIT 377 TIMES
0513 3050 DCA SAVCNT
0514 1050 TAD SAVCNT
0515 3047 DCA TSTCNT
0516 4436 SIMCHK /CHECK FOR THE SIMULATOR
0517 4017 4017 /CONTROL WORD FOR THE SIMULATOR
0520 4437 LDDSIM /LOAD THE SIMULATOR IF SELECTED
0521 1047 TAD TSTCNT /GET THE WORD TO BE TRANSMITTED
0522 1056 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

```

```

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
0542 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 2056      AND          K377      /MASK OUT FOR 8 BITS
0550 3053      DCA          SLUXMT  /SAVE THE WORD TO BE TRANSMITTED
0551 1053      TAD          /GET THE WORD
0552 6046      TLA          /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  /ARE THEY EQUAL?
0566 7640      SZA          CLA      /NO DATA ERROR ON SERIAL LINE UNIT
0567 4434      SLUDER      /GET THE PROGRAM INTERRUPT FLAG
0570 1041      TAD          INTFLG  /GET THE PROGRAM INTERRUPT FLAG
0571 7640      SZA          CLA
0572 4427      ERROR      /PROGRAM INTERRUPTED WITHOUT INT ENA
0573 4424      DONLDP      /DONE? OR REPEAT TEST IF SR2=1
0574 7000      NOP
0575 7000      NOP

0576 1021      TAD          OP1SEL  /GET THE HARDWARE CONFIGURATION
0577 0057      AND          K200      /CHECK FOR THE SIMULATOR
0602 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
0612 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 6157      SKPRDR      /SKIP ON READER RUN SET
0633 7410      SKP          /INITIALIZE FAILED TO CLEAR READER RUN
0634 4427      ERROR      /CLEAR AC AND RECEIVE FLAG AND SET 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      DONLDP      /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
0662 4437      LODSIM      /LOAD THE SIMULATOR
0661 6007      CAF          /CLEAR ALL FLAGS
0662 4145      RTCENA      /SET REAL TIME CLOCK INT ENA

```

```

0663 6001 ION /TURN THE INTERRUPT ON
0664 6035 KIE /DISABLE SLU INT ENABLE
0665 6156 CLRDET /CLEAR READER RUN
0666 6157 SKPRDR /SKIP ON READER DETECTOR F/F SET
0667 7610 SKP CLA
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 KSFWAT /WAIT FOR THE RECEIVE FLAG
0701 4427 ERROR /RECEIVE FLAG FAILED TO SET
0702 6156 CLRDET /CLEAR READER RUN DETECTOR F/F
0703 6157 SKPRDR /SKIP ON READER RUN DETECTOR F/F SET
0704 7610 SKP CLA
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 3047 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
1012 3000
1013 0000
1014 3000 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 /SIMULATOR NOT SELECTED,CHECK TEST LOOP SWITCH
1027 5237 JMP LOOPSW /ADD A 1 TO THE CONTROL WORD?
1028 2067 ISZ SIMCNT
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 SMA CLA /LOOP?
1038 5621 JMP I LOPDON /NO,GO TO NEXT TEST
1039 5445 JMP I TEST /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 /SAVE THE AC
1048 5321 JMP FLGCK5 /RETURN TO THE PROGRAM

```

```

1051 0000 AC, 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 /SAVE THE AC
1056 1042 TAD CLKFLG /WERE WE EXPECTING A CLOCK INTERRUPT?
1057 7650 SNA CLA
1058 4776 JMS CHKACT /GO CHECK FOR THE ACT LINE
1059 6137 CLSK /YES = SKIP ON REAL TIME CLOCK FLAG
1060 7410 SKP
1061 5305 JMP FLGCK1 /GO CHECK THE OTHER FLAGS
1062 1133 TAD ACTFLG /GET THE ACT FLAG
1063 7440 SZA /DID THE PROGRAM GO TO THE PROM ?
1064 5300 JMP ACTCK2 /YES,CHECK PARALLEL I/O DATA ACCEPTED
1065 4041 TSF /HAS IT A TRANSMIT FLAG?
1066 7610 SKP CLA
1067 5310 JMP FLGCK2 /TRANSMIT FLAG SET = CHECK THE OTHER FLAGS
1068 6031 KSF /HAS IT A RECEIVE FLAG?
1069 7410 SKP
1070 5313 JMP FLGCK3 /YES = GO CHECK THE OTHER FLAGS
1071 6571 DBSK /HAS THE DATA READY FLAG SET?
1072 7410 SKP
1073 5316 JMP FLGCK4 /YES = CHECK DATA ACCEPTED FLAG
1074 4570 ACTCK2, DBST /HAS DATA ACCEPTED SET=IF SO CLEAR IT
1075 7640 SZA CLA
1076 5317 JMP FLGCK5#2 /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, DBSK       /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
1118 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=GET 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=GET 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
1160 4363      JMS ADDTIM         /GO ADD ONE TO THE COUNTER
1161 2353      ISZ WTCLSK
1162 5753      JMP I WTCLSK       /RETURN TO THE PROGRAM=GET 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
    
```

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      SWCHK              /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 OP1SEL
1212 7700      SMA CLA
1213 5216      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 0
1222 1636      TAD I KB           /GET THE INTERRUPT PC
1223 3237      DCA RETADD        /SAVE IT
1224 5224      RIF
1225 1131      TAD KODF          /ADD A CDF INSTRUCTION TO IT
    
```

```

1226 3227 DCA ,+1 /SAVE IT IN THE NEXT LOCATION
1227 7402 HLT/CPF /RETURN TO THE PROGRAM DATA FIELD
1230 1620 TAD I RETURN /GET THE INTERRUPT RETURN LOCATION
1231 3240 DCA SAVLOC /SAVE IT
1232 723 USE 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 KRTE
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 1103 CAL
1261 1102 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 0007 C7, 7
1271 0010 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 SWCHK /CHECK SR0 TO INHIBIT ERROR HALT
1300 7710 SPA CLA

```

```

1301 5307 JMP AERSWH /SR0=1 CHECK LOOP ON LOGIC ERROR
1302 7240 CLA CHA
1303 1275 TAD AERROR
1304 7402 HLT /AC = ADDRESS WHERE ERROR WAS DETECTED
1305 4314 JMS SIMWRD /WAS THE SIMULATOR SELECTED
1306 7402 HLT /AC=SIMULATOR CONTROL WORD
1307 4435 AERSWH, SWCHK /CHECK SR1=1 TO LOOP ON ERROR
1310 7004 RAL
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 SMA CLA
1321 5324 JMP ,=3
1322 1055 TAD CONTWD
1323 5714 JMP I SIMWRD
1324 2314 USE 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 4726 JMP I ACTCHK /NO, RETURN TO ERROR ROUTINE
1333 4002 IOF /TURN THE INTERRUPT OFF
1334 7344 CLA CLL CHA RAL
1335 1326 TAD ACTCHK
1336 3343 DCA ERRPC
1337 7240 CLA CHA
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 USE 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 5350 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, R
1365 2101 ONACTL, ISZ ACTCNT /100 CLOCK TICKS YET?
1366 5357 JMP CLKSET+5/NO RETURN TO PROGRAM
1367 1102 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, R
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 P10XMT /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 P10REC /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
1430 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 P10XMT /GET THE WORD TRANSMITTED
1437 7041 CIA
1440 1052 TAD P10REC /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
1449 4427 ERROR /CAF FAILED TO CLEAR THE 12 BIT DATA BUFFER
1451 2200 ISZ DATPIO /BUMP RETURN ADDRESS POINTER BY 1
1452 5600 JMP I DATPIO /RETURN TO TEST

```

/ROUTINE FOR TRANSMITTING, READING AND COMPARING DATA FOR SLU

```

1453 1000 DATSLU, R
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 TLD /LOAD AND TRANSMIT IT AND CLEAR THE FLAG
1462 4431 YSFMT /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
1470 4432 KSFMT /WAIT FOR THE RECEIVE FLAG TO SET
1471 4427 ERROR /RECEIVE FLAG FAILED TO SET
1472 2041 ISZ INTFLG /DID THE RECEIVE FLAG CAUSE A INTERRUPT
1473 4427 ERROR /RECEIVE FLAG FAILED TO CAUSE A INTERRUPT
1474 6036 KRB /CLEAR THE AC AND RCV FLAG AND READ BUFFER
1475 3054 DCA SLUREC /SAVE THE WORD READ BACK
1476 6001 ION /TURN THE INTERRUPT BACK ON
1477 1041 TAD INTFLG /CHECK THAT KRB CLEARED THE RCV FLAG
1478 7640 SZA CLA
1480 7640 ERROR /KRB FAILED TO CLEAR RCV FLAG OR INTERRUPTED
1491 4427 TAD SLUXMT /GET THE WORD TRANSMITTED
1492 1053 CIA
1493 7041 TAD SLUREC /GET THE WORD READ BACK
1494 1054 SZA CLA
1495 7640 JMP I DATSLU /DATA ERROR-RETURN TO REPORT THE ERROR
1496 5653 ISZ DATSLU /BUMP RETURN ADDRESS POINTER BY ONE
1497 2253 JMP I DATSLU /RETURN TO TEST
1510 5653

```

/DATA ERROR ROUTINE FOR PARALLEL I/O

1511 0000 DERPIO, R

```

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 DERP10
1518 7402 HLT /AC = ADDRESS WHERE ERROR WAS DETECTED
1519 7200 CLA
1520 1051 TAD P10XMT /GET THE WORD TRANSMITTED
1521 7402 HLT /AC = THE GOOD WORD
1522 7200 CLA
1523 1052 TAD P10REC /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 7004 SNA CLA /LOOP?
1528 5711 JMP I DERP10 /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 OPISL /CHECK FOR SIMULATOR
1563 1057 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
1570 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 | 11111111 | 11111111 | 11111111 |
| 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 | 11111111 |
| 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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2400  
2500  
  
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2700  
  
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3100  
  
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3300  
  
3400  
3500  
  
3600  
3700

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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 | 0181 | INACTY | 0076 | PIOMY  | 0051 | YSF    | 6041 |
| ACTFLG | 0135 | INTFLG | 0041 | PNDINT | 0075 | YTFWAT | 4431 |
| ACTRET | 1364 | INTRET | 1130 | POWFAL | 1241 | YSTCNT | 0047 |
| ADDTIM | 1163 | K0     | 1256 | PRGEND | 5440 | YSTGOD | 0135 |
| AERROR | 1275 | K1     | 0124 | RECFLG | 0073 | YSTLOP | 0046 |
| AERSWH | 1307 | K10    | 1271 | REYADD | 1237 | WATKSF | 1142 |
| RADPAS | 0077 | K11    | 1273 | RETURN | 1200 | WATTSF | 1131 |
| AT     | 1270 | K12    | 1274 | RMF    | 6244 | WTCLSK | 1193 |
| CAF    | 6007 | K125   | 0061 | RTGENA | 4145 | XMTFLG | 0072 |
| CAL    | 0103 | K2     | 0125 | RTCPFG | 0074 |        |      |
| CHKACT | 1344 | K200   | 0077 | RTF    | 6095 |        |      |
| CHKSIH | 1561 | K252   | 0060 | SAVADD | 0123 |        |      |
| CHKSHH | 1207 | K2925  | 0063 | SAVCNT | 0090 |        |      |
| CLCL   | 0136 | K3     | 0126 | SAVLOG | 1240 |        |      |
| CLKFLG | 0042 | K377   | 0096 | SBE    | 6101 |        |      |
| CLKSET | 1352 | K5252  | 0062 | SIMCHK | 4430 |        |      |
| CLKSHC | 0134 | K7     | 0064 | SIMCLR | 6100 |        |      |
| CLLE   | 0136 | 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 | 1092 |        |      |
| CNT    | 0043 | KJWP   | 0127 | SKPOAV | 6165 |        |      |
| CNT1   | 0044 | KJWP7  | 1265 | SKPFRQ | 6162 |        |      |
| CONTWD | 0055 | KJWPRT | 1272 | SKPRDH | 6157 |        |      |
| DATPIO | 1400 | KRB    | 6036 | SKPSTR | 6167 |        |      |
| DATSLU | 1453 | KRMF   | 0130 | SLUDAT | 4433 |        |      |
| DBCE   | 0576 | KRS    | 6034 | SLUDCR | 4434 |        |      |
| DBCF   | 0573 | KRTF   | 0132 | SLUREC | 0094 |        |      |
| DBRD   | 0572 | KSF    | 6031 | SLUSWH | 1594 |        |      |
| DBSE   | 0575 | KSFWAT | 4432 | SLUXMT | 0093 |        |      |
| DBSK   | 0571 | KTEST  | 1246 | SP1    | 6045 |        |      |
| DBSS   | 0577 | LINK   | 0071 | EPL    | 6102 |        |      |
| DBST   | 0570 | LOADSH | 6151 | STRFRQ | 6161 |        |      |
| DBTD   | 0574 | LODFRQ | 6163 | SWHCHK | 4435 |        |      |
| DEBPIO | 1511 | LODSIH | 4437 | SWITCH | 0020 |        |      |
| DEBSLU | 1534 | LODFPC | 4423 | TCF    | 6042 |        |      |
| DONLDP | 4424 | LODFSW | 1037 | TEST   | 0045 |        |      |
| ENARTC | 1145 | LOPDDN | 1021 | TEST29 | 0201 |        |      |
| ENDPAS | 1200 | M0     | 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 | 0492 |        |      |
| FLGCK2 | 1110 | OP1SEL | 0021 | TEST35 | 0470 |        |      |
| FLGCK3 | 1113 | OP2SEL | 0022 | TEST36 | 0507 |        |      |
| FLGCK4 | 1116 | PATCH  | 0103 | TEST37 | 0527 |        |      |
| FLGCK5 | 1121 | PCLOOP | 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=6307 /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=6304

/OPTION BOARD NUMBER 1 IOT'S

//SERIAL LINE UNIT  
/RECEIVER IOTS  
6030 XCF=6030 /CLEAR RECEIVE FLAG, DON'T SET READER RUN  
6031 XSF=6031 /SKIP ON RECEIVE FLAG  
6032 XCC=6032 /CLEAR RECEIVE FLAG AND AC, SET READER RUN  
6034 XRS=6034 /READ RECEIVE BUFFER  
6035 XIC=6035 /AC 11=1 SET INTERRUPT ENABLE  
6036 XRB=6036 /AC 11=0 CLEAR INTERRUPT ENABLE  
/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 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 0BSS=6577 /ISSUE A STROBE PULSE

/SWITCH REGISTER SETTINGS

/SRD=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 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 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 RMP /RESTORE MEMORY FILES
0002 5403 JMP I 3 /RETURN TO INTERRUPT SERVICE ROUTINE
0003 0444 SIMINT/SKPCHN/SIMCHK/RTCINT/SLUINT /INTERRUPT SERVICE ROUTINES

0020 *20
0020 0000 SWITCH, 0
0021 0000 DP1SEL, 0000
/ 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 = 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 DP2SEL, 0
4423 LOOPPC=JMS I, PCLOOP
0023 0400 DONLOP=JMS I,
4424 DONLOP=JMS I, LOPDON
0024 0421 CLSKWT=JMS I, WTCLSK
4425 CLSKWT=JMS I,
0025 0593 PIODAT=JMS I, DATPIO
4426 PIODAT=JMS I,
0026 1000 ERROR=JMS I,
4427 ERROR=JMS I, AERROR
0027 0675 PIODER=JMS I,
4430 PIODER=JMS I, DERPIO
0030 1111 TSFWAT=JMS I,
4431 TSFWAT=JMS I, WATTSP
0031 0531 KSFWAT=JMS I,
4432 KSFWAT=JMS I, WATKSP
0032 0542 SLUDAT=JMS I, DATSLU
4433 SLUDAT=JMS I,
0033 1053 SLUDER=JMS I,
4434 SLUDER=JMS I, DERSLU
0034 1134 SHCHCK=JMS I,
4435 SHCHCK=JMS I, CHKSWH
0035 0607 SIMCHK=JMS I,
4436 SIMCHK=JMS I, CWKSIM
0036 1161 LODSIM=JMS I,
4437 LODSIM=JMS I, SIML0D
0037 0414 RTCENA=JMS ENARTC
4146 RTCENA=JMS ENARTC
    
```

```

0040 5440 PRGEND=JMP I ,
      5600 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 P10XHT, 0
0052 0000 P10REQ, 0
0053 0000 SLUXHT, 0
0054 0000 SLUREQ, 0
0055 0000 CONTHD, 0
0056 0377 K377, 377
0057 0200 K200, 200
0060 0252 K252, 252
0061 0125 K125, 125
0062 0252 K5252, 5252
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 EXPACD, 0
0072 0000 LINK, 0
0073 0000 XHTFLG, 0
0074 0000 REOFLG, 0
0075 0000 RTOFLG, 0
0076 0000 PHOINT, 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 H144, =144

```

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

```

0104 0000 PATCH, 0
0105 1574 TAD I PATCH /GET THE INTERRUPT SERVICE ADDRESS
0106 3124 DCA SAVADD /SAVE INTERRUPT ADDRESS
0107 6201 CDF /CHANGE DATA FIELD TO FIELD 3
0110 1131 TAD KRMF /GET THE INSTRUCTION RMF
0111 3525 DCA I K1 /PUT IT IN LOCATION 1 OF FIELD 3
0112 1130 TAD KJMP /GET THE INSTRUCTION JMP I 3
0113 3526 DCA I K2 /PUT IT IN LOCATION 2 OF FIELD 3
0114 1124 TAD SAVADD /GET THE INTERRUPT SERVICE ADDRESS

```

```

0115 3527 DCA I K3 /PUT IT IN LOCATION 3 IF FIELD 3
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 7492 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 TSTG00, 0
0137 1022 TAD DP2SEL /GET THE HARDWARE FLAG
0140 7700 SMA CLA /ARE WE ON THE ACT LINE?
0141 5536 JMP I TSTG00 /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 TSTG00 /RETURN TO THE PROGRAM

```

```

0146 0000 ENARTC, 0
0147 1022 TAD DP2SEL /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

```

```

*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 5160          SIMCLR
0201 1021          TAD DP1SEL      /GET HARDWARE CONFIGURATION
0202 7057          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 6021          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          LOOFRQ      /LOAD THE FREQUENCY COUNT IN TO THE AC
0227 3250          DCA FRCNT     /SAVE THE FREQUENCY COUNT READ
0230 1251          TAD RTCFRQ    /GET THE NEGATIVE VALUE OF MAX TOLERANCE
0231 1250          TAD FRCNT     /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
0241 4427          ERRR          /GO BACK FOR NEXT ALLOWED NUMBER
                                /RTC TIMING ERROR PRESS "CONT" FOR
                                /SIMULATOR CONTROL WORD
                                /CHECK SR1 TO LOOP ON ERROR
                                /PUT IT IN BIT 0

0242 4435          SWHCHK
0243 7004          RAL
0244 7710          SPA CLA      /REPEAT TEST
0245 5446          JMP I TSTL0P   /DONE OR REPEAT TEST IF SR2=1
0246 4424          RTIMOK, DONL0P /GO TO NEXT TEST
0247 5252          JMP TEST41

0250 0000          FRCNT, 0
0251 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  
 \*\*\*\*\*

```

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
0261 6007          CAF          /CLEAR ALL FLAGS
0262 4146          RTCENA      /SET REAL TIME CLOCK INT ENA
0263 6035          KIE          /CLEAR SLU INTERRUPT ENABLE
0264 6021          ION          /TURN THE INTERRUPT ON
0265 6161          STRFRQ      /START A FREQUENCY COUNT
0266 6162          SKPFRQ      /SKIP ON FREQUENCY COUNT IN PROGRESS
0267 7610          SKP CLA      /FREQUENCY COUNT ENDED GO READ IT
0270 5266          JMP (=2      /WAIT FOR FREQUENCY COUNT ENDED
0271 6163          LOOFRQ      /LOAD FREQUENCY COUNT INTO AC
0272 3250          DCA FRCNT     /SAVE THE WORD READ
0273 1055          TAD CONTWD    /GET THE CONTROL WORD
0274 7064          AND K7        /MASK OUT THE BAUD RATE
0275 1376          TAD (=FRTAB   /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 FRCNT     /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
0311 5325          JMP (=4
0312 4427          ERRR          /BUMP SLU TIMING CHECK COUNTER
                                /RETURN TO ADD A 1 TO THE NUMBER
                                /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 TSTL0P   /YES DO SAME BAUD RATE
0317 4424          SLUTOK, DONL0P /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          FRTAB, =5443 /110 BAUD = 2841 + OR = 10
0322 3723          =4055 /150 BAUD = 2083 + OR = 10
0323 3723          =4055 /300 BAUD = 2083 + OR = 10
0324 3723          =4055 /600 BAUD = 2083 + OR = 10
0325 5744          =2034 /1200 BAUD = 1042 + OR = 10
0326 6755          =1023 /2400 BAUD = 0521 + OR = 10
0327 7362          =041A /4800 BAUD = 0262 + OR = 10
0330 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.  
 \*\*\*\*\*

```

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 5002 IOF /TURN THE INTERRUPT OFF
0337 4470 JMS I DELAYR /DELAY FOR APPROXIMATELY 200MS TO
 /ALLOW FLAGS TO SETTLE
0340 5007 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 PIOXMT /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 5135 CLLE /SET RTC INT ENA
0366 7200 CLA
0367 5575 DBSE /SET 12 BIT PARALLEL I/O INT ENA
0370 4046 TLS /LOAD AND TRANSMIT ON SLU
0371 5574 DBTD /TRANSMIT ALL 0'S ON P I/O
0372 5001 ION /TURN THE INTERRUPT ON
0373 5373 JMP /GO BABY GO!!!

0374 7740 M40, *40

0376 5321
0377 7760
  
```

0400 PAGE

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

```

0400 0000 PCL00P, P
0401 7340 CLA CLL CMA
0402 1200 TAD PCL00P
0403 3045 DCA TEST
0404 1600 TAD I PCL00P
0405 3067 DCA SIMCNT
0406 7240 CLA CMA
0407 3050 DCA SAVCNT
0408 1050 TAD SAVCNT
0409 3047 DCA TSTCNT
0410 2200 ISZ PCL00P
0411 5600 JMP I PCL00P

0414 1000 SIMLOD, P
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, P
0422 2047 ISZ TSTCNT /TEST DONE?
0423 5446 JMP I TSTLOP /NO RETURN TO TEST
0424 1021 TAD DPSEL /IS THE SIMULATOR SELECTED
0425 1057 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, SHMCHK /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 FLOCKS /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 /WHERE 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 /OID 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 5530 INTRET
0526 1251 TAD AC
0527 5750 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=GOY 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
0550 4363 JMS ADDTIM /GO ADD A ONE TO THE COUNTER
0551 2342 ISZ WATKSF
0552 5742 JMP I WATKSF /RETURN TO THE PROGRAM=GOY 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=GOY 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 7340 CLA CLL CMA RTL
0570 7001 IAC
0571 1363 TAD ADDTIM
0572 3363 DCA ADDTIM
0573 5763 JMP I ADDTIM
    
```

```

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 7000 CHKSWH, ?
0610 7200 CLA
0611 1021 TAD OP1SEL
0612 7700 SNA 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 7000 RETURN, ?
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

K0, ?
RETADD, ?
SAVLOC, ?
    
```

/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.

```

0641 7200 POWFAL, CLA CLA
0642 6201 CDF 00
0643 1245 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 RMP
0660 6103 CAL
0661 6102 SPL
0662 7610 SKP CLA
0663 5261 JMP ,+2
0664 5445 JMP I TEST

KJMP7, JMP 7
KTEST, TEST
FLGRST, TAD 12
C7, 7
K10, 10
KJMPRT, JMP I TEST
K11, 11
K12, 12

/LOGIC ERROR ROUTINE = RESTART TEST IF SR1=1

0675 0000 AERROR, ?
0676 4326 JMS ACTCHK /GO CHECK TO SEE IF RUNNING ON ACT LINE
0677 4435 SWHCHK /CHECK SR0 TO INHIBIT ERROR HALT
0680 7710 SPA CLA
0681 5307 JMP AERSWH /SR0=1 CHECK LOOP ON LOGIC ERROR
0682 7240 CLA CHA
0683 1275 TAD AERROR
0684 7402 HLT /AC = ADDRESS WHERE ERROR WAS DETECTED
0685 4314 JMS SIMWRD /WAS THE SIMULATOR SELECTED
0686 7402 HLT /AC=SIMULATOR CONTROL WORD
0687 4435 AERSWH, SWHCHK /CHECK SR1=1 TO LOOP ON ERROR
0690 7004 RAL
0691 7700 SNA 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

SIMWRD, ?
0714 7000 CLA CLL
0715 7300 TAD OP1SEL
0716 1021 AND K200
0717 0057 SNA CLA
0720 7650 JMP ,+3
0721 5324 TAD CONTND
0722 1055 JMP I SIMWRD
0723 5714 ISZ SIMWRD
0724 2314 JMP I SIMWRD
0725 5714
    
```

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

```

0726 0000 ACTCHK, 0
0727 7330 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 6802 IOF /TURN THE INTERRUPT OFF
0734 7344 CLA CLL CHA RAL
0735 1326 TAD ACTCHK
0736 3343 OCA ERRPC
0737 7240 CLA CHA
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 4137 CLSK /HAS 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 DNACTL /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 DNACTL, ISZ ACTCNT /130 CLOCK TICKS YET?
0766 5357 JMP CLKSET+5 /NO RETURN TO PROGRAM
0767 1103 TAD M144 /RESET ACT TIME COUNTER
0770 3102 OCA 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 CHA
0774 3134 OCA 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 OCA INTFLG /CLEAR PROGRAM INTERRUPT FLAG
1015 6572 DBRD /READ THE 12 BIT PARALLEL I/O BUFFER
1016 3052 OCA 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 ACPT 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 5630 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 OCA INTFLG /CLEAR THE PROGRAM INTERRUPT FLAG
1060 1053 TAD SLUXMT /GET THE WORD TO BE TRANSMITTED
1061 6046 TFS /LOAD AND TRANSMIT IT AND CLEAR THE FLAG
1062 4431 TSFAT /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      ION          /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      ION          /TURN THE INTERRUPT BACK ON
1077 1041      TAD          INTFLG   /CHECK THAT KRB CLEARED THE RCV FLAG
1100 7642      SZA          CLA          /KRB FAILED TO CLEAR RCV FLAG OR INTERRUPTED
1101 4427      ERROR      /KRB FAILED TO CLEAR RCV FLAG OR INTERRUPTED
1102 1093      TAD          SLUXMT   /GET THE WORD TRANSMITTED
1103 7041      CIA          /GET THE WORD READ BACK
1104 1094      TAD          SLUREC   /GET THE WORD READ BACK
1105 7642      SZA          CLA
1106 5693      JMP I DATSLU  /DATA ERROR=RETURN TO REPORT THE ERROR
1107 2293      ISZ          DATSLU  /BUMP RETURN ADDRESS POINTER BY ONE
1110 5693      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
1120 7402      HLT          /AC = ADDRESS WHERE ERROR WAS DETECTED
1121 7200      CLA
1122 1051      TAD          PIDXMT   /GET THE WORD TRANSMITTED
1123 7402      HLT          /AC = THE GOOD WORD
1124 7200      CLA
1125 1052      TAD          PIOREC   /GET THE WORD READ
1126 7402      HLT          /AC = THE BAD WORD - WORD READ
1127 4435      PIOSWH, SWHCHK  /LOOP ON DATA ERROR IF SR1=1
1130 7004      RAL
1131 7700      SMA          CLA          /LOOP?
1132 5711      JMP I DERPIO  /NO, RETURN TO TEST
1133 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
1140 5354      JMP          SLUSWH  /GO CHECK SR1=1 TO LOOP ON ERROR
1141 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
1150 1094      TAD          SLUREC  /GET THE WORD READ
1151 7402      HLT          /AC=THE BAD WORD=THE WORD READ
1152 4776'    JMS          SIMWRD  /WAS THE SIMULATOR SELECTED
1153 7402      HLT          /AC=THE SIMULATOR CONTROL WORD
1154 4435      SLUSWH, SWHCHK  /LOOP ON DATA ERROR IF SR1=1
1155 7004      RAL
1156 7700      SMA          CLA          /LOOP?
1157 5754      JMP I DERSLU  /NO, RETURN TO TEST
1160 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 3059      DCA          CONTWD  /SAVE IT
1170 7410      SKP
1171 2361      ISZ          CHKSIM
1172 2361      ISZ          CHKSIM
1173 1361      TAD          CHKSIM
1174 3040      DCA          TSTLOP
1175 5761      JMP I CHKSIM

```

```

1176 0714
1177 0726
1200 1200

```

PAGE

```

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

```

```

1200 6160      RTCTIM, SIMCLR
1201 4104      JMS          PATCH   /SETUP INTERRUPT SERVICE
1202 1219      RTCINT
1203 1377      TAD          (=5667      /SET UP A COUNT FOR 2000 CLOCK TICKS
1204 3047      DCA          /SAVE CLOCK TICK COUNTER
1205 4007      CAF          /CLEAR ALL FLAGS
1206 6137      CLSK          /WAIT FOR THE FIRST CLOCK FLAG
1207 5200      JMP          ,=1
1210 6136      CLCL          /CLEAR THE CLOCK FLAG

```

```

1211 7301 CLA CLL IAC
1212 6135 CLLE /LOAD CLOCK INTERRUPT ENABE
1213 6001 ION /TURN THE INTERRUPT ON
1214 5214 JMP
1215 6136 RTCTIM, CLCL /CLEAR THE CLOCK FLAG
1216 7300 CLA /CLEAR THE AC AND LINK
1217 2047 ISZ TSTCNT /DONE YET ?
1218 5213 JMP RTCTIM*2 /RETURN TO WAIT FOR NEXT FLAG
1219 7602 HLT CLA /HAS IT 30 SECONDS
1220 5200 JMP RTCTIM /DO TEST OVER OR DO ANOTHER TEST

```

.....  
/SERIAL LINE UNIT TIMING TEST  
.....

```

1223 6160 SLUTIM, SIMCLR
1224 4124 JMS PATCH /SETUP INTERRUPT SERVICE
1225 1271 SLUINT
1226 7402 HLT /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 4 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
/DOA CNT1
/CLEAR ALL FLAGS
/LOAD AND TRANSMIT THE FIRST CHARACTER
/IF 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 /SKIP ON THE RECEIVE FLAG
1272 7610 SKP CLA
1273 5264 JMP INTON /CLEAR THE RECEIVE FLAG AND TURN INT ON
1274 6041 TSF /SKIP IF TRANSMIT FLAG SET
1275 4427 ERROR /ILLEGAL INTERRUPT
1276 2043 ISZ CNT /ADD ONE TO THE FIRST COUNTER
1277 5266 JMP INTON+2
1300 2044 ISZ CNT1 /OVERFLOWED FIRST COUNT ADD 1 TO SECOND
1301 5266 JMP INTON+2 /GO DO ANOTHER 4295 INTERRUPTS
1302 7602 HLT CLA /HAS IT 30 SECONDS ???
1303 5223 JMP SLUTIM /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, =912 /10 BITS AT 11 CHAR/SEC=330 CHAR/30 SEC
1321 7777 =1
1322 7324 =454 /11 BITS AT 10 CHAR/SEC=300 CHAR/30 SEC
1323 7777 =1

```

/BAUD RATE CONSTANTS FOR 150 BAUD

```

1324 7076 BR150, =702 /10 BITS AT 15 CHAR/SEC=450 CHAR/30 SEC
1325 7777 =1
1326 7147 =631 /11 BITS AT 13,64 CHAR/SEC=429 CHAR/30 SEC
1327 7777 =1

```

/BAUD RATE CONSTANTS FOR 300 BAUD

```

1330 6174 BR300, =1604 /10 BITS AT 30 CHAR/SEC=900 CHAR/30 SEC
1331 7777 =1
1332 6316 =1462 /11 BITS AT 27,27 CHAR/SEC=810 CHAR/30 SEC
1333 7777 =1

```

/BAUD RATE CONSTANTS FOR 600 BAUD

```

1334 4370 BR600, =3410 /10 BITS AT 60 CHAR/SEC=1800 CHAR/30 SEC
1335 7777 =1
1336 4633 =3145 /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=13,091 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 1400
    
```

PAGE

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

```

1400 3325      INTSKP, DCA      ADDR1      /SAVE THE AC
1401 7010      RAR
    
```

```

1402 3326      DCA      LINKRT      /SAVE THE LINK
1403 6102      SPL
1404 7610      SKP      CLA      /SKIP ON POWER LOW FLAG
1405 5777'     JMP      POWFAL      /POWER GOING DOWN
1406 6041      TSF
1407 7610      SKP      CLA      /SKIP ON SLU XMIT FLAG
1410 5327      JMP      XMTSER      /XMIT FLAG SET GO SERVICE IT
1411 6031      KSF
1412 7610      SKP      CLA      /SKIP ON RECEIVE FLAG
1413 5776'     JMP      RECSER      /SERVICE THE RECEIVE FLAG AND COMPARE DATA
1414 6137      CLSK
1415 7610      SKP      CLA      /SKIP ON REAL TIME CLOCK FLAG
1416 5333      JMP      RTOSER      /GO SERVICE THE RTC FLAG
1417 6571      DBSK
1420 7610      SKP      CLA      /SKIP ON P I/O DATA READY FLAG
1421 5224      JMP      PIOSER      /GO SERVICE THE PARALLEL I/O FLAG
1422 4427      ERROR
1423 5445      JMP I  TEST      /ILLEGAL INTERRUPT
                                /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
1427 6573      DBCF
1430 3052      DCA      PIOREC      /READ THE 12 BIT P I/O DATA WORD
1431 6570      DBST
1432 4427      ERROR
1433 6570      DBST
1434 7610      SKP      CLA      /CLEAR THE DATA READY FLAG
1435 4427      FRROR
1436 4775'     JMS      CMPACL      /SAVE THE WORD READ
1437 1051      TAO      PIOXMT      /ORST FAILED TO CLEAR DATA ACCEPTED
1440 7041      CIA
1441 1052      TAD      PIOREC      /COMPARE THE AC DATA AND LINK
1442 7640      SZA      CLA
1443 4774'     JMS      PIDERR      /COMPARE THE XMITTED WITH WORD READ
1444 7301      CLA      IAC
1445 1323      TAD      RAN1
1446 1324      TAD      RAN2
1447 7106      CLL      HTL
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      /ARE THEY EQUAL?
1457 7010      RAR
1458 3072      DCA
1460 2091      ISZ     LINK
1462 1051      TAD      PIOXMT      /NO DATA ERROR
1463 6574      DBTD
1464 7300      CLA
1465 5306      JMP      AGLION      /GENERATE A RANDOM AC DATA WORD
                                /SAVE THE EXPECTED AC DATA WORD
                                /SAVE THE EXPECTED LINK
                                /ADD ONE TO THE WORD TO BE TRANSMITTED
                                /GET THE WORD
                                /LOAD AND TRANSMIT IT
                                /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
1480 7240 CLA CMA
1481 3074 DCA RECFLG /SET SLU REC FLAG TO INACTIVE
1482 7240 CLA CMA
1483 3075 DCA RTCFLG /SET RTC FLAG TO INACTIVE
1484 1372 TAD (=40 /RESET DEVICE INACTIVE COUNTER
1485 3077 DCA INACTV /TO =40
1486 4771 ACLION, JMS RETURN /SETUP INTERRUPT RETURN
1487 1522 INTERA
1490 7300 CLA CLL /SETUP AC AND LINK AND TURN INTERRUPT ON
1491 1072 TAD LINK /GET THE LINK
1492 7004 RAL
1493 1071 TAD EXPACD /GET THE AC DATA WORD
1494 6001 ION /TURN THE INTERRUPT ON
1495 2076 ISZ PNOINT /ADD 1 TO P I/O NO INTERRUPT COUNTER
1496 5722 JMP I INTERA /RETURN TO PROGRAM
1497 7300 CLA CLL
1498 4427 ERROR /ERROR PARALLEL I/O FAILED TO INTERRUPT
1499 5445 JMP I TEST /RESTART THE TEST

1922 0000 INTERA, 0
1923 1234 RAN1, 1234
1924 5670 RAN2, 5670
1925 0000 ADDR1, 0
1926 0000 LINKRT, 0
    
```

/SERIAL LINE UNIT INTERACTIVE TRANSMITTER SERVICE ROUTINE TEST 42

```

1927 3073 XMTSER, DCA XMTFLG /SET TRANSMITTER ACTIVE FLAG
1930 6042 TCF /CLEAR THE TRANSMIT FLAG
1931 4775 JMS CMPACL /COMPARE THE AC DATA WORD AND LINK
1932 5266 JMP RTCSLU /GO CHECK FOR ACTIVE DEVICES
    
```

/REAL TIME CLOCK INTERACTIVE CLOCK SERVICE ROUTINE TEST 42

```

1933 3075 RTCSER, DCA RTCFLG /SET CLOCK ACTIVE FLAG
1934 6136 CLCL /CLEAR THE CLOCK FLAG
1935 4775 JMS CMPACL /COMPARE THE AC AND LINK
1936 1022 TAD OP2SEL /CHECK TO SEE IF RUNNING ON ACT LINE
1937 7700 SMA CLA /IS IT?
1938 5346 JMP ,+6 /NO
1939 2102 ISZ ACTCNT /1 SECOND YET?
1940 5346 JMP ,+4
1941 1103 TAD M144 /RESET ACT COUNTER
    
```

```

1944 3102 DCA ACTCNT /SAVE IT
1945 4136 JMS TSTGDD /GOOD PAS SO FAR
1946 2047 ISZ TSTCNT /INCREMENT PROGRAM TEST COUNTER
1947 5266 JMP RTCSLU /GO CHECK FOR ACTIVE DEVICES
1948 4470 JMS I DELAYR /DELAY FOR 200MS TO ALLOW FLAGS TO SETTLE
1949 6007 CAF /CLEAR ALL FLAGS BUT SET SLU INT ENA
1950 4136 JMS TSTGDD /GOOD AGAIN!!!
1951 4435 SHMCHK /CHECK SR231 TO LOOP ON TEST
1952 7006 RTL
1953 7710 SPA CLA /LOOP?
1954 5445 JMP I TEST /YES, DO TEST OVER
1955 5440 PRGEND /NO, END OF TEST

1971 1620
1972 7740
1973 1670
1974 1742
1975 1621
1976 1600
1977 7641
1978 1600
    
```

PAGE

/SERIAL LINE UNIT INTERACTIVE RECEIVER SERVICE ROUTINE TEST 42

```

1600 3074 RECSE, 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?
1608 4317 JMS SLUERR /NO, DATA ERROR
1609 1053 TAD SLUXMT /ADD ONE TO THE WORD TO BE TRANSMITTED
1610 7001 IAC /
1611 2056 AND K377 /MASK OUT FOR THE EIGHT BITS
1612 3053 DCA SLUXMT /SAVE THE NEW WORD
1613 1053 TAD SLUXMT /GET THE WORD AND TRANSMIT IT
1614 6046 TLA /LOAD AND TRANSMIT THE WORD
1615 7300 CLA CLL
1616 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 ADDR1 /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 SWHCHK /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 /AC CONTAINS ADDRESS WHERE THE ERROR WAS DETECTED
1647 7200 CLA
1650 1071 TAD EXPACD
1651 7402 HLT
1652 7200 CLA /THE AC CONTAINS AC DATA BEFORE INTERRUPT
1653 1776 TAD ACCRET /
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, SWHCHK
1664 7004 RAL
1665 7710 SPA CLA /SCOPE LOOP
1666 5446 JMP I TSTLOP /RETURN TO TEST
1667 5621 JMP I CMPACL

```

/INACTIVE DEVICE ERROR

```

1670 0000 INACDV, 0
1671 4774 JMS ACTCHK /CHECK TO SEE IF RUNNING ON THE ACT LINE
1672 4435 SWHCHK /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 /AC = ADDRESS WHERE ERROR WAS DETECTED
1700 7300 CLA CLL
1701 1073 TAD XMTFLG
1702 7640 SEA CLA
1703 7402 HLT /SLU XMIT FLAG IS INACTIVE
1704 1074 TAD RECFLG
1705 7640 SEA CLA
1706 7402 HLT /SLU RECEIVE FLAG IS INACTIVE
1707 1075 TAD RTCPFG
1710 7640 SEA CLA
1711 7402 HLT /RTC FLAG IS INACTIVE
1712 4435 INACLP, SWHCHK /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 SWHCHK
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 /AC = ADDRESS WHERE ERROR WAS DETECTED
1727 7200 CLA
1730 1053 TAD SLUXMT
1731 7402 HLT /AC = WORD TRANSMITTED
1732 7200 CLA
1733 1054 TAD SLUREC
1734 7402 HLT
1735 4435 SLULOP, SWHCHK /AC = WORD THAT WAS READ
1736 7004 RAL /CHECK SR1=1 TO LOOP ON ERROR
1737 7710 SPA CLA /SCOPE LOOP
1740 5446 JMP I TSTLOP /RETURN TO TEST
1741 5717 JMP I SLUERR

```

/PARALLEL I/O DATA ERROR DURING INTERACTION TEST 42

```

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

```

```

1774 0726
1775 1926
1776 1525
1777 1466

```

5

|      |          |          |          |          |          |          |          |          |          |
|------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 0000 | 11110000 | 00000000 | 11111111 | 11111111 | 11111111 | 11111111 | 11111111 | 11111111 | 11111111 |
| 0100 | 11111111 | 11111111 | 11111111 | 11111111 | 11111111 | 11111111 | 11111000 | 00000000 | 00000000 |
| 0200 | 11111111 | 11111111 | 11111111 | 11111111 | 11111111 | 11111111 | 11111111 | 11111111 | 11111111 |
| 0300 | 11111111 | 11111111 | 11111111 | 11111111 | 11111111 | 11111111 | 11111111 | 11111111 | 11110011 |
| 0400 | 11111111 | 11111111 | 11111111 | 11111111 | 11111111 | 11111111 | 11111111 | 11111111 | 11111111 |
| 0500 | 11111111 | 11111111 | 11111111 | 11111111 | 11111111 | 11111111 | 11111111 | 11111111 | 11110111 |
| 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 | 01111111 |
| 1600 | 11111111 | 11111111 | 11111111 | 11111111 | 11111111 | 11111111 | 11111111 | 11111111 | 11111111 |
| 1700 | 11111111 | 11111111 | 11111111 | 11111111 | 11111111 | 11111111 | 11111000 | 00001111 |          |

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|        |      |        |      |         |      |        |      |
|--------|------|--------|------|---------|------|--------|------|
| AC     | 0451 | DBSS   | 6577 | KJMP7   | 0665 | RTCSLU | 1466 |
| ACDRET | 1929 | DBST   | 6570 | KJMPRT  | 0672 | RTCTIM | 1200 |
| ACLERR | 1634 | DBTD   | 6574 | KRB     | 0236 | RTF    | 6025 |
| ACLION | 1906 | DELAY  | 1360 | KRMF    | 0131 | RTIMSK | 0246 |
| ACLLOP | 1663 | DELAYR | 0070 | KRS     | 0034 | SAVADD | 0124 |
| ACTCHK | 2726 | DEPPIO | 1111 | KRTF    | 0133 | SAVCNT | 0050 |
| ACTCK2 | 0500 | DEPSLU | 1134 | KSF     | 0031 | SAVLOC | 0640 |
| ACTCNT | 0102 | DNLOP  | 4424 | KSPWAT  | 4432 | 9BE    | 6101 |
| ACTFLG | 0134 | ENARTC | 0146 | KTEST   | 0666 | SIMCHK | 4436 |
| ACTRET | 0764 | ENDPAS | 0600 | LINK    | 0072 | SIMCLR | 6160 |
| ADDTIM | 0563 | ERROR  | 4427 | LINKRT  | 1526 | SIMCNT | 0067 |
| AERROR | 0675 | ERRPC  | 0743 | LOADSM  | 6151 | SIMINT | 0444 |
| AERSWH | 0707 | EXPACD | 0071 | LOADFRQ | 6163 | SIMLSD | 0414 |
| BADPAS | 0100 | FLGCK1 | 0505 | LOADSIM | 4437 | SIMWRD | 0714 |
| BAUDRT | 1305 | FLGCK2 | 0510 | LOADPPC | 4423 | SKPCHN | 0452 |
| BAUDTB | 1310 | FLGCK3 | 0513 | LOADPSW | 0437 | SKPDAV | 6165 |
| BAUDWD | 1304 | FLGCK4 | 0516 | LOADPON | 0421 | SKPFRQ | 6162 |
| BDPNTR | 1307 | FLGCK5 | 0521 | M10     | 0066 | SKPRDR | 6157 |
| BR110  | 1320 | FLGRST | 0667 | M14     | 0103 | SKPSTR | 6167 |
| BR1200 | 1340 | FROCNT | 0250 | M15     | 1371 | SLUDAT | 4433 |
| BR130  | 1324 | FROTAB | 0321 | M4      | 0065 | SLUDER | 4434 |
| BR2400 | 1344 | GOODPS | 0101 | M4B     | 0374 | SLUERR | 1717 |
| BR320  | 1330 | DTF    | 6004 | DNACTL  | 0765 | SLUINT | 1271 |
| BR4800 | 1350 | HLT    | 7402 | OP1LK4  | 0000 | SLULOP | 1735 |
| BR600  | 1334 | INACDV | 1670 | OP1SEL  | 0021 | SLUREC | 0054 |
| BR9600 | 1354 | INACLP | 1712 | OP2SEL  | 0022 | SLUSTR | 1250 |
| C7     | 0670 | INACTV | 0077 | PATCH   | 0104 | SLUSWH | 1154 |
| CAF    | 0007 | INTERA | 1522 | PCLOOP  | 0400 | SLUTIM | 1223 |
| CAL    | 6103 | INTFLG | 0041 | PIODAT  | 4420 | SLUTDK | 0317 |
| CHKACT | 0744 | INTON  | 1264 | PIODEN  | 4430 | SLUXMT | 0053 |
| CHKSIM | 1161 | INTRET | 0530 | PIODERH | 1742 | SPI    | 0045 |
| CHKSWH | 0607 | INTSKP | 1400 | PIOLOP  | 1760 | SPL    | 6102 |
| CLCL   | 6136 | K0     | 0636 | PIOREC  | 0092 | STPBIT | 1306 |
| CLKFLG | 0042 | K1     | 0125 | PIOSER  | 1424 | STRFRQ | 6161 |
| CLKSET | 0752 | K10    | 0671 | PIOSWH  | 1127 | SWHCHK | 4435 |
| CLKSNC | 0135 | K11    | 0673 | PIOXMT  | 0051 | SWITCH | 0020 |
| CLLE   | 6135 | K12    | 0674 | PNDINT  | 0076 | TABFRQ | 0300 |
| CLRDSE | 6156 | K125   | 0061 | POWFLP  | 0641 | TCF    | 6042 |
| CLRSIM | 6150 | K2     | 0126 | PRGEND  | 5440 | TEST   | 0045 |
| CLSK   | 6137 | K200   | 0057 | RAN1    | 1523 | TEST40 | 0205 |
| CLSKMT | 4425 | K252   | 0060 | RAN2    | 1524 | TEST41 | 0252 |
| CMFACL | 1621 | K3     | 0063 | RECFLG  | 0074 | TEST42 | 0331 |
| CNT    | 0043 | K377   | 0127 | RECSEH  | 1630 | TFL    | 6040 |
| CNT1   | 0044 | K5252  | 0056 | RESET   | 1476 | TLS    | 6046 |
| CONTHD | 0055 | K7     | 0062 | RETA00  | 0637 | TPC    | 6044 |
| DATPIO | 1000 | K771R  | 0150 | RETURN  | 0620 | TSF    | 6041 |
| DATSLU | 1053 | KCC    | 0032 | RMP     | 6244 | TSFWAT | 4431 |
| DBCE   | 6576 | KCDF   | 0132 | RTCENA  | 4146 | TSTCNT | 0047 |
| DBDF   | 6573 | KCF    | 0030 | RTCFLG  | 0075 | TSTGDD | 0136 |
| DBRD   | 6572 | KIE    | 0035 | RTCPRQ  | 0251 | TSTLOP | 0046 |
| DBSE   | 6575 | KJMP   | 0130 | RTCINT  | 1215 | WATKSF | 0542 |
| DBSK   | 6571 |        |      | RTCSEH  | 1533 | WATTSF | 0531 |

WTCLSK 0553  
XHTFLG 0073  
XHTSER 1527

ERRORS DETECTED: 0  
LINKS GENERATED: 26  
RUN-TIME: 18 SECONDS  
2K CORE USED