IDENTIFICATION

PRODUCT CODE:	MAINDEC-08-DJDKA-B-D
PRODUCT NAME:	DKC8-AA OPTION TEST #1
DATE CREATED:	JULY 15, 1975
MAINTAINER:	DIAGNOSTIC ENGINEERING
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SUPERCEDES:	MAINDEC-08-DJDKA-A

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1.0 ABSTRACT

THE DKC8-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 "KGH" 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 JUMBERS
5. ONE QUAD EXTENDER.

SPECIAL:

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

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

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

1. TWO PDP-8A OPTION BOARD #1'S (ONE MODIFIED FOR "KGM" SIDE
2. TWO OPTION 1 & 2 TEST MODULES (G5041'S)
3. TWO BERG INTERFACE CABLES (PN-7010274)
4. THREE 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 DKC8-AA OPTION TEST 1 (4.5) WHICH WILL INCLUDE THE REAL TIME CLOCK AND SERIAL LINE UNIT TIMING TEST. IF THE OPTION 1 + 2 TEST MODULE IS NOT USED DO THE FOLLOWING TEST:

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

4.1 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 0003, AND SR TO BE ONLY LIGHT ON
37. LOAD ADDRESS TO 0200
38. PRESS THE NUMBER 6 AND THEN DISP
39. CHECK THE MD LIGHT TO BE THE ONLY LIGHT ON
40. PRESS THE NUMBERS 7402 AND CHECK CONTENT TO EQUAL THIS NUMBER
41. PRESS D THIS
42. CHECK ADDRESS EQUAL 0200 AND CONTENT EQUAL 7402
43. PRESS THE NUMBERS 7604 = CHECK CONTENT TO EQUAL THIS NUMBER

44', PRESS D NEXT
45', CHECK ADDRESS EQUAL 0201 AND CONTENT EQUAL 7604
46', PRESS THE NUMBERS 7421 AND CHECK CONTENT TO EQUAL 7421
47', PRESS D NEXT
48', CHECK ADDRESS TO EQUAL 0202 AND CONTENT EQUAL 7421
49', PRESS THE NUMBERS 1201 AND CHECK CONTENT TO EQUAL 1201
50', PRESS D NEXT
51', CHECK ADDRESS TO EQUAL 0203 AND CONTENT EQUAL TO 1201
52', PRESS NUMBERS 7402 AND CHECK CONTENT TO EQUAL 7402
53', PRESS D NEXT
54', CHECK ADDRESS TO EQUAL 0204 AND CONTENT TO EQUAL 7402
55', PRESS NUMBERS 7001 AND CHECK CONTENT TO EQUAL THIS NUMBER
56', PRESS D NEXT
57', CHECK ADDRESS TO EQUAL 0205 AND CONTENT TO EQUAL 7001
58', PRESS NUMBERS 5204 AND CHECK CONTENT TO EQUAL THIS NUMBER
59', PRESS D NEXT
60', CHECK ADDRESS TO EQUAL 0206 AND CONTENT TO EQUAL 5204
61', LOAD ADDRESS TO 0200
62', PRESS E THIS
63', CHECK ADDRESS EQUAL TO 0200 AND CONTENT EQUAL 7604
64', PRESS E NEXT
65', CHECK ADDRESS EQUAL TO 0201 AND CONTENT EQUAL 7604
66', PRESS E NEXT
67', CHECK ADDRESS EQUAL TO 0202 AND CONTENT EQUAL TO 7421
68', PRESS E NEXT
69', CHECK ADDRESS EQUAL TO 0203 AND CONTENT EQUAL TO 1201
70', PRESS E NEXT
71', CHECK ADDRESS EQUAL TO 0204 AND CONTENT EQUAL TO 7402
72', PRESS E NEXT
73', CHECK ADDRESS TO EQUAL 0205 AND CONTENT TO EQUAL 7001
74', PRESS E NEXT
75', CHECK ADDRESS TO EQUAL 0206 AND CONTENT TO EQUAL 5204
76', PRESS NUMBERS 5252
77', CHECK ADDRESS TO EQUAL 0206, CONTENT TO EQUAL 5252 AND
NO LIGHTS ON
78', PRESS LSR
79', CHECK ADDRESS TO EQUAL 0206, CONTENT TO EQUAL 5204 AND
MD LIGHT TO BE ONLY LIGHT LIT
80', PRESS THE NUMBER 4 AND DISPLAY
81', CHECK ADDRESS TO BE 206 AND CONTENT TO BE 5252 AND
THE SR LIGHT TO BE ONLY LIGHT LIT
82', LOAD ADDRESS TO 0200 & PRESS INIT AND THEN RUN
83', CHECK THAT MA EQUALS 0204, CONTENT EQUALS 5252 AND
SR LIGHT TO BE ONLY LIGHT LIT
84', PRESS THE NUMBER 6 AND THEN DISP
85', CHECK ADDRESS TO BE 0204 AND CONTENT TO BE 7402 AND
THAT THE MD LIGHT IS THE ONLY LIGHT LIT
86', PRESS THE NUMBER 1 AND THEN DISP
87', CHECK ADDRESS TO BE 0204 AND CONTENT TO BE 5252 AND
THAT THE 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 PSITION
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 ADND 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 DKC8-AA OPTION TEST 1. THESE 1K SEGMENTS ARE IN RIM FORMAT AND EACH TAPE SHOULD BE RUN CONSECUTIVELY. THE TAPES ARE LABELED AS MAINDEC-08-DJDKA-B-PM1, -PM2, -PM3 AND -PM4. TO LOAD THESE PROGRAMS, DEPOSIT INTO LOCATIONS LISTED BELOW THE APPROPRIATE RIM LOADER FOR THE LOADING DEVICE TO BE USED.

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

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

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

4.3 SETTING THE M8316 MODULE UP FOR TEST

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

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

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

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

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

B. SET SWITCHES S1-5 AND S1-6 TO THE ON POSITION TO ENABLE THE REAL TIME CLOCK AND THE TEST SWITCH.

C. SET SWITCH S1-7 TO ONE OF THE FOLLOWING POSITIONS:

S1-7 IN THE ON POSITION = ONE STOP BIT ON THE SERIAL LINE UNIT

S1-7 IN THE OFF POSITION = TWO STOP BITS ON THE SERIAL LINE UNIT

D. SET SWITCH S1-8 TO THE ON POSITION IF THE MODULE IS SETUP FOR 110 BAUD, OTHERWISE, ALWAYS SET THE SWITCH TO THE OFF POSITION.

E. CONNECT BERG SOCKETS J4 AND J5 ON THE M8316 MODULE IN PARALLEL USING THE BC08R-01 CABLE. THIS CONNECTS THE 12 BIT PARALLEL I/O OUTPUTS TO ITS INPUTS. BE SURE THAT THE CABLE IS INSTALLED CORRECTLY, I.E., ONE END OF THE CABLE HAS TO BE PLUGGED IN WITH THE LETTERING FACING DOWNWARDS (UPSIDE DOWN).

F. DO STEP 1 BELOW TO CONNECT THE SERIAL LINE UNIT UP FOR EIA LOOP BACK OR DO STEP 2 BELOW FOR 20MA LOOP BACK.

1. USING THE TERMI-POINT JUMPERS, CONNECT PIN F TO PIN J AND PIN E TO PIN M ON THE J3 BERG SOCKET ON THE M8316 MODULE OR PLUG THE EIA TEST BERG INTO THE J3 BERG SOCKET. GO TO PARAGRAPH 4.4, PROGRAM INITIALIZATION.

2. USING THE TERMI-POINT 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, DKC8-AA OPTION TEST 1

4.5 RUN DKC8-AA OPTION TEST 1

A, IF THE COMPUTER CONTAINS 4K OF MEMORY, THE MAIN TAPE (DJDKA-8-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 REGISETER TO 0400, OR IF THE PSEUDO SWITCH REGISTER WAS SET TO 0400 DEPENDING ON WHICH ONE WAS SELECTED BY THE OPERATOR, THE COMPUTER WILL HALT AT THE COMPLETION OF A PROGRAM PASS.

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

4.6 RUN REAL TIME CLOCK TIMING TEST

A. THE TEST IS A 30 SECOND STOP WATCH TIMING TEST

B. LOAD ADDRESS TO 4000 FOR TAPE MAINDEC-08-DJDKA-B-PB1 OR TO 1200 FOR TAPE MAINDEC-08-DJDKA-B-PM4, 1K VERSION PART 4, AND THEN PRESS "INIT".

C. CHECK STOP WATCH AND PRESS "RUN".

D. THE PROGRAM SHOULD HALT IN APPROXIMATELY 30 SECONDS AT LOCATION 4021 FOR TAPE MAINDEC-08-DJDKA-B-PB1 OR 1221 FOR TAPE MAINDEC-08-DJDKA-B-PM4.

4.7 RUN SERIAL LINE UNIT TIMING TEST

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

A. THIS TEST IS A 30 SECOND STOP WATCH TIMING TEST.

B. LOAD ADDRESS TO 4023 FOR TAPE MAINDEC-08-DJDKA-B-PB1 OR TO 1223 FOR TAPE MAINDEC-08-DJDKA-B-PM4, PRESS "INIT" AND THEN "RUN".

C. THE COMPUTER WILL HALT AT ADDRESS 4026 OR 1226 FOR TAPES LISTED IN STEP B ABOVE.

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

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

E. CHECK STOP WATCH AND PRESS "INIT" AND THEN "RUN".

F. THE PROGRAM SHOULD HALT IN APPROXIMATELY 30 SECONDS AT LOCATION 4102 FOR TAPE MAINDEC-08-DJDKA-B-PB1 OR AT LOCATION 1302 FOR TAPE MAINDEC-08-DJDKA-B-PM4.

4.8 PDP-8A XOR TESTING

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

A. LOAD THE BINARY PAPER TAPE, MAINDEC-08-DJDKA-B-PB1, USING THE STANDARD BINARY LOADER TECHNIQUE.

B. POWER THE PDP-8A XOR DOWN AND DO THE FOLLOWING:

1. UNPLUG ANY TELETYPE MODULE THAT MAY BE PLUGGED INTO THE XOR TESTER.

2. PLUG A PDP-8A OPTION 1 & 2 TEST MODULE INTO THE "KGM" AND "MUT" SIDES OF THE XOR TESTER.

3. PLUG A BUSS LOADS MODULE UNDER EACH OPTION 1 & 2 TEST MODULE.

4. TAKE ONE OF THE I.C. SOCKET CONNECTOR CABLES AND PLUG IT INTO TS-3, 1ST SOCKET ABOVE E63, ON THE OPTION 1 & 2 TEST MODULE ON THE "KGM" SIDE, AND THEN

DO THE SAME ON THE "MUT" SIDE.

5. TAKE THE END OF THE BERG CONNECTOR CABLE WHICH HAS ONLY ONE BERG CONNECTOR ON IT, AND PLUG IT INTO THE BERG SOCKET ON THE TEST MODULE ON THE "KGM" SIDE. NOW DO THE SAME FOR THE "MUT" SIDE.

6. NOW TAKE THE OTHER I.C. SOCKET CONNECTOR CABLE AND PLUG IT INTO TS-4, 1ST SOCKET ABOVE E2, ON THE OPTION TEST MODULE ON THE "KGM" SIDE. NOW PLUG THE OTHER END OF THIS I.C. SOCKET CABLE INTO TS-5, 1ST SOCKET ABOVE E69, ON THE OPTION TEST MODULE ON THE "MUT" SIDE.

7. NOW USING THE MODIFIED PDP-8A OPTION BOARD #1, PLUG THE THREE BERG CONNECTORS FROM THE TEST MODULE ON THE "KGM" SIDE INTO BERG SOCKETS J3, J4, AND J5 ON THE PDP-8A OPTION BOARD #1. NOW PLUG THIS MODULE INTO THE "KGM" SIDE OF THE XOR ABOVE THE OPTION 1 & 2 TEST MODULE.

8. MAKE THE SAME CONNECTIONS AS IN STEP 7 ABOVE ON THE MODULE TO BE TESTED AND PLUG IT INTO THE "MUT" SIDE, ABOVE THE OPTION 1 & 2 TEST MODULE.

9. NOW PLUG THE OTHER END OF THE I.C. SOCKET CONNECTOR CABLE FROM EACH TEST MODULE INTO THE TEST SOCKET ON EACH OF THE PDP-8A OPTION BOARD #1'S.

10. SET ALL SWITCHES ON EACH OF THE PDP-8A OPTION BOARD #1'S TO THE OFF POSITION, AND POWER THE XOR BACK UP.

12. LOAD ADDRESS TO 0021 IN FIELD 0 AND DEPOSIT 6303 INTO THIS LOCATION.

13. SET THE TIME OUT SWITCH ON THE PDP-8A XOR TESTER TO THE SECOND POSITION. SET THE DEVICE CODE SWITCHES ON THE XOR TESTER TO 88 WHEN RUNNING THIS TEST. SET BOARD SELECT TO OTHERS.

14. LOAD ADDRESS TO 0200 AND PRESS "CLEAR" AND THEN "CONTINUE".

C. THE PROGRAM SHOULD NOW RUN UNTIL AN XOR ERROR IS ENCOUNTERED, AT WHICH TIME THE PROGRAM WILL HANG IN A SCOPE LOOP, LOOPING ON THE TEST THE ERROR WAS ENCOUNTERED IN.

D. THE AREAS OF LOGIC WHICH THE PROGRAM CAN NOT TEST ARE THE BAUD RATE MULTIPLEXER SECTION AND FRONT PANEL SECTION. IF THE BAUD RATE ON THE "MUT" SIDE IS A LOT HIGHER THAN ON THE "KGM" SIDE , A ERROR WILL NOT BE DETECTED, IF THE BAUD RATE ON THE "MUT" SIDE IS SLOWER THEN ON THE "KGM" SIDE A ERROR WILL BE DETECTED.

5.0 ERRORS

5.1 DKC8-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 Ø, 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 3Ø 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',Ø SWITCH REGISTER SETTINGS

6',1 NORMAL OPERATING SWITCHES

SR3 = 1 (Ø4ØØ) HALT PROGRAM AT COMPLETION OF A PROGRAM PASS

6',2 ERROR SWITCHES

SRØ = 1 (4ØØØ) INHIBIT ERROR HALT
SR1 = 1 (2ØØØ) LOOP ON ERROR
SR2 = 1 (1ØØØ) LOOP ON TEST SUCH AS TEST 1, TEST 2, ETC.,,

7',Ø REVISIONS

SUPERCEDES MAINDEC-Ø8-DJDKA-A

8',Ø PROGRAM DESCRIPTION

8',1 DKC8-AA OPTION TEST 1

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

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

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

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

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

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

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

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

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

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

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

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

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

```
        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 F/F CAN BE SET BY DBSS AND TP3 AND THAT TIME
        STATE 1 CAN CLEAR IT.

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

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

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

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

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

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

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

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

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

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

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

TEST 30 = CHECKS THAT CAF WILL CLEAR THE SLU RECEIVE FLAG.

TEST 31 = CHECKS THE EFFECT OF THE SERIAL LINE UNITS
IOT'S UPON THE AC'.

TEST 32 = CHECKS THAT ALL ZEROES CAN BE TRANSMITTED
AND READ BACK ON THE SERIAL LINE UNIT'.

TEST 33 = CHECKS THAT ALL ONES CAN BE TRANSMITTED OR
READ BACK ON THE SERIAL LINE UNIT'.

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

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

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

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

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

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

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

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

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

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

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

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

8.2 REAL TIME CLOCK TIMING TEST

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

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

8.3 SERIAL LINE UNIT TIMING TEST

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

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

9.0 FLOW CHARTS

NOT APPLICABLE

10.0 PROGRAM LISTINGS

ATTACHED

```
/DKC8-AA OPTION TEST 1 MAINDEC-08-DJDKA-B-L 4K
/
/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.
////////////////////////////////////////////////////////////////////////
```

```
                        /DKC8-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    KRS=6034                /READ RECEIVE BUFFER
6035    KIE=6035                /AC 11=1 SET INTERRUPT ENABLE
                                /AC 11=0 CLEAR INTERRUPT ENABLE
6036    KRB=6036                /CLEAR RECEIVE FLAG AND AC, SET READER RUN AND READ
                                /RECEIVE BUFFER
        /TRANSMIT IOTS

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

        /REAL TIME CRYSTAL CLOCK

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

        /12 BIT PARALLEL I/O

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



```
6577    DBSS=6577               /ISSUE A STROBE PULSE

        /SWITCH REGISTER SETTINGS

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

        /OPTION BOARD 1 SIMULATOR IOT'S
6150    CLRSIM=6150             /CLEAR SIMULATOR CONTROL REGISTERS
6151    LOADSM=6151             /LOAD SIMULATOR CONTROL WORD 1
6156    CLRDET=6156             /CLEAR READER RUN, STROBE, AND DATA AVAILABLE CATCHER F/F'S
6157    SKPRDR=6157             /SKIP ON READER RUN CATCHER F/F SET
6160    SIMCLR=6160             /CLEAR CONTROL REGISTERS AND MOST OF LOGIC ON SIMUALTOR
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    SKPDAV=6165             /SKIP ON DATA AVAILABLE CATCHER F/F SET
6167    SKPSTR=6167             /SKIP ON STROBE CATCHER F/F SET

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

        /BIT  1         PARALLEL I/O CLEAR DATA         1=TS1
        /               AVAILABLE SELECT                0=DATA ACCEPTED IN

        /BIT  2         NOT USED

        /BIT  3         NOT USED

        /BIT  4         NOT USED

        /BIT  5         RTC FREQUENCY OR                1=RTC
        /               SLU FREQUENCY CHECK             0=SLU BAUD RATES


        /BIT  6         REAL TIME CLOCK                 1=OFF
        /                                               0=ON

        /BIT  7         SLU EIA/20MA SELECT             1=EIA RECEIVE DATA
        /                                               0=20 MA RECEIVE DATA

        /BIT  8         STOP BIT SELECT                 1=1 STOP BITS
        /                                               0=2 STOP BIT


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

        /BIT 10         BAUD RATE SELECT                EQUALS 110 BAUD, EACH


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

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


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

                0020    *20

0020  0000    SWITCH, 0

0021  2003    OP1SEL, 2003
                                        /BIT 0=0  USE LOCATION 20 AS A PSEUDO SWITCH REGISTER
                                        /BIT 0=1  USE HARDWARE FRONT PANEL SWITCH REGISTER
                                        /BIT 1=1  HAS OPTION 1
                                        /BIT 2=1  HAS OPTION 2
                                        /BIT 3=1  HAS 8A CPU SIMULATOR
                                        /BIT 4=1  HAS 8A OPTION 1+2 SIMULATOR
                                        /BIT 5=1  PROGRAM ON 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
0022  0000    OP2SEL, 0               /BIT 0 IS SET FOR THE ACT LINE
                4423            LOOPPC=JMS I,
0023  3200                              PCLOOP
                4424            DONLOP=JMS I,
0024  3221                              LOPDON
                4425            CLSKWT=JMS I,
0025  3352                              WTCLSK
                4426            PIODAT=JMS I,
0026  3600                              DATPIO
                4427            ERROR=JMS I,
0027  3475                              AERROR
                4430            PIODER=JMS I,
0030  3711                              DERPIO
                4431            TSFWAT=JMS I,
0031  3327                              WATTSF
                4432            KSFWAT=JMS I,
0032  3341                              WATKSF
                4433            SLUDAT=JMS I,
0033  3653                              DATSLU
                4434            SLUDER=JMS I,
0034  3734                              DERSLU
                4435            SWHCHK=JMS I,
0035  3407                              CHKSWH
```



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


                5440    PRGEND=JMP I ,
0040  3400                      ENDPAS

                /LOCATIONS USED BY THE PROGRAM

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

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

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

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

```
0106  3124          DCA     SAVADD          /SAVE INTERRUPT ADDRESS
0107  6201          CDF                     /CHANGE DATA FIELD TO FIELD 0
0110  1131          TAD     KRMF            /GET THE INSTRUCTION RMF
0111  3525          DCA  I  K1              /PUT IT IN LOCATION 1 OF FIELD 0
0112  1130          TAD     KJMP            /GET THE INSTRUCTION JMP I 3
0113  3526          DCA  I  K2              /PUT IT IN LOCATION 2 OF FIELD 0
0114  1124          TAD     SAVADD          /GET THE INTERRUPT SERVICE ADDRESS
0115  3527          DCA  I  K3              /PUT IT IN LOCATION 3 IF FIELD 0
0116  6224          RIF                     /GET THE PROGRAM FIELD INTO THE AC
0117  1132          TAD     KCDF            /AND IT TO THE CDF INSTRUCTION
0120  3121          DCA     .+1             /PUT IT IN THE NEXT LOCATION
0121  7402          HLT/CDF                 /EXECUTE IT
0122  2104          ISZ     PATCH           /ADD 1 TO THE ENTRANCE
0123  5504          JMP  I  PATCH           /RETURN

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

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

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

0146  0000    ENARTC, 0
0147  1022          TAD     OP2SEL          /CHECK TO SEE IF ON ACT LINE
0150  7710    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 (6572) MAY NOT WORK, THE TEST WAITS FOR THE
                /RTC FLAG TO SET AND CHECKS THE FLAG TO SKIP, NO INTERRUPTS SHOULD OCCUR,
                /NOTE! INITIALIZE SETS THE SERIAL LINE UNIT'S INTERRUPT ENABLE,
                /**********************************************************************

0200  6160    TEST1,  SIMCLR
0201  4104           JMS PATCH               /SETUP INTERRUPT SERVICE
0202  3244           SIMINT
0203  4423           LOOPPC          /STORE THE LOOPING PC AND SETUP TEST COUNT
0204  7777           -1              /SETUP SIMULATOR ITERATION COUNTER
0205  4436           SIMCHK          /CHECK FOR SIMULATOR
0206  4000           4000            /CONTROL WORD FOR SIMULATOR
0207  4437           LODSIM          /LOAD SIMULATOR=TEST LOOP USING SIMULATOR
0210  3041           DCA INTFLG      /CLEAR PROGRAM INTERRUPT FLAG
0211  6007           CAF             /INITIALIZE THE MODULE = CAF SETS INT ENA ON SLU
0212  6001           ION             /TURN THE INTERRUPT ON
0213  6031           KSF             /SKIP ON RECEIVE FLAG
0214  7410           SKP
0215  4427           ERROR           /RECEIVE FLAG SET OR KSF SKIPPED
0216  6041           TSF             /SKIP ON TRANSMIT FLAG
0217  7410           SKP
0220  4427           ERROR           /TRANSMIT FLAG SET OR TSF SKIPPED
0221  6045           SPI             /SKIP ON XMIT/RECEIVE = INT ENA
0222  7410           SKP
0223  4427           ERROR           /0 SIDE OF XMIT/RECEIVE 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 ISZ LOOP
0242  1041           TAD INTFLG      /DID THE PROGRAM INTERRUPT
0243  7640           SZA CLA
0244  4427           ERROR           /PROGRAM INTERRUPTED = ALL FLAGS ZERO EXCEPT CLK FLG
0245  4424           DONLOP          /CHECK TO SEE IF DONE, OR LOOP ON TEST IF SR2=1

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

0246  4104    TEST2,  JMS PATCH       /SETUP INTERRUPT SERVICE
0247  3252           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  3135          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  2135          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  3135          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  2135          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          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  3135          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  2135          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    XORENA, ERROR         /CLK FLAG FAILED TO SET
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          4000              /CONTROL WORD FOR THE SIMULATOR
0417  4437          LODSIM            /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
                                      /LOOP = THIS ADDRESS IF  SIMULATOR SELECTED
                                      /OTHERWISE SCOPE LOOP IS THIS ADDRESS +1
0420  7344          CLA CLL CMA RAL /SETUP A PROGRAM LOOP TO LOOK AT 2 CLOCK FLAGS
0421  3135          DCA CLKSNC      /TO SYNC UP THE REAL TIME CLOCK
0422  3041          DCA INTFLG      /CLEAR PROGRAM INTERRUPT FLAG
0423  6007          CAF             /CLEAR ALL FLAGS AND SET INT ENA ON SLU
0424  6001          ION             /TURN THE INTERRUPT ON
0425  4425          CLSKWT          /WAIT FOR THE CLOCK FLAG
0426  4427          ERROR           /CLK FLAG FAILED TO SET
0427  1041          TAD INTFLG      /GET THE PROGRAM INTERRUPT FLAG
0430  7640          SZA CLA
0431  4427          ERROR           /PROGRAM INTERRUPTED WITHOUT CLK INT ENA
0432  2135          ISZ CLKSNC      /2ND FLAG SET?
0433  5222          JMP .-11        /NO, GO CLEAR FLAG AND WAIT FOR NEXT
0434  7301          CLA CLL IAC
0435  6135          CLLE            /SET INTERRUPT INABLE TO A ONE
0436  7300          CLA     CLL     /SHOULD INTERRUPT HERE
0437  2041          ISZ INTFLG      /DID THE PROGRAM INTERRUPT
0440  4427          ERROR           /PROGRAM FAILED TO INTERRUPT WITH CLK FLAG + CLK INT ENA
0441  6007          CAF             /CLEAR ALL FLAGS
0442  6001          ION
0443  4425          CLSKWT          /WAIT FOR CLK FLAG
0444  4427          ERROR           /CLK FLAG FAILED TO RESET
0445  1041          TAD INTFLG      /GET THE PROGRAM INTERRUPT FLAG
0446  7640          SZA CLA         /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          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 EANBLE
0463  1126          TAD K2
0464  7640          SZA CLA
0465  4427          ERROR           /CLIE CHANGED THE AC
0466  7240          CLA CMA
0467  6136          CLCL            /CLEAR CLOCK FLAG
0470  7001          IAC
0471  7640          SZA CLA
0472  4427          ERROR           /CLCL CHANGED THE AC
0473  7240          CLA CMA
0474  6137          CLSK            /SKIP ON CLOCK FLAG
0475  7000          NOP
0476  7001          IAC
0477  7640          SZA CLA
0500  4427          ERROR           /CLSK CHANGED THE AC
0501  4424          DONLOP          /CHECK TO SEE IF DONE OR LOOP ON TEST,
0502  4136          JMS     TSTGOD  /GO CHECK FOR THE ACT LINE

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

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

0503  4104    TEST7,  JMS PATCH
0504  3252          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  4146          RTCENA          /SET REAL TIME CLOCK INT ENA
0514  3041          DCA     INTFLG  /CLEAR PROGRAM INTERRUPT FLAG
0515  3042          DCA     CLKFLG  /SET INTERRUPT SERVICE TO IGNORE CLOCK FLAG
0516  6001          ION             /TURN THE INTERRUPT ON
0517  6571          DBSK            /SKIP ON THE DATA READY FLAG
0520  7640          SZA     CLA     /CHECK THAT DBSK DIDN'T READ ANYTHING INTO AC
```

```
0521  4427            ERROR           /INIT FAILED TO 0 DATA READY,DBSK SKIPPED OR
                                      /READ SOMETHING INTO THE AC
0522  6570            DBST            /SKIP ON DATA ACCEPTED, 0 DATA ACCEPTED AND DATA AVAILABLE
0523  7640            SZA     CLA
0524  4427            ERROR           /INIT FAILED TO 0 DATA ACCEPTED, DBST SKIPPED OR
                                      /DBST READ SOMETHING INTO THE AC
0525  1041            TAD     INTFLG  /GET THE PROGRAM INTERRUPT FLAG
0526  7640            SZA     CLA
0527  4427            ERROR           /PROGRAM INTERRUPTED WITHOUT INT ENA AND FLAG SET
0530  6573            DBCF            /CLEAR DATA READY SET DATA ACCEPTED
0531  7640            SZA     CLA
0532  4427            ERROR           /DBCF SKIPPED OR READ SOMETHING INTO AC
0533  6571            DBSK            /SKIP ON DATA READY
0534  7610            SKP     CLA
0535  4427            ERROR           /DATA READY FLAG GOT SET BY DBST OR DBCF
0536  6570            DBST            /SKIP ON DATA ACCEPTED AND CLEAR IT
0537  4427            ERROR           /DATA ACCEPTED NOT SET OR DBST FAILED TO SKIP
0540  6570            DBST            /SKIP ON DATA ACCEPTED TO CHECK THAT IT CLEARED
0541  7610            SKP     CLA
0542  4427            ERROR           /DBST AND TP4 FAILED TO CLEAR DATA ACCEPTED F/F
0543  1041            TAD     INTFLG  /GET THE PROGRAM INTERRUPT FLAG
0544  7640            SZA     CLA
0545  4427            ERROR           /PROGRAM INTERRUPTED WITHOUT INT ENA SET
0546  4424            DONLOP          /REPEAT TEST IF SR EQUAL TO 1000

                /*********************************************************************
                /TEST 8 = CHECKS THAT THE DATA READY FLAG CAN BE SET AND CLEARED. TO
                /SET THE DATA READY FLAG, THE PROGRAM ISSUES THE 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.
0554  6007            CAF             /CLEAR ALL FLAGS
0555  4146            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            SZA     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  6571            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  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  6570            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  6570            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            DONLOP          /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  4000            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 ADDRES
0625  6007            CAF             /CLEAR ALL FLAGS
0626  4146            RTCENA          /SET REAL TIME CLOCK INT ENA
0627  3041            DCA     INTFLG  /CLEAR PROGRAM INTERRUPT FLAG
0630  6001            ION             /TURN THE INTERRUPT ON
0631  6574            DBTD            /TRANSMIT AND SET DATA READY FLAG
0632  6571            DBSK            /SKIP ON DATA READY FLAG
0633  4427            ERROR           /DBTD FAILED TO SET DATA READY
0634  6570            DBST            /SKIP ON DATA ACCEPTED AND CLEAR IT
0635  7410            SKP
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  6007            CAF             /CLEAR DATA READY FLAG
0643  4146            RTCENA          /SET REAL TIME CLOCK INT ENA
0644  6571            DBSK            /SKIP ON DATA READY FLAG
0645  7610            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
                                    /THE PROGRAM ASSUMES THAT DBCF SET DATA ACCEPTED
0651  6007          CAF             /CLEAR DATA ACCEPTED
0652  4146          RTCENA          /SET REAL TIME CLOCK INT ENA
0653  6001          ION             /TURN THE INTERRUPT ON
0654  6570          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          DONLOP          /REPEAT TEST IF SR = 1000

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

0663  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 INTERUPT FLAG
0673  6001          ION             /TURN THE INTERRUPT ON
0674  6571          DBSK            /SKIP ON DATA READY FLAG
0675  7610          SKP     CLA
0676  4427          ERROR           /DATA READY FLAGS SET FOLLOWING INIT
0677  6570          DBST            /SKIP ON DATA ACCEPTED
0700  7610          SKP     CLA
0701  4427          ERROR           /DATA ACCEPTED SET FOLLOWING INIT
0702  1041          TAD     INTFLG  /CHECK THAT THE PROGRAM DID NOT INTERRUPT
0703  7640          SZA     CLA
0704  4427          ERROR           /PROGRAM INTERRUPTED WITHOUT FLAGS AND INT ENA SET
0705  6575          DBSE            /SET INTERRUPT ENABLE TO A 1
0706  7640          SZA     CLA     /CHECK THAT DBSE DIDN'T CHANGE THE AC
0707  4427          ERROR           /DBSE SKIPPED OR READ SOMETHING INTO AC
0710  1041          TAD     INTFLG  /GET THE PROGRAM INTERRUPT FLAG
0711  7640          SZA     CLA
0712  4427          ERROR           /PROGRAM INTERRUPTED WITHOUT FLAG SET
0713  6574          DBTD            /TRANSMIT AND SET DATA READY
0714  6571          DBSK            /SKIP ON DATA READY FLAG
0715  4427          ERROR           /DBTD FAILED TO SET DATA READY
0716  2041          ISZ     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          DONLOP          /REPEAT TEST IF SR = 1000

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

0733  4423  TEST11, LOOPPC          /SETUP TEST COUNT AND TEST LOOPING ADDRESS
0734  7777        =1                /SIMULATOR ITERATION COUNTER
0735  4436        SIMCHK            /CHECK TO SEE IF SIMULATOR SELECTED
0736  4000        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          ISZ     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          DONLOP          /REPEAT TEST IF SR = 1000

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

```
0774  4423    TEST12, LOOPPC          /SETUP TEST COUNT AND TEST LOOPING ADDRESS
0775  7777            =1              /SIMULATOR ITERATION COUNTER
0776  4436            SIMCHK          /CHECK TO SEE IF SIMULATOR IS SELECTED
0777  4000            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  4146            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            ISE     INTFLG  /DID THE PROGRAM INTERRUPT
1015  4427            ERROR           /NO,FAILED TO INTERRUPT WITH INT ENA AND DATA ACCEPTED SET
1016  6001            ION             /TURN THE INTERRUPT BACK ON
1017  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  4146            RTCENA          /SET REAL TIME CLOCK INT ENA
1037  6001            ION             /TURN INTERRUPT ON
1040  7240            CLA CMA         /SET THE AC TO ALL ONES
1041  6574            DBTD            /TRANSMIT DATA
1042  7001            IAC
1043  7640            SZA CLA
1044  4427            ERROR           /DBTD CHANGED THE AC
1045  6007            CAF             /CLEAR ALL
1046  4146            RTCENA          /SET REAL TIME CLOCK INT ENA
1047  6001            ION             /TURN INTERRUPT BACK OR
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            IOF
1062  7240            CLA CMA         /SET THE AC TO ALL ONES
1063  6573            DBCF            /CLEAR DATA READY FLAG SET DATA ACCEPT FLAG
1064  7001            IAC
1065  7640            SZA CLA
1066  4427            ERROR           /DBCF CHANGED THE AC
1067  6007            CAF             /CLEAR ALL FLAGS
1070  4146            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            LODSIM          /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
                                      /LOOP = THIS ADDRESS IF  SIMULATOR SELECTED
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```
                                        /OTHERWISE SCOPE LOOP IS THIS ADDRESS +1
1131  3041          DCA INTFLG          /CLEAR PROGRAM INTERRUPT FLAG
1132  7240          CLA CMA
1133  3051          DCA PIOXMT          /SET THE WORD TO BE TRANSMITTED TO ALL ONES
1134  4426          PIODAT              /GO TRANSMIT AND COMPARE THE WORD
1135  4430          PIODER              /DATA ERROR = WORD DIDN'T COMPARE IN ROUTINE PIODAT
1136  4424          DONLOP              /REPEAT TEST IF NOT DONE OR LOOP ON TEST IF SR2=1

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

1137  4423    TEST15, LOOPPC              /SETUP TEST SCOPE LOOP AND TEST COUNT
1140  7777          -1                    /SIMULATOR ITERATION COUNTER
1141  4436          SIMCHK                /CHECK TO SEE IF SIMULATOR IS SELECTED
1142  4000          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 CMA               /SET THE FIRST WORD TO ALL ONES
1146  3051          DCA PIOXMT            /SAVE IT
1147  4426          PIODAT                /GO TRANSMIT AND COMPARE THE WORD
1150  4430          PIODER                /DATA ERROR = WORD DIDN'T COMPARE IN ROUTINE PIODAT
1151  3051          DCA PIOXMT            /SET THE WORD TO 0
1152  4426          PIODAT                /GO TRANSMIT AND COMPARE THE WORD
1153  4430          PIODER                /DATA ERROR= FAILED TO READ ZEROES BACK
1154  4424          DONLOP                /REPEAT TEST IF NOT DONE OR LOOP ON TEST IF SR2=1

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

1155  4423    TEST16, LOOPPC              /SETUP TEST LOOP AND TEST COUNT
1156  7777          -1                    /SIMULATOR ITERATION COUNTER
1157  4436          SIMCHK                /CHECK TO SEE IF SIMULATOR IS SELECTED
1160  4000          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
1164  3051          DCA PIOXMT            /SET THE FIRST WORD TO TRANSMIT=5252
1165  4426          PIODAT                /GO TRANSMIT AND COMPARE THE DATA WORD
1166  4430          PIODER                /DATA ERROR = WORD DIDN'T COMPARE
1167  1063          TAD K2525
1170  3051          DCA PIOXMT            /SET THE SECOND WORD TO TRANSMIT = 2525
1171  4426          PIODAT                /GO TRANSMIT AND COMPARE THE WORD
1172  4430          PIODER                /DATA ERROR=THE WORD DIDN'T COMPARE
1173  4424          DONLOP                /REPEAT THE TEST IF NOT DONE OR LOOP ON TEST IF SR2=1

1174  5777'         JMP     TEST17  /DO NEXT TEST
1177  1200
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1200    IFDEF OP13K <PAGE>

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

1200  4423    TEST17, LOOPPC              /SET UP TEST LOOPING ADDRESS
1201  7777          -1                    /SIMULATOR ITERATION COUNTER
1202  4104          JMS PATCH             /GO SET UP FOR INTERRUPT RETURN
1203  3252          SKPCHN
1204  3042          DCA CLKFLG            /SET INTERRUPT TO IGNORE RTC FLAGS
1205  7300          CLA CLL
1206  3050          DCA SAVCNT
1207  3047          DCA TSTCNT            /CLEAR PROGRAM TEST COUNTER
1210  4436          SIMCHK                /CHECK FOR SIMULATOR
1211  4000          4000                  /SIMULATOR CONTROL WORD
1212  4437          LODSIM                /LOAD THE SIMULATOR IF SELECTED
1213  3041          DCA INTFLG            /CLEAR PROGRAM INTERRUPT FLAG
1214  1047          TAD TSTCNT            /GET TEST COUNTER
1215  3051          DCA PIOXMT            /SET THE WORD TO BE TRANSMITTED = TO IT
1216  4426          PIODAT                /GO TRANSMIT AND COMPARE THE WORD
1217  4430          PIODER                /DATA ERROR
1220  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
                /**********************************************************************

1221  4423    TEST18, LOOPPC              /SETUP TEST COUNT AND TEST LOOP ADDRESS
1222  7777          -1                    /SIMULATOR ITERATION COUNTER
1223  7300          CLA CLL
1224  3050          DCA SAVCNT
1225  3047          DCA TSTCNT
1226  4436          SIMCHK                /CHECK FOR THE SIMULATOR
1227  4000          4000                  /SIMULATOR CONTROL WORD
1230  4437          LODSIM                /LOAD SIMULATOR IF SELECTED
1231  6007          CAF                   /CLEAR ALL FLAGS
1232  4146          RTCENA                /SET REAL TIME CLOCK INT ENA
1233  6001          ION                   /TURN THE INTERRUPT ON
1234  3041          DCA INTFLG            /CLEAR PROGRAM INTERRUPT FLAG
1235  1047          TAD TSTCNT            /GET THE TEST COUNTER
1236  3051          DCA PIOXMT            /PUT IT IN THE WORD TO TRANSMIT
1237  1051          TAD PIOXMT            /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 CMA               /SET THE AC TO ALL ONE'S
1244  6572          DBRD                  /READ THE DATA BUFFER
1245  3052          DCA PIOREC            /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 FAILAED 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  1051          TAD PIOXMT      /COMPARE THE WORD TRANSMITTED WITH THE WORD READ
1295  7041          CIA
1296  1052          TAD PIOREC
1297  7640          SZA CLA
1298  4430          PIODER          /PARALLEL I/O DATA ERROR
1299  6007          CAF             /CLEAR ALL INCLUDING THE TRANSMIT BUFFER
1300  4146          RTCENA          /SET REAL TIME CLOCK INT ENA
1301  6001          ION             /TURN THE INTERRUPT BACK ON
1302  6572          DBRD            /READ THE BUFFER
1303  7640          SZA CLA         /DID INIT CLEAR THE BUFFER?
1304  4427          ERROR           /NO,INIT FAILED TO CLEAR BUFFER
1305  1041          TAD INTFLG      /GET THE PROGRAM INTERRUPT FLAG
1306  7640          SZA CLA
1307  4427          ERROR           /PROGRAM INTERRUPTED WITHOUT INT ENA SET
1310  4424          DONLOP          /DONE OR REPEAT TEST IF SR2=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.
                /**********************************************************************

1311  4423    TEST19, LOOPPC          /SETUP TEST COUNT AND TEST LOOP ADDRESS
1312  7777          =1                /SIMULATOR ITERATION COUNTER
1313  4436          SIMCHK            /CHECK TO SEE IF SIMULATOR IS SELECTED
1314  4000          4000              /SIMULATOR CONTROL WORD
1315  4437          LODSIM            /LOAD THE CONTROL WORD
1316  1021          TAD     OP1SEL    /RECHECK THE SIMULATOR BIT
1317  0057          AND     K200      /MASK OUT FOR SIMULATOR BIT
1320  7640          SZA     CLA       /IS IT SET
1321  5306          JMP     .+3       /YES GO CHECK THAT STROBE SETS AND CLEARS
1322  5705          JMP  I  .+1       /GO TO NEXT TEST
1323  1527          TEST23            /ADDRESS OF THE NEXT TEST
1324  6007          CAF               /CLEAR ALL FLAGS
1325  4146          RTCENA            /SET REAL TIME CLOCK INT ENA
1326  3041          DCA     INTFLG    /CLEAR THE PROGRAM INTERRUPT FLAG
1327  6001          ION               /TURN THE INTERRUPT ON
1330  6136          CLRDET            /CLEAR SIMULATOR DETECTOR F/F'S
1331  6167          SKPSTR            /SKIP ON STROBE DETECTOR F/F SET
1332  7610          SKP     CLA
1333  4427          ERROR             /STROBE IS SET TO A ONE
1334  6577          DBSS              /ISSUE A STROBE PULSE
1335  7440          SZA
1336  4427          ERROR             /DBSS SKIPPED OR READ SOMETHING INTO THE AC
1337  6167          SKPSTR            /SKIP ON STROBE DETECTOR F/F SET
1340  4427          ERROR             /DBSS FAILED TO SET STROBE OR SIMULATOR DETECTOR F/F
1341  6136          CLRDET            /CLEAR READER RUN AND STROBE DETECTOR F/F
1342  6167          SKPSTR            /SKIP ON STROBE DETECTOR F/F SET
1343  7410          SKP
1344  4427          ERROR             /STROBE STILL SET OR DETECTOR F/F DIDN'T CLEAR
1345  6577          DBSS              /ISSUE ANOTHER STROBE PULSE
1346  6167          SKPSTR            /SKIP ON STROBE DETECTOR F/F SET
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1347  4427          ERROR           /DBSS FAILED TO SET STROBE OR DETECTOR F/F
1350  6136          CLRDET          /CLEAR READER RUN AND STROBE DETECTOR F/F
1351  6167          SKPSTR          /SKIP ON STROBE DETECTOR F/F SET
1352  7410          SKP
1353  4427          ERROR           /STROBE STILL SET OR DETECTOR F/F DIDN'T 0
1354  1041          TAD     INTFLG  /CHECK THAT THE PROGRAM DIDN'T INTERRUPT
1355  7640          SZA     CLA
1356  4427          ERROR           /PROGRAM INTERRUPTED
1357  6002          IOF             /TURN THE INTERRUPT OF
1360  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,
                /**********************************************************************

1361  4423    TEST20, LOOPPC          /SETUP TEST COUNT AND TEST LOOP ADDRESS
1362  7777          =1                /SIMULATOR ITERATION COUNTER
1363  4436          SIMCHK            /CHECK TO SEE IF SIMULATOR IS SELECTED
1364  4000          4000              /SIMULATOR CONTROL WORD
1365  4437          LODSIM            /LOAD THE CONTROL WORD
1366  6007          CAF               /CLEAR ALL FLAGS
1367  4146          RTCENA            /SET REAL TIME CLOCK INT ENA
1370  3041          DCA     INTFLG    /CLEAR THE PROGRAM INTERRUPT FLAG
1371  6001          ION               /TURN THE INTERRUPT ON
1372  6136          CLRDET            /CLEAR SIMULATOR DETECTOR F/F'S
1373  6165          SKPDAV            /SKIP ON DATA AVAILABLE DETECTOR F/F
1374  7610          SKP     CLA
1375  4427          ERROR             /CAF FAILED TO CLEAR DATA AVAIL, OR IT IS STUCK ON
1376  6574          DBTD              /TRANSMIT AND SET DATA READY AND DATA AVAILABLE
1377  6571          DBSK              /SKIP ON DATA READY
1400  4427          ERROR             /DBTD FAILED TO SET DATA READY
1401  6165          SKPDAV            /SKIP ON DATA AVAILABLE DETECTOR F/F
1402  4427          ERROR             /DATA AVAILABLE FAILED TO SET
1403  6136          CLRDET            /CLEAR DETECTOR F/F'S
1404  6165          SKPDAV            /SKIP ON DATA AVAILABLE DETECTOR F/F
1405  4427          ERROR             /DATA AVAILABLE GOT CLEARED
1406  6007          CAF               /CLEAR ALL FLAGS
1407  4146          RTCENA            /SET REAL TIME CLOCK INT ENA
1410  6001          ION               /TURN THE INTERRUPT ON
1411  6136          CLRDET            /CLEAR THE SIMULATOR DETECTOR F/F'S
1412  6165          SKPDAV            /SKIP ON DATA AVAILABLE DETECTOR F/F
1413  7610          SKP     CLA
1414  4427          ERROR             /INIT FAILED TO CLEAR DATA AVAILABLE
1415  6571          DBSK              /SKIP ON DATA READY
1416  7610          SKP     CLA
1417  4427          ERROR             /INIT FAILED TO CLEAR DATA READY
1420  1041          TAD     INTFLG    /GET THE PROGRAM INTERRUPT FLAG
1421  7640          SZA     CLA
1422  4427          ERROR             /ERROR, PROGRAM INTERRUPTED
1423  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 DBSF WILL CLEAR IT.
                    /**********************************************************************

1406  4423  TEST21, LOOPPC          /SETUP TEST COUNT AND TEST LOOP ADDRESS
1407  7777          -1              /SIMULATOR ITERATION COUNTER
1410  4436          SIMCHK          /CHECK TO SEE IF THE SIMULATOR IS SELECTED
1411  4000          4000            /SIMULATOR CONTROL WORD
1412  4437          LODSIM          /LOAD THE SIMULATOR CONTROL WORD
1413  6007          CAF             /CLEAR ALL FLAGS
1414  4146          RTCENA          /SET REAL TIME CLOCK INT ENA
1415  3041          DCA     INTFLG  /CLEAR PROGRAM INTERRUPT FLAG
1416  6001          ION             /TURN THE INTERRUPT ON
1417  6156          CLRDET          /CLEAR SIMULATOR DETECTOR F/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, & 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          DONLOP          /DONE OR REPEAT TEST IS SR = 1000

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

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



```
1464  6007          CAF             /CLEAR ALL FLAGS
1465  4146          RTCENA          /SET REAL TIME CLOCK INT ENA
1466  6001          ION             /TURN THE INTERRUPT ON
1467  3041          DCA     INTFLG  /CLEAR PROGRAM INTERRUPT FLAG
1470  6156          CLRDET          /CLEAR SIMULATOR DETECTOR F/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 AVAILABLE DETECTOR F/F
1515  4427          ERROR           /DATA AVAILABLE FAILED TO SET
1516  6156          CLRDET          /CLEAR SIMULATOR DETECTOR F/F'S
1517  6165          SKPDAV          /SKIP ON DATA AVAILABLE DETECTOR F/F
1520  7610          SKP     CLA
1521  4427          ERROR           /TS1 FAILED TO  CLEAR DATA AVAILABLE
1522  6007          CAF             /CLEAR ALL FLAGS
1523  6571          DBSK            /SKIP ON DATA READY
1524  7610          SKP     CLA
1525  4427          ERROR           /INIT FAILED TO CLEAR DATA READY
1526  4424          DONLOP          /DONE OR REPEAT TEST IF SR = 1000

                    /**********************************************************************
                    //FIRST SECTION OF SERIAL LINE UNIT DIAGNOSTIC
                    /TEST 23 = TRY TO CLEAR SLU INT ENA BY ISSUING A KIE COMMAND.  THEN TEST THE SLU XMIT
                    /FLAG TO SET BY TFL AND CLEAR BY TCF.  THE FLAG IS CHECKED WITH TSF AND SP1,  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
```

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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  6035          KIE                     /CLEAR SLU INT ENA
1546  7610          SKP CLA
1547  4427          ERROR                   /KIE SKIPPED,
1550  1041          TAD INTFLG
1551  7640          SZA CLA
1552  4427          ERROR                   /PROGRAM INTERRUPTED
1553  6040          TFL                     /SET THE TRANSMIT FLAG
1554  7410          SKP
1555  4427          ERROR                   /TFL SKIPPED
1556  6041          TSF                     /SKIP ON XMIT FLAG
1557  4427          ERROR                   /TFL + TP3 FAILED TO SET XMIT FLAG OR NO SKIP OCCURRED
1560  6045          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          SZA 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          TSF                     /SKIP ON XMIT FLAG
1575  7410          SKP
1576  4427          ERROR                   /TCF + TP3 FAILED TO CLEAR XMIT FLAG
1577  6045          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 0
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          SZA CLA
1607  4427          ERROR                   /PROGRAM INTERRUPTED WITHOUT INT ENA + FLAG
1610  4424          DONLOP                  /REPEAT TEST IF NOT DONE OR LOOP ON TEST IF SR2=1

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

1611  4423    TEST24, LOOPPC                /SETUP TEST COUNT AND SCOPE LOOPING ADDRESS
1612  7777          -1                      /SIMULATOR ITERATION COUNTER
1613  4436          SIMCHK                  /CHECK TO SEE IF SIMULATOR IS SELECTED
1614  4000          4000                    /CONTROL WORD FOR THE SIMULATOR
1615  4437          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  6035          KIE                     /CLEAR SLU INT ENA
1623  6040          TFL                     /SET THE TRANSMIT FLAG
1624  6041          TSF                     /SKIP ON THE XMIT FLAG
1625  4427          ERROR                   /TFL AND TP3 FAILED TO SET THE XMIT FLAG
1626  6045          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          TSF                     /SKIP ON THE TRANSMIT FLAG
1633  7410          SKP
1634  4427          ERROR                   /BBUF INIT HIGH FAILED TO CLEAR XMIT FLAG
1635  1041          TAD INTFLG              /GET THE PROGRAM INTERRUPT FLAG
1636  7640          SZA CLA
1637  4427          ERROR                   /PROGRAM INTERRUPTED CHECK INT ENA,
1640  6031          KSF                     /SKIP ON RECEIVE FLAG
1641  7610          SKP CLA
1642  4427          ERROR                   /RECEIVE FLAG SET BY ABOVE CODE
1643  4424          DONLOP                  /REPEAT TEST IF NOT DONE OR LOOP IF SR2=1

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

1644  4423    TEST25, LOOPPC                /SETUP TEST COUNT AND SCOPE LOOPING ADDRESS
1645  7777          -1                      /SIMULATOR ITERATION COUNTER
1646  4436          SIMCHK                  /CHECK TO SEE IF SIMULATOR IS SELECTED
1647  4000          4000                    /CONTROL WORD FOR THE SIMULATOR
1650  4437          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          TSF                     /SKIP ON XMIT FLAG
1656  7410          SKP
1657  4427          ERROR                   /XMIT FLAG SET AFTER A CAF
1660  6045          SPI                     /SKIP ON XMIT/RECEIVE AND INT ENA ON A 1
1661  7410          SKP
1662  4427          ERROR                   /SPI SKIPPED WITH INT ENA SET AND NO FLAG
1663  1041          TAD INTFLG              /GET THE PROGRAM INTERRUPT FLAG
1664  7640          SZA CLA
1665  4427          ERROR                   /PROGRAM INTERRUPTED WITHOUT XMIT FLAG
1666  6040          TFL                     /SET THE TRANSMIT FLAG
1667  6041          TSF                     /SKIP ON THE TRANSMIT FLAG
1670  4427          ERROR                   /TFL FAILED TO SET THE XMIT FLAG
1671  6045          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          4000                    /CONTROL WORD FOR THE SIMULATOR
1725  4437          LODSIM                  /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
                                            /LOOP = THIS ADDRESS IF  SIMULATOR SELECTED
                                            /OTHERWISE SCOPE LOOP IS THIS ADDRESS +1
1726  3041          DCA INTFLG              /CLEAR PROGRAM INTERRUPT FLAG
1727  6007          CAF                     /CLEAR ALL FLAGS
1730  4146          RTCENA                  /SET REAL TIME CLOCK INT ENA
1731  6035          KIE                     /CLEAR SLU INTERRUPT ENABLE
1732  6001          ION                     /TURN THE INTERRUPT ON
1733  6040          TFL                     /SET THE TRANSMIT FLAG
1734  6041          TSF                     /SKIP ON TRANSMIT FLAG
1735  4427          ERROR                   /TFL FAILED TO SET TRANSMIT FLAG
1736  6045          SPI                     /SKIP ON XMIT/RECEIVE + INT ENA ON A 1
1737  7610          SKP CLA
1740  4427          ERROR                   /ERROR, INT ENA SET OR KIE FAILED TO CLEAR INT ENA
1741  1041          TAD INTFLG              /GET THE PROGRAM INTERRUPT FLAG
1742  7640          SZA CLA
1743  4427          ERROR                   /PROGRAM INTERRUPTED WITHOUT INT ENA SET
1744  7301          CLA CLL IAC             /SET DATA 11 TO A 1
1745  6035          KIE                     /SET INT ENA
1746  6041          TSF                     /SKIP ON TRANSMIT FLAG
1747  4427          ERROR                   /XMIT FLAG GOT CLEARED
1750  6045          SPI                     /SKIP ON XMIT + INT ENA ON A 1
1751  4427          ERROR                   /KIE AND DATA 11 ON A 1 FAILED TO SET INT ENA
1752  7200          CLA
1753  2041          ISZ INTFLG
1754  4427          ERROR                   /PROGRAM FAILED TO INTERRUPT WITH INT ENA + XMIT FLAG
```



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

                /**********************************************************************
                /TEST 27 = CHECKS THAT TLS WILL CLEAR THE XMIT FLAG AND THEN SET IT WITH
                /XMIT BUFF MT H,  THE PROGRAM THEN CLEARS THE XMIT FLAG AND WAITS FOR
                /RCV DATA AVAILABLE H 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          4030                    /CONTROL WORD FOR SIMULATOR
2010  4437          LODSIM                  /LOAD SIMULATOR=MUST BE SET FOR XOR
2011  5217          JMP     TEST27+5        /START TEST
2012  4423    TEST27, LOOPPC                /SETUP TEST COUNT AND SCOPE LOOPING ADDRESS
2013  7740          =40                     /SIMULATOR ITERATION COUNTER
2014  4436          SIMCHK                  /CHECK TO SEE IF SIMULATOR IS SELECTED
2015  4000          4000                    /CONTROL WORD FOR THE SIMULATOR
2016  4437          LODSIM                  /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
                                            /LOOP = THIS ADDRESS IF  SIMULATOR SELECTED
                                            /OTHERWISE SCOPE LOOP IS THIS ADDRESS +1
2017  3041          DCA INTFLG              /CLEAR PROGRAM INTERRUPT FLAG
2020  6007          CAF                     /CLEAR ALL FLAGS BUT SET SLU INT ENA
2021  4146          RTCENA                  /SET REAL TIME CLOCK INT ENA
2022  6001          ION                     /TURN THE INTERRUPT ON
2023  6040          TFL                     /SET THE TRANSMIT FLAG
2024  6041          TSF                     /SKIP ON XMIT FLAG
2025  4427          ERROR                   /TRANSMIT FLAG FAILED TO SET BY TFL
2026  6045          SPI                     /SKIP ON XMIT FLAG AND INT ENA ON A 1
2027  4427          ERROR                   /SPI FAILED TO SKIP WITH INT ENA + FLAG SET
2030  2041          ISZ INTFLG              /DID THE PROGRAM INTERRUPT
2031  4427          ERROR                   /PROGRAM FAILED TO INTERRUPT WITH XMIT AND INT ENA SET
```

```
2032  6046            TLS                     /LOAD TRANSMIT BUFFER, TRANSMIT AND CLEAR XMIT FLAG
2033  7610            SKP CLA
2034  4427            ERROR                   /TLS SKIPPED
2035  6001            ION                     /TURN THE INTERRUPT ON
2036  6041            TSF                     /SKIP ON THE TRANSMIT FLAG
2037  7610            SKP CLA
2040  4427            ERROR                   /TLS FAILED TO CLEAR XMIT FLAG
2041  4431            TSFWAT                  /WAIT FOR TRANSMIT FLAG TO SET
2042  4427            ERROR                   /XMIT BUFF MT FAILED TO SET XMIT FLAG
2043  2041            ISZ INTFLG              /DID THE PROGRAM INTERRUPT?
2044  4427            ERROR                   /ERROR, NO INTERRUPT WITH XMIT AND INT ENA SET
2045  6045            SPI                     /SKIP ON SLU INTERRUPT (XMIT SIDE)
2046  4427            ERROR                   /FAILED TO SKIP OR INT ENA OR FLAG GOT CLEARED
2047  6042            TCF                     /CLEAR TRANSMIT FLAG
2050  6001            ION                     /TURN THE INTERRUPT ON
2051  4432            KSFWAT                  /WAIT FOR THE RECEIVE FLAG TO SET
2052  4427            ERROR                   /NO SKIP, OR RECEIVE FLAG NOT SET BY RCD DATA AVAILABLE
2053  6045            SPI                     /SKIP ON RCV FLAG AND INT ENA
2054  4427            ERROR                   /0 SIDE OF RCV FLAG NOT LOW OR FAILED TO INTERRUPT
2055  2041            ISZ INTFLG              /DID RCV AND INT ENA CAUSE AN INTERRUPT?
2056  4427            ERROR                   /NO, ERROR
2057  6030            KCF                     /CLEAR RECEIVE FLAG
2060  7610            SKP CLA
2061  4427            ERROR                   /KCF SKIPPED
2062  6001            ION                     /TURN THE INTERRUPT ON
2063  6031            KSF                     /SKIP ON RECEIVE FLAG
2064  7610            SKP CLA
2065  4427            ERROR                   /KCF + TP3 FAILED TO CLEAR RECEIVE FLAG
2066  1041            TAD INTFLG              /GET THE PROGRAM INTERRUPT FLAG
2067  7640            SZA CLA
2070  4427            ERROR                   /PROGRAM INTERRUPTED WITH RCV FLAG CLEARED
2071  6041            TSF                     /SKIP ON XMIT FLAG
2072  7610            SKP CLA
2073  4427            ERROR                   /TRANSMIT FLAG GOT RESET BY ABOVE CODE
2074  4424            DONLOP                  /REPEAT TEST IF NOT DONE OR SCOPE LOOP IF SR2=1

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

2075  1021            TAD     OP1SEL          /GET THE HARDWARE CONFIGURATION
2076  0377            AND     (100            /MASK OUT THE XOR BIT
2077  7650            SNA     CLA             /IS THE XOR SELECTED
2100  5307            JMP     TEST28          /NO, DO THE NORMAL TEST
2101  4423            LOOPPC                  /YES=SETUP TEST COUNT AND SCOPE LOOP
2102  7772            =6                      /SIMULATOR ITERATION COUNTER
2103  4436            SIMCHK                  /CHECK TO SEE IF SIMULATOR SELECTED
2104  4010            4010                    /CONTROL WORD FOR SIMULATOR
2105  4437            LODSIM                  /LOAD SIMULATOR CONTROL WORD
2106  5314            JMP     TEST28+5        /START THE TEST
2107  4423    TEST28, LOOPPC                  /SETUP TEST COUNT AND SCOPE LOOPING ADDRESS
2110  7740            =40                     /SIMULATOR ITERATION COUNTER
2111  4436            SIMCHK                  /CHECK TO SEE IF SIMULATOR IS SELECTED
```



```
2112  4000            4000                    /CONTROL WORD FOR THE SIMULATOR
2113  4437            LODSIM                  /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
                                              /LOOP = THIS ADDRESS IF  SIMULATOR SELECTED
                                              /OTHERWISE SCOPE LOOP IS THIS ADDRESS +1
2114  3041            DCA INTFLG              /CLEAR PROGRAM INTERRUPT
2115  6007            CAF                     /CLEAR ALL FLAGS BUT SET SLU INT ENA
2116  4146            RTCENA                  /SET REAL TIME CLOCK INT ENA
2117  6001            ION                     /TURN THE INTERRUPT ON
2120  6040            TFL                     /SET THE TRANSMIT FLAG
2121  6041            TSF                     /SKIP ON TRANSMIT FLAG
2122  4427            ERROR                   /TFL FAILED TO SET XMIT FLAG
2123  2041            ISZ INTFLG
2124  4427            ERROR                   /PROGRAM FAILED TO INTERRUPT
2125  6044            TPC                     /LOAD TRANSMIT BUFFER AND TRANSMIT
2126  7610            SKP CLA
2127  4427            ERROR                   /TPC SKIPPED
2130  6041            TSF                     /SKIP ON XMIT FLAG
2131  4427            ERROR                   /TPC CLEARED XMIT FLAG
2132  6042            TCF                     /CLEAR TRANSMIT FLAG
2133  6001            ION                     /TURN THE INTERRUPT BACK ON
2134  4431            TSFWAT                  /WAIT FOR XMIT BUFF MT H TO SET XMIT FLAG
2135  4427            ERROR                   /TPC FAILED TO SET XMIT FLAG
2136  2041            ISZ INTFLG              /CHECK TO SEE IF PROGRAM INTERRUPTED
2137  4427            ERROR                   /PROGRAM FAILED TO INTERRUPT WITH XMIT FLAG + INT ENA
2140  6042            TCF                     /CLEAR THE TRANSMIT FLAG
2141  6001            ION                     /TURN THE INTERRUPT ON
2142  4432            KSFWAT                  /WAIT FOR RECEIVE FLAG TO SET
2143  4427            ERROR                   /RECEIVE FLAG FAILED TO SET BY A TPC COMMAND
2144  6045            SPI                     /SKIP ON RCV FLAG AND INT ENA
2145  4427            ERROR                   /FAILED TO SKIP
2146  2041            ISZ INTFLG              /DID THE PROGRAM INTERRUPT
2147  4427            ERROR                   /FAILED TO INTERRUPT WITH RCV AND INT ENA SET
2150  6032            KCC                     /CLEAR THE RECEIVE FLAG
2151  7610            SKP CLA
2152  4427            ERROR                   /KCC SKIPPED
2153  6001            ION                     /TURN THE INTERRUPT ON
2154  6031            KSF                     /SKIP ON RECEIVE FLAG
2155  7610            SKP CLA
2156  4427            ERROR                   /KCC FAILED TO CLEAR RCV FLAG
2157  1041            TAD INTFLG              /GET THE PROGRAM INTERRUPT FLAG
2160  7640            SZA CLA
2161  4427            ERROR                   /PROGRAM INTERRUPTED WITH RCV FLAG CLEARED
2162  4424            DONLOP                  /REPEAT TEST IF NOT DONE OR LOOP ON TEST IF SR2=1

2163  5776'           JMP     TEST29

2176  2200
2177  0100
      2200      IFDEF OP13K <PAGE>

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

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                    /*****************************************************************
2200  4423    TEST29, LOOPPC                  /SETUP TEST COUNT AND SCOPE LOOPING ADDRESS
2201  7775            =3                      /SIMULATOR ITERATION COUNTER
2202  4104            JMS     PATCH           /SET UP SKIP CHAIN
2203  3252            SKPCHN
2204  3042            DCA     CLKFLG          /SET INTERRUPT TO IGNORE RTC
2205  4436            SIMCHK                  /CHECK TO SEE IF SIMULATOR IS SELECTED
2206  4017            4017                    /CONTROL WORD FOR THE SIMULATOR
2207  4437            LODSIM                  /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
                                              /LOOP = THIS ADDRESS IF  SIMULATOR SELECTED
                                              /OTHERWISE SCOPE LOOP IS THIS ADDRESS +1
2210  3041            DCA INTFLG              /CLEAR PROGRAM INTERRUPT FLAG
2211  6007            CAF                     /CLEAR ALL FLAGS AND SET SLU INT ENA
2212  4146            RTCENA                  /SET REAL TIME CLOCK INT ENA
2213  6001            ION                     /TURN THE INTERRUPT ON
2214  6046            TLS                     /TRANSMIT AND CLEAR THE FLAG
2215  4431            TSFWAT                  /WAIT FOR THE XMIT FLAG TO SET
2216  4427            ERROR                   /XMIT FLAG FAILED TO SET BY TLS
2217  2041            ISZ INTFLG              /DID THE PROGRAM INTERRUPT
2220  4427            ERROR                   /FAILED TO INTERRUPT WITH INT ENA AND XMIT FLAG
2221  6042            TCF                     /CLEAR XMIT FLAG
2222  6001            ION                     /TURN THE INTERRUPT ON
2223  4432            KSFWAT                  /WAIT FOR THE RCV FLAG TO SET
2224  4427            ERROR                   /RECEIVE FLAG FAILED TO SET
2225  6034            KRS                     /READ THE RECEIVE BUFFER
2226  7610            SKP CLA
2227  4427            ERROR                   /KRS SKIPPED
2230  6031            KSF                     /SKIP ON RECEIVE FLAG
2231  4427            ERROR                   /KRS CLEARED THE RCV FLAG
2232  2041            ISZ INTFLG              /DID THE PROGRAM INTERRUPT
2233  4427            ERROR                   /FAILED TO INTERRUPT WITH INT ENA + RCV FLAG
2234  6036            KRB                     /CLEAR RECEIVE FLAG
2235  7610            SKP CLA
2236  4427            ERROR                   /KRB SKIPPED
2237  6001            ION                     /TURN THE INTERRUPT BACK ON
2240  6031            KSF                     /SKIP ON RECEIVE FLAG
2241  7610            SKP CLA
2242  4427            ERROR                   /KRB FAILED TO CLEAR RECEIVE FLAG
2243  1041            TAD INTFLG              /GET THE PROGRAM INTERRUPT FLAG
2244  7640            SZA CLA
2245  4427            ERROR                   /PROGRAM INTERRUPTED WITHOUT RCV FLAG SET
2246  4424            DONLOP                  /REPEAT TEST IF NOT DONE OR LOOP IF SR2=1
                    /*****************************************************************
                    /TEST 30 = CHECKS THAT CAF WILL CLEAR RCV FLAG
                    /*****************************************************************
2247  4423    TEST30, LOOPPC                  /SETUP TEST COUNT AND SCOPE LOOPING ADDRESS
2250  7775            =3                      /SIMULATOR ITERATION COUNTER
2251  4436            SIMCHK                  /CHECK TO SEE IF SIMULATOR IS SELECTED
2252  4017            4017                    /CONTROL WORD FOR THE SIMULATOR
2253  4437            LODSIM                  /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
                                              /LOOP = THIS ADDRESS IF  SIMULATOR SELECTED
                                              /OTHERWISE SCOPE LOOP IS THIS ADDRESS +1
```



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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            TLS                     /TRANSMIT AND CLEAR THE XMIT FLAG
2261  4431            TSFWAT                  /WAIT FOR XMIT FLAG
2262  4427            ERROR                   /XMIT FLAG FAILED TO SET
2263  2041            ISZ INTFLG              /DID THE PROGRAM INTERRUPT?
2264  4427            ERROR                   /PROGRAM FAILED TO INTERRUPT
2265  6042            TCF                     /CLEAR TRANSMIT FLAG
2266  6001            ION
2267  4432            KSFWAT                  /WAIT FOR RECEIVE FLAG
2270  4427            ERROR                   /RECEIVE FLAG FAILED TO SET
2271  2041            ISZ INTFLG              /DID THE PROGRAM INTERRUPT
2272  4427            ERROR                   /PROGRAM FAILED TO INTERRUPT
2273  6007            CAF                     /CLEAR ALL FLAGS
2274  6001            ION                     /TURN THE INTERRUPT BACK ON
2275  6031            KSF                     /SKIP ON RECEIVE FLAG
2276  7610            SKP CLA
2277  4427            ERROR                   /INITIALIZE FAILED TO CLEAR RECEIVE FLAG
2300  4424            DONLOP                  /REPEAT TEST IF NOT DONE OR LOOP IF SR2=1
                    /*****************************************************************
                    /TEST 31 = CHECKS THE EFFECT OF THE SLU IOT'S UPON THE AC
                    /*****************************************************************
2301  4423    TEST31, LOOPPC                  /SETUP TEST COUNT AND SCOPE LOOPING ADDRESS
2302  7777            -1                      /SIMULATOR ITERATION COUNTER
2303  4436            SIMCHK                  /CHECK TO SEE IF SIMULATOR IS SELECTED
2304  4007            4007                    /CONTROL WORD FOR THE SIMULATOR
2305  4437            LODSIM                  /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
                                              /LOOP = THIS ADDRESS IF  SIMULATOR SELECTED
                                              /OTHERWISE SCOPE LOOP IS THIS ADDRESS +1
2306  3041            DCA INTFLG              /CLEAR PROGRAM INTERRUPT FLAG
2307  6007            CAF                     /CLEAR ALL FLAGS
2310  4146            RTCENA                  /SET REAL TIME CLOCK INT ENA
2311  6001            ION                     /TURN THE INTERRUPT ON
2312  7344            CLA CLL CMA RAL         /SET THE AC TO =2
2313  6035            KIE                     /CLEAR SLU INTERRUPT ENABLE
2314  7050            CMA RAR
2315  7620            SNL CLA
2316  4427            ERROR                   /KIE CHANGED THE AC
2317  7240            CLA CMA
2320  6032            KCC                     /CLEAR RECEIVE FLAG AND AC
2321  7640            SZA CLA
2322  4427            ERROR                   /KCC FAILED TO CLEAR THE AC
2323  7240            CLA CMA
2324  6036            KRB                     /READ RECEIVE FLAG, CLEAR AC AND READ RECEIVE BUFFER
2325  7510            SPA
2326  4427            ERROR                   /KRB FAILED TO CLEAR AC
2327  7240            CLA CMA
2330  6034            KRS                     /READ RECEIVE BUFFER = INCLUSIVE OR WITH AC
2331  7040            CMA                     /SET THE AC BACK TO 0
2332  7640            SZA CLA
2333  4427            ERROR                   /KRS CHANGED THE AC
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2334  7340          CLA CLL CMA
2335  6031          KSF                     /SKIP ON RECEIVE FLAG
2336  7040          CMA
2337  7640          SZA CLA
2340  4427          ERROR                   /KSF CHANGED THE AC
2341  7240          CLA CMA
2342  6030          KCF                     /CLEAR RECEIVE FLAG
2343  7040          CMA
2344  7640          SZA CLA
2345  4427          ERROR                   /KCF CHANGED THE AC
2346  7240          CLA CMA
2347  6040          TFL                     /SET TRANSMIT FLAG
2350  7040          CMA
2351  7640          SZA CLA
2352  4427          ERROR                   /TFL CHANGED THE AC
2353  7240          CLA CMA
2354  6042          TCF                     /CLEAR THE TRANSMIT FLAG
2355  7040          CMA
2356  7640          SZA CLA
2357  4427          ERROR                   /TCF CHANGED THE AC
2360  7240          CLA CMA
2361  6041          TSF                     /SKIP ON TRANSMIT FLAG
2362  7040          CMA
2363  7640          SZA     CLA
2364  4427          ERROR                   /TSF CHANGED THE AC
2365  7240          CLA CMA
2366  6044          TPC                     /LOAD TRANSMIT BUFFER AND TRANSMIT
2367  7040          CMA
2370  7640          SZA CLA
2371  4427          ERROR                   /TPC CHANGED THE AC
2372  4431          TSFWAT                  /WAIT FOR THE TRANSMIT FLAG
2373  4427          ERROR                   /TRANSMIT FLAG FAILED TO SET
2374  4432          KSFWAT                  /WAIT FOR THE RECEIVE FLAG
2375  4427          ERROR                   /RECEIVE FLAG FAILED TO SET
2376  6042          TCF                     /CLEAR THE XMIT FLAG
2377  6030          KCF                     /CLEAR THE RECEIVE FLAG
2400  7240          CLA CMA
2401  6045          SPI                     /SKIP IF XMIT/RCV FLAG SET AND INT ENA SET
2402  7040          CMA
2403  7640          SZA CLA
2404  4427          ERROR                   /SPI CHANGED THE AC
2405  7240          CLA CMA
2406  6046          TLS                     /LOAD TRANSMIT BUFFER, TRANSMIT + CLEAR FLAG
2407  7040          CMA
2410  7640          SZA CLA
2411  4427          ERROR                   /TLS CHANGED THE AC
2412  4431          TSFWAT                  /WAIT FOR THE TRANSMIT FLAG
2413  4427          ERROR                   /TRANSMIT FLAG FAILED TO SET
2414  4432          KSFWAT                  /WAIT FOR THE RECEIVE FLAG TO SET
2415  4427          ERROR                   /ERROR RECEIVE FLAG FAILED TO SET
2416  6042          TCF                     /CLEAR THE TRANSMIT FLAG
2417  6032          KCC                     /CLEAR AC AND RECEIVE FLAG
2420  1041          TAD INTFLG              /DID THE PROGRAM INTERRUPT?
2421  7640          SZA CLA
2422  4427          ERROR                   /PROGRAM INTERRUPTED WITHOUT INT ENA SET
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2423  4424          DONLOP                  /REPEAT TEST IF NOT DONE OR LOOP IF SR2=1

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

2424  4423    TEST32, LOOPPC                  /SETUP TEST COUNT AND SCOPE LOOP ADDRESS
2425  7775          =3                      /SIMULATOR ITERATION COUNTER
2426  4436          SIMCHK                  /CHECK TO SEE IF SIMULATOR IS SELECTED
2427  4017          4017                    /CONTROL WORD FOR THE SIMULATOR
2430  4437          LODSIM                  /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
                                            /LOOP = THIS ADDRESS IF  SIMULATOR SELECTED
                                            /OTHERWISE SCOPE LOOP IS THIS ADDRESS +1
2431  3041          DCA INTFLG              /CLEAR PROGRAM INTERRUPT FLAG
2432  3053          DCA SLUXMT              /CLEAR THE WORD TO BE TRANSMITTED
2433  4433          SLUDAT                  /GO TRANSMIT, READ AND COMPARE THE WORD
2434  4434          SLUDER                  /DATA ERROR=WORD WAS NON ZERO BEING READ BACK
2435  4424          DONLOP                  /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                  /SETUP TEST COUNT AND SCOPE LOOP ADDRESS
2437  7775          =3                      /SIMULATOR ITERATION COUNTER
2440  4436          SIMCHK                  /CHECK TO SEE IF SIMULATOR IS SELECTED
2441  4017          4017                    /CONTROL WORD FOR THE SIMULATOR
2442  4437          LODSIM                  /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
                                            /LOOP = THIS ADDRESS IF  SIMULATOR SELECTED
                                            /OTHERWISE SCOPE LOOP IS THIS ADDRESS +1
2443  3041          DCA INTFLG              /CLEAR PROGRAM INTERRUPT FLAG
2444  1056          TAD K377
2445  3053          DCA SLUXMT              /SET THE WORD TO BE TRANSMITTED TO ALL ONE'S
2446  4433          SLUDAT                  /GO TRANSMIT, READ AND COMPARE
2447  4434          SLUDER                  /DATA ERROR - WORDS DO NOT COMPARE
2450  4424          DONLOP                  /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                  /SETUP TEST COUNT AND SCOPE LOOPING ADDRESS
2452  7775          =3                      /SIMULATOR ITERATION COUNTER
2453  4436          SIMCHK                  /CHECK TO SEE IF SIMULATOR IS SELECTED
2454  4017          4017                    /CONTROL WORD FOR THE SIMULATOR
2455  4437          LODSIM                  /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
                                            /LOOP = THIS ADDRESS IF  SIMULATOR SELECTED
                                            /OTHERWISE SCOPE LOOP IS THIS ADDRESS +1
2456  3041          DCA INTFLG              /CLEAR PROGRAM INTERRUPT FLAG
2457  3053          DCA SLUXMT              /CLEAR THE WORD TO BE TRANSMITTED
2460  4433          SLUDAT                  /GO TRANSMIT READ AND COMPARE THE WORD
2461  4434          SLUDER                  /DATA ERROR = TRANSMITTING ZEROES
2462  1056          TAD K377
```

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2463  3053          DCA SLUXMT              /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          DONLOP                  /REPEAT TEST IF NOT DONE OR LOOP IF SR2=1

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

2467  4423    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          LODSIM                  /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
                                            /LOOP = THIS ADDRESS IF  SIMULATOR SELECTED
                                            /OTHERWISE SCOPE LOOP IS THIS ADDRESS =1
2474  3041          DCA INTFLG              /CLEAR PROGRAM INTERRUPT FLAG
2475  1060          TAD K252
2476  3053          DCA SLUXMT              /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 SLUXMT              /SET TRANSMIT WORD TO 125
2503  4433          SLUDAT                  /TRANSMIT, READ AND COMPARE THE WORD
2504  4434          SLUDER                  /DATA ERROR = TRANSMITTED A 125
2505  4424          DONLOP                  /REPEAT TEST IF NOT DONE OR LOOP IF SR2=1

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


2506  4423    TEST36, 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          LODSIM                  /LOAD THE SIMULATOR IF SELECTED
2520  1047          TAD TSTCNT              /GET THE WORD TO BE TRANSMITTED
2521  0056          AND K377                /MASK OFF THE 8 BITS
2522  3053          DCA SLUXMT              /SET TRANSMIT WORD TO THIS NUMBER
2523  4433          SLUDAT                  /TRANSMIT READ AND COMPARE THE WORD
2524  4434          SLUDER                  /DATA ERROR=
2525  4424          DONLOP                  /REPEAT TEST IF NOT DONE OR LOOP IF SR2=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
```



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                /**********************************************************************

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          LODSIM                  /LOAD THE SIMULATOR CONTROL WORD
2540  6007          CAF                     /CLEAR ALL FLAGS
2541  4146          RTCENA                  /SET REAL TIME CLOCK INT ENA
2542  6001          ION                     /TURN THE INTERRUPT ON
2543  3041          DCA     INTFLG          /CLEAR PROGRAM INTERRUPT FLAG
2544  6035          KIE                     /CLEAR SLU INT ENABLE
2545  1047          TAD     TSTCNT          /GET THE TEST COUNT NUMBER
2546  0056          AND     K377            /MASK OUT FOR 8 BITS
2547  3053          DCA     SLUXMT          /SAVE THE WORD TO BE TRANSMITTED
2550  1053          TAD     SLUXMT          /GET THE WORD
2551  6046          TLS                     /TRANSMIT IT
2552  4431          TSFWAT                  /WAIT FOR THE TRANSMIT FLAG TO SET
2553  4427          ERROR                   /TRANSMIT FLAG FAILED TO SET
2554  6042          TCF                     /CLEAR THE TRANSMIT FLAG
2555  4432          KSFWAT                  /WAIT FOR THE RECEIVE FLAG TO SET
2556  4427          ERROR                   /RECEIVE FLAG FAILED TO SET
2557  7240          CLA     CMA             /SET THE AC TO ALL ONES
2560  6036          KRB                     /READ THE WORD
2561  3054          DCA     SLUREC          /SAVE THE WORD READ
2562  1053          TAD     SLUXMT          /COMPARE THE WORD TRANSMITTED WITH THE WORD READ
2563  7041          CIA
2564  1054          TAD     SLUREC
2565  7640          SZA     CLA             /ARE THEY EQUAL?
2566  4434          SLUDER                  /NO;DATA ERROR ON SERIAL LINE UNIT
2567  1041          TAD     INTFLG          /GET THE PROGRAM INTERRUPT FLAG
2570  7640          SZA     CLA
2571  4427          ERROR                   /PROGRAM INTERRUPTED WITHOUT INT ENA
2572  4424          DONLOP                  /DONE? OR REPEAT TEST IF SR2=1
2573  7000          NOP
2574  7000          NOP

2575  1021          TAD     OP1SEL          /GET THE HARDWARE CONFIGURATION
2576  0057          AND     K200            /CHECK FOR THE SIMULATOR
2577  7650          SNA     CLA             /IS IT SELECTED
2600  5602          JMP  I  .+2             /NO,GO DO INTERACTION TEST
2601  5203          JMP     TEST38          /YES, GO DO SIMULATOR TEST
2602  3124          TEST42                  /INTERACTION TEST

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

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

                    /**********************************************************************
                    /THIS TEST IS ENTERED WHEN SIMULATOR IS SELECTED.
                    /TEST 39 - CHECKS THAT READER RUN WILL CLEAR AFTER A WORD HAS BEEN TRANSMITTED
                    /AND DATA LOOPS BACK INTO THE RECEIVE BUFFERS USING THE 20 MA CURRENT
                    /LOOP FOR 110 BAUD TO 9600 BAUD.
                    /**********************************************************************
2653  4423    TEST39, LOOPPC                  /SETUP TEST COUNT AND TEST LOOP ADDRESS
2654  7771            -7                      /SIMULATOR ITERATION COUNTER
2655  4436            SIMCHK                  /CHECK FOR SIMULATOR
2656  4000            4000                    /SIMULATOR CONTROL WORD
```



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2657  4437            LODSIM                  /LOAD THE SIMULATOR
2660  6007            CAF                     /CLEAR ALL FLAGS
2661  4146            RTCENA                  /SET REAL TIME CLOCK INT ENA
2662  6001            ION                     /TURN THE INTERRUPT ON
2663  6035            KIE                     /DISABLE SLU INT ENABLE
2664  6156            CLRDET                  /CLEAR READER RUN
2665  6157            SKPRDR                  /SKIP ON READER DETECTOR F/F SET
2666  7610            SKP     CLA
2667  4427            ERROR                   /READER RUN FAILED TO CLEAR BY INIT
2670  6032            KCC                     /SET READER RUN
2671  6157            SKPRDR                  /SKIP ON READER RUN DETECTOR F/F SET
2672  4427            ERROR                   /KCC FAILED TO SET READER RUN
2673  6046            TLS                     /TRANSMIT
2674  4431            TSFWAT                  /WAIT FOR THE TRANSMIT FLAG
2675  4427            ERROR                   /TRANSMIT FLAG FAILED TO SET
2676  6042            TCF                     /CLEAR THE TRANSMIT FLAG
2677  4432            KSFWAT                  /WAIT FOR THE RECEIVE FLAG
2700  4427            ERROR                   /RECEIVE FLAG FAILED TO SET
2701  6156            CLRDET                  /CLEAR READER RUN DETECTOR F/F
2702  6157            SKPRDR                  /SKIP ON READER RUN DETECTOR F/F SET
2703  7610            SKP     CLA
2704  4427            ERROR                   /CLOCK PULSE TO READER RUN FAILED TO CLEAR READER RUN
2705  4424            DONLOP                  /REPEAT TEST FOR NEXT BAUD RATE
2706  1021            TAD     OP1SEL          /GET THE HARDWARE CONFIGURATION
2707  0377            AND     (100            /MASK OUT THE XOR BIT
2710  7650            SNA     CLA             /IS THE XOR SELECTED
2711  5776'           JMP     TEST40          /NO,GO TO THE NEXT TEST
2712  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  3042            DCA     CLKFLG          /SET INTERRUPT TO IGNORE RTC
3005  4436            SIMCHK                  /CHECK FOR SIMULATOR
3006  4100            4100                    /CONTROL WORD FOR THE SIMULATOR
3007  4437            LODSIM                  /LOAD THE SIMULATOR CONTROL WORD
3010  1377            TAD     (-20
3011  3043            DCA     CNT
3012  6007            CAF                     /CLEAR ALL
3013  4146            RTCENA                  /SET REAL TIME CLOCK INT ENA
3014  6001            ION                     /TURN THE INTERRUPT ON
3015  6161            STRFRQ                  /START A FREQUENCY COUNT
3016  6162            SKPFRQ                  /SKIP ON FREQUENCY COUNT IN PROGRESS
```

```
3017  7610          SKP     CLA             /FREQUENCY COUNT ENDED GO READ IT
3020  5216          JMP     .-2             /WAIT FOR A FREQUENCY COUNT ENDED
3021  6163          LODFRQ                  /LOAD THE FREQUENCY COUNT IN TO THE AC
3022  3243          DCA     FRQCNT          /SAVE THE FREQUENCY COUNT READ
3023  1244          TAD     RTCFRQ          /GET THE NEGATIVE VALUE OF MAX TOLERANCE
3024  1243          TAD     FRQCNT          /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          SWHCHK                  /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  FRQCNT, 0
3044  3062  RTCFRQ, -4716                  /RTC FREQUENCY COUNT 2500 + OR - 10

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

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



```
3074  1673          TAD  I  TABFRQ          /GET THE NEG MAXIMUM FREQUENCY COUNT
3075  1243          TAD     FRQCNT          /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          SWHCHK                  /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  FRQTAB, -5443                  /110  BAUD = 2841 + OR - 10
3115  3723          -4055                   /150  BAUD = 2083 + OR - 10
3116  3723          -4055                   /300  BAUD = 2083 + OR - 10
3117  3723          -4055                   /600  BAUD = 2083 + OR - 10
3120  5744          -2034                   /1200 BAUD = 1042 + OR - 10
3121  6755          -1023                   /2400 BAUD = 0521 + OR - 10
3122  7362          -0416                   /4800 BAUD = 0262 + OR - 10
3123  7564          -0214                   /9600 BAUD = 0130 + OR - 10

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

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

```
3137  3071          DCA     EXPACD          /CLEAR THE EXPECTED AC DATA
3140  3072          DCA     LINK            /CLEAR THE LINK BIT
3141  3053          DCA     SLUXMT          /SET INITIAL AC DATA TO 0
3142  3051          DCA     PIOXMT          /SET PIO INITIAL DATA TO 0
3143  7240          CLA     CMA
3144  3073          DCA     XMTFLG          /SET SLU XMT FLAG TO INACTIVE
3145  7240          CLA     CMA
3146  3074          DCA     RECFLG          /SET SLU RCV FLAG TO INACTIVE
3147  7240          CLA     CMA
3150  3075          DCA     RTCFLG          /SET RTC FLAG TO INACTIVE
3151  1066          TAD     M10
3152  3076          DCA     PNOINT          /SETUP A COUNT FOR NO INT'S ON P I/O
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          TLS                     /LOAD AND TRANSMIT ON SLU
3164  6574          DBTD                    /TRANSMIT ALL 0'S ON P I/O
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  7340          CLA CLL CMA
3202  1200          TAD PCLOOP
3203  3045          DCA TEST
3204  1600          TAD I PCLOOP
3205  3067          DCA SIMCNT
3206  7240          CLA CMA
3207  3050          DCA SAVCNT
3210  1050          TAD SAVCNT
3211  3047          DCA TSTCNT
3212  2200          ISZ PCLOOP
3213  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          DONONE
3224  1021          TAD OP1SEL      /IS THE SIMULATOR SELECTED
3225  0057          AND K200
3226  7650          SNA CLA
3227  5237          JMP LOOPSW      /SIMULATOR NOT SELECTED,CHECK TEST LOOP SWITCH
3230  2067          ISZ SIMCNT      /ADD A 1 TO THE CONTROL WORD?
3231  7610          SKP CLA
3232  5237          JMP LOOPSW      /NO,CHECK TEST LOOP SWITCH
3233  2055          ISZ CONTWD      /ADD 1 TO THE CONTROL WORD FOR BAUD RATES
3234  1050          TAD SAVCNT      /GET THE TEST COUNT
3235  3047          DCA TSTCNT      /RESTORE IT FOR A NEW PASS FOR A DIFFERENT BAUD
3236  5446          JMP I TSTLOP    /RETURN FOR NEW BAUD RATE
3237  4435  LOOPSW, SWHCHK         /CHECK FOR SR2=1
3240  7006          RTL
3241  7700          SMA 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      /WERE 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  5303          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 INTXOR      /GO CHECK FOR THE XOR BIT AND TSF 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  6570  ACTCK2,   DBST                /WAS DATA ACCEPTED SET=IF SO CLEAR IT
3277  7640            SZA CLA
3300  5315            JMP FLGCK5=2        /YES,THE FLAG SHOULD BE CLEAR NOW
3301  4427            ERROR               /ILLEGAL INTERRUPT =
3302  5315            JMP FLGCK5=2        /RETURN
3303  6041  FLGCK1,   TSF                 /SKIP ON XMIT FLAG
3304  7410            SKP
3305  4427            ERROR               /XMIT FLAG SET
3306  6031  FLGCK2,   KSF                 /SKIP ON RECEIVE FLAG
3307  7410            SKP
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            CLA CMA
3321  3041            DCA INTFLG          /SET INTERRUPT FLAG
3322  4774'           JMS RETURN
3323  3326            INTRET
3324  1251            TAD AC
3325  5726            JMP I INTRET

3326  0000  INTRET,   0

                      /ROUTINE TO WAIT FOR SERIAL LINE UNITS XMIT FLAG

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

                      /ROUTINE TO WAIT FOR THE SERIAL LINE UNIT RECEIVE FLAG

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

3407  0000  CHKSWH,   0
3410  7200            CLA
3411  1021            TAD OP1SEL
3412  7700            SMA CLA
3413  5216            JMP .+3
3414  7604            LAS
3415  5607            JMP I CHKSWH
3416  1020            TAD SWITCH
3417  5607            JMP I CHKSWH
                      /

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

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

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

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

3441  7200  POWFAL, CLA CLA
3442  6201        CDF 00
3443  1265        TAD KJMP7
3444  3636        DCA I K0
3445  1045        TAD TEST
3446  3666        DCA I KTEST
3447  1267        TAD FLGRST
3450  3670        DCA I C7
3451  1133        TAD KRTF
3452  3671        DCA I K10
3453  1272        TAD KJMPRT
3454  3673        DCA I K11
3455  6004        GTF
3456  3674        DCA I K12
3457  6244        RMF
3460  6103        CAL
3461  6102        SPL
3462  7610        SKP CLA
3463  5261        JMP .-2
3464  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  KJMPRT, JMP I TEST
3473  0011  K11,    11
3474  0012  K12,    12
```



```
              /LOGIC ERROR ROUTINE - RESTART TEST IF SR1=1

3475  0000  AERROR, 0
3476  4326        JMS     ACTCHK          /GO CHECK TO SEE IF RUNNING ON ACT LINE
3477  4435        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  7004        RAL
3511  7700        SMA CLA
3512  5675        JMP I AERROR            /RETURN WITHOUT LOOPING ON TEST
3513  5446        JMP I TSTLOP            /SCOPE LOOP GO BACK TO START OF TEST SECTION

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


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

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

3543  0000  ERRPC,  0
```

```
3544  0000  CHKACT, 0
3545  6137        CLSK            /WAS THE CLOCK FLAG SET
3546  7410        SKP             /NO=RETURN TO INT SERVICE ROUTINE
3547  5352        JMP     CLKSET  /YES=CLEAR THE FLAG
3550  2344        ISZ     CHKACT  /ADD 1 TO THE INCOMING PC
3551  5744        JMP  I  CHKACT  /RETURN TO SKIP CHAIN
3552  6136  CLKSET, CLCL          /CLEAR THE CLOCK FLAG
3553  1022        TAD     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  5350        JMP     CHKACT+4/RETURN TO INTERRUPT ROUTINE
3557  4220        JMS     RETURN  /NO,RETURN TO THE PROGRAM
3560  3564        ACTRET
3561  1776'       TAD     AC
3562  6001        ION             /TURN THE INTERRUPT ON
3563  5764        JMP  I  ACTRET  /RETURN TO THE PROGRAM
3564  0000  ACTRET, 0
3565  2102  ONACTL, ISZ     ACTCNT  /100 CLOCK TICKS YET?
3566  5357        JMP     CLKSET+5/NO RETURN TO PROGRAM
3567  1103        TAD     M144    /RESET ACT TIME COUNTER
3570  3102        DCA     ACTCNT  /SAVE THE NUMBER
3571  6272        CIF     7Ø      /CHANGE INSTRUCTION FIELD TO 7
3572  4501        JMS  I  GOODPS  /SIGNAL PROM THAT PROGRAM STILLS PAS
3573  7240        CLA     CMA
3574  3134        DCA     ACTFLG  /SET THE ACT LINE FLAG TO ONES
3575  5357        JMP     CLKSET+5/RETURN TO THE PROGRAM

3576  3251
3577  0200
      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  6575        DBSE            /SET PARALLEL I/O INT ENA
3605  1051        TAD PIOXMT      /GET THE WORD TO BE LOADED INTO PARALLEL I/O
3606  6574        DBTD            /LOAD AND TRANSMIT THE WORD
3607  7200        CLA
3610  6571        DBSK            /SKIP ON DATA READY
3611  4427        ERROR           /ERROR, DATA READY FLAG FAILED TO SET SY DBTD
3612  2041        ISZ INTFLG      /GET PROGRAM INTERRUPT FLAG
3613  4427        ERROR           /PROGRAM FAILED TO INTERRUPT WITH INT ENA + FLAG SET
3614  3041        DCA INTFLG      /CLEAR PROGRAM INTERRUPT FLAG
3615  6572        DBRD            /READ THE 12 BIT PARALLEL I/O BUFFER
3616  3052        DCA PIOREC      /SAVE THE WORD READ
3617  6571        DBSK            /SKIP ON DATA READY FLAG
3620  4427        ERROR           /DBRD CLEARED DATA READY FLAG
3621  6573        DBCF            /CLEAR DATA READY FLAG
3622  6001        ION             /TURN INTERRUPT BACK ON
3623  7000        NOP             /SHOULD INTERRUPT HERE FOR DATA ACCEPT FLAG
```



```
3624  6570        DBST            /SKIP ON DATA ACCEPT
3625  7610        SKP CLA
3626  4427        ERROR           /DATA ACCEPT FAILED TO CLEAR IN INTERRUPT ROUTINE
3627  2041        ISZ INTFLG      /CHECK TO SEE IT IT INTERRUPTED
3630  4427        ERROR           /DATA ACEPT 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        TLS             /LOAD AND TRANSMIT IT AND CLEAR THE FLAG
3662  4431        TSFWAT          /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        KSFWAT          /WAIT FOR THE RECEIVE FLAG TO SET
3671  4427        ERROR           /RECEIVE FLAG FAILED TO SET
3672  2041        ISZ     INTFLG  /DID THE RECEIVE FLAG CAUSE A INTERRUPT
3673  4427        ERROR           /RECEIVE FLAG FAILED TO CAUSE A INTERRUPT
3674  6036        KRB             /CLEAR THE AC AND RCV FLAG AND READ BUFFER
3675  3054        DCA     SLUREC  /SAVE THE WORD READ BACK
3676  6001        ION             /TURN THE INTERRUPT BACK ON
3677  1041        TAD     INTFLG  /CHECK THAT KRB CLEARED THE RCV FLAG
3700  7640        SZA     CLA
3701  4427        ERROR           /KRB FAILED TO CLEAR RCV 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            SWHCHK                  /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 PIOXMT              /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, SWHCHK                  /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            SWHCHK          /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=ADRESS 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, SWHCHK          /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  1761            TAD I CHKSIM    /GET THE CONTROL WORD
3767  3055            DCA CONTWD      /SAVE IT
3770  7410            SKP
3771  2361            ISZ CHKSIM
3772  2361            ISZ CHKSIM
3773  1361            TAD CHKSIM
3774  3046            DCA TSTLOP
3775  5761            JMP 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     CLL             /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          SWHCHK                  /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 (0 = 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  SLUSTR, TAD     BDPNTR          /ACTUAL TEST STARTS HERE
4051  3047          DCA     TSTCNT          /SAVE THE POINTER IN TEST COUNT
4052  1447          TAD  I  TSTCNT          /GET THE FIRST CONSTANT
4053  3043          DCA     CNT             /SAVE IT
4054  2047          ISZ     TSTCNT          /ADD 1 TO THE WORKING POINTER
4055  1447          TAD  I  TSTCNT          /GET THE SECOND CONSTANT
4056  3044          DCA     CNT1            /DCA CNT1
4057  6007          CAF                     /CLEAR ALL FLAGS
4060  6046          TLS                     /LOAD AND TRANSMIT THE FIRST CHARACTER
4061  6041          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  6036  INTON, KRB                     /CLEAR THE RECEIVE FLAG
4065  7610          SKP     CLA
4066  6046          TLS                     /LOAD AND TRANSMIT AND CLEAR FLAG
4067  6001          ION                     /TURN THE INTERRUPT ON
4070  5270          JMP     .
4071  6031  SLUINT, KSF                     /SKIP ON THE RECEIVE FLAG
4072  7610          SKP     CLA
4073  5264          JMP     INTON           /CLEAR THE RECEIVE FLAG AND TURN INT ON
4074  6041          TSF                     /SKIP IF TRANSMIT FLAG SET
4075  4427          ERROR                   /ILLEGAL INTERRUPT
4076  2043          ISZ     CNT             /ADD ONE TO THE FIRST COUNTER
4077  5266          JMP     INTON+2
4100  2044          ISZ     CNT1            /OVERFLOWED FIRST COUNT ADD 1 TO SECOND
4101  5266          JMP     INTON+2         /GO DO ANOTHER 4095 INTERRUPTS
4102  7602          HLT     CLA                     /WAS IT 30 SECONDS ???
4103  5223          JMP     SLUTIM          /GO DO IT AGAIN OR START ANOTHER TEST

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

                  /POINTERS TO BAUD RATE TABLES

4110  4120  BAUDTB, BR110
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```
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 109,09 CHAR/SEC=3273 CHAR/30 SEC
4143  7777          -1

                  /BAUD RATE CONSTANTS FOR 2400 BAUD

4144  1737  BR2400, -6041                  /10 BIT AT 240 CHAR/SEC=7200 CHAR/30 SEC
4145  7776          -2
4146  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
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4153  7774            -4

                      /BAUD RATE CONSTANTS FOR 9600 BAUD

4154  7571    BR9600, -207                    /10 BITS AT 960 CHAR/SEC=28,800 CHAR/30 SEC
4155  7770            -10
4156  4664            -3114                   /11 BITS AT 872,73 CHAR/SEC=26,182 CHAR/30 SEC
4157  7771            -7

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

4160  0000    DELAY,  0
4161  1371            TAD     M15
4162  3044            DCA     CNT1
4163  3043            DCA     CNT
4164  2043            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 PI/O TEST 42

4200  3325    INTSKP, DCA     ACCRET          /SAVE THE AC
4201  7010            RAR
4202  3326            DCA     LINKRT          /SAVE THE LINK
4203  6102            SPL                     /SKIP ON POWER LOW FLAG
4204  7610            SKP     CLA
4205  5777'           JMP     POWFAL          /POWER GOING DOWN
4206  6041            TSF                     /SKIP ON SLU XMIT FLAG
4207  7610            SKP     CLA
4210  5327            JMP     XMTSER          /XMIT FLAG SET GO SERVICE IT
4211  6031            KSF                     /SKIP ON RECEIVE FLAG
4212  7610            SKP     CLA
4213  5776'           JMP     RECSER          /SERVICE THE RECEIVE FLAG AND COMPARE DATA
4214  6137            CLSK                    /SKIP ON REAL TIME CLOCK FLAG
4215  7610            SKP     CLA
4216  5333            JMP     RTCSER          /GO SERVICE THE RTC FLAG
4217  6571            DBSK                    /SKIP ON P I/O DATA READY FLAG
4220  7610            SKP     CLA
4221  5224            JMP     PIOSER          /GO SERVICE THE PARALLEL I/O FLAG
4222  4427            ERROR                   /ILLEGAL INTERRUPT
4223  5445            JMP  I  TEST            /RESTART THE TEST

                      /12 BIT PARALLEL I/O INTERACTIVE SERVICE ROUTINE TEST 42
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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                    /READ THE 12 BIT P I/O DATA WORD
4227  6573            DBCF                    /CLEAR THE DATA READY FLAG
4230  3052            DCA     PIOREC          /SAVE THE WORD READ
4231  6570            DBST                    /SKIP AND CLEAR DATA ACCEPTED & DATA AVAIL.
4232  4427            ERROR                   /DBCF FAILED TO SET DATA ACCEPTED
4233  6570            DBST                    /SKIP ON DATA ACCEPTED
4234  7610            SKP     CLA
4235  4427            ERROR                   /DBST FAILED TO CLEAR DATA ACCEPTED
4236  4775'           JMS     CMPACL          /COMPARE THE AC DATA AND LINK
4237  1051            TAD     PIOXMT          /COMPARE THE XMITTED WITH WORD READ
4240  7041            CIA
4241  1052            TAD     PIOREC
4242  7640            SZA     CLA             /ARE THEY EQUAL?
4243  4774'           JMS     PIOERR          /NO DATA ERROR
4244  7301            CLA CLL IAC             /GENERATE A RANDOM AC DATA WORD
4245  1323            TAD     RAN1
4246  1324            TAD     RAN2
4247  7106            CLL     RTL
4250  3323            DCA     RAN1
4251  1324            TAD     RAN2
4252  7012            RTR
4253  1323            TAD     RAN1
4254  3324            DCA     RAN2
4255  1324            TAD     RAN2
4256  3071            DCA     EXPACD          /SAVE THE EXPECTED AC DATA WORD
4257  7010            RAR
4260  3072            DCA     LINK            /SAVE THE EXPECTED LINK
4261  2051            ISZ     PIOXMT          /ADD ONE TO THE WORD TO BE TRANSMITTED
4262  1051            TAD     PIOXMT          /GET THE WORD
4263  6574            DBTD                    /LOAD AND TRANSMIT IT
4264  7300            CLA     CLL
4265  5306            JMP     ACLION          /GO GET THE AC DATA WORD AND L ,ION

4266  1073    RTCSLU, TAD     XMTFLG          /CHECK ALL DEVICES TO BE INTERRUPTING
4267  1074            TAD     RECFLG          /
4270  1075            TAD     RTCFLG          /
4271  7650            SNA     CLA             /ARE THEY?
4272  5276            JMP     RESET           /YES RESET FLAGS TO INACTIVE
4273  2077            ISZ     INACTV          /BUMP DEVICE INACTIVE COUNTER
4274  5306            JMP     ACLION          /CONTINUE THE TEST
4275  4773'           JMS     INACDV          /ERROR A DEVICE IS INACTIVE
4276  7340    RESET,  CLA CLL CMA
4277  3073            DCA     XMTFLG          /SET SLU XMIT FLAG TO INACTIVE
4300  7240            CLA     CMA
4301  3074            DCA     RECFLG          /SET SLU REC FLAG TO INACTIVE
4302  7240            CLA     CMA
4303  3075            DCA     RTCFLG          /SET RTC FLAG TO INACTIVE
4304  1372            TAD     (-40            /RESET DEVICE INACTIVE COUNTER
4305  3077            DCA     INACTV          /TO -40
4306  4771'   ACLION, JMS     RETURN          /SETUP INTERRUPT RETURN
4307  4322            INTERA
4310  7300            CLA     CLL             /SETUP AC AND LINK AND TURN INTERRUPT ON
4311  1072            TAD     LINK            /GET THE LINK
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4312  7004            RAL
4313  1071            TAD     EXPACD          /GET THE AC DATA WORD
4314  6001            ION                     /TURN THE INTERRUPT ON
4315  2076            ISZ     PNOINT          /ADD 1 TO P I/O NO INTERRUPT COUNTER
4316  5722            JMP  I  INTERA          /RETURN TO PROGRAM
4317  7300            CLA     CLL
4320  4427            ERROR                   /ERROR PARALLEL I/O FAILED TO INTERRUPT
4321  5445            JMP  I  TEST            /RESTART THE TEST

4322  0000    INTERA, 0
4323  1234    RAN1,   1234
4324  5670    RAN2,   5670
4325  0000    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     RTCFLG          /SET CLOCK ACTIVE FLAG
4334  6136            CLCL                    /CLEAR THE CLOCK FLAG
4335  4775'           JMS     CMPACL          /COMPARE THE AC AND LINK
4336  1022            TAD     OP2SEL          /CHECK TO SEE IF RUNNING ON ACT LINE
4337  7700            SMA     CLA             /IS IT?
4340  5346            JMP     .+6             /NO
4341  2102            ISZ     ACTCNT          /1 SECOND YET?
4342  5346            JMP     .+4
4343  1103            TAD     M144            /RESET ACT COUNTER
4344  3102            DCA     ACTCNT          /SAVE IT
4345  4136            JMS     TSTGOD          /GOOD PAS SO FAR
4346  2047            ISZ     TSTCNT          /INCREMENT PROGRAM TEST COUNTER
4347  5266            JMP     RTCSLU          /GO CHECK FOR ACTIVE DEVICES
4350  4470            JMS  I  DELAYR          /DELAY FOR 200MS TO ALLOW FLAGS TO SETTLE
4351  6007            CAF                     /CLEAR ALL FLAGS BUT SET SLU INT ENA
4352  4136            JMS     TSTGOD          /GOOD AGAIN!!!!
4353  4435            SWHCHK                  /CHECK SR2=1 TO LOOP ON TEST
4354  7006            RTL
4355  7710            SPA     CLA             /LOOP?
4356  5445            JMP  I  TEST            /YES,DO TEST OVER
4357  5440            PRGEND                  /NO, END OF TEST

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

                /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            /MASK OUT FOR THE EIGHT BITS
4414  3053            DCA     SLUXMT          /SAVE THE NEW WORD
4415  1053            TAD     SLUXMT          /GET THE WORD AND TRANSMIT IT
4416  6046            TLS                     /LOAD AND TRANSMIT THE WORD
4417  7300            CLA     CLL
4420  5777'           JMP     RTCSLU          /GO CHECK FOR ACTIVE DEVICES AND RESET THE AC


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

4421  0000    CMPACL, 0
4422  1071            TAD     EXPACD          /GET THE EXPECTED AC DATA
4423  7041            CIA
4424  1776'           TAD     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            SWHCHK                  /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                     /AC CONTAINS ADDRESS WHERE THE ERROR WAS DETECTED
4447  7200            CLA
4450  1071            TAD     EXPACD
4451  7402            HLT                     /THE AC CONTAINS AC DATA BEFORE INTERRUPT
4452  7200            CLA
4453  1776'           TAD     ACDRET          /
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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  1775'           TAD     LINKRT
4462  7402            HLT                     /THE AC CONTAINS LINK AFTER INTERRUPT
4463  4435    ACLLOP, SWHCHK                  /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    INACDV, 0
4471  4774'           JMS     ACTCHK          /CHECK TO SEE IF RUNNING ON THE ACT LINE
4472  4435            SWHCHK                  /INHIBIT ERROR HALT?
4473  7710            SPA     CLA
4474  5312            JMP     INACLP          /YES CHECK LOOP SWITCH
4475  7240            CLA     CMA
4476  1270            TAD     INACDV
4477  7402            HLT                     /AC = ADDRESS WHERE ERROR WAS DETECTED
4500  7300            CLA     CLL
4501  1073            TAD     XMTFLG
4502  7640            SZA     CLA
4503  7402            HLT                     /SLU XMIT FLAG IS INACTIVE
4504  1074            TAD     RECFLG
4505  7640            SZA     CLA
4506  7402            HLT                     /SLU RECEIVE FLAG IS INACTIVE
4507  1075            TAD     RTCFLG
4510  7640            SZA     CLA
4511  7402            HLT                     /RTC  FLAG IS INACTIVE
4512  4435    INACLP, SWHCHK                  /CHECK SR1=1 TO LOOP ON ERROR
4513  7004            RAL
4514  7710            SPA     CLA
4515  5446            JMP  I  TSTLOP          /SCOPE LOOP
4516  5670            JMP  I  INACDV          /RETURN TO THE TEST

                /SLU DATA ERROR DURING INTERACTION TEST 42

4517  0000    SLUERR, 0
4520  4774'           JMS     ACTCHK          /CHECK TO SEE IF RUNNING ON ACT LINE
4521  4435            SWHCHK
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
4530  1053            TAD     SLUXMT
4531  7402            HLT                     /AC = WORD TRANSMITTED
4532  7200            CLA
4533  1054            TAD     SLUREC
4534  7402            HLT                     /AC = WORD THAT WAS READ
```



```
4535  4435    SLULOP, SWHCHK                  /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            SWHCHK
4545  7710            SPA     CLA             /INHIBIT ERROR HALT?
4546  5360            JMP     PIOLOP          /YES, CHECK LOOP SWITCH
4547  7240            CLA     CMA
4550  1342            TAD     PIOERR
4551  7402            HLT                     /AC = ADDRESS WHERE ERROR WAS DETECTED
4552  7200            CLA
4553  1051            TAD     PIOXMT
4554  7402            HLT                     /AC = THE WORD TRANSMITTED
4555  7200            CLA
4556  1052            TAD     PIOREC
4557  7402            HLT                     /AC = THE WORD READ FROM P I/O
4560  4435    PIOLOP, SWHCHK                  /LOOP ON ERROR IF SR1=1
4561  7004            RAL
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

4600  0000    PASSED, 0
4601  7710            SPA     CLA
4602  7402            HLT                     /SR3=1 END OF A COMPLETE PROGRAM PASS
4603  1021            TAD     OP1SEL          /GET THE HARDWARE CONFIGURATION
4604  0377            AND     (100            /MASK OUT XOR BIT
4605  7650            SNA     CLA             /IS IT SET ?
4606  5224            JMP     STNPAS          /NO RETURN
4607  6007            CAF                     /CLEAR ALL FLAGS
4610  6173            STIP                    /SKIP IF MUT POWER ON AND 1ST XRON
4611  7410            SKP
4612  5216            JMP     .+4             /MUT POWER ON GO ISSUE SECOND XRON
4613  6007            CAF                     /CLEAR ALL FLAGS
4614  6170            XRON                    /START INITIALIZATION OF MUX
4615  5224            JMP     STNPAS          /RETURN TO PROGRAM
4616  6160            SIMCLR                  /CLEAR THE SIMULATOR
4617  6007            CAF                     /CLEAR ALL FLAGS
4620  6171            SKXR                    /SKIP IF ERROR 1 FLOP SET
4621  6170            XRON                    /START ACTUAL TEST AND ENABLE ALL ERRORS
4622  6007            CAF                     /CLEAR ALL FLAGS
4623  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, Ø
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, Ø
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  6002  XORTSF, IOF                     /TURN THE INTERRUPT OFF
4652  1055          TAD     CONTWD          /GET THE SIMULATOR CONTROL WORD
4653  0064          AND     K7              /MASK THE BAUD RATE BITS OUT
4654  1376          TAD     (X110B          /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, Ø                       /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             /WAS 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             /WAS IT TEST 37
4677  7301          CLA CLL IAC             /NO, SET THE AC TO 0001
4700  6035          KIE                     /ENABLE OR DISABLE SLU INT ENA
4701  7200          CLA                     /CLEAR THE AC BIT IF SET
4702  5667          JMP  I  OFONKI          /RETURN
```



```
4703  0000  TEMP,   Ø

                  DECIMAL
4704  5664  X110B,  -110Ø                  /110MS
4705  6340  X150B,  -8ØØ                  /8ØMS
4706  7160  X300B,  -4ØØ                  /4ØMS
4707  7470  X600B,  -2ØØ                  /2ØMS
4710  7634  X1200B, -1ØØ                  /1ØMS
4711  7716  X2400B, -5Ø                   /5MS
4712  7747  X4800B, -25                   /2',5MS
4713  7763  X9600B, -13                   /1',3MS
                  OCTAL

4714  0000  INTXOR, Ø
4715  6041          TSF                     /SKIP ON SLU XMIT FLAG
4716  5714          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, Ø
4725  7300          CLA     CLL
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  0724          AND  I  DELAYB
4744  0724          AND  I  DELAYB
4745  0324          AND     DELAYB
4746  5330          JMP     DELLOP

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


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

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

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

5000  0000    XORCLK, 0
5001  6135            CLLE                    /CLEAR CLK INT ENA
5002  6002            IOF                     /TURN THE INTERRUPT OFF
5003  1777'           TAD     X1200B          /GET A 10MS CONSTANT
5004  3776'           DCA     NDELAY          /SAVE IT FOR THE DELAY
5005  4775'           JMS     DELAYB          /DELAY FOR APPROXIMATELY 10MS
5006  6137            CLSK                    /SKIP ON THE CLOCK FLAG
5007  4427            ERROR                   /FLAG NOT SET IN ALLOTTED TIME
5010  1774'           TAD     WTCLSK          /GET THE ADDRESS INTO CLOCK WAIT ROUTINE
5011  1373            TAD     (=XORENA        /CHECK TO SEE IF ENABLE OR DISABLE INT ENA
5012  7650            SNA     CLA             /ENABLE OR DISABLE CLK INT ENA ?
5013  7301            CLA CLL IAC             /ENABLE THE CLK INT ENA
5014  6135            CLLE                    /DISABLE IT IF ABOVE SKIPPED
5015  7200            CLA
5016  6001            ION                     /TURN THE INTERRUPT ON
5017  7000            NOP                     /SHOULD INTERRUPT WERE IF IT IS GOING TO
5020  2200            ISZ     XORCLK          /BUMP RETURN POINTER BY 2
5021  2200            ISZ     XORCLK          /
5022  5600            JMP  I  XORCLK          /RETURN TO THE PROGRAM

5173  7404
5174  3352
5175  4724
5176  4747
5177  4710
      0200            *200



      $
0177  4753
```



```
0000  11110000  00000000  11111111  11111111  11111111  11111111  11111111  11111111
0100  11111111  11111111  11111111  11111111  11111111  11111000  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
```

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

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

4400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
4500  11111111  11111111  11111111  11111111  11111111  11111111  11110000  00001111

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

5000  11111111  11111111  11100000  00000000  00000000  00000000  00000000  00000000
5100  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00011111

5200
5300

5400
5500

5600
5700

6000
6100

6200
6300

6400
6500

6600
6700

7000
7100

7200
7300

7400
7500

7600
7700
```



```
AC       3251        DBSE    6575        K7       0064        RECSER   4400
ACDRET   4325        DBSK    6571        K7710    0150        RESET    4276
ACLERR   4434        DBSS    6577        KCC      6032        RETADD   3437
ACLION   4306        DBST    6570        KCDF     0132        RETURN   3420
ACLLOP   4463        DBTD    6574        KCF      6030        RMF      6244
ACTCHK   3526        DELAY   4160        KIE      6035        RTCENA   4146
ACTCK2   3276        DELAYB  4724        KJMP     0130        RTCFLG   0075
ACTCNT   0102        DELAYN  4750        KJMP7    3465        RTCFRQ   3044
ACTFLG   0134        DELAYR  0070        KJMPRT   3472        RTCINT   4015
ACTRET   3564        DELLOP  4730        KRB      6036        RTCSER   4333
ADDTIM   3362        DERPIO  3711        KRMF     0131        RTCSLU   4266
AERROR   3475        DERSLU  3734        KRS      6034        RTCTIM   4000
AERSWH   3507        DONLOP  4424        KRTF     0133        RTF      6005
BADPAS   0100        DONONE  4626        KSF      6031        RTIMOK   3041
BAUDRT   4105        ENARTC  0146        KSFWAT   4432        SAVADD   0124
BAUDTB   4110        ENDPAS  3400        KTEST    3466        SAVCNT   0050
BAUDWD   4104        ERROR   4427        LINK     0072        SAVLOC   3440
BDPNTR   4107        ERRPC   3543        LINKRT   4326        SBE      6101
BR110    4120        EXPACD  0071        LOADSM   6151        SIMCHK   4436
BR1200   4140        FLGCK1  3303        LODFRQ   6163        SIMCLR   6160
BR150    4124        FLGCK2  3306        LODSIM   4437        SIMCNT   0067
BR2400   4144        FLGCK3  3311        LOOPPC   4423        SIMINT   3244
BR300    4130        FLGCK4  3314        LOOPSW   3237        SIMLOD   3214
BR4800   4150        FLGCK5  3317        LOPDON   3221        SIMWRD   3514
BR600    4134        FLGRST  3467        M10      0066        SKPCHN   3252
BR9600   4154        FRQCNT  3043        M144     0103        SKPDAV   6165
C7       3470        FRQTAB  3114        M15      4171        SKPFRQ   6162
CAF      6007        GOODPS  0101        M4       0065        SKPRDR   6157
CAL      5103        GTF     6004        M40      3167        SKPSTR   6167
CHKACT   3544        HLT     7402        NDELAY   4747        SKXR     6171
CHKSIM   3761        INACDV  4470        OFONKI   4667        SLUDAT   4433
CHKSWH   3407        INACLP  4512        ONACTL   3565        SLUDER   4434
CLCL     6136        INACTV  0077        OP13K    0000        SLUERR   4517
CLKFLG   0042        INTERA  4322        OP1SEL   0021        SLUINT   4071
CLKSET   3552        INTFLG  0041        OP2SEL   0022        SLULOP   4535
CLKSNC   2135        INTON   4064        PASSED   4600        SLUREC   0054
CLKXOR   4753        INTRET  3326        PATCH    0104        SLUSTR   4050
CLLE     6135        INTSKP  4200        PCLOOP   3200        SLUSWH   3754
CLRDET   6156        INTXOR  4714        PIODAT   4426        SLUTIM   4023
CLRSIM   6150        K0      3436        PIODER   4430        SLUTOK   3112
CLSK     6137        K1      0125        PIOERR   4542        SLUXMT   0053
CLSKWT   4425        K10     3471        PIOLOP   4560        SPI      6045
CMPACL   4421        K11     3473        PIOREC   0052        SPL      6102
CNT      0043        K12     3474        PIOSER   4224        STIP     6173
CNT1     0044        K125    0061        PIOSWH   3727        STNPAS   4624
CON100   4751        K2      0126        PIOXMT   0051        STPBIT   4106
CONTWD   0055        K200    0057        PNOINT   0076        STRFRQ   6161
DATPIO   3600        K252    0060        POWFAL   3441        SWHCHK   4435
DATSLU   3653        K2525   0063        PRGEND   5440        SWITCH   0020
DBCE     6576        K3      0127        RAN1     4323        SXRC     6175
DBCF     6573        K377    0056        RAN2     4324        TABFRQ   3073
DBRD     6572        K5252   0062        RECFLG   0074        TCF      6042
```

TEMP	4703	TSTGOD	0136
TEST	0045	TSTLOP	0046
TEST1	0200	US100	4752
TEST10	0663	WATKSF	3341
TEST11	0733	WATTSF	3327
TEST12	0774	WTCLSK	3352
TEST13	1027	X110B	4704
TEST14	1124	X1200B	4710
TEST15	1137	X150B	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	XRCI	6172
TEST26	1721	XRON	6170
TEST27	2012	XRSI	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		
TSF	6041		
TSFRET	4647		
TSFWAT	4431		
TSFXOR	4637		
TSTCNT	0047		

ERRORS DETECTED: 0

LINKS GENERATED: 38

RUN-TIME: 22 SECONDS

3K CORE USED

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

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



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

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

        /OPTION BOARD NUMBER 1 IOT'S

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

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

        /REAL TIME CRYSTAL CLOCK

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

        /12 BIT PARALLEL I/O

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

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

                        /SWITCH REGISTER SETTINGS

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

                        /OPTION BOARD 1 SIMULATOR IOT'S
                6150    CLRSIM=6150             /CLEAR SIMULATOR CONTROL REGISTERS
                6151    LOADSM=6151             /LOAD SIMULATOR CONTROL WORD 1
                6156    CLRDET=6156             /CLEAR READER RUN, STROBE, AND DATA AVAILABLE CATCHER F/F'S
                6157    SKPRDR=6157             /SKIP ON READER RUN CATCHER F/F SET
                6160    SIMCLR=6160             /CLEAR CONTROL REGISTERS AND MOST OF LOGIC ON SIMUALTOR
                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    SKPDAV=6165             /SKIP ON DATA AVAILABLE CATCHER F/F SET
                6167    SKPSTR=6167             /SKIP ON STROBE CATCHER F/F SET

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

                        /BIT  1         PARALLEL I/O CLEAR DATA         1=TS1
                        /               AVAILABLE SELECT                0=DATA ACCEPTED IN

                        /BIT  2         NOT USED

                        /BIT  3         NOT USED

                        /BIT  4         NOT USED

                        /BIT  5         RTC FREQUENCY OR                1=RTC
                        /               SLU FREQUENCY CHECK             0=SLU BAUD RATES


                        /BIT  6         REAL TIME CLOCK                 1=OFF
                        /                                               0=ON

                        /BIT  7         SLU EIA/20MA SELECT             1=EIA RECEIVE DATA
                        /                                               0=20 MA RECEIVE DATA

                        /BIT  8         STOP BIT SELECT                 1=1 STOP BITS
                        /                                               0=2 STOP BIT


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

                        /BIT 10         BAUD RATE SELECT                EQUALS 110 BAUD, EACH

                        /BIT 11         BAUD RATE SELECT                INCREASING BIT SELECTS
```



```
                        /                                               NEXT HIGHEST BAUD RATE)


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

                0020    =20

0020    0000    SWITCH, 0

0021    2000    OP1SEL, 2000
                                        /BIT 0=0  USE LOCATION 20 AS A PSEUDO SWITCH REGISTER
                                        /BIT 0=1  USE HARDWARE FRONT PANEL SWITCH REGISTER
                                        /BIT 1=1  HAS OPTION 1
                                        /BIT 2=1  HAS OPTION 2
                                        /BIT 3=1  HAS 8A CPU SIMULATOR
                                        /BIT 4=1  HAS 8A OPTION 1+2 SIMULATOR
                                        /BIT 5=1  PROGRAM ON PDP=8A XOR(REQUIRES BIT 4 SET ALSO)
                                        /BIT 6=1  HAS PDP=8E TYPE CPU
                                        /BIT 7=11 MEMORY SIZE = 0'S=1K, 37=32K, MEMORY
                                        /SIZE CAN BE INCREASED IN 1K INCREMENTS BY ADDING
                                        /ONE TO THE NUMBER IN BITS 7 = 11
0022    0000    OP2SEL, 0               /BIT 0 IS SET FOR THE ACT LINE
        4423            LOOPPC=JMS I,
0023    1200                    PCLOOP
        4424            DONLOP=JMS I,
0024    1221                    LOPDON
        4425            CLSKWT=JMS I,
0025    1353                    WTCLSK
        4426            PIODAT=JMS I,
0026    1600                    DATPIO
        4427            ERROR=JMS I,
0027    1475                    AERROR
        4430            PIODER=JMS I,
0030    1711                    DERPIO
        4431            TSFWAT=JMS I,
0031    1331                    WATTSF
        4432            KSFWAT=JMS I,
0032    1342                    WATKSF
        4433            SLUDAT=JMS I,
0033    1653                    DATSLU
        4434            SLUDER=JMS I,
0034    1734                    DERSLU
        4435            SWHCHK=JMS I,
0035    1407                    CHKSWH
        4436            SIMCHK=JMS I,
0036    1761                    CHKSIM
        4437            LODSIM=JMS I ,
0037    1214                    SIMLOD
        4145            RTCENA=JMS ENARTC
```

```
          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    TSTLOP, 0
0047      0000    TSTCNT, 0
0050      0000    SAVCNT, 0
0051      0000    PIOXMT, 0
0052      0000    PIOREC, 0
0053      0000    SLUXMT, 0
0054      0000    SLUREC, 0
0055      0000    CONTWD, 0
0056      0377    K377,   377
0057      0200    K200,   200
0060      0252    K252,   252
0061      0125    K125,   125
0062      5252    K5252,  5252
0063      2525    K2525,  2525
0064      0007    K7,     7
0065      7774    M4,     =4
0066      7770    M10,    =10
0067      0000    SIMCNT, 0

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

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

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



```
0114      3526            DCA  I  K3              /PUT IT IN LOCATION 3 IF FIELD 0
0115      6224            RIF                     /GET THE PROGRAM FIELD INTO THE AC
0116      1131            TAD     KCDF            /AND IT TO THE CDF INSTRUCTION
0117      3120            DCA     .+1             /PUT IT IN THE NEXT LOCATION
0120      7402            HLT/CDF                 /EXECUTE IT
0121      2103            ISZ     PATCH           /ADD 1 TO THE ENTRANCE
0122      5503            JMP  I  PATCH           /RETURN

0123      0000    SAVADD, 0
0124      0001    K1,     1
0125      0002    K2,     2
0126      0003    K3,     3
0127      5403    KJMP,   JMP  I  3
0130      6244    KRMF,   6244
0131      6201    KCDF,   CDF
0132      6005    KRTF,   RTF
0133      0000    ACTFLG, 0
0134      0000    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    K7710,  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


                  /**********************************************************************
                  /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 (6572) MAY NOT WORK, THE TEST WAITS FOR THE
                  /RTC FLAG TO SET AND CHECKS THE FLAG TO SKIP, NO INTERRUPTS SHOULD OCCUR.
                  /NOTE! INITIALIZE SETS THE SERIAL LINE UNIT'S INTERRUPT ENABLE.
                  /**********************************************************************

0200      6160    TEST1,  SIMCLR
```

```
0201  4103          JMS PATCH              /SETUP INTERRUPT SERVICE
0202  1244          SIMINT
0203  4423          LOOPPC          /STORE THE LOOPING PC AND SETUP TEST COUNT
0204  7777          =1              /SETUP SIMULATOR ITERATION COUNTER
0205  4436          SIMCHK          /CHECK FOR SIMULATOR
0206  4000          4000            /CONTROL WORD FOR SIMULATOR
0207  4437          LODSIM          /LOAD SIMULATOR=TEST LOOP USING SIMULATOR
0210  3041          DCA INTFLG      /CLEAR PROGRAM INTERRUPT FLAG
0211  6007          CAF             /INITIALIZE THE MODULE = CAF SETS INT ENA ON SLU
0212  6001          ION             /TURN THE INTERRUPT ON
0213  6031          KSF             /SKIP ON RECEIVE FLAG
0214  7410          SKP
0215  4427          ERROR           /RECEIVE FLAG SET OR KSF SKIPPED
0216  6041          TSF             /SKIP ON TRANSMIT FLAG
0217  7410          SKP
0220  4427          ERROR           /TRANSMIT FLAG SET OR TSF SKIPPED
0221  6045          SPI             /SKIP ON XMIT/RECEIVE + INT ENA
0222  7410          SKP
0223  4427          ERROR           /0 SIDE OF XMIT/RECEIVE 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 ISZ LOOP
0242  1041          TAD INTFLG      /DID THE PROGRAM INTERRUPT
0243  7640          SZA CLA
0244  4427          ERROR           /PROGRAM INTERRUPTED = ALL FLAGS ZERO EXCEPT CLK FLG
0245  4424          DONLOP          /CHECK TO SEE IF DONE, OR LOOP ON TEST IF SR2=1

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

0246  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            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    XORENA, ERROR           /CLK FLAG FAILED TO SET
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            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
0431  4427            ERROR           /PROGRAM INTERRUPTED WITHOUT CLK INT ENA
0432  2134            ISZ CLKSNC      /2ND FLAG SET?
0433  5222            JMP .-11        /NO, GO CLEAR FLAG AND WAIT FOR NEXT
0434  7301            CLA CLL IAC
0435  6135            CLLE            /SET INTERRUPT INABLE TO A ONE
0436  7300            CLA     CLL     /SHOULD INTERRUPT HERE
0437  2041            ISZ INTFLG      /DID THE PROGRAM INTERRUPT
0440  4427            ERROR           /PROGRAM FAILED TO INTERRUPT WITH CLK FLAG + CLK INT ENA
0441  6007            CAF             /CLEAR ALL FLAGS
0442  6001            ION
0443  4425            CLSKWT          /WAIT FOR CLK FLAG
0444  4427            ERROR           /CLK FLAG FAILED TO RESET
0445  1041            TAD INTFLG      /GET THE PROGRAM INTERRUPT FLAG
0446  7640            SZA CLA         /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            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 EANBLE
0463  1125            TAD K2
```

```
0464  7640          SZA CLA
0465  4427          ERROR           /CLIE CHANGED THE AC
0466  7240          CLA CMA
0467  6136          CLCL            /CLEAR CLOCK FLAG
0470  7001          IAC
0471  7640          SZA CLA
0472  4427          ERROR           /CLCL CHANGED THE AC
0473  7240          CLA CMA
0474  6137          CLSK            /SKIP ON CLOCK FLAG
0475  7000          NOP
0476  7001          IAC
0477  7640          SZA CLA
0500  4427          ERROR           /CLSK CHANGED THE AC
0501  4424          DONLOP          /CHECK TO SEE IF DONE OR LOOP ON TEST.
0502  4135          JMS     TSTGOD  /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            SZA     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
0522  6570            DBST            /SKIP ON DATA ACCEPTED, 0 DATA ACCEPTED AND DATA AVAILABLE
0523  7640            SZA     CLA
0524  4427            ERROR           /INIT FAILED TO 0 DATA ACCEPTED, DBST SKIPPED OR
                                      /DBST READ SOMETHING INTO THE AC
0525  1041            TAD     INTFLG  /GET THE PROGRAM INTERRUPT FLAG
```



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

                /**********************************************************************
                /TEST 8 = CHECKS THAT THE DATA READY FLAG CAN BE SET AND CLEARED, TO
                /SET THE DATA READY FLAG, THE PROGRAM ISSUES THE 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.
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            SZA     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
```

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0576  6571          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  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  6570          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  6570          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          DONLOP          /REPEAT TEST IF SR = 1ØØØ

                /*****************************************************************
                /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  4ØØØ            4ØØØ            /SIMULATOR CONTROL WORD
0624  4437            LOOSIM          /LOAD SIMULATOR IF SELECTED, ALSO SET SCOPE
                                      /LOOP EQUAL THIS ADDRESS IF SIMULATOR SELECTED
                                      /OTHERWISE SCOPE LOOP WILL BE NEXT ADDRES
0625  6ØØ7           CAF             /CLEAR ALL FLAGS
0626  4145          RTCENA          /SET REAL TIME CLOCK INT ENA
0627  3Ø41          DCA     INTFLG  /CLEAR PROGRAM INTERRUPT FLAG
0630  6ØØ1          ION             /TURN THE INTERRUPT ON
0631  6574          DBTD            /TRANSMIT AND SET DATA READY FLAG
0632  6571          DBSK            /SKIP ON DATA READY FLAG
0633  4427          ERROR           /DBTD FAILED TO SET DATA READY
0634  6570          DBST            /SKIP ON DATA ACCEPTED AND CLEAR IT
0635  7410          SKP
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  6ØØ7          CAF             /CLEAR DATA READY FLAG
0643  4145          RTCENA          /SET REAL TIME CLOCK INT ENA
0644  6571          DBSK            /SKIP ON DATA READY FLAG
0645  7610          SKP     CLA
0646  4427          ERROR           /INIT FAILED TO CLEAR DATA READY FLAG
0647  6ØØ1          ION             /TURN THE INTERRUPT BACK ON
0650  6573          DBCF            /CLEAR DATA READY SET DATA ACCEPTED
                                      /THE PROGRAM ASSUMES THAT DBCF SET DATA ACCEPTED
0651  6ØØ7          CAF             /CLEAR DATA ACCEPTED
0652  4145          RTCENA          /SET REAL TIME CLOCK INT ENA
0653  6ØØ1          ION             /TURN THE INTERRUPT ON
```



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0654  6570          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          DONLOP          /REPEAT TEST IF SR = 1ØØØ

                /*****************************************************************
                /TEST 1Ø = CHECKS THAT INT ENA CAN BE SET AND CLEARED USING THE
                /DATA READY FLAG TO SKIP AND INTERRUPT ON,
                /*****************************************************************

0663  4423    TEST1Ø, LOOPPC          /SETUP TEST COUNT AND TEST LOOPING ADDRESS
0664  7777            =1              /SIMULATOR ITERATION COUNTER
0665  4436            SIMCHK          /CHECK TO SEE IF SIMULATOR SELECTED
0666  4ØØØ            4ØØØ            /SIMULATOR CONTROL WORD
0667  4437            LOOSIM          /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
                                      /LOOP = THIS ADDRESS IF SIMULATOR SELECTED
                                      /OTHERWISE SCOPE LOOP IS NEXT ADDRESS
0670  6ØØ7           CAF             /CLEAR ALL FLAGS
0671  4145          RTCENA          /SET REAL TIME CLOCK INT ENA
0672  3Ø41          DCA     INTFLG  /CLEAR PROGRAM INTERUPT FLAG
0673  6ØØ1          ION             /TURN THE INTERRUPT ON
0674  6571          DBSK            /SKIP ON DATA READY FLAG
0675  7610          SKP     CLA
0676  4427          ERROR           /DATA READY FLAGS SET FOLLOWING INIT
0677  6570          DBST            /SKIP ON DATA ACCEPTED
0700  7610          SKP     CLA
0701  4427          ERROR           /DATA ACCEPTED SET FOLLOWING INIT
0702  1041          TAD     INTFLG  /CHECK THAT THE PROGRAM DID NOT INTERRUPT
0703  7640          SZA     CLA
0704  4427          ERROR           /PROGRAM INTERRUPTED WITHOUT FLAGS AND INT ENA SET
0705  6575          DBSE            /SET INTERRUPT ENABLE TO A 1
0706  7640          SZA     CLA     /CHECK THAT DBSE DIDN'T CHANGE THE AC
0707  4427          ERROR           /DBSE SKIPPED OR READ SOMETHING INTO AC
0710  1041          TAD     INTFLG  /GET THE PROGRAM INTERRUPT FLAG
0711  7640          SZA     CLA
0712  4427          ERROR           /PROGRAM INTERRUPTED WITHOUT FLAG SET
0713  6574          DBTD            /TRANSMIT AND SET DATA READY
0714  6571          DBSK            /SKIP ON DATA READY FLAG
0715  4427          ERROR           /DBTD FAILED TO SET DATA READY
0716  2041          ISZ     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  6ØØ1          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 Ø INT ENA
0731  6ØØ7          CAF             /CLEAR ALL FLAGS
```

```
0732  4424            DONLOP          /REPEAT TEST IF SR = 1000

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

0733  4423    TEST11, LOOPPC          /SETUP TEST COUNT AND TEST LOOPING ADDRESS
0734  7777            -1              /SIMULATOR ITERATION COUNTER
0735  4436            SIMCHK          /CHECK TO SEE IF SIMULATOR SELECTED
0736  4000            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
0760  4427            ERROR           /INIT FAILED TO CLEAR DATA READY
0761  6574            DBTD            /TRANSMIT AND SET DATA READY
0762  6571            DBSK            /SKIP ON DATA READY FLAG
0763  4427            ERROR           /DBTD FAILED TO SET DATA READY FLAG
0764  1041            TAD     INTFLG  /GET THE PROGRAM INTERRUPT FLAG
0765  7640            SZA     CLA
0766  4427            ERROR           /PROGRAM INTERRUPTED- INIT FAILED TO
                                      /CLEAR INTERRUPT ENABLE F/F
0767  6007            CAF             /CLEAR DATA READY FLAG
0770  6571            DBSK            /SKIP ON DATA READY FLAG
0771  7410            SKP
0772  4427            ERROR           /INIT FAILED TO CLEAR DATA READY
0773  4424            DONLOP          /REPEAT TEST IF SR = 1000

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

0774  4423    TEST12, LOOPPC          /SETUP TEST COUNT AND TEST LOOPING ADDRESS
0775  7777            -1              /SIMULATOR ITERATION COUNTER
0776  4436            SIMCHK          /CHECK TO SEE IF SIMULATOR IS SELECTED
0777  4000            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 OR
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
```

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1060  4427          ERROR           /DBSK CHANGED THE AC
1061  6002          IOF
1062  7240          CLA CMA         /SET THE AC TO ALL ONES
1063  6573          DBCF            /CLEAR DATA READY FLAG SET DATA ACCEPT FLAG
1064  7001          IAC
1065  7640          SZA CLA
1066  4427          ERROR           /DBCF CHANGED THE AC
1067  6007          CAF             /CLEAR ALL FLAGS
1070  4145          RTCENA          /SET REAL TIME CLOCK INT ENA
1071  6001          ION             /SET INTERRUPT ENABLE
1072  7240          CLA CMA
1073  6570          DBST            /SKIP AND CLEAR DATA ACCEPTED AND DATA AVAILABLE
1074  7001          IAC
1075  7640          SZA CLA
1076  4427          ERROR           /DBST SKIPPED OR CHANGED THE AC
1077  7240          CLA CMA
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          LODSIM            /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 PIOXMT        /SET THE WORD TO BE TRANSMITTED TO ALL ONES
1134  4426          PIODAT            /GO TRANSMIT AND COMPARE THE WORD
1135  4430          PIODER            /DATA ERROR = WORD DIDN'T COMPARE IN ROUTINE PIODAT
1136  4424          DONLOP            /REPEAT TEST IF NOT DONE OR LOOP ON TEST IF SR2=1
```



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                /**********************************************************************
                /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 CMA           /SET THE FIRST WORD TO ALL ONES
1146  3051          DCA PIOXMT        /SAVE IT
1147  4426          PIODAT            /GO TRANSMIT AND COMPARE THE WORD
1150  4430          PIODER            /DATA ERROR = WORD DIDN'T COMPARE IN ROUTINE PIODAT
1151  3051          DCA PIOXMT        /SET THE WORD TO 0
1152  4426          PIODAT            /GO TRANSMIT AND COMPARE THE WORD
1153  4430          PIODER            /DATA ERROR= FAILED TO READ ZEROES BACK
1154  4424          DONLOP            /REPEAT TEST IF NOT DONE OR LOOP ON TEST IF SR2=1

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

1155  4423    TEST16, LOOPPC          /SETUP TEST LOOP AND TEST COUNT
1156  7777          =1                /SIMULATOR ITERATION COUNTER
1157  4436          SIMCHK            /CHECK TO SEE IF SIMULATOR IS SELECTED
1160  4000          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
1164  3051          DCA PIOXMT        /SET THE FIRST WORD TO TRANSMIT=5252
1165  4426          PIODAT            /GO TRANSMIT AND COMPARE THE DATA WORD
1166  4430          PIODER            /DATA ERROR = WORD DIDN'T COMPARE
1167  1063          TAD K2525
1170  3051          DCA PIOXMT        /SET THE SECOND WORD TO TRANSMIT = 2525
1171  4426          PIODAT            /GO TRANSMIT AND COMPARE THE WORD
1172  4430          PIODER            /DATA ERROR=THE WORD DIDN'T COMPARE
1173  4424          DONLOP            /REPEAT THE TEST IF NOT DONE OR LOOP ON TEST IF SR2=1

1174  5440          PRGEND            /END OF 1ST 1K SEGMENT
                IFDEF OP13K <PAGE>

                IFDEF OP13K <PAGE>


                IFDEF OP13K <PAGE>
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                1200            PAGE


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

1200  0000    PCLOOP, 0
1201  7340            CLA CLL CMA
1202  1200            TAD PCLOOP
1203  3045            DCA TEST
1204  1600            TAD I PCLOOP
1205  3067            DCA SIMCNT
1206  7240            CLA CMA
1207  3050            DCA SAVCNT
1210  1050            TAD SAVCNT
1211  3047            DCA TSTCNT
1212  2200            ISZ PCLOOP
1213  5600            JMP I PCLOOP

1214  0000    SIMLOD, 0
1215  1055            TAD CONTWD      /GET THE CONTROL WORD
1216  6151            LOADSM          /LOAD THE SIMULATOR CONTROL WORD
1217  7300            CLA CLL
1220  5614            JMP I SIMLOD

1221  0000    LOPDON, 0
1222  2047            ISZ TSTCNT      /TEST DONE?
1223  5446            JMP I TSTLOP    /NO RETURN TO TEST
1224  1021            TAD OP1SEL      /IS THE SIMULATOR SELECTED
1225  0057            AND K200
1226  7650            SNA CLA
1227  5237            JMP LOOPSW      /SIMULATOR NOT SELECTED,CHECK TEST LOOP SWITCH
1230  2067            ISZ SIMCNT      /ADD A 1 TO THE CONTROL WORD?
1231  7610            SKP CLA
1232  5237            JMP LOOPSW      /NO,CHECK TEST LOOP SWITCH
1233  2055            ISZ CONTWD      /ADD 1 TO THE CONTROL WORD FOR BAUD RATES
1234  1050            TAD SAVCNT      /GET THE TEST COUNT
1235  3047            DCA TSTCNT      /RESTORE IT FOR A NEW PASS FOR A DIFFERENT BAUD
1236  5446            JMP I TSTLOP    /RETURN FOR NEW BAUD RATE
1237  4435    LOOPSW, SWHCHK          /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
```



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

1251  0000    AC,     0


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

1330  0000    INTRET, 0
```

```
                    /ROUTINE TO WAIT FOR SERIAL LINE UNITS XMIT FLAG

1331  0000  WATTSF, 0
1332  7300        CLA     CLL
1333  1147        TAD     K7710
1334  3044        DCA     CNT1
1335  3043        DCA     CNT
1336  6041        TSF                     /SKIP ON SLU TRANSMIT FLAG
1337  4363        JMS     ADDTIM          /GO ADD ONE TO THE COUNTER
1340  2331        ISZ     WATTSF
1341  5731        JMP  I  WATTSF          /RETURN TO THE PROGRAM=GOT 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=GOT 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=GOT 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        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        SWHCHK                  /GO GET SWITCH REGISTER
1402  7006        RTL
1403  7004        RAL
1404  7710        SPA     CLA
1405  7402        HLT                     /SR3=1 END OF A COMPLETE PROGRAM PASS
1406  5777        JMP     0200            /START PROGRAM OVER

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

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

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

1420  0000  RETURN, 0
1421  6201        CDF                     /CHANGE DATA FIELD TO FIELD 0
1422  1636        TAD  I  K0              /GET THE INTERRUPT PC
1423  3237        DCA     RETADD          /SAVE IT
1424  6224        RIF                     /READ THE PROGRAM INSTRUCTION FIELD
1425  1131        TAD     KCDF            /ADD A CDF INSTRUCTION TO IT
1426  3227        DCA     .+1             /SAVE IT IN THE NEXT LOCATION
1427  7402        HLT/CDF                 /RETURN TO THE PROGRAM DATA FIELD
1430  1620        TAD  I  RETURN          /GET THE INTERRUPT RETURN LOCATION
1431  3240        DCA     SAVLOC          /SAVE IT
1432  2220        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  6103            CAL
1461  6102            SPL
1462  7610            SKP CLA
1463  5261            JMP .=2
1464  5445            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            SWHCHK                  /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                     /AC = ADDRESS WHERE ERROR WAS DETECTED
1505  4314            JMS SIMWRD              /WAS THE SIMULATOR SELECTED
1506  7402            HLT                     /AC=SIMULATOR CONTROL WORD
1507  4435    AERSWH, SWHCHK                  /CHECK SR1=1 TO LOOP ON ERROR
1510  7004            RAL
1511  7700            SMA CLA
1512  5675            JMP I AERROR            /RETURN WITHOUT LOOPING ON TEST
1513  5446            JMP I TSTLOP            /SCOPE LOOP GO BACK TO START OF TEST SECTION

1514  0000    SIMWRD, 0
1515  7300            CLA CLL
1516  1021            TAD OP1SEL
1517  0057            AND K200
1520  7650            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  6002            IOF             /TURN THE INTERRUPT OFF
1534  7344            CLA CLL CMA RAL
1535  1326            TAD     ACTCHK
1536  3343            DCA     ERRPC
1537  7240            CLA     CMA
1540  1743            TAD  I  ERRPC   /GET THE LOCATION WHERE THE ERROR WAS DETECTED
1541  6272            CIF     70      /CHANGE INSTRUCTION FIELD TO FIELD 7
1542  5477            JMP  I  BADPAS  /GO TO THE PROM

1543  0000    ERRPC,  0




1544  0000    CHKACT, 0
1545  6137            CLSK            /WAS THE CLOCK FLAG SET
1546  7410            SKP             /NO=RETURN TO INT SERVICE ROUTINE
1547  5352            JMP     CLKSET  /YES=CLEAR THE FLAG
1550  2344            ISZ     CHKACT  /ADD 1 TO THE INCOMING PC
1551  5744            JMP  I  CHKACT  /RETURN TO SKIP CHAIN
1552  6136    CLKSET, CLCL            /CLEAR THE CLOCK FLAG
1553  1022            TAD     OP2SEL  /GET THE ACT LINE BIT
1554  7710            SPA     CLA     /IS THE PROGRAM RUNNING ON ACT LINE
1555  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  6001            ION             /TURN THE INTERRUPT ON
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     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
```

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                1600            PAGE

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

1600  0000      DATPIO, 0
1601  6007              CAF               /CLEAR ALL
1602  4145              RTCENA            /SET REAL TIME CLOCK INT ENA
1603  6001              ION               /TURN THE INTERRUPT ON
1604  6575              DBSE              /SET PARALLEL I/O INT ENA
1605  1051              TAD PIOXMT        /GET THE WORD TO BE LOADED INTO PARALLEL I/O
1606  6574              DBTD              /LOAD AND TRANSMIT THE WORD
1607  7200              CLA
1610  6571              DBSK              /SKIP ON DATA READY
1611  4427              ERROR             /ERROR, DATA READY FLAG FAILED TO SET BY DBTD
1612  2041              ISZ INTFLG        /GET PROGRAM INTERRUPT FLAG
1613  4427              ERROR             /PROGRAM FAILED TO INTERRUPT WITH INT ENA + FLAG SET
1614  3041              DCA INTFLG        /CLEAR PROGRAM INTERRUPT FLAG
1615  6572              DBRD              /READ THE 12 BIT PARALLEL I/O BUFFER
1616  3052              DCA PIOREC        /SAVE THE WORD READ
1617  6571              DBSK              /SKIP ON DATA READY FLAG
1620  4427              ERROR             /DBRD CLEARED DATA READY FLAG
1621  6573              DBCF              /CLEAR DATA READY FLAG
1622  6001              ION               /TURN INTERRUPT BACK ON
1623  7000              NOP               /SHOULD INTERRUPT HERE FOR DATA ACCEPT FLAG
1624  6570              DBST              /SKIP ON DATA ACCEPT
1625  7610              SKP CLA
1626  4427              ERROR             /DATA ACCEPT FAILED TO CLEAR IN INTERRUPT ROUTINE
1627  2041              ISZ INTFLG        /CHECK TO SEE IT IT INTERRUPTED
1630  4427              ERROR             /DATA ACEPT FLAG FAILED TO INTERRUPT
1631  6001              ION               /TURN THE INTERRUPT BACK ON
1632  7000              NOP
1633  1041              TAD INTFLG        /GET PROGRAM INTERRUPT FLAG
1634  7640              SZA CLA           /DID IT INTERRUPT?
1635  4427              ERROR             /PROGRAM INTERRUPTED WITHOUT DATA READY SET
1636  1051              TAD PIOXMT        /GET THE WORD TRANSMITTED
1637  7041              CIA
1640  1052              TAD PIOREC        /GET THE WORD READ
1641  7640              SZA CLA           /ARE THEY EQUAL?
1642  5600              JMP I DATPIO      /DATA ERROR RETURN TO REPORT ERROR
1643  6007              CAF               /CLEAR ALL FLAGS AND P I/O BUFFER
1644  4145              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              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
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1660  1053              TAD     SLUXMT    /GET THE WORD TO BE TRANSMITTED
1661  6046              TLS               /LOAD AND TRANSMIT IT AND CLEAR THE FLAG
1662  4431              TSFWAT            /WAIT FOR THE TRANSMIT FLAG
1663  4427              ERROR             /XMIT FLAG FAILED TO SET
1664  2041              ISZ     INTFLG    /DID THE PROGRAM INTERRUPT?
1665  4427              ERROR             /PROGRAM FAILED TO INTERRUPT
1666  6042              TCF               /CLEAR THE XMIT FLAG
1667  6001              ION               /TURN THE INTERRUPT BACK ON
1670  4432              KSFWAT            /WAIT FOR THE RECEIVE FLAG TO SET
1671  4427              ERROR             /RECEIVE FLAG FAILED TO SET
1672  2041              ISZ     INTFLG    /DID THE RECEIVE FLAG CAUSE A INTERRUPT
1673  4427              ERROR             /RECEIVE FLAG FAILED TO CAUSE A INTERRUPT
1674  6036              KRB               /CLEAR THE AC AND RCV FLAG AND READ BUFFER
1675  3054              DCA     SLUREC    /SAVE THE WORD READ BACK
1676  6001              ION               /TURN THE INTERRUPT BACK ON
1677  1041              TAD     INTFLG    /CHECK THAT KRB CLEARED THE RCV FLAG
1700  7640              SZA     CLA
1701  4427              ERROR             /KRB FAILED TO CLEAR RCV FLAG OR INTERRUPTED
1702  1053              TAD     SLUXMT    /GET THE WORD TRANSMITTED
1703  7041              CIA
1704  1054              TAD     SLUREC    /GET THE WORD READ BACK
1705  7640              SZA     CLA
1706  5653              JMP  I  DATSLU    /DATA ERROR=RETURN TO REPORT THE ERROR
1707  2253              ISZ     DATSLU    /BUMP RETURN ADDRESS POINTER BY ONE
1710  5653              JMP  I  DATSLU    /RETURN TO TEST


                        /DATA ERROR ROUTINE FOR PARALLEL I/O

1711  0000      DERPIO, 0
1712  4777'             JMS     ACTCHK            /CHECK TO SEE IF RUNNING ON ACT LINE
1713  4435              SWHCHK            /CHECK SR0 TO INHIBIT ERROR HALT
1714  7710              SPA CLA           /IS SR0 SET?
1715  5327              JMP PIOSWH        /YES, GO CHECK SR1 TO LOOP ON ERROR
1716  7240              CLA CMA
1717  1311              TAD DERPIO
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,   SWHCHK            /LOOP ON DATA ERROR IF SR1=1
1730  7004              RAL
1731  7700              SMA CLA           /LOOP?
1732  5711              JMP I DERPIO      /NO, RETURN TO TEST
1733  5446              JMP I TSTLOP      /RETURN AND DO SAME PATTERN(S)

                        /DATA ERROR ROUTINE FOR SERIAL LINE UNIT

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

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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=ADRESS 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, SWHCHK          /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  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
```

$


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

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

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

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

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

1200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1300  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11110111

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

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

2000
2100

2200
2300

2400
2500

2600
2700


3000
3100

3200
3300

3400
3500

3600
3700
```

```
4000
4100

4200
4300

4400
4500

4600
4700


5000
5100

5200
5300

5400
5500

5600
5700


6000
6100

6200
6300

6400
6500

6600
6700


7000
7100

7200
7300

7400
7500

7600
7700
```


AC	1251	GOODPS	0100	PIODER	4430	TEST5	0413
ACTCHK	1526	GTF	6004	PIOREQ	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	6040
ADDTIM	1363	K0	1436	PRGEND	5440	TLS	6046
AERROR	1475	K1	0124	RECFLG	0073	TPC	6044
AERSWH	1507	K10	1471	RETADD	1437	TSF	6041
BADPAS	0077	K11	1473	RETURN	1420	TSFWAT	4431
C7	1470	K12	1474	RMF	6244	TSTCNT	0047
CAF	6007	K125	0061	RTCENA	4145	TSTGOD	0135
CAL	6103	K2	0125	RTCFLG	0074	TSTLOP	0046
CHKACT	1544	K200	0057	RTF	6005	WATKSF	1342
CHKSIM	1761	K252	0060	SAVADD	0123	WATTSF	1331
CHKSWH	1407	K2525	0063	SAVCNT	0050	WTCLSK	1353
CLCL	6136	K3	0126	SAVLOC	1440	XMTFLG	0072
CLKFLG	0042	K377	0056	SBE	6101	XORENA	0374
CLKSET	1552	K5252	0062	SIMCHK	4436		
CLKSNC	0134	K7	0064	SIMCLR	6160		
CLLE	6135	K7710	0147	SIMCNT	0067		
CLRDET	6156	KCC	6032	SIMINT	1244		
CLRSIM	6150	KCDF	0131	SIMLOD	1214		
CLSK	6137	KCF	6030	SIMWRD	1514		
CLSKWT	4425	KIE	6035	SKPCHN	1252		
CNT	0043	KJMP	0127	SKPDAV	6165		
CNT1	0044	KJMP7	1465	SKPFRQ	6162		
CONTWD	0055	KJMPRT	1472	SKPRDR	6157		
DATPIO	1600	KRB	6036	SKPSTR	6167		
DATSLU	1653	KRMF	0130	SLUDAT	4433		
DBCE	6576	KRS	6034	SLUDER	4434		
DBCF	6573	KRTF	0132	SLUREQ	0054		
DBRD	6572	KSF	6031	SLUSWH	1754		
DBSE	6575	KSFWAT	4432	SLUXMT	0053		
DBSK	6571	KTEST	1466	SPI	6045		
DBSS	6577	LINK	0071	SPL	6102		
DBST	6570	LOADSM	6151	STRFRQ	6161		
DBTD	6574	LODFRQ	6163	SWHCHK	4435		
DERPIO	1711	LODSIM	4437	SWITCH	0020		
DERSLU	1734	LOOPPC	4423	TCF	6042		
DONLOP	4424	LOOPSW	1237	TEST	0045		
ENARTC	0145	LOPDON	1221	TEST1	0200		
ENDPAS	1400	M10	0066	TEST10	0663		
ERROR	4427	M144	0102	TEST11	0733		
ERRPC	1543	M4	0065	TEST12	0774		
EXPACD	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


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

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

```
                /DKC8-AA OPTION TEST 1 MAINDEC-08-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
5101    SBE=6101                        /SKIP ON BATTERY EMPTY
7402    HLT=7402
6244    RMF=6244                        /RESTORE MEMORY FIELD
6005    RTF=6005
6004    GTF=6004

                /OPTION BOARD NUMBER 1 IOT'S

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

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

                /REAL TIME CRYSTAL CLOCK

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

                /12 BIT PARALLEL I/O

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



```
6577    DBSS=6577               /ISSUE A STROBE PULSE

                /SWITCH REGISTER SETTINGS

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

                /OPTION BOARD 1 SIMULATOR IOT'S
6150    CLRSIM=6150             /CLEAR SIMULATOR CONTROL REGISTERS
6151    LOADSM=6151             /LOAD SIMULATOR CONTROL WORD 1
6156    CLRJET=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 SIMUALTOR
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    SKPDAV=6165             /SKIP ON DATA AVAILABLE CATCHER F/F SET
6167    SKPSTR=6167             /SKIP ON STROBE CATCHER F/F SET

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

                /BIT  1         PARALLEL I/O CLEAR DATA         1=TS1
                /               AVAILABLE SELECT                0=DATA ACCEPTED IN

                /BIT  2         NOT USED

                /BIT  3         NOT USED

                /BIT  4         NOT USED

                /BIT  5         RTC FREQUENCY OR                1=RTC
                /               SLU FREQUENCY CHECK             0=SLU BAUD RATES


                /BIT  6         REAL TIME CLOCK                 1=OFF
                /                                               0=ON

                /BIT  7         SLU EIA/20MA SELECT             1=EIA RECEIVE DATA
                /                                               0=20 MA RECEIVE DATA

                /BIT  8         STOP BIT SELECT                 1=1 STOP BITS
                /                                               0=2 STOP BIT


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

                /BIT 10         BAUD RATE SELECT                EQUALS 110 BAUD, EACH

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

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

                0020    *20

0020  0000    SWITCH, 0

0021  2000    OP1SEL, 2000
                                        /BIT 0=0  USE LOCATION 20 AS A PSEUDO SWITCH REGISTER
                                        /BIT 0=1  USE HARDWARE FRONT PANEL SWITCH REGISTER
                                        /BIT 1=1  HAS OPTION 1
                                        /BIT 2=1  HAS OPTION 2
                                        /BIT 3=1  HAS 8A CPU SIMULATOR
                                        /BIT 4=1  HAS 8A OPTION 1+2 SIMULATOR
                                        /BIT 5=1  PROGRAM ON PDP-8A XOR(REQUIRES BIT 4 SET ALSO)
                                        /BIT 6=1  HAS PDP-8E TYPE CPU
                                        /BIT 7-11 MEMORY SIZE = 0'S=1K, 37=32K, MEMORY
                                        /SIZE CAN BE INCREASED IN 1K INCREMENTS BY ADDING
                                        /ONE TO THE NUMBER IN BITS 7 - 11
0022  0000    OP2SEL, 0               /BIT 0 IS SET FOR THE ACT LINE
              4423              LOOPPC=JMS I,
0023  1200                      PCLOOP
              4424              DONLOP=JMS I,
0024  1221                      LOPDON
              4425              CLSKWT=JMS I,
0025  1353                      WTCLSK
              4426              PIODAT=JMS I,
0026  1600                      DATPIO
              4427              ERROR=JMS I,
0027  1475                      AERROR
              4430              PIODER=JMS I,
0030  1711                      DERPIO
              4431              TSFWAT=JMS I,
0031  1331                      WATTSF
              4432              KSFWAT=JMS I,
0032  1342                      WATKSF
              4433              SLUDAT=JMS I,
0033  1653                      DATSLU
              4434              SLUDER=JMS I,
0034  1734                      DERSLU
              4435              SWHCHK=JMS I,
0035  1407                      CHKSWH
              4436              SIMCHK=JMS I,
0036  1761                      CHKSIM
              4437              LODSIM=JMS I ,
0037  1214                      SIMLOD
              4145              RTCENA=JMS ENARTC
```



```
              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    TSTLOP, 0
0047  0000    TSTCNT, 0
0050  0000    SAVCNT, 0
0051  0000    PIOXMT, 0
0052  0000    PIOREC, 0
0053  0000    SLUXMT, 0
0054  0000    SLUREC, 0
0055  0000    CONTWD, 0
0056  0377    K377,   377
0057  0200    K200,   200
0060  0252    K252,   252
0061  0125    K125,   125
0062  5252    K5252,  5252
0063  2525    K2525,  2525
0064  0007    K7,     7
0065  7774    M4,     -4
0066  7770    M10,    -10
0067  0000    SIMCNT, 0

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

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

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

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

0123  0000    SAVADD, 0
0124  0001    K1,     1
0125  0002    K2,     2
0126  0003    K3,     3
0127  5403    KJMP,   JMP  I  3
0130  6244    KRMF,   6244
0131  6201    KCDF,   CDF
0132  6005    KRTF,   RTF
0133  0000    ACTFLG, 0
0134  0000    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    K7710,  SPA     CLA             /IF NOT CLEAR RTC INT ENA
0150  7301          CLA CLL IAC             /SET AC BIT 11
0151  6135          CLLE                    /LOAD BIT 11 INTO CLOCK INT ENA
0152  7200          CLA
0153  5545          JMP  I  ENARTC

      0200    *200

                IFDEF OP13K <PAGE>

                /************************************************************************
                /TEST 17 - CHECKS FOR AN INCREMENTING DATA PATTERN.
                /************************************************************************

0200  6160          SIMCLR          /CLEAR THE SIMULATOR
0201  4423    TEST17, LOOPPC        /SET UP TEST LOOPING ADDRESS
0202  7777          -1              /SIMULATOR ITERATION COUNTER
0203  4103          JMS PATCH       /GO SET UP FOR INTERRUPT RETURN
0204  1252          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 PIOXMT      /SET THE WORD TO BE TRANSMITTED = TO IT
0217  4426          PIODAT          /GO TRANSMIT AND COMPARE THE WORD
0220  4430          PIODER          /DATA ERROR
0221  4424          DONLOP          /DONE OR LOOP ON TEST IF SR2=1


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

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

```
0267  4427          ERROR           /NO,INIT FAILED TO CLEAR BUFFER
0270  1041          TAD INTFLG      /GET THE PROGRAM INTERRUPT FLAG
0271  7640          SZA CLA
0272  4427          ERROR           /PROGRAM INTERRUPTED WITHOUT INT ENA SET
0273  4424          DONLOP          /DONE OR REPEAT TEST IF SR2=1

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

0274  4423    TEST19, LOOPPC          /SETUP TEST COUNT AND TEST LOOP ADDRESS
0275  7777          =1                /SIMULATOR ITERATION COUNTER
0276  4436          SIMCHK            /CHECK TO SEE IF SIMULATOR IS SELECTED
0277  4000          4000              /SIMULATOR CONTROL WORD
0300  4437          LODSIM            /LOAD THE CONTROL WORD
0301  1021          TAD     OP1SEL    /RECHECK THE SIMULATOR BIT
0302  0057          AND     K200      /MASK OUT FOR SIMULATOR BIT
0303  7640          SZA     CLA       /IS IT SET
0304  5307          JMP     .+3       /YES GO CHECK THAT STROBE SETS AND CLEARS
0305  5726          JMP  I  .+1       /GO TO NEXT TEST
0306  0530          TEST23            /ADDRESS OF THE NEXT TEST
0307  6007          CAF               /CLEAR ALL FLAGS
0310  4145          RTCENA            /SET REAL TIME CLOCK INT ENA
0311  3041          DCA     INTFLG    /CLEAR THE PROGRAM INTERRUPT FLAG
0312  6001          ION               /TURN THE INTERRUPT ON
0313  6156          CLRDET            /CLEAR SIMULATOR DETECTOR F/F'S
0314  6167          SKPSTR            /SKIP ON STROBE DETECTOR F/F SET
0315  7610          SKP     CLA
0316  4427          ERROR             /STROBE IS SET TO A ONE
0317  6577          DBSS              /ISSUE A STROBE PULSE
0320  7440          SZA
0321  4427          ERROR             /DBSS SKIPPED OR READ SOMETHING INTO THE AC
0322  6167          SKPSTR            /SKIP ON STROBE DETECTOR F/F SET
0323  4427          ERROR             /DBSS FAILED TO SET STROBE OR SIMULATOR DETECTOR F/F
0324  6156          CLRDET            /CLEAR READER RUN AND STROBE DETECTOR F/F
0325  6167          SKPSTR            /SKIP ON STROBE DETECTOR F/F SET
0326  7410          SKP
0327  4427          ERROR             /STROBE STILL SET OR DETECTOR F/F DIDN'T CLEAR
0330  6577          DBSS              /ISSUE ANOTHER STROBE PULSE
0331  6167          SKPSTR            /SKIP ON STROBE DETECTOR F/F SET
0332  4427          ERROR             /DBSS FAILED TO SET STROBE OR DETECTOR F/F
0333  6156          CLRDET            /CLEAR READER RUN AND STROBE DETECTOR F/F
0334  6167          SKPSTR            /SKIP ON STROBE DETECTOR F/F SET
0335  7410          SKP
0336  4427          ERROR             /STROBE STILL SET OR DETECTOR F/F DIDN'T 0
0337  1041          TAD     INTFLG    /CHECK THAT THE PROGRAM DIDN'T INTERRUPT
0340  7640          SZA     CLA
0341  4427          ERROR             /PROGRAM INTERRUPTED
0342  6002          IOF               /TURN THE INTERRUPT OF
0343  4424          DONLOP            /REPEAT TEST IF SR = 1000
```



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

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

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

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

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

              /*****************************************************************
              /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  6ØØØ            6ØØØ            /SIMULATOR CONTROL WORD
0464  4437            LODSIM          /LOAD THE CONTROL WORD
0465  6ØØ7            CAF             /CLEAR ALL FLAGS
0466  4145            RTCENA          /SET REAL TIME CLOCK INT ENA
0467  6ØØ1            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
```



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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  6ØØ7          CAF             /CLEAR ALL FLAGS
0507  4145          RTCENA          /SET REAL TIME CLOCK INT ENA
0510  6ØØ1          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  6ØØ7          CAF             /CLEAR ALL FLAGS
0524  6571          DBSK            /SKIP ON DATA READY
0525  7610          SKP     CLA
0526  4427          ERROR           /INIT FAILED TO CLEAR DATA READY
0527  4424          DONLOP          /DONE OR REPEAT TEST IF SR = 1ØØØ

              /*****************************************************************
              //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 Ø,
              /*****************************************************************

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  4ØØØ            4ØØØ                    /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  6ØØ7            CAF                     /CLEAR ALL FLAGS + SET SLU INT ENA
0541  4145            RTCENA                  /SET REAL TIME CLOCK INT ENA
0542  6ØØ1            ION                     /TURN THE INTERRUPT ON
0543  6ØØ3            KSF                     /CHECK TO SEE IF RECEIVE FLAG IS A Ø
0544  7610            SKP CLA
0545  4427            ERROR                   /RECEIVE FLAG SET OR KSF SKIPPED
0546  6ØØ5            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  6ØØ2            TFL                     /SET THE TRANSMIT FLAG
0555  7410            SKP
```

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0556  4427          ERROR                   /TFL SKIPPED
0557  6041          TSF                     /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          TSF                     /SKIP ON XMIT FLAG
0576  7410          SKP
0577  4427          ERROR                   /TCF + TP3 FAILED TO CLEAR XMIT FLAG
0600  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 7
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          TSF                     /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          TSF                     /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  6037          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          TSF                     /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          TSF                     /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          TSF                     /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
```

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

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

0722  4423    TEST26, LOOPPC                  /SETUP TEST COUNT AND SCOPE LOOPING ADDRESS
0723  7777          =1                      /SIMULATOR ITERATION COUNTER
0724  4436          SIMCHK                  /CHECK TO SEE IF SIMULATOR IS SELECTED
0725  4000          4000                    /CONTROL WORD FOR THE SIMULATOR
0726  4437          LODSIM                  /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
                                            /LOOP = THIS ADDRESS IF  SIMULATOR SELECTED
                                            /OTHERWISE SCOPE LOOP IS THIS ADDRESS +1
0727  3041          DCA INTFLG              /CLEAR PROGRAM INTERRUPT FLAG
0730  6007          CAF                     /CLEAR ALL FLAGS
0731  4145          RTCENA                  /SET REAL TIME CLOCK INT ENA
0732  6035          KIE                     /CLEAR SLU INTERRUPT ENABLE
0733  6001          ION                     /TURN THE INTERRUPT ON
0734  6040          TFL                     /SET THE TRANSMIT FLAG
0735  6041          TSF                     /SKIP ON TRANSMIT FLAG
0736  4427          ERROR                   /TFL FAILED TO SET TRANSMIT FLAG
0737  6045          SPI                     /SKIP ON XMIT/RECEIVE + INT ENA ON A 1
0740  7610          SKP CLA
0741  4427          ERROR                   /ERROR, INT ENA SET OR KIE FAILED TO CLEAR INT ENA
0742  1041          TAD INTFLG              /GET THE PROGRAM INTERRUPT FLAG
0743  7640          SZA CLA
0744  4427          ERROR                   /PROGRAM INTERRUPTED WITHOUT INT ENA SET
0745  7301          CLA CLL IAC             /SET DATA 11 TO A 1
0746  6035          KIE                     /SET INT ENA
0747  6041          TSF                     /SKIP ON TRANSMIT FLAG
0750  4427          ERROR                   /XMIT FLAG GOT CLEARED
0751  6045          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  6035          KIE                     /CLEAR INTERRUPT ENABLE
0760  6001          ION                     /TURN THE INTERRUPT ON
0761  6041          TSF                     /SKIP ON XMIT FLAG
0762  4427          ERROR                   /XMIT FLAG CLEARED
0763  6045          SPI                     /SKIP ON XMIT + INT ENA ON A 1
0764  7610          SKP CLA
0765  4427          ERROR                   /KIE + DATA 11 ON A 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  6042          TCF                     /CLEAR THE XMIT FLAG
```



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

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

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

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1047  7610          SKP CLA
1050  4427          ERROR                   /KCF SKIPPED
1051  6001          ION                     /TURN THE INTERRUPT ON
1052  6031          KSF                     /SKIP ON RECEIVE FLAG
1053  7610          SKP CLA
1054  4427          ERROR                   /KCF + TP3 FAILED TO CLEAR RECEIVE FLAG
1055  1041          TAD INTFLG              /GET THE PROGRAM INTERRUPT FLAG
1056  7640          SZA CLA
1057  4427          ERROR                   /PROGRAM INTERRUPTED WITH RCV FLAG CLEARED
1060  6041          TSF                     /SKIP ON XMIT FLAG
1061  7610          SKP CLA
1062  4427          ERROR                   /TRANSMIT FLAG GOT RESET BY ABOVE CODE
1063  4424          DONLOP                  /REPEAT TEST IF NOT DONE OR SCOPE LOOP IF SR2=1

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

1064  4423    TEST28, LOOPPC                  /SETUP TEST COUNT AND SCOPE LOOPING ADDRESS
1065  7740          =40                     /SIMULATOR ITERATION COUNTER
1066  4436          SIMCHK                  /CHECK TO SEE IF SIMULATOR IS SELECTED
1067  4000          4000                    /CONTROL WORD FOR THE SIMULATOR
1070  4437          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  6007          CAF                     /CLEAR ALL FLAGS BUT SET SLU INT ENA
1073  4145          RTCENA                  /SET REAL TIME CLOCK INT ENA
1074  6001          ION                     /TURN THE INTERRUPT ON
1075  6040          TFL                     /SET THE TRANSMIT FLAG
1076  6041          TSF                     /SKIP ON TRANSMIT FLAG
1077  4427          ERROR                   /TFL FAILED TO SET XMIT FLAG
1100  2041          ISZ INTFLG
1101  4427          ERROR                   /PROGRAM FAILED TO INTERRUPT
1102  6044          TPC                     /LOAD TRANSMIT BUFFER AND TRANSMIT
1103  7610          SKP CLA
1104  4427          ERROR                   /TPC SKIPPED
1105  6041          TSF                     /SKIP ON XMIT FLAG
1106  4427          ERROR                   /TPC CLEARED XMIT FLAG
1107  6042          TCF                     /CLEAR TRANSMIT FLAG
1110  6001          ION                     /TURN THE INTERRUPT BACK ON
1111  4431          TSFWAT                  /WAIT FOR XMIT BUFF MT H TO SET XMIT FLAG
1112  4427          ERROR                   /TPC FAILED TO SET XMIT FLAG
1113  2041          ISZ INTFLG              /CHECK TO SEE IF PROGRAM INTERRUPTED
1114  4427          ERROR                   /PROGRAM FAILED TO INTERRUPT WITH XMIT FLAG + INT ENA
1115  6042          TCF                     /CLEAR THE TRANSMIT FLAG
1116  6001          ION                     /TURN THE INTERRUPT ON
1117  4432          KSFWAT                  /WAIT FOR RECEIVE FLAG TO SET
1120  4427          ERROR                   /RECEIVE FLAG FAILED TO SET BY A TPC COMMAND
1121  6045          SPI                     /SKIP ON RCV FLAG AND INT ENA
1122  4427          ERROR                   /FAILED TO SKIP
1123  2041          ISZ INTFLG              /DID THE PROGRAM INTERRUPT
1124  4427          ERROR                   /FAILED TO INTERRUPT WITH RCV AND INT ENA SET
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1125  6032          KCC                     /CLEAR THE RECEIVE FLAG
1126  7610          SKP CLA
1127  4427          ERROR                   /KCC SKIPPED
1130  6001          ION                     /TURN THE INTERRUPT ON
1131  6031          KSF                     /SKIP ON RECEIVE FLAG
1132  7610          SKP CLA
1133  4427          ERROR                   /KCC FAILED TO CLEAR RCV FLAG
1134  1041          TAD INTFLG              /GET THE PROGRAM INTERRUPT FLAG
1135  7640          SZA CLA
1136  4427          ERROR                   /PROGRAM INTERRUPTED WITH RCV FLAG CLEARED
1137  4424          DONLOP                  /REPEAT TEST IF NOT DONE OR LOOP ON TEST IF SR2=1

1140  5440          PRGEND                  /END OF 2ND 1K SEGMENT

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                /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  5630          JMP I PCLOOP

1214  0000    SIMLOD, 0
1215  1055          TAD CONTWD      /GET THE CONTROL WORD
1216  6151          LOADSM          /LOAD THE SIMULATOR CONTROL WORD
1217  7300          CLA CLL
1220  5614          JMP I SIMLOD

1221  0000    LOPDON, 0
1222  2047          ISZ TSTCNT      /TEST DONE?
1223  5446          JMP I TSTLOP    /NO RETURN TO TEST
1224  1021          TAD OP1SEL      /IS THE SIMULATOR SELECTED
1225  0057          AND K200
```

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


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

1251  0000  AC,     0


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



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

1330  0000  INTRET, 0


                /ROUTINE TO WAIT FOR SERIAL LINE UNITS XMIT FLAG

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

```
                    /ROUTINE TO WAIT FOR THE FLAG

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


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                    /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         SWHCHK                 /GO GET SWITCH REGISTER
1402  7006         RTL
1403  7004         RAL
1404  7710         SPA     CLA
1405  7402         HLT                    /SR3=1 END OF A COMPLETE PROGRAM PASS
1406  5777'        JMP     0200           /START PROGRAM OVER

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

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

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

1420  0000  RETURN, 0
1421  6201         CDF                    /CHANGE DATA FIELD TO FIELD 0
1422  1636         TAD  I  K0             /GET THE INTERRUPT PC
1423  3237         DCA     RETADD         /SAVE IT
1424  6224         RIF                    /READ THE PROGRAM INSTRUCTION FIELD
1425  1131         TAD     KCDF           /ADD A CDF INSTRUCTION TO IT
1426  3227         DCA     .+1            /SAVE IT IN THE NEXT LOCATION
1427  7402         HLT/CDF                /RETURN TO THE PROGRAM DATA FIELD
1430  1620         TAD  I  RETURN         /GET THE INTERRUPT RETURN LOCATION
1431  3240         DCA     SAVLOC         /SAVE IT
1432  2220         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  6103         CAL
1461  6102         SPL
1462  7610         SKP CLA
1463  5261         JMP .+2
1464  5445         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         SWHCHK                 /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                    /AC = ADDRESS WHERE ERROR WAS DETECTED
1505  4314         JMS SIMWRD             /WAS THE SIMULATOR SELECTED
```

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

1514  0000  SIMWRD, 0
1515  7300          CLA CLL
1516  1021          TAD OP1SEL
1517  0057          AND K200
1520  7650          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  6002          IOF             /TURN THE INTERRUPT OFF
1534  7344          CLA CLL CMA RAL
1535  1326          TAD     ACTCHK
1536  3343          DCA     ERRPC
1537  7240          CLA     CMA
1540  1743          TAD  I  ERRPC   /GET THE LOCATION WHERE THE ERROR WAS DETECTED
1541  6272          CIF     70      /CHANGE INSTRUCTION FIELD TO FIELD 7
1542  5477          JMP  I  BADPAS  /GO TO THE PROM

1543  0000  ERRPC,  0




1544  0000  CHKACT, 0
1545  6137          CLSK            /WAS THE CLOCK FLAG SET
1546  7410          SKP             /NO=RETURN TO INT SERVICE ROUTINE
1547  5352          JMP     CLKSET  /YES=CLEAR THE FLAG
1550  2344          ISZ     CHKACT  /ADD 1 TO THE INCOMING PC
1551  5744          JMP  I  CHKACT  /RETURN TO SKIP CHAIN
1552  6136  CLKSET, CLCL           /CLEAR THE CLOCK FLAG
1553  1022          TAD     OP2SEL  /GET THE ACT LINE BIT
1554  7710          SPA     CLA     /IS THE PROGRAM RUNNING ON ACT LINE
1555  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  6001          ION             /TURN THE INTERRUPT ON
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     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          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 SY 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 WERE 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 IT IT INTERRUPTED
1630  4427          ERROR           /DATA ACEPT 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
```

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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          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  1053          TAD     SLUXMT  /GET THE WORD TO BE TRANSMITTED
1661  6046          TLS             /LOAD AND TRANSMIT IT AND CLEAR THE FLAG
1662  4431          TSFWAT          /WAIT FOR THE TRANSMIT FLAG
1663  4427          ERROR           /XMIT FLAG FAILED TO SET
1664  2041          ISZ     INTFLG  /DID THE PROGRAM INTERRUPT?
1665  4427          ERROR           /PROGRAM FAILED TO INTERRUPT
1666  6042          TCF             /CLEAR THE XMIT FLAG
1667  6001          ION             /TURN THE INTERRUPT BACK ON
1670  4432          KSFWAT          /WAIT FOR THE RECEIVE FLAG TO SET
1671  4427          ERROR           /RECEIVE FLAG FAILED TO SET
1672  2041          ISZ     INTFLG  /DID THE RECEIVE FLAG CAUSE A INTERRUPT
1673  4427          ERROR           /RECEIVE FLAG FAILED TO CAUSE A INTERRUPT
1674  6036          KRB             /CLEAR THE AC AND RCV FLAG AND READ BUFFER
1675  3054          DCA     SLUREC  /SAVE THE WORD READ BACK
1676  6001          ION             /TURN THE INTERRUPT BACK ON
1677  1041          TAD     INTFLG  /CHECK THAT KRB CLEARED THE RCV FLAG
1700  7640          SZA     CLA
1701  4427          ERROR           /KRB FAILED TO CLEAR RCV FLAG OR INTERRUPTED
1702  1053          TAD     SLUXMT  /GET THE WORD TRANSMITTED
1703  7041          CIA
1704  1054          TAD     SLUREC  /GET THE WORD READ BACK
1705  7640          SZA     CLA
1706  5653          JMP  I  DATSLU  /DATA ERROR-RETURN TO REPORT THE ERROR
1707  2253          ISZ     DATSLU  /BUMP RETURN ADDRESS POINTER BY ONE
1710  5653          JMP  I  DATSLU  /RETURN TO TEST


                /DATA ERROR ROUTINE FOR PARALLEL I/O

1711  0000    DERPIO, 0
1712  4777'         JMS     ACTCHK          /CHECK TO SEE IF RUNNING ON ACT LINE
1713  4435          SWHCHK          /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
```



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

                /DATA ERROR ROUTINE FOR SERIAL LINE UNIT

1734  0000    DERSLU, 0
1735  4777'         JMS     ACTCHK  /CHECK TO SEE IF RUNNING ON THE ACT LINE
1736  4435          SWHCHK          /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=ADRESS 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, SWHCHK        /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 CP1SEL      /CHECK FOR SIMULATOR
1763  7057          AND     K200
1764  7650          SNA     CLA
1765  5371          JMP ,+4         /NO
1766  1761          TAD I CHKSIM    /GET THE CONTROL WORD
1767  3055          DCA CONTWD      /SAVE IT
1770  7410          SKP
1771  2361          ISZ CHKSIM
1772  2361          ISZ CHKSIM
1773  1361          TAD CHKSIM
1774  3046          DCA TSTLOP
1775  5761          JMP I CHKSIM
```

```
1776  1514
1777  1526
      3200          *200


$
```



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

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

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

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


1000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1100  11111111  11111111  11111111  11111111  10000000  00000000  00000000  00000000

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
2100

2200
2300

2400
2500

2600
2700


3000
3100

3200
3300

3400
3500

3600
3700
```

```
4000
4100

4200
4300

4400
4500

4600
4700


5000
5100

5200
5300

5400
5500

5600
5700


6000
6100

6200
6300

6400
6500

6600
6700


7000
7100

7200
7300

7400
7500

7600
7700
```



```
AC        1251    GOODPS    0100    PIODER    4430    TEST28    1064
ACTCHK    1526    GTF       6004    PIOREC    0052    TFL       6040
ACTCK2    1300    HLT       7402    PIOSWH    1727    TLS       6046
ACTCNT    0101    INACTV    0076    PIOXMT    0051    TPC       6044
ACTFLG    0133    INTFLG    0041    PNOINT    0075    TSF       6041
ACTRET    1564    INTRET    1330    POWFAL    1441    TSFWAT    4431
ADDTIM    1363    K0        1436    PRGEND    5440    TSTCNT    0047
AERROR    1475    K1        0124    RECFLG    0073    TSTGOD    0135
AERSWH    1507    K10       1471    RETADD    1437    TSTLOP    0046
BADPAS    0077    K11       1473    RETURN    1420    WATKSF    1342
C7        1470    K12       1474    RMF       6244    WATTSF    1331
CAF       6007    K125      0061    RTCENA    4145    WTCLSK    1393
CAL       6103    K2        0125    RTCFLG    0074    XMTFLG    0072
CHKACT    1544    K200      0057    RTF       6005
CHKSIM    1761    K252      0060    SAVADD    0123
CHKSWH    1407    K2525     0063    SAVCNT    0090
CLCL      6136    K3        0126    SAVLOC    1440
CLKFLG    0042    K377      0056    SBE       6101
CLKSET    1552    K5252     0062    SIMCHK    4436
CLKSNC    0134    K7        0064    SIMCLR    6160
CLLE      6135    K7710     0147    SIMCNT    0067
CLRDET    6156    KCC       6032    SIMINT    1244
CLRSIM    6150    KCDF      0131    SIMLOD    1214
CLSK      6137    KCF       6030    SIMWRD    1514
CLSKWT    4425    KIE       6035    SKPCHN    1252
CNT       0043    KJMP      0127    SKPDAV    6165
CNT1      0044    KJMP7     1465    SKPFRQ    6162
CONTWD    0055    KJMPRT    1472    SKPRDR    6157
DATPIO    1600    KRB       6036    SKPSTR    6167
DATSLU    1653    KRMF      0130    SLUDAT    4433
DBCE      6576    KRS       6034    SLUDER    4434
DBCF      6573    KRTF      0132    SLUREC    0054
DBRQ      6572    KSF       6031    SLUSWH    1754
DBSE      6575    KSFWAT    4432    SLUXMT    0053
DBSK      6571    KTEST     1466    SPI       6045
DBSS      6577    LINK      0071    SPL       6102
DBST      6570    LOADSM    6151    STRFRQ    6161
DBTD      6574    LODFRQ    6163    SWHCHK    4435
DERPIO    1711    LODSIM    4437    SWITCH    0020
DERSLU    1734    LOOPPC    4423    TCP       6042
DONLOP    4424    LOOPSW    1237    TEST      0045
ENARTC    0145    LOPDON    1221    TEST17    0201
ENDPAS    1400    M10       0066    TEST18    0222
ERROR     4427    M144      0102    TEST19    0274
ERRPC     1543    M4        0065    TEST20    0344
EXPACD    0070    ONACTL    1565    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
FLGRST    1467    PIODAT    4426    TEST27    1001
```

ERRORS DETECTED: 0

LINKS GENERATED: 9

RUN-TIME: 19 SECONDS

2K CORE USED


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



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

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

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

                /OPTION BOARD NUMBER 1 IOT'S

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

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

                /REAL TIME CRYSTAL CLOCK

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

                /12 BIT PARALLEL I/O

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



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6577    DBSS=6577               /ISSUE A STROBE PULSE

                /SWITCH REGISTER SETTINGS

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

                /OPTION BOARD 1 SIMULATOR IOT'S
6150    CLRSIM=6150             /CLEAR SIMULATOR CONTROL REGISTERS
6151    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 SIMUALTOR
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    SKPDAV=6165             /SKIP ON DATA AVAILABLE CATCHER F/F SET
6167    SKPSTR=6167             /SKIP ON STROBE CATCHER F/F SET

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

                /BIT  1         PARALLEL I/O CLEAR DATA         1=TS1
                /               AVAILABLE SELECT                0=DATA ACCEPTED IN

                /BIT  2         NOT USED

                /BIT  3         NOT USED

                /BIT  4         NOT USED

                /BIT  5         RTC FREQUENCY OR                1=RTC
                /               SLU FREQUENCY CHECK             0=SLU BAUD RATES


                /BIT  6         REAL TIME CLOCK                 1=OFF
                /                                               0=ON

                /BIT  7         SLU EIA/20MA SELECT             1=EIA RECEIVE DATA
                /                                               0=20 MA RECEIVE DATA

                /BIT  8         STOP BIT SELECT                 1=1 STOP BITS
                /                                               0=2 STOP BIT


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

                /BIT 10         BAUD RATE SELECT                EQUALS 110 BAUD, EACH

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

```
                0000    *0
0000  3302              302                     /PROGRAM REVISION LETTER-MAINDEC-08-DJDKA-B
0001  6244              RMF                     /RESTORE MEMORY FIELDS
0002  5403              JMP  I  3               /RETURN TO INTERRUPT SERVICE ROUTINE
0003  1044              SIMINT/SKPCHN/SIMCHK/RTCINT/SLUINT      /INTERRUPT SERVICE ROUTINES

                0020    *20

0020  0000    SWITCH, 0

0021  2000    OP1SEL, 2000
                                        /BIT 0=0  USE LOCATION 20 AS A PSEUDO SWITCH REGISTER
                                        /BIT 0=1  USE HARDWARE FRONT PANEL SWITCH REGISTER
                                        /BIT 1=1  HAS OPTION 1
                                        /BIT 2=1  HAS OPTION 2
                                        /BIT 3=1  HAS 8A CPU SIMULATOR
                                        /BIT 4=1  HAS 8A OPTION 1+2 SIMULATOR
                                        /BIT 5=1  PROGRAM ON PDP-8A XOR(REQUIRES BIT 4 SET ALSO)
                                        /BIT 6=1  HAS PDP-8E TYPE CPU
                                        /BIT 7-11 MEMORY SIZE = 0/S=1K, 37=32K, MEMORY
                                        /SIZE CAN BE INCREASED IN 1K INCREMENTS BY ADDING
                                        /ONE TO THE NUMBER IN BITS 7 - 11
0022  0000    OP2SEL, 0               /BIT 0 IS SET FOR THE ACT LINE
      4423            LOOPPC=JMS I,
0023  1000                    PCLOOP
      4424            DONLOP=JMS I,
0024  1021                    LOPDON
      4425            CLSKWT=JMS I,
0025  1153                    WTCLSK
      4426            PIODAT=JMS I,
0026  1400                    DATPIO
      4427            ERROR=JMS I,
0027  1275                    AERROR
      4430            PIODER=JMS I,
0030  1511                    DERPIO
      4431            TSFWAT=JMS I,
0031  1131                    WATTSF
      4432            KSFWAT=JMS I,
0032  1142                    WATKSF
      4433            SLUDAT=JMS I,
0033  1453                    DATSLU
      4434            SLUDER=JMS I,
0034  1534                    DERSLU
      4435            SWHCHK=JMS I,
0035  1207                    CHKSWH
      4436            SIMCHK=JMS I,
0036  1561                    CHKSIM
      4437            LODSIM=JMS I ,
0037  1014                    SIMLOD
      4145            RTCENA=JMS ENARTC
```



```
      5440    PRGEND=JMP I ,
0040  1200              ENDPAS

                /LOCATIONS USED BY THE PROGRAM

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

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

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

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

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

0123  0000    SAVADD, 0
0124  0001    K1,     1
0125  0002    K2,     2
0126  0003    K3,     3
0127  5403    KJMP,   JMP  I  3
0130  6244    KRMF,   6244
0131  6201    KCDF,   CDF
0132  6005    KRTF,   RTF
0133  0000    ACTFLG, 0
0134  0000    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    K7710,  SPA     CLA             /IF NOT CLEAR RTC INT ENA
0150  7301          CLA CLL IAC             /SET AC BIT 11
0151  6135          CLLE                    /LOAD BIT 11 INTO CLOCK INT ENA
0152  7200          CLA
0153  5545          JMP  I  ENARTC

      0200    *200

                IFDEF OP13K <PAGE>

                IFDEF OP13K <PAGE>


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

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



```
0202  7775          =3                      /SIMULATOR ITERATION COUNTER
0203  4103          JMS     PATCH           /SET UP SKIP CHAIN
0204  1052          SKPCHN
0205  3042          DCA     CLKFLG          /SET INTERRUPT TO IGNORE RTC
0206  4436          SIMCHK                  /CHECK TO SEE IF SIMULATOR IS SELECTED
0207  4017          4017                    /CONTROL WORD FOR THE SIMULATOR
0210  4437          LODSIM                  /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
                                            /LOOP = THIS ADDRESS IF  SIMULATOR SELECTED
                                            /OTHERWISE SCOPE LOOP IS THIS ADDRESS +1
0211  3041          DCA INTFLG              /CLEAR PROGRAM INTERRUPT FLAG
0212  6007          CAF                     /CLEAR ALL FLAGS AND SET SLU INT ENA
0213  4145          RTCENA                  /SET REAL TIME CLOCK INT ENA
0214  6001          ION                     /TURN THE INTERRUPT ON
0215  6046          TLS                     /TRANSMIT AND CLEAR THE FLAG
0216  4431          TSFWAT                  /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          KSFWAT                  /WAIT FOR THE RCV FLAG TO SET
0225  4427          ERROR                   /RECEIVE FLAG FAILED TO SET
0226  6034          KRS                     /READ THE RECEIVE BUFFER
0227  7610          SKP CLA
0230  4427          ERROR                   /KRS SKIPPED
0231  6031          KSF                     /SKIP ON RECEIVE FLAG
0232  4427          ERROR                   /KRS CLEARED THE RCV FLAG
0233  2041          ISZ INTFLG              /DID THE PROGRAM INTERRUPT
0234  4427          ERROR                   /FAILED TO INTERRUPT WITH INT ENA + RCV FLAG
0235  6036          KRB                     /CLEAR RECEIVE FLAG
0236  7610          SKP CLA
0237  4427          ERROR                   /KRB SKIPPED
0240  6001          ION                     /TURN THE INTERRUPT BACK ON
0241  6031          KSF                     /SKIP ON RECEIVE FLAG
0242  7610          SKP CLA
0243  4427          ERROR                   /KRB FAILED TO CLEAR RECEIVE FLAG
0244  1041          TAD INTFLG              /GET THE PROGRAM INTERRUPT FLAG
0245  7640          SZA CLA
0246  4427          ERROR                   /PROGRAM INTERRUPTED WITHOUT RCV FLAG SET
0247  4424          DONLOP                  /REPEAT TEST IF NOT DONE OR LOOP IF SR2=1

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

0250  4423    TEST30, LOOPPC                  /SETUP TEST COUNT AND SCOPE LOOPING ADDRESS
0251  7775          =3                      /SIMULATOR ITERATION COUNTER
0252  4436          SIMCHK                  /CHECK TO SEE IF SIMULATOR IS SELECTED
0253  4017          4017                    /CONTROL WORD FOR THE SIMULATOR
0254  4437          LODSIM                  /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
                                            /LOOP = THIS ADDRESS IF  SIMULATOR SELECTED
                                            /OTHERWISE SCOPE LOOP IS THIS ADDRESS +1
0255  3041          DCA INTFLG              /CLEAR PROGRAM INTERRUPT FLAG
0256  6007          CAF                     /CLEAR ALL FLAGS
0257  4145          RTCENA                  /SET REAL TIME CLOCK INT ENA
```

```
0260  6001          ION                     /TURN THE INTERRUPT ON
0261  6046          TLS                     /TRANSMIT AND CLEAR THE XMIT FLAG
0262  4431          TSFWAT                  /WAIT FOR XMIT FLAG
0263  4427          ERROR                   /XMIT FLAG FAILED TO SET
0264  2041          ISZ INTFLG              /DID THE PROGRAM INTERRUPT?
0265  4427          ERROR                   /PROGRAM FAILED TO INTERRUPT
0266  6042          TCF                     /CLEAR TRANSMIT FLAG
0267  6001          ION
0270  4432          KSFWAT                  /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  6007          CAF                     /CLEAR ALL FLAGS
0275  6001          ION                     /TURN THE INTERRUPT BACK ON
0276  6031          KSF                     /SKIP ON RECEIVE FLAG
0277  7610          SKP CLA
0300  4427          ERROR                   /INITIALIZE FAILED TO CLEAR RECEIVE FLAG
0301  4424          DONLOP                  /REPEAT TEST IF NOT DONE OR LOOP IF SR2=1

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

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



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

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

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

0425  4423    TEST32, LOOPPC                  /SETUP TEST COUNT AND SCOPE LOOP ADDRESS
0426  7775            -3                      /SIMULATOR ITERATION COUNTER
0427  4436            SIMCHK                  /CHECK TO SEE IF SIMULATOR IS SELECTED
0430  4017            4017                    /CONTROL WORD FOR THE SIMULATOR
0431  4437            LODSIM                  /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            LODSIM                  /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
0450  4434            SLUDER                  /DATA ERROR = WORDS DO NOT COMPARE
0451  4424            DONLOP                  /REPEAT TEST IF NOT DONE OR LOOP IF SR2=1

                    /*****************************************************************
                    /TEST 34 = CHECKS THAT A COMPLEMENTING PATTERN (200=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            LODSIM                  /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  4007            4007                    /CONTROL WORD FOR THE SIMULATOR
0474  4437            LODSIM                  /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
0513  3050            DCA SAVCNT              /SETUP COUNTER TO TRANSMIT 377 TIMES
0514  1050            TAD SAVCNT
0515  3047            DCA TSTCNT
0516  4436            SIMCHK                  /CHECK FOR THE SIMULATOR
0517  4007            4007                    /CONTROL WORD FOR THE SIMULATOR
0520  4437            LODSIM                  /LOAD THE SIMULATOR IF SELECTED
0521  1047            TAD TSTCNT              /GET THE WORD TO BE TRANSMITTED
0522  0056            AND K377                /MASK OFF THE 8 BITS
0523  3053            DCA SLUXMT              /SET TRANSMIT WORD TO THIS NUMBER
0524  4433            SLUDAT                  /TRANSMIT READ AND COMPARE THE WORD
0525  4434            SLUDER                  /DATA ERROR=
0526  4424            DONLOP                  /REPEAT TEST IF NOT DONE OR LOOP IF SR2=1


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

0527  4423    TEST37, LOOPPC                  /SET UP TEST COUNT AN TEST LOOP ADDRESS
```

```
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          4017                    /SIMULATOR CONTROL WORD
0540  4437          LODSIM                  /LOAD THE SIMULATOR CONTROL WORD
0541  6007          CAF                     /CLEAR ALL FLAGS
0542  4145          RTCENA                  /SET REAL TIME CLOCK INT ENA
0543  6001          ION                     /TURN THE INTERRUPT ON
0544  3041          DCA     INTFLG          /CLEAR PROGRAM INTERRUPT FLAG
0545  6035          KIE                     /CLEAR SLU INT ENABLE
0546  1047          TAD     TSTCNT          /GET THE TEST COUNT NUMBER
0547  0056          AND     K377            /MASK OUT FOR 8 BITS
0550  3053          DCA     SLUXMT          /SAVE THE WORD TO BE TRANSMITTED
0551  1053          TAD     SLUXMT          /GET THE WORD
0552  6046          TLS                     /TRANSMIT IT
0553  4431          TSFWAT                  /WAIT FOR THE TRANSMIT FLAG TO SET
0554  4427          ERROR                   /TRANSMIT FLAG FAILED TO SET
0555  6042          TCF                     /CLEAR THE TRANSMIT FLAG
0556  4432          KSFWAT                  /WAIT FOR THE RECEIVE FLAG TO SET
0557  4427          ERROR                   /RECEIVE FLAG FAILED TO SET
0560  7240          CLA     CMA             /SET THE AC TO ALL ONES
0561  6036          KRB                     /READ THE WORD
0562  3054          DCA     SLUREC          /SAVE THE WORD READ
0563  1053          TAD     SLUXMT          /COMPARE THE WORD TRANSMITTED WITH THE WORD READ
0564  7041          CIA
0565  1054          TAD     SLUREC
0566  7640          SZA     CLA             /ARE THEY EQUAL?
0567  4434          SLUDER                  /NO,DATA ERROR ON SERIAL LINE UNIT
0570  1041          TAD     INTFLG          /GET THE PROGRAM INTERRUPT FLAG
0571  7640          SZA     CLA
0572  4427          ERROR                   /PROGRAM INTERRUPTED WITHOUT INT ENA
0573  4424          DONLOP                  /DONE? OR REPEAT TEST IF SR2=1
0574  7000          NOP
0575  7000          NOP

0576  1021          TAD     OP1SEL          /GET THE HARDWARE CONFIGURATION
0577  0057          AND     K200            /CHECK FOR THE SIMULATOR
0600  7650          SNA     CLA             /IS IT SELECTED
0601  5440          PRGEND                  /NO,END OF PROGRAM IF NO SIMULATOR
0602  5204          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 INIALIZE, THE SIMULATOR IS USED TO CHECK THAT READER
                    /RUN SETS AND CLEARS,
                    /**********************************************************************

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



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

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

0654  4423    TEST39, LOOPPC                /SETUP TEST COUNT AND TEST LOOP ADDRESS
0655  7771          =7                      /SIMULATOR ITERATION COUNTER
0656  4436          SIMCHK                  /CHECK FOR SIMULATOR
0657  4000          4000                    /SIMULATOR CONTROL WORD
0660  4437          LODSIM                  /LOAD THE SIMULATOR
0661  6007          CAF                     /CLEAR ALL FLAGS
0662  4145          RTCENA                  /SET REAL TIME CLOCK INT ENA
```

```
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

              IFDEF OP13K <PAGE>


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

1000  0000  PCLOOP, 0
1001  7340          CLA CLL CMA
1002  1200          TAD PCLOOP
1003  3045          DCA TEST
1004  1600          TAD I PCLOOP
1005  3067          DCA SIMCNT
1006  7240          CLA CMA
1007  3050          DCA SAVCNT
1010  1050          TAD SAVCNT
1011  3047          DCA TSTCNT
1012  2200          ISZ PCLOOP
1013  5600          JMP I PCLOOP

1014  0000  SIMLOD, 0
1015  1055          TAD CONTWD      /GET THE CONTROL WORD
1016  6151          LOADSM          /LOAD THE SIMULATOR CONTROL WORD
1017  7300          CLA CLL
1020  5614          JMP I SIMLOD
```



```
1021  0000  LOPDON, 0
1022  2047          ISZ TSTCNT      /TEST DONE?
1023  5446          JMP I TSTLOP    /NO RETURN TO TEST
1024  1021          TAD OP1SEL      /IS THE SIMULATOR SELECTED
1025  0057          AND K200
1026  7650          SNA CLA
1027  5237          JMP LOOPSW      /SIMULATOR NOT SELECTED,CHECK TEST LOOP SWITCH
1030  2067          ISZ SIMCNT      /ADD A 1 TO THE CONTROL WORD?
1031  7610          SKP CLA
1032  5237          JMP LOOPSW      /NO,CHECK TEST LOOP SWITCH
1033  2055          ISZ CONTWD      /ADD 1 TO THE CONTROL WORD FOR BAUD RATES
1034  1050          TAD SAVCNT      /GET THE TEST COUNT
1035  3047          DCA TSTCNT      /RESTORE IT FOR A NEW PASS FOR A DIFFERENT BAUD
1036  5446          JMP I TSTLOP    /RETURN FOR NEW BAUD RATE
1037  4435  LOOPSW, SWHCHK         /CHECK FOR SR2=1
1040  7006          RTL
1041  7700          SMA CLA         /LOOP?
1042  5621          JMP I LOPDON    /NO,GO TO NEXT TEST
1043  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
1050  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
1060  4776'         JMS CHKACT      /GO CHECK FOR THE ACT LINE
1061  6137          CLSK            /YES = SKIP ON REAL TIME CLOCK FLAG
1062  7410          SKP
1063  5305          JMP FLGCK1      /GO CHECK THE OTHER FLAGS
1064  1133          TAD ACTFLG      /GET THE ACT FLAG
1065  7440          SZA             /DID THE PROGRAM GO TO THE PROM ?
1066  5300          JMP ACTCK2      /YES,CHECK PARALLEL I/O DATA ACCEPTED
1067  6041          TSF             /WAS IT A TRANSMIT FLAG?
1070  7610          SKP CLA
1071  5310          JMP FLGCK2      /TRANSMIT FLAG SET = CHECK THE OTHER FLAGS
1072  6031          KSF             /WAS IT A RECEIVE FLAG?
1073  7410          SKP
1074  5313          JMP FLGCK3      /YES = GO CHECK THE OTHER FLAGS
1075  6571          DBSK            /WAS THE DATA READY FLAG SET?
1076  7410          SKP
1077  5316          JMP FLGCK4      /YES = CHECK DATA ACCEPTED FLAG
1100  6570  ACTCK2, DBST            /WAS DATA ACCEPTED SET=IF SO CLEAR IT
1101  7640          SZA CLA
1102  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
1120  4427            ERROR               /DATA ACCEPTED FLAG SET
1121  3133  FLGCK5,    DCA ACTFLG          /CLEAR THE ACT FLAG
1122  7240            CLA CMA
1123  3041            DCA INTFLG          /SET INTERRUPT FLAG
1124  4775'           JMS RETURN
1125  1130            INTRET
1126  1251            TAD AC
1127  5730            JMP I INTRET

1130  0000  INTRET,   Ø

                      /ROUTINE TO WAIT FOR SERIAL LINE UNITS XMIT FLAG

1131  0000  WATTSF,   Ø
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=GOT THE FLAG

                      /ROUTINE TO WAIT FOR THE SERIAL LINE UNIT RECEIVE FLAG

1142  0000  WATKSF,   Ø
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=GOT THE FLAG

                      /ROUTINE TO WAIT FOR THE REAL TIME CLOCK FLAG

1153  0000  WTCLSK,   Ø
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=GOT THE FLAG

                      /ROUTINE TO WAIT FOR THE FLAG

1163  0000  ADDTIM,   Ø
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


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1176  1344
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      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            SWHCHK                      /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 AVAILABE TO DO EITHER A TAD SWITCH OR A LAS COMMAND

1207  0000  CHKSWH,   Ø
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,   Ø
1221  6201            CDF                         /CHANGE DATA FIELD TO FIELD Ø
1222  1636            TAD  I  KØ                  /GET THE INTERRUPT PC
1223  3237            DCA     RETADD              /SAVE IT
1224  6224            RIF                         /READ THE PROGRAM INSTRUCTION FIELD
1225  1131            TAD     KCDF                /ADD A CDF INSTRUCTION TO IT
```

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

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

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

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

1265  5007    KJMP7,  JMP 7
1266  0045    KTEST,  TEST
1267  1012    FLGRST, TAD 12
1270  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          SWHCHK          /CHECK SR0 TO INHIBIT ERROR HALT
1300  7710          SPA CLA
```



```
1301  5307          JMP AERSWH      /SR0=1 CHECK LOOP ON LOGIC ERROR
1302  7240          CLA CMA
1303  1275          TAD AERROR
1304  7402          HLT             /AC = ADDRESS WHERE ERROR WAS DETECTED
1305  4314          JMS SIMWRD      /WAS THE SIMULATOR SELECTED
1306  7402          HLT             /AC=SIMULATOR CONTROL WORD
1307  4435    AERSWH, SWHCHK        /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  0000    SIMWRD, 0
1315  7300          CLA CLL
1316  1021          TAD OP1SEL
1317  0057          AND K200
1320  7650          SNA CLA
1321  5324          JMP .+3
1322  1055          TAD CONTWD
1323  5714          JMP I SIMWRD
1324  2314          ISZ SIMWRD
1325  5714          JMP I SIMWRD


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

1326  0000    ACTCHK, 0
1327  7300          CLA     CLL
1330  1022          TAD     OP2SEL  /GET THE HARDWARE CONTROL WORD
1331  7700          SMA     CLA     /IS THE PROGRAM RUNNING ON THE ACT LINE?
1332  5726          JMP  I  ACTCHK  /NO, RETURN TO ERROR ROUTINE
1333  6002          IOF             /TURN THE INTERRUPT OFF
1334  7344          CLA CLL CMA RAL
1335  1326          TAD     ACTCHK
1336  3343          DCA     ERRPC
1337  7240          CLA     CMA
1340  1743          TAD  I  ERRPC   /GET THE LOCATION WHERE THE ERROR WAS DETECTED
1341  6272          CIF     70      /CHANGE INSTRUCTION FIELD TO FIELD 7
1342  5477          JMP  I  BADPAS  /GO TO THE PROM

1343  0000    ERRPC,  0




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

```
1351  5744            JMP  I  CHKACT  /RETURN TO SKIP CHAIN
1352  6136  CLKSET,  CLCL           /CLEAR THE CLOCK FLAG
1353  1022            TAD     OP2SEL  /GET THE ACT LINE BIT
1354  7710            SPA     CLA     /IS THE PROGRAM RUNNING ON ACT LINE
1355  5365            JMP     ONACTL  /YES,CHECK FOR # OF CLOCK TICKS
1356  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  0000  ACTRET,  0
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 STILLS 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

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1377  0200
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                /ROUTINE FOR TRANSMITTING, READING AND COMPARING DATA FOR PARALLEL I/O

1400  0000  DATPIO,  0
                      CAF             /CLEAR ALL
1401  6007            RTCENA          /SET REAL TIME CLOCK INT ENA
1402  4145            ION             /TURN THE INTERRUPT ON
1403  6001            DBSE            /SET PARALLEL I/O INT ENA
1404  6575            TAD PIOXMT      /GET THE WORD TO BE LOADED INTO PARALLEL I/O
1405  1051            DBTD            /LOAD AND TRANSMIT THE WORD
1406  6574            CLA
1407  7200            DBSK            /SKIP ON DATA READY
1410  6571            ERROR           /ERROR, DATA READY FLAG FAILED TO SET BY DBTD
1411  4427            ISZ INTFLG      /GET PROGRAM INTERRUPT FLAG
1412  2041            ERROR           /PROGRAM FAILED TO INTERRUPT WITH INT ENA + FLAG SET
1413  4427            DCA INTFLG      /CLEAR PROGRAM INTERRUPT FLAG
1414  3041            DBRD            /READ THE 12 BIT PARALLEL I/O BUFFER
1415  6572            DCA PIOREC      /SAVE THE WORD READ
1416  3052            DBSK            /SKIP ON DATA READY FLAG
1417  6571            ERROR           /DBRD CLEARED DATA READY FLAG
1420  4427            DBCF            /CLEAR DATA READY FLAG
1421  6573            ION             /TURN INTERRUPT BACK ON
1422  6001            NOP             /SHOULD INTERRUPT HERE FOR DATA ACCEPT FLAG
1423  7000            DBST            /SKIP ON DATA ACCEPT
1424  6570            SKP CLA
1425  7610            ERROR           /DATA ACCEPT FAILED TO CLEAR IN INTERRUPT ROUTINE
1426  4427            ISZ INTFLG      /CHECK TO SEE IT IT INTERRUPTED
1427  2041            ERROR           /DATA ACEPT FLAG FAILED TO INTERRUPT
1430  4427            ION             /TURN THE INTERRUPT BACK ON
1431  6001            NOP
1432  7000
```



```
1433  1041            TAD INTFLG      /GET PROGRAM INTERRUPT FLAG
1434  7640            SZA CLA         /DID IT INTERRUPT?
1435  4427            ERROR           /PROGRAM INTERRUPTED WITHOUT DATA READY SET
1436  1051            TAD PIOXMT      /GET THE WORD TRANSMITTED
1437  7041            CIA
1440  1052            TAD PIOREC      /GET THE WORD READ
1441  7640            SZA CLA         /ARE THEY EQUAL?
1442  5600            JMP I DATPIO    /DATA ERROR RETURN TO REPORT ERROR
1443  6007            CAF             /CLEAR ALL FLAGS AND P I/O BUFFER
1444  4145            RTCENA
1445  6001            ION             /TURN THE INTERRUPT ON
1446  6572            DBRD            /READ THE 12 BIT P I/O BUFFER
1447  7640            SZA     CLA
1450  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  0000  DATSLU,  0
                      CAF             /CLEAR ALL FLAGS BUT SET INT ENA ON SLU
1454  6007            RTCENA          /SET REAL TIME CLOCK INT ENA
1455  4145            ION             /TURN THE INTERRUPT ON
1456  6001            DCA     INTFLG  /CLEAR THE PROGRAM INTERRUPT FLAG
1457  3041            TAD     SLUXMT  /GET THE WORD TO BE TRANSMITTED
1460  1053            TLS             /LOAD AND TRANSMIT IT AND CLEAR THE FLAG
1461  6046            TSFWAT          /WAIT FOR THE TRANSMIT FLAG
1462  4431            ERROR           /XMIT FLAG FAILED TO SET
1463  4427            ISZ     INTFLG  /DID THE PROGRAM INTERRUPT?
1464  2041            ERROR           /PROGRAM FAILED TO INTERRUPT
1465  4427            TCF             /CLEAR THE XMIT FLAG
1466  6042            ION             /TURN THE INTERRUPT BACK ON
1467  6001            KSFWAT          /WAIT FOR THE RECEIVE FLAG TO SET
1470  4432            ERROR           /RECEIVE FLAG FAILED TO SET
1471  4427            ISZ     INTFLG  /DID THE RECEIVE FLAG CAUSE A INTERRUPT
1472  2041            ERROR           /RECEIVE FLAG FAILED TO CAUSE A INTERRUPT
1473  4427            KRB             /CLEAR THE AC AND RCV FLAG AND READ BUFFER
1474  6036            DCA     SLUREC  /SAVE THE WORD READ BACK
1475  3054            ION             /TURN THE INTERRUPT BACK ON
1476  6001            TAD     INTFLG  /CHECK THAT KRB CLEARED THE RCV FLAG
1477  1041            SZA     CLA
1500  7640            ERROR           /KRB FAILED TO CLEAR RCV FLAG OR INTERRUPTED
1501  4427            TAD     SLUXMT  /GET THE WORD TRANSMITTED
1502  1053            CIA
1503  7041            TAD     SLUREC  /GET THE WORD READ BACK
1504  1054            SZA     CLA
1505  7640            JMP  I  DATSLU  /DATA ERROR-RETURN TO REPORT THE ERROR
1506  5653            ISZ     DATSLU  /BUMP RETURN ADDRESS POINTER BY ONE
1507  2253            JMP  I  DATSLU  /RETURN TO TEST
1510  5653

                /DATA ERROR ROUTINE FOR PARALLEL I/O

1511  0000  DERPIO,  0
```

```
1512  4777'          JMS     ACTCHK          /CHECK TO SEE IF RUNNING ON ACT LINE
1513  4435          SWHCHK                  /CHECK SRØ TO INHIBIT ERROR HALT
1514  7710          SPA CLA                 /IS SRØ SET?
1515  5327          JMP PIOSWH              /YES, GO CHECK SR1 TO LOOP ON ERROR
1516  7240          CLA CMA
1517  1311          TAD DERPIO
1520  7402          HLT                     /AC = ADDRESS WHERE ERROR WAS DETECTED
1521  7200          CLA
1522  1051          TAD PIOXMT              /GET THE WORD TRANSMITTED
1523  7402          HLT                     /AC = THE GOOD WORD
1524  7200          CLA
1525  1052          TAD PIOREC              /GET THE WORD READ
1526  7402          HLT                     /AC = THE BAD WORD = WORD READ
1527  4435  PIOSWH, SWHCHK                 /LOOP ON DATA ERROR IF SR1=1
1530  7004          RAL
1531  7700          SMA CLA                 /LOOP?
1532  5711          JMP I DERPIO            /NO, RETURN TO TEST
1533  5446          JMP I TSTLOP            /RETURN AND DO SAME PATTERN(S)

                /DATA ERROR ROUTINE FOR SERIAL LINE UNIT

1534  0000  DERSLU, Ø
1535  4777'         JMS     ACTCHK  /CHECK TO SEE IF RUNNING ON THE ACT LINE
1536  4435          SWHCHK          /CHECK SRØ=1 TO INHIBIT ERROR HALT
1537  7710          SPA     CLA
1540  5354          JMP     SLUSWH  /GO CHECK SR1=1 TO LOOP ON ERROR
1541  7240          CLA     CMA
1542  1334          TAD     DERSLU  /
1543  7402          HLT             /AC=ADRESS WHERE ERROR WAS DETECTED
1544  7200          CLA
1545  1053          TAD     SLUXMT  /GET THE WORD TRANSMITTED
1546  7402          HLT             /AC=GOOD WORD=THE WORD TRANSMITTED
1547  7200          CLA
1550  1054          TAD     SLUREC  /GET THE WORD READ
1551  7402          HLT             /AC=THE BAD WORD=THE WORD READ
1552  4776'         JMS     SIMWRD  /WAS THE SIMULATOR SELECTED
1553  7402          HLT             /AC=THE SIMULATOR CONTROL WORD
1554  4435  SLUSWH, SWHCHK         /LOOP ON DATA ERROR IF SR1=1
1555  7004          RAL
1556  7700          SMA     CLA     /LOOP?
1557  5734          JMP  I  DERSLU  /NO, RETURN TO TEST
1560  5446          JMP  I  TSTLOP



1561  0000  CHKSIM, Ø
1562  1021          TAD OP1SEL      /CHECK FOR SIMULATOR
1563  0057          AND     K2ØØ
1564  7650          SNA     CLA
1565  5371          JMP ,+4         /NO
1566  1761          TAD I CHKSIM    /GET THE CONTROL WORD
1567  3055          DCA CONTWD      /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
0100  11111111  11111111  11111111  11111111  11111111  11110000  00000000  00000000

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

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

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

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

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

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

1600
1700

2000
2100

2200
2300

2400
2500

2600
2700

3000
3100

3200
3300

3400
3500

3600
3700
```



```
4000
4100

4200
4300

4400
4500

4600
4700

5000
5100

5200
5300

5400
5500

5600
5700

6000
6100

6200
6300

6400
6500

6600
6700

7000
7100

7200
7300

7400
7500

7600
7700
```

```
AC      1051    GOODPS  0100    PIOUER  4430    TFL     6040
ACTCHK  1326    GTF     6004    PIOREC  0052    TLS     6046
ACTCK2  1100    HLT     7402    PIOSWH  1527    TPC     6044
ACTCNT  0101    INACTV  0076    PIOXMT  0051    TSF     6041
ACTFLG  0133    INTFLG  0041    PNOINT  0075    TSFWAT  4431
ACTRET  1364    INTRET  1130    POWFAL  1241    TSTCNT  0047
ADDTIM  1163    K0      1236    PRGEND  5440    TSTGOD  0135
AERROR  1275    K1      0124    RECFLG  0073    TSTLOP  0046
AERSWH  1307    K10     1271    RETADD  1237    WATKSF  1142
BADPAS  0077    K11     1273    RETURN  1220    WATTSF  1131
C7      1270    K12     1274    RMF     6244    WTCLSK  1153
CAF     6007    K125    0061    RTCENA  4145    XMTFLG  0072
CAL     6103    K2      0125    RTCFLG  0074
CHKACT  1344    K200    0057    RTF     6005
CHKSIM  1561    K252    0060    SAVADD  0123
CHKSWH  1207    K2525   0063    SAVCNT  0050
CLCL    6136    K3      0126    SAVLOC  1240
CLKFLG  0042    K377    0056    SBE     6101
CLKSET  1352    K5252   0062    SIMCHK  4436
CLKSNC  0134    K7      0064    SIMCLR  6160
CLLE    6135    K7710   0147    SIMCNT  0067
CLRDET  6156    KCC     6032    SIMINT  1044
CLRSIM  6150    KCDF    0131    SIMLOD  1014
CLSK    6137    KCF     6030    SIMWRD  1314
CLSKWT  4425    KIE     6035    SKPCHN  1052
CNT     0043    KJMP    0127    SKPDAV  6165
CNT1    0044    KJMP7   1265    SKPFRQ  6162
CONTWD  0055    KJMPRT  1272    SKPRDR  6157
DATPIO  1400    KRB     6036    SKPSTR  6167
DATSLU  1453    KRMF    0130    SLUDAT  4433
DBCE    6576    KRS     6034    SLUDER  4434
DBCF    6573    KRTF    0132    SLUREC  0054
DBRD    6572    KSF     6031    SLUSWH  1554
DBSE    6575    KSFWAT  4432    SLUXMT  0053
DBSK    6571    KTEST   1266    SPI     6045
DBSS    6577    LINK    0071    SPL     6102
DBST    6570    LOADSM  6151    STRFRQ  6161
DBTD    6574    LODFRQ  6163    SWHCHK  4435
DERPIO  1511    LODSIM  4437    SWITCH  0020
DERSLU  1534    LOOPPC  4423    TCF     6042
DONLOP  4424    LOOPSW  1037    TEST    0045
ENARTC  7145    LOPDON  1021    TEST29  0201
ENDPAS  1200    M10     0066    TEST30  0250
ERROR   4427    M144    0102    TEST31  0302
ERRPC   1343    M4      0065    TEST32  0425
EXPACO  0070    ONACTL  1365    TEST33  0437
FLGCK1  1105    OP11K3  0000    TEST34  0452
FLGCK2  1110    OP1SEL  0021    TEST35  0470
FLGCK3  1113    OP2SEL  0022    TEST36  0507
FLGCK4  1116    PATCH   0103    TEST37  0527
FLGCK5  1121    PCLOOP  1000    TEST38  0604
FLGRST  1267    PIODAT  4426    TEST39  0654
```



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

```
                        /DKC8-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.
                        ////////////////////////////////////////////////////////////////////////
```



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

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

                        /OPTION BOARD NUMBER 1 IOT'S

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

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

                        /REAL TIME CRYSTAL CLOCK

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

                        /12 BIT PARALLEL I/O

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

```
                6577    OBSS=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 SIMUALTOR
                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    SKPDAV=6165             /SKIP ON DATA AVAILABLE CATCHER F/F SET
                6167    SKPSTR=6167             /SKIP ON STROBE CATCHER F/F SET

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

                        /BIT  1         PARALLEL I/O CLEAR DATA         1=TS1
                        /               AVAILABLE SELECT                0=DATA ACCEPTED IN

                        /BIT  2         NOT USED

                        /BIT  3         NOT USED

                        /BIT  4         NOT USED

                        /BIT  5         RTC FREQUENCY OR                1=RTC
                        /               SLU FREQUENCY CHECK             0=SLU BAUD RATES


                        /BIT  6         REAL TIME CLOCK                 1=OFF
                        /                                               0=ON

                        /BIT  7         SLU EIA/20MA SELECT             1=EIA RECEIVE DATA
                        /                                               0=20 MA RECEIVE DATA

                        /BIT  8         STOP BIT SELECT                 1=1 STOP BITS
                        /                                               0=2 STOP BIT


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

                        /BIT 10         BAUD RATE SELECT                EQUALS 110 BAUD, EACH

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



```
                0000    *0
0000    0302            302                     /PROGRAM REVISION LETTER=MAINDEC-08-DJDKA-B
0001    6244            RMF                     /RESTORE MEMORY FIELDS
0002    5403            JMP  I  3               /RETURN TO INTERRUPT SERVICE ROUTINE
0003    7444            SIMINT/SKPCHN/SIMCHK/RTCINT/SLUINT      /INTERRUPT SERVICE ROUTINES

                0020    *20

0022    0000    SWITCH, 0

0021    2000    OP1SEL, 2000
                                        /BIT 0=0  USE LOCATION 22 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
0022    0000    OP2SEL, 0               /BIT 0 IS SET FOR THE ACT LINE
        4423            LOOPPC=JMS I,
0023    0400                    PCLOOP
        4424            DONLOP=JMS I,
0024    0421                    LOPDON
        4425            CLSKWT=JMS I,
0025    0553                    WTCLSK
        4426            PIODAT=JMS I,
0026    1000                    DATPIO
        4427            ERROR=JMS I,
0027    0675                    AERROR
        4430            PIODER=JMS I,
0030    1111                    DERPIO
        4431            TSFWAT=JMS I,
0031    0531                    WATTSF
        4432            KSFWAT=JMS I,
0032    0542                    WATKSF
        4433            SLUDAT=JMS I,
0033    1053                    DATSLU
        4434            SLUDER=JMS I,
0034    1134                    DERSLU
        4435            SWHCHK=JMS I,
0035    0607                    CHKSWH
        4436            SIMCHK=JMS I,
0036    1161                    CHKSIM
        4437            LODSIM=JMS I ,
0037    0414                    SIMLOD
        4146            RTCENA=JMS ENARTC
```

```
                5440    PRGEND=JMP I .
0040  0600              ENDPAS

                        /LOCATIONS USED BY THE PROGRAM

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

0070  1360    DELAYR, DELAY
0071  0000    EXPACD, 0
0072  0000    LINK,   0
0073  0000    XMTFLG, 0
0074  0000    RECFLG, 0
0075  0000    RTCFLG, 0
0076  0000    PNOINT, 0
0077  0000    INACTV, 0
0100  6520    BADPAS, 6520            /ACT LINE ERROR RETURN TO FIELD 7
0101  6500    GOODPS, 6500            /ACT LINE GOOD RETURN TO FIELD 7
0102  7634    ACTCNT, -144
0103  7634    M144,   -144

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

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



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

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

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

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


0146  0000    ENARTC, 0
0147  1022            TAD     OP2SEL          /CHECK TO SEE IF ON ACT LINE
0150  7710    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

                        IFDEF OP13K <PAGE>

                        IFDEF OP13K <PAGE>

                        IFDEF OP13K <PAGE>

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

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

0205  4423  TEST40, LOOPPC                  /SETUP TEST COUNT AND TEST LOOP ADDRESS
0206  7777          -1                      /SIMULATOR ITERATION COUNTER
0207  4104          JMS     PATCH           /SETUP INTERRUPT SKIP CHAIN
0210  6452          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          LODSIM                  /LOAD THE SIMULATOR CONTROL WORD
0215  1377          TAD     (-20
0216  3043          DCA     CNT
0217  6007          CAF                     /CLEAR ALL
0220  4146          RTCENA                  /SET REAL TIME CLOCK INT ENA
0221  6001          ION                     /TURN THE INTERRUPT ON
0222  6161          STRFRQ                  /START A FREQUENCY COUNT
0223  6162          SKPFRQ                  /SKIP ON FREQUENCY COUNT IN PROGRESS
0224  7610          SKP     CLA             /FREQUENCY COUNT ENDED GO READ IT
0225  5223          JMP     .-2             /WAIT FOR A FREQUENCY COUNT ENDED
0226  6163          LODFRQ                  /LOAD THE FREQUENCY COUNT IN TO THE AC
0227  3250          DCA     FRQCNT          /SAVE THE FREQUENCY COUNT READ
0230  1251          TAD     RTCFRQ          /GET THE NEGATIVE VALUE OF MAX TOLERANCE
0231  1250          TAD     FRQCNT          /GET THE COUNT READ
0232  7450          SNA                     /ARE THEY EQUAL?
0233  5246          JMP     RTIMOK          /YES-CHECK FOR LOOP ON TEST
0234  7001          IAC                     /ADD 1 TO THE NUMBER
0235  7450          SNA                     /ARE THEY EQUAL?
0236  5246          JMP     RTIMOK          /YES-CHECK FOR LOOP ON TEST
0237  2043          ISZ     CNT
0240  5234          JMP     .-4             /GO BACK FOR NEXT ALLOWED NUMBER
0241  4427          ERROR                   /RTC TIMING ERROR PRESS "CONT" FOR
                                            /SIMULATOR CONTROL WORD
0242  4435          SWHCHK                  /CHECK SR1 TO LOOP ON ERROR
0243  7004          RAL                     /PUT IT IN BIT 0
0244  7710          SPA     CLA
0245  5446          JMP  I  TSTLOP          /REPEAT TEST
0246  4424  RTIMOK, DONLOP                  /DONE OR REPEAT TEST IF SR2=1
0247  5252          JMP     TEST41          /GO TO NEXT TEST

0250  0000  FRQCNT, 0
0251  3062  RTCFRQ, -4716                   /RTC FREQUENCY COUNT 2500 + 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          LODSIM                  /LOAD THE SIMULATOR CONTROL WORD
0257  1377          TAD     (-20
0260  3043          DCA     CNT
0261  6007          CAF                     /CLEAR ALL FLAGS
0262  4146          RTCENA                  /SET REAL TIMME CLOCK INT ENA
0263  6035          KIE                     /CLEAR SLU INTERRUPT ENABLE
0264  6001          ION                     /TURN THE INTERRUPT ON
0265  6161          STRFRQ                  /START A FREQUENCY COUNT
0266  6162          SKPFRQ                  /SKIP ON FRQUENCY COUNT IN PROGRESS
0267  7610          SKP     CLA             /FREQUENCY COUNT ENDED GO READ IT
0270  5266          JMP     .-2             /WAIT FOR FREQUENCY COUNT ENDED
0271  6163          LODFRQ                  /LOAD FREQUENCY COUNT INTO AC
0272  3250          DCA     FRQCNT          /SAVE THE WORD READ
0273  1055          TAD     CONTWD          /GET THE CONTROL WORD
0274  7064          AND     K7              /MASK OUT THE BAUD RATE
0275  1376          TAD     (FRQTAB         /GET THE ADDRESS OF FREQUENCY TABLE
0276  3300          DCA     TABFRQ          /SAVE THE ADDRESS
0277  7410          SKP
0300  7402  TABFRQ, HLT                     /POINTER ADDRESS TO FREQUENCY TABLE
0301  1700          TAD  I  TABFRQ          /GET THE NEG MAXIMUM FREQUENCY COUNT
0302  1250          TAD     FRQCNT          /GET THE COUNT READ
0303  7450          SNA                     /ARE THEY EQUAL
0304  5317          JMP     SLUTOK          /YES, SLU TIMING IS OK
0305  7001          IAC                     /ADD ONE TO THE NUMBER
0306  7450          SNA                     /ARE THEY EQUAL?
0307  5317          JMP     SLUTOK          /YES SLU TIMING IS OK
0310  2043          ISZ     CNT             /BUMP SLU TIMING CHECK COUNTER
0311  5305          JMP     .-4             /RETURN TO ADD A 1 TO THE NUMBER
0312  4427          ERROR                   /SLU TIMING ERROR-PRESS "CONTINUE" FOR
                                            /SIMULATOR CONTROL WORD
0313  4435          SWHCHK                  /CHECK FOR LOOP ON ERROR
0314  7004          RAL
0315  7710          SPA     CLA             /LOOP?
0316  5446          JMP  I  TSTLOP          /YES DO SAME BAUD RATE
0317  4424  SLUTOK, DONLOP                  /DONE OR REPEAT TEST IF SR2=1
0320  5331          JMP     TEST42          /GO DO THE INTERACTION TEST


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

0321  2335  FRQTAB, -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          -0416                   /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            LODSIM                  /LOAD SIMULATOR IF SELECTED ALSO SET SCOPE
                                              /LOOP = THIS ADDRESS IF  SIMULATOR SELECTED
                                              /OTHERWISE SCOPE LOOP IS THIS ADDRESS +1
0336  6002            IOF                     /TURN THE INTERRUPT OFF
0337  4470            JMS  I  DELAYR          /DELAY FOR APPROXIMATELY 200MS TO
                                              /ALLOW FLAGS TO SETTLE
0340  6007            CAF                     /CLEAR ALL FLAGS BUT SET SLU INT ENA
0341  4146            RTCENA                  /SET REAL TIME CLOCK INT ENA
0342  4104            JMS     PATCH           /SETUP INTERRUPT SERVICE
0343  1400            INTSKP
0344  3071            DCA     EXPACD          /CLEAR THE EXPECTED AC DATA
0345  3072            DCA     LINK            /CLEAR THE LINK BIT
0346  3053            DCA     SLUXMT          /SET INITIAL AC DATA TO 0
0347  3051            DCA     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  6135            CLLE                    /SET RTC INT ENA
0366  7200            CLA
0367  6575            DBSE                    /SET 12 BIT PARALLEL I/O INT ENA
0370  6046            TLS                     /LOAD AND TRANSMIT ON SLU
0371  6574            DBTD                    /TRANSMIT ALL 0'S ON P I/O
0372  6001            ION                     /TURN THE INTERRUPT ON
0373  5373            JMP     .               /GO BABY GO!!!!


0374  7740    M40,    -40



0376  5321
0377  7760
```



```
0400            PAGE



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

0400  0000    PCLOOP, 0
0401  7340            CLA CLL CMA
0402  1200            TAD PCLOOP
0403  3045            DCA TEST
0404  1600            TAD I PCLOOP
0405  3067            DCA SIMCNT
0406  7240            CLA CMA
0407  3050            DCA SAVCNT
0410  1050            TAD SAVCNT
0411  3047            DCA TSTCNT
0412  2200            ISZ PCLOOP
0413  5600            JMP I PCLOOP

0414  0000    SIMLOD, 0
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, 0
0422  2047            ISZ TSTCNT      /TEST DONE?
0423  5446            JMP I TSTLOP    /NO RETURN TO TEST
0424  1021            TAD OP1SEL      /IS THE SIMULATOR SELECTED
0425  0057            AND K200
0426  7650            SNA CLA
0427  5237            JMP LOOPSW      /SIMULATOR NOT SELECTED,CHECK TEST LOOP SWITCH
0430  2067            ISZ SIMCNT      /ADD A 1 TO THE CONTROL WORD?
0431  7610            SKP CLA
0432  5237            JMP LOOPSW      /NO,CHECK TEST LOOP SWITCH
0433  2055            ISZ CONTWD      /ADD 1 TO THE CONTROL WORD FOR BAUD RATES
0434  1050            TAD SAVCNT      /GET THE TEST COUNT
0435  3047            DCA TSTCNT      /RESTORE IT FOR A NEW PASS FOR A DIFFERENT BAUD
0436  5446            JMP I TSTLOP    /RETURN FOR NEW BAUD RATE
0437  4435    LOOPSW, SWHCHK          /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 FLGCK5      /RETURN TO THE PROGRAM
```

```
0451  0000    AC,     0


0452  6102    SKPCHN, SPL             /SKIP ON POWER LOW
0453  7410            SKP
0454  5777'           JMP POWFAL      /POWER GOING DOWN SAVE EVERYTHING
0455  3251            DCA AC          /SAVE THE AC
0456  1042            TAD CLKFLG      /WERE WE EXPECTING A CLOCK INTERRUPT?
0457  7650            SNA CLA
0460  4776'           JMS CHKACT      /GO CHECK FOR THE ACT LINE
0461  6137            CLSK            /YES - SKIP ON REAL TIME CLOCK FLAG
0462  7410            SKP
0463  5305            JMP FLGCK1      /GO CHECK THE OTHER FLAGS
0464  1134            TAD ACTFLG      /GET THE ACT FLAG
0465  7440            SZA             /DID THE PROGRAM GO TO THE PROM ?
0466  5300            JMP ACTCK2      /YES,CHECK PARALLEL I/O DATA ACCEPTED
0467  6041            TSF             /WAS IT A TRANSMIT FLAG?
0470  7610            SKP CLA
0471  5310            JMP FLGCK2      /TRANSMIT FLAG SET - CHECK THE OTHER FLAGS
0472  6031            KSF             /WAS IT A RECEIVE FLAG?
0473  7410            SKP
0474  5313            JMP FLGCK3      /YES - GO CHECK THE OTHER FLAGS
0475  6571            DBSK            /WAS THE DATA READY FLAG SET?
0476  7410            SKP
0477  5316            JMP FLGCK4      /YES - CHECK DATA ACCEPTED FLAG
0500  6570    ACTCK2, DBST            /WAS DATA ACCEPTED SET-IF SO CLEAR IT
0501  7640            SZA CLA
0502  5317            JMP FLGCK5-2    /YES,THE FLAG SHOULD BE CLEAR NOW
0503  4427            ERROR           /ILLEGAL INTERRUPT -
0504  5317            JMP FLGCK5-2    /RETURN
0505  6041    FLGCK1, TSF             /SKIP ON XMIT FLAG
0506  7410            SKP
0507  4427            ERROR           /XMIT FLAG SET
0510  6031    FLGCK2, KSF             /SKIP ON RECEIVE FLAG
0511  7410            SKP
0512  4427            ERROR           /RECEIVE FLAG SET
0513  6571    FLGCK3, DBSK            /SKIP ON P I/O DATA READY
0514  7410            SKP
0515  4427            ERROR           /DATA READY FLAG SET
0516  6570    FLGCK4, DBST            /SKIP ON DATA ACCEPTED
0517  7610            SKP CLA
0520  4427            ERROR           /DATA ACCEPTED FLAG SET
0521  3134    FLGCK5, DCA ACTFLG      /CLEAR THE ACT FLAG
0522  7240            CLA CMA
0523  3041            DCA INTFLG      /SET INTERRUPT FLAG
0524  4775'           JMS RETURN
0525  0530            INTRET
0526  1251            TAD AC
0527  5730            JMP I INTRET

0530  0000    INTRET, 0

                /ROUTINE TO WAIT FOR SERIAL LINE UNITS XMIT FLAG
```



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


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0577  0641
      0600          PAGE

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

0600  6160    ENDPAS, SIMCLR                  /CLEAR THE SIMULATOR
```

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

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

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

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

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

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

              /POWER FAIL ROUTINE, THE PROGRAM WILL DO IT'S OWN  AUTO-RESTART
              /AT THE BEGINNING OF THE TEST THAT IT WAS EXECUTING UNLESS ALL POWER
              /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  1265          TAD KJMP7
0644  3636          DCA I K0
0645  1045          TAD TEST
0646  3666          DCA I KTEST
0647  1267          TAD FLGRST
0650  3670          DCA I C7
0651  1133          TAD KRTF
```



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


0665  5007    KJMP7,  JMP 7
0666  1045    KTEST,  TEST
0667  1012    FLGRST, TAD 12
0670  0007    C7,     7
0671  0010    K10,    10
0672  5445    KJMPRT, JMP I TEST
0673  0011    K11,    11
0674  0012    K12,    12

              /LOGIC ERROR ROUTINE - RESTART TEST IF SR1=1

0675  0000    AERROR, 0
0676  4326          JMS     ACTCHK          /GO CHECK TO SEE IF RUNNING ON ACT LINE
0677  4435          SWHCHK          /CHECK SR0 TO INHIBIT ERROR HALT
0700  7710          SPA CLA
0701  5307          JMP AERSWH      /SR0=1 CHECK LOOP ON LOGIC ERROR
0702  7240          CLA CMA
0703  1275          TAD AERROR
0704  7402          HLT             /AC = ADDRESS WHERE ERROR WAS DETECTED
0705  4314          JMS SIMWRD      /WAS THE SIMULATOR SELECTED
0706  7402          HLT             /AC=SIMULATOR CONTROL WORD
0707  4435    AERSWH, SWHCHK        /CHECK SR1=1 TO LOOP ON ERROR
0710  7004          RAL
0711  7700          SMA CLA
0712  5675          JMP I AERROR    /RETURN WITHOUT LOOPING ON TEST
0713  5446          JMP I TSTLOP    /SCOPE LOOP GO BACK TO START OF TEST SECTION

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


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

```
0726  0000  ACTCHK, 0
0727  7300        CLA     CLL
0730  1022        TAD     OP2SEL  /GET THE HARDWARE CONTROL WORD
0731  7700        SMA     CLA     /IS THE PROGRAM RUNNING ON THE ACT LINE?
0732  5726        JMP  I  ACTCHK  /NO, RETURN TO ERROR ROUTINE
0733  6002        IOF             /TURN THE INTERRUPT OFF
0734  7344        CLA CLL CMA RAL
0735  1326        TAD     ACTCHK
0736  3343        DCA     ERRPC
0737  7240        CLA     CMA
0740  1743        TAD  I  ERRPC   /GET THE LOCATION WHERE THE ERROR WAS DETECTED
0741  6272        CIF     70      /CHANGE INSTRUCTION FIELD TO FIELD 7
0742  5500        JMP  I  BADPAS  /GO TO THE PROM

0743  0000  ERRPC,  0




0744  0000  CHKACT, 0
0745  6137        CLSK            /WAS THE CLOCK FLAG SET
0746  7410        SKP             /NO-RETURN TO INT SERVICE ROUTINE
0747  5352        JMP     CLKSET  /YES-CLEAR THE FLAG
0750  2344        ISZ     CHKACT  /ADD 1 TO THE INCOMING PC
0751  5744        JMP  I  CHKACT  /RETURN TO SKIP CHAIN
0752  6136  CLKSET, CLCL          /CLEAR THE CLOCK FLAG
0753  1022        TAD     OP2SEL  /GET THE ACT LINE BIT
0754  7710        SPA     CLA     /IS THE PROGRAM RUNNING ON ACT LINE
0755  5365        JMP     ONACTL  /YES,CHECK FOR # OF CLOCK TICKS
0756  5350        JMP     CHKACT+4/RETURN TO INTERRUPT ROUTINE
0757  4220        JMS     RETURN  /NO,RETURN TO THE PROGRAM
0760  0764        ACTRET
0761  1776'       TAD     AC
0762  6001        ION             /TURN THE INTERRUPT ON
0763  5764        JMP  I  ACTRET  /RETURN TO THE PROGRAM
0764  0000  ACTRET, 0
0765  2102  ONACTL, ISZ     ACTCNT  /120 CLOCK TICKS YET?
0766  5357        JMP     CLKSET+5/NO RETURN TO PROGRAM
0767  1103        TAD     M144    /RESET ACT TIME COUNTER
0770  3102        DCA     ACTCNT  /SAVE THE NUMBER
0771  6272        CIF     70      /CHANGE INSTRUCTION FIELD TO 7
0772  4501        JMS  I  GOODPS  /SIGNAL PROM THAT PROGRAM STILLS PAS
0773  7240        CLA     CMA
0774  3134        DCA     ACTFLG  /SET THE ACT LINE FLAG TO ONES
0775  5357        JMP     CLKSET+5/RETURN TO THE PROGRAM

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

            /ROUTINE FOR TRANSMITTING,READING AND COMPARING DATA FOR SLU

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

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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          KSFWAT                  /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  3054          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  7640          SZA     CLA
1101  4427          ERROR                   /KRB FAILED TO CLEAR RCV FLAG OR INTERRUPTED
1102  1053          TAD     SLUXMT          /GET THE WORD TRANSMITTED
1103  7041          CIA
1104  1054          TAD     SLUREC          /GET THE WORD READ BACK
1105  7640          SZA     CLA
1106  5653          JMP  I  DATSLU          /DATA ERROR-RETURN TO REPORT THE ERROR
1107  2253          ISZ     DATSLU          /BUMP RETURN ADDRESS POINTER BY ONE
1110  5653          JMP  I  DATSLU          /RETURN TO TEST


                /DATA ERROR ROUTINE FOR PARALLEL I/O

1111  0000    DERPIO, 0
1112  4777'         JMS     ACTCHK                  /CHECK TO SEE IF RUNNING ON ACT LINE
1113  4435          SWHCHK                  /CHECK SR0 TO INHIBIT ERROR HALT
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 PIOXMT              /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 HALT
1137  7710          SPA     CLA
1140  5354          JMP     SLUSWH  /GO CHECK SR1=1 TO LOOP ON ERROR
1141  7240          CLA     CMA
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1142  1334          TAD     DERSLU  /
1143  7402          HLT                     /AC=ADRESS 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  1054          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  5734          JMP  I  DERSLU  /NO, RETURN TO TEST
1160  5446          JMP  I  TSTLOP



1161  0000    CHKSIM, 0
1162  1021          TAD OP1SEL              /CHECK FOR SIMULATOR
1163  0057          AND     K200
1164  7650          SNA     CLA
1165  5371          JMP ,+4                 /NO
1166  1761          TAD I CHKSIM            /GET THE CONTROL WORD
1167  3055          DCA CONTWD              /SAVE IT
1170  7410          SKP
1171  2361          ISZ CHKSIM
1172  2361          ISZ CHKSIM
1173  1361          TAD CHKSIM
1174  3046          DCA TSTLOP
1175  5761          JMP I CHKSIM



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

1200  6160    RTCTIM, SIMCLR
1201  4104          JMS     PATCH           /SETUP INTERRUPT SERVICE
1202  1215          RTCINT
1203  1377          TAD     (-5667          /SET UP A COUNT FOR 2999 CLOCK TICKS
1204  3047          DCA     TSTCNT          /SAVE CLOCK TICK COUNTER
1205  6007          CAF                     /CLEAR ALL FLAGS
1206  6137          CLSK                    /WAIT FOR THE FIRST CLOCK FLAG
1207  5206          JMP     .-1
1210  6136          CLCL                    /CLEAR THE CLOCK FLAG
```

```
1211  7301          CLA CLL IAC
1212  6135          CLLE                    /LOAD CLOCK INTERRUPT ENABE
1213  6001          ION                     /TURN THE INTERRUPT ON
1214  5214          JMP     .
1215  6136  RTCINT, CLCL                    /CLEAR THE CLOCK FLAG
1216  7300          CLA     CLL             /CLEAR THE AC AND LINK
1217  2047          ISZ     TSTCNT          /DONE YET ?
1220  5213          JMP     RTCINT-2        /RETURN TO WAIT FOR NEXT FLAG
1221  7602          HLT     CLA                     /WAS IT 30 SECONDS
1222  5200          JMP     RTCTIM  /DO TEST OVER OR DO ANOTHER TEST

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

1223  6160  SLUTIM, SIMCLR
1224  4104          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;
1227  4435          SWHCHK                  /GO GET LOCATION 20 OR THE SR
1230  0376          AND     (17             /MASK OUT THE BAUD RATE AND STOP BIT
1231  3304          DCA     BAUDWD          /SAVE THE BAUD RATE AND STOP BIT
1232  1304          TAD     BAUDWD          /GET THE WORD
1233  0064          AND     K7              /MASK OUT THE BAUD RATE
1234  3305          DCA     BAUDRT          /SAVE IT
1235  1304          TAD     BAUDWD          /CHECK FOR THE NUMBER OF STOP BITS
1236  0375          AND     (10
1237  7640          SZA     CLA             /1 OR 2 STOP BITS
1240  7326          CLA CLL CML RTL         /STOP BITS EQUAL 2
1241  3306          DCA     STPBIT          /SAVE THE STOP BITS
1242  1305          TAD     BAUDRT          /GET THE BAUD RATE (0 = 7)
1243  1374          TAD     (BAUDTB         /GET THE ADDRESS OF THE BAUD RATE TABLE
1244  3307          DCA     BDPNTR          /SAVE THE TABLE POINTER ADDRESS
1245  1707          TAD  I  BDPNTR          /GET THE ADDRESS OF THE CONSTANTS
1246  1306          TAD     STPBIT          /ADD 0 FOR 1 SB OR 2 FOR 2 SB
1247  3307          DCA     BDPNTR          /SAVE THE POINTER TO THE CONSTANTS
1250  1307  SLUSTR, TAD     BDPNTR          /ACTUAL TEST STARTS HERE
1251  3047          DCA     TSTCNT          /SAVE THE POINTER IN TEST COUNT
1252  1447          TAD  I  TSTCNT          /GET THE FIRST CONSTANT
1253  3043          DCA     CNT             /SAVE IT
1254  2047          ISZ     TSTCNT          /ADD 1 TO THE WORKING POINTER
1255  1447          TAD  I  TSTCNT          /GET THE SECOND CONSTANT
1256  3044          DCA     CNT1            /DCA CNT1
1257  6007          CAF                     /CLEAR ALL FLAGS
1260  6046          TLS                     /LOAD AND TRANSMIT THE FIRST CHARACTER
1261  6041          TSF                     /THE FIRST FLAG COMES UP WITHIN USEC'S
1262  5261          JMP     .-1
1263  5266          JMP     .+3             /GO AND CLEAR FLAG AND TRANSMIT AGAIN
1264  6036  INTON,  KRB                     /CLEAR THE RECEIVE FLAG
1265  7610          SKP     CLA
1266  6046          TLS                     /LOAD AND TRANSMIT AND CLEAR FLAG
1267  6001          ION                     /TURN THE INTERRUPT ON
1270  5270          JMP     .
```



```
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 4095 INTERRUPTS
1302  7602          HLT     CLA                     /WAS 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,  -512                   /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=409 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=818 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          PAGE


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

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



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

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

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

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

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

                /SERIAL LINE UNIT INTERACTIVE TRANSMITTER SERVICE ROUTINE TEST 42

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

                /REAL TIME CLOCK INTERACTIVE CLOCK SERVICE ROUTINE TEST 42

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



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

1571  3620
1572  7740
1573  1670
1574  1742
1575  1621
1576  1600
1577  3641
      1600            PAGE
                /

                /SERIAL LINE UNIT INTERACTIVE RECEIVER SERVICE ROUTINE TEST 42

1600  3074    RECSER, DCA     RECFLG          /SET RECEIVE FLAG TO ACTIVE
1601  6036            KRB                     /CLEAR AC AND FLAG AND READ BUFFER
1602  3054            DCA     SLUREC          /SAVE THE WORD READ
1603  4221            JMS     CMPACL          /COMPARE THE AC AND LINK
1604  1053            TAD     SLUXMT          /COMPARE THE WORD TRANSMITTED WITH WORD READ
1605  7041            CIA
1606  1054            TAD     SLUREC
1607  7640            SZA     CLA             /ARE THEY EQUAL?
1610  4317            JMS     SLUERR          /NO, DATA ERROR
1611  1053            TAD     SLUXMT          /ADD ONE TO THE WORD TO BE TRANSMITTED
1612  7001            IAC                     /
1613  0056            AND     K377            /MASK OUT FOR THE EIGHT BITS
1614  3053            DCA     SLUXMT          /SAVE THE NEW WORD
1615  1053            TAD     SLUXMT          /GET THE WORD AND TRANSMIT IT
1616  6046            TLS                     /LOAD AND TRANSMIT THE WORD
1617  7300            CLA     CLL
1620  5777'           JMP     RTCSLU          /GO CHECK FOR ACTIVE DEVICES AND RESET THE AC



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

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

```
1627  1072            TAD     LINK            /GET EXPECTED LINK
1630  7041            CIA
1631  1775'           TAD     LINKRT          /GET THE RETURN LINK
1632  7650            SNA     CLA             /ARE THEY EQUAL?
1633  5621            JMP  I  CMPACL          /YES,RETURN TO TEST
1634  1221    ACLERR, TAD     CMPACL
1635  3237            DCA     .+2
1636  7610            SKP     CLA
1637  7402            HLT/CMPACL
1640  4774'           JMS     ACTCHK          /CHECK TO SEE IF RUNNING ON ACT LINE
1641  4435            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                     /THE AC CONTAINS AC DATA BEFORE INTERRUPT
1652  7200            CLA
1653  1776'           TAD     ACDRET          /
1654  7402            HLT                     /THE AC CONTAINS AC DATA AFTER INTERRUPT
1655  7200            CLA
1656  1072            TAD     LINK            /
1657  7402            HLT                     /THE AC CONTAINS THE LINK BEFORE INTERRUPT
1660  7200            CLA
1661  1775'           TAD     LINKRT
1662  7402            HLT                     /THE AC CONTAINS LINK AFTER INTERRUPT
1663  4435    ACLLOP, SWHCHK                  /CHECK SR 1 TO LOOP ON ERROR
1664  7004            RAL
1665  7710            SPA     CLA
1666  5446            JMP  I  TSTLOP          /SCOPE LOOP
1667  5621            JMP  I  CMPACL          /RETURN TO TEST

                /INACTIVE DEVICE ERROR

1670  0000    INACDV, 0
1671  4774'           JMS     ACTCHK          /CHECK TO SEE IF RUNNING ON THE ACT LINE
1672  4435            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            SZA     CLA
1703  7402            HLT                     /SLU XMIT FLAG IS INACTIVE
1704  1074            TAD     RECFLG
1705  7640            SZA     CLA
1706  7402            HLT                     /SLU RECEIVE FLAG IS INACTIVE
1707  1075            TAD     RTCFLG
1710  7640            SZA     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                     /AC = WORD THAT WAS READ
1735  4435    SLULOP, SWHCHK                  /CHECK SR1=1 TO LOOP ON ERROR
1736  7004            RAL
1737  7710            SPA     CLA
1740  5446            JMP  I  TSTLOP          /SCOPE LOOP
1741  5717            JMP  I  SLUERR          /RETURN TO TEST

                /PARALLEL I/O DATA ERROR DURING INTERACTION TEST 42

1742  0000    PIOERR, 0
1743  4774'           JMS     ACTCHK          /CHECK TO SEE IF RUNNING ON ACT LINE
1744  4435            SWHCHK
1745  7710            SPA     CLA             /INHIBIT ERROR HALT?
1746  5360            JMP     PIOLOP          /YES, CHECK LOOP SWITCH
1747  7240            CLA     CMA
1750  1342            TAD     PIOERR
1751  7402            HLT                     /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     PIOREC
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
1763  5446            JMP  I  TSTLOP          /SCOPE LOOP
1764  5742            JMP  I  PIOERR          /RETURN TO TEST


1774  0726
1775  1526
1776  1525
1777  1466
```

0200 *200

$


```
0000  11110000  00000000  11111111  11111111  11111111  11111111  11111111  11111111
0100  11111111  11111111  11111111  11111111  11111111  11111000  00000000  00000000

0200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0300  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111011

0400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0500  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11110111

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

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

1200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1300  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11101111

1400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1500  11111111  11111111  11111111  11111111  11111111  11111111  00000000  01111111

1600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1700  11111111  11111111  11111111  11111111  11111111  11111111  11111000  00001111

2000
2100

2200
2300

2400
2500

2600
2700

3000
3100

3200
3300

3400
3500

3600
3700
```

```
4000
4100

4200
4300

4400
4500

4600
4700


5000
5100

5200
5300

5400
5500

5600
5700


6000
6100

6200
6300

6400
6500

6600
6700


7000
7100

7200
7300

7400
7500

7600
7700
```



```
AC      0451        DBSS    6577        KJMP7   0665        RTCSLU  1466
ACDRET  1525        DBST    6570        KJMPRT  0672        RTCTIM  1200
ACLERR  1634        DBTD    6574        KRB     6036        RTF     6005
ACLION  1506        DELAY   1360        KRMF    0131        RTIMOK  0246
ACLLOP  1663        DELAYR  0070        KRS     6034        SAVADD  0124
ACTCHK  0726        DERPIO  1111        KRTF    0133        SAVCNT  0050
ACTCK2  0500        DERSLU  1134        KSF     6031        SAVLOC  0640
ACTCNT  0102        DONLOP  4424        KSFWAT  4432        SBE     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        LODFRQ  6163        SIMLOD  0414
BADPAS  0100        FLGCK1  0505        LODSIM  4437        SIMWRD  0714
BAUDRT  1305        FLGCK2  0510        LOOPPC  4423        SKPCHN  0452
BAUDTB  1310        FLGCK3  0513        LOOPSW  0437        SKPDAV  6165
BAUDWD  1304        FLGCK4  0516        LOPDON  0421        SKPFRQ  6162
BDPNTR  1307        FLGCK5  0521        M10     0066        SKPRDR  6157
BR110   1320        FLGRST  0667        M144    0103        SKPSTR  6167
BR1200  1340        FRQCNT  0250        M15     1371        SLUDAT  4433
BR150   1324        FRQTAB  0321        M4      0065        SLUDER  4434
BR2400  1344        GOODPS  0101        M40     0374        SLUERR  1717
BR300   1330        GTF     6004        ONACTL  0765        SLUINT  1271
BR4800  1350        HLT     7402        OPS1K4  0000        SLULOP  1735
BR600   1334        INACDV  1670        OP1SEL  0021        SLUREC  0054
BR9600  1354        INACLP  1712        OP2SEL  0022        SLUSTR  1250
C7      0670        INACTV  0077        PATCH   0134        SLUSWH  1154
CAF     6007        INTERA  1522        PCLOOP  0400        SLUTIM  1223
CAL     6103        INTFLG  0041        PIODAT  4426        SLUTOK  0317
CHKACT  0744        INTON   1264        PIODER  4430        SLUXMT  0053
CHKSIM  1161        INTRET  0530        PIOERR  1742        SPI     6045
CHKSWH  0607        INTSKP  1400        PIOLOP  1760        SPL     6102
CLCL    6136        K0      0636        PIOREC  0052        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        PNOINT  0076        TABFRQ  0300
CLRDET  6156        K125    0061        POWFAL  0641        TCF     6042
CLRSIM  6150        K2      0126        PRGEND  5440        TEST    0045
CLSK    6137        K200    0057        RAN1    1523        TEST40  0205
CLSKWT  4425        K252    0060        RAN2    1524        TEST41  0252
CMPACL  1621        K2525   0063        RECFLG  0074        TEST42  0331
CNT     0043        K3      0127        RECSER  1630        TFL     6040
CNT1    0044        K377    0056        RESET   1476        TLS     6046
CONTWD  0055        K5252   0062        RETADD  0637        TPC     6044
DATPIO  1000        K7      0064        RETURN  0620        TSF     6041
DATSLU  1053        K7710   0150        RMP     6244        TSFWAT  4431
DBCE    6576        KCC     6032        RTCENA  4146        TSTCNT  0047
DBCF    6573        KCDF    0132        RTCFLG  0075        TSTGOD  0136
DBRD    6572        KCF     6030        RTCFRQ  0251        TSTLOP  0046
DBSE    6575        KIE     6035        RTCINT  1215        WATKSF  0542
DBSK    6571        KJMP    0130        RTCSER  1533        WATTSF  0531
```

```
WTOLSK  0553
XMTFLG  0073
XMTSER  1527

ERRORS DETECTED: 0

LINKS GENERATED: 26

RUN-TIME:  18 SECONDS

2K CORE USED
```