

IDENTIFICATION

PRODUCT CODE: MAINDEC-08-DJADA-C-D

PRODUCT NAME: AD8A A-D CONVERTER AND MULTIPLEXER DIAGNOSTIC

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MAINTAINER: DIAGNOSTIC GROUP

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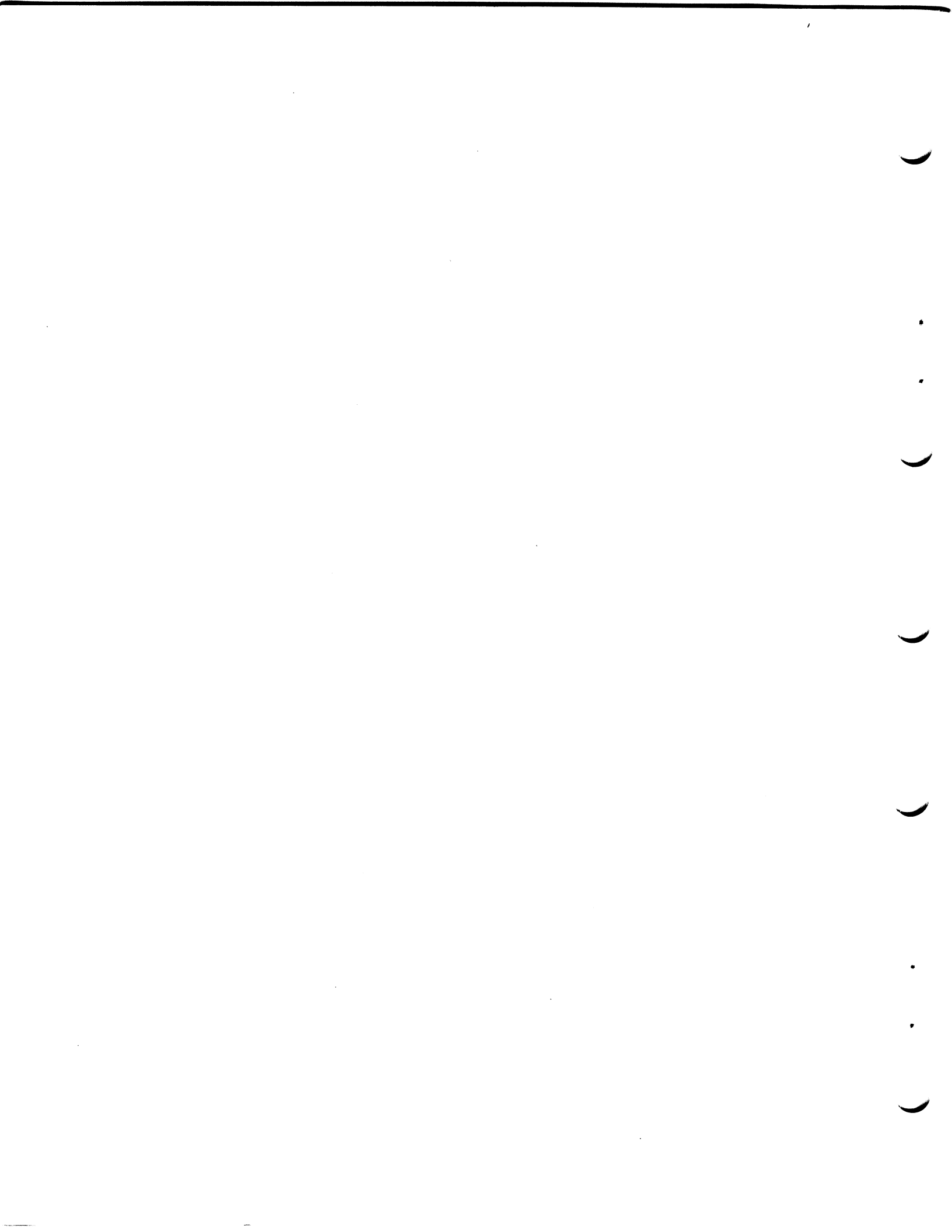


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READ THIS DOCUMENT PRIOR TO RUNNING PROGRAM:

1.0 ABSTRACT

THIS PROGRAM PERFORMS BASIC TESTS ON THE INPUT/OUTPUT CONTROL LOGIC AND MULTIPLEXER. THE ANALOG TESTS ARE DESIGNED TO PROVIDE A MEANS OF CALIBRATING THE CONVERTER AND CHECKING CONVERSION PARAMETERS. THE IOT FOR THE A/D, THE CLOCK, AND THE SCOPE MAY BE CHANGED BY LOADING THE NEW VALUES INTO LOCATIONS FIRST, CLKNOW, AND SCPNOW RESPECTIVELY ON PAGE ZERO.

MODIFIED FOR THE CONSOLE PACKAGE, JAN. 1976, SEE SECTION 8.
THE DIAGNOSTIC ITSELF WAS ALSO MODIFIED. SEE SECTION 9.

2.0 REQUIREMENTS

2.1 EQUIPMENT

PDP-8/E WITH 4K CORE, WITH PROGRAMMER'S FRONT CONSOLE, ASR33 TELETYPE, AD8A A-D CONVERTER, ADJUSTABLE HIGH QUALITY VOLTAGE SOURCE, EDC MODEL MV105G OR EQUIVALENT.

TO RUN WITH THE CONSOLE PACKAGE, 8K IS REQUIRED.

NOTE: TO RUN MONOTONICITY TEST, A FUNCTION GENERATOR CAPABLE OF .1 CPS, TRIANGULAR WAVE OUTPUT MUST BE USED.

2.2 STORAGE

THE DIAGNOSTIC RESIDES IN LOCATIONS 0000-7500, OF FIELD 0. IF CONSOLE PACKAGE IS ACTIVE, LOCATIONS 5600 THROUGH 7500 OF FIELD 1 ARE USED AS BUFFER STORAGE AREA FOR THE RESOLUTION ACCURACY TEST.

2.3 PRELIMINARY PROGRAMS

ALL BASIC CPU AND TELETYPE MAINDECS MUST HAVE BEEN RUN SUCCESSFULLY.

NOTE: IF EXTERNAL ENABLE UTILIZING THE DK8-E REAL TIME CLOCK IS TO BE RUN, THE MAINDEC FOR THE DK8-E MUST BE SUCCESSFULLY RUN FIRST. IN ADDITION, VC8-E CONTROL TESTS MUST BE RUN PRIOR TO SPECIAL LAB-A SYSTEM CHECK ROUTINE.

3.0 LOADING PROCEDURE

THE BINARY LOADER IS USED TO LOAD THE PROGRAM.

3.1 CONTROL SWITCHES

- SW0 - SUPPRESS ERROR MESSAGES AND "END LOGIC TEST" MESSAGE.
- SW1 - HALT ON ERROR WITH PC DISPLAYED IN AC.
- SW2 - EXTERNAL ENABLE TEST: HALTS WITH CONVERTED WORD IN THE AC.
OTHER TESTS: SCOPE LOOP OVERRIDE TO EXIT FROM LOOP ON ERROR AND PERMIT CONTINUANCE OF TEST.
- SW3 - LOGIC TEST: SET IF ALL 1'S JUMPER IS INSTALLED.
OTHER TESTS: ENABLES HALT DURING CALIBRATION ROUTINE WITH CONVERTED WORD DISPLAYED IN AC.
- SW4 - EXTERNAL ENABLE TEST: SW4 MUST BE SET TO RUN TEST.
LOGIC TEST: FOR PROCESSORS WITH CYCLE TIME OF 1.5 SW4=0, FOR PROCESSORS WITH CYCLE TIME OF 1.2 AND 1.4 SW4=1.
- SW5 - ALLOWS OPERATOR TO EXPLICITLY SELECT ANY ONE OF THE LOGIC ROUTINES.
- SW6 - ENABLES UNIPOLAR DURING CALIBRATION.

NOTE: IOT FOR A/D, CLOCK, AND SCOPE ARE INITIALIZED TO THE VALUES LOADED INTO FIRST, CLKNOW, AND SCPNOW RESPECTIVELY. THESE ARE LOCATED ON PAGE ZERO.

4.0 USAGE PROCEDURE

SEE SPECIFICATIONS FOR MAXIMUM VOLTAGE INPUTS!

INSURE THAT TELETYPE IS ON-LINE.

4.1 CONTROL LOGIC TESTS

1. LOAD 200.
2. PLACE NINE BITS OF IOT 6XXX IN SW3-11.
3. PRESS CLEAR THEN CONTINUE.
4. SW4 MUST BE SET (1) IF RUNNING TESTS ON A PROCESSOR WITH CYCLE TIME OF 1.4 AND 1.2. FOR THE 8A AND PROCESSORS WITH CYCLE TIME OF 1.5, SW4 = 0.
5. IF SW5 IS SET (1), SELECT TEST FROM SW7-11.
6. PRESS CONTINUE.
7. AFTER EACH PASS "END OF LOGIC TEST" WILL BE PRINTED.

4.2 IOT SCOPE LOOP

1. LOAD 201.
2. PLACE NINE BITS OF IOT 6XXX IN SW3-11.

3. PRESS CLEAR THEN CONTINUE.

NOTE: NEW IOT MAY BE SELECTED WHILE RUNNING.

4.3 DISPLAY CONVERTED VALUE IN AC.

1. APPLY VOLTAGE TO A-D INPUT CHANNEL OR TO MULTIPLEXER CHANNEL INPUTS.
2. LOAD 202.
3. IF A HALT AFTER CONVERSION IS DESIRED, SELECT SW3.
4. SELECT MPX CHANNEL FROM SW8-11, SELECT CHANNEL 0 IF NO MULTIPLEXER IS AVAILABLE; SELECT SW6 FOR UNIPOLAR IF DESIRED.
5. PRESS CLEAR, THEN CONTINUE; THE CONVERTED VALUE WILL BE OBSERVED IN THE AC.
6. WHEN SW3 HALT SELECT IS ENGAGED, OPERATOR MAY CHANGE CHANNELS IF DESIRED, THEN PRESS CONTINUE TO LOOP. SW3 MAY BE DESELECTED AT THIS TIME.

4.4 EXTERNAL ENABLE WITH REAL TIME CLOCK (DK8EP OR DK8ES), TESTS THAT CONVERSION CAN BE STARTED BY CLOCK.

1. APPLY VOLTAGE TO A-D INPUT CHANNEL.
2. IOT FOR A/D, CLOCK, AND SCOPE MAY BE CHANGED, IF DESIRED.
3. LOAD 203.
4. SELECT SWITCHES 0, 2, 6 AS DESIRED.
5. PRESS CLEAR, THEN CONTINUE. HALT WILL OCCUR.
6. SELECT CHANNEL WITH SW 8-11.
7. PRESS CONTINUE.
8. AFTER EACH PASS THE TTY BELL WILL RING.
9. IF ERROR OCCURS, THE PROGRAM TYPES OUT MESSAGE, THE PC AT THE ERROR LOCATION, TEMPA = IOT OF CURRENT CLOCK AND TEMPB = IOT OF CURRENT A-D.

NOTE: CHANNEL MAY BE CHANGED WHILE RUNNING TEST.

PAGE 5

4.5 MONOTINICITY TEST

NOTE1: THIS TEST IS FOR IN-HOUSE USE ONLY AND IS NOT INTENDED FOR USE BY THE CUSTOMER.

NOTE2: RAMP SPEED OF FUNCTION GENERATOR MUST BE SLOWER THAN SLEW RATE OF CONVERTER. SEE ENGINEERING SPECIFICATIONS. (.1 HZ IS A GOOD SETTING).FOR

BIPOLAR THE AMPLITUDE VARIES FROM -2.5V TO +2.5V.,
FOR UNIPOLAR IT VARIES FROM 0V. TO +5V.

1. CONNECT FUNCTION GENERATOR TO CHNL 0 OR TO AD8A INPUT.
2. LOAD 204.
3. SELECT SW0 AND/OR SW6 IF DESIRED, AND MULTIPLEX CHANNEL FROM SW8-11.
4. PRESS CLEAR, THEN CONTINUE.
5. IF ERROR OCCURS, PROGRAM WILL TYPE OUT MESSAGE, THE PC AT THE ERROR LOCATION, TEMPA = THE NTH WORD, AND TEMPB = N+1ST WORD.
6. IF NO ERROR OCCURS, TTY BELL WILL RING ONCE AND PROGRAM WILL RECYCLE.

4.6 RESOLUTION ACCURACY TEST

1. APPLY A KNOWN VOLTAGE TO A-D CONVERTER INPUT.
2. LOAD 205.
3. SELECT SWS 0, 1, 6 IF DESIRED.
4. SELECT CHANNEL WITH SW8-11, UNIPOLAR OR BIPOLAR WITH SW6.
5. PRESS CLEAR, THEN CONTINUE.
6. IF ERROR OCCURS, PROGRAM WILL TYPEOUT MESSAGE, THE TWO NON-COMPARING WORDS TEMPA AND TEMPB, AND THE PC AT THE ERROR LOCATION ON TTY THEN CONTINUE WITH TEST.
7. IF NO ERROR OCCURS, TTY BELL WILL RING ONCE, THEN PROGRAM WILL RECYCLE. ONE CYCLE BEING 500,000(10) CONVERSIONS.

NOTE: THIS TEST USES A 1000(10) LOCATION BUFFER AREA TO STORE EACH GROUP OF 1000 CONVERSIONS. IF THIS TEST IS RUN WITH CONSOLE PACKAGE NOT ACTIVE, THE BUFFER AREA WILL OVERLAY THE CONSOLE PACKAGE IN FIELD 0, STARTING AT LOC 5600. IF THIS TEST IS RUN WITH CONSOLE PACKAGE ACTIVE, THE BUFFER AREA WILL START AT LOC 5600 IN FIELD 1.

4.7 SUCCESSIVE A-D BUFFER READS TEST

1. APPLY KNOWN VOLTAGE TO AN A-D CHANNEL.
2. LOAD 206.
3. SELECT SW0 IF DESIRED.
4. SELECT CHANNEL FROM SW8-11, SELECT UNIPOLAR(1) OR BIPOLAR(0) WITH SW6.
5. PRESS CLEAR, THEN CONTINUE.

6. IF ERROR OCCURS, PROGRAM WILL TYPE MESSAGE, THE PC AT THE ERROR LOCATION, TEMPA = FIRST READ AND TEMPB = SECOND READ,
7. TO RESTART, PRESS CONTINUE.
8. IF NO ERROR OCCURS, TTY BELL WILL RING ONCE, THEN PROGRAM WILL RECYCLE.

4.8 MULTIPLEXER NOISE TEST

1. LOAD 207.
2. SELECT CHANNEL IN SW8-11 AND APPLY VOLTAGE TO THAT CHANNEL, SELECT UNIPOLAR OR BIPOLAR WITH SW6.
3. SELECT SW0 IF DESIRED.
4. PRESS CLEAR, THEN CONTINUE.
5. IF ERROR OCCURS, PROGRAM WILL TYPE MESSAGE, THE PC AT THE ERROR LOCATION, TEMPA = EXPECTED CONVERTED VALUE AND TEMPB = ACTUAL CONVERTED VALUE.
6. IF NO ERROR OCCURS, TTY BELL WILL RING ONCE AND THE PROGRAM WILL RECYCLE.

4.9 LAB8-A SYSTEM TEST

THE SYSTEM MUST CONTAIN A DK8-EP OPTION AND A VC8-E OPTION WITH A DISPLAY.

1. APPLY A VOLTAGE INPUT TO THE A/D OR MULTIPLEXER.
2. IOT FOR A/D, CLOCK, AND SCOPE MAY BE CHANGED, IF DESIRED.
3. LOAD 210.
4. DEPRESS CLEAR, CONTINUE.
5. PROGRAM WILL HALT.
6. SELECT CLOCK FREQUENCY VIA SW3-5, REFERENCE LAB8-A PROGRAMMING CARD FOR DK8-EP CLOCK RATE. (1MHZ=6, 100KHZ=5, ..., 100HZ=2).
7. PRESS CONTINUE THEN OBSERVE PRINTOUT:
"SET SW5(AUTO=INC) AND THE NUMBER OF CHNLS IN SW8-11 OR SET SW8-11 (SINGLE CHNL)".
8. IF ALL CHANNELS ARE TO BE DISPLAYED AT THE SAME TIME, SET SW5, THEN SET THE NUMBER OF CHANNELS CONTAINED WITHIN THE SYSTEM INTO SW8-11.
I.E., IF SYSTEM CONTAINS ONE AD8A, SET THE SWITCH REGISTER TO 1110. IF ONLY CHNL FOUR IS TO BE OBSERVED SET THE SWITCH REGISTER TO 0004.
9. CHOOSE UNIPOLAR(1) OR BIPOLAR(0) WITH SW6.
10. DEPRESS CONTINUE AND OBSERVE THE DISPLAY SCOPE. A HORIZONTAL LINE SHOULD BE PRESENT FOR CHANNEL SELECTED. BY VARYING THE INPUT VOLTAGE THE LINE SHOULD MOVE UP OR DOWN. 0V=MID-SCREEN, +V=TOP, -V= BOTTOM. A SWEEP OF THE SCOPE IS GENERATED ON EACH CLOCK OVERFLOW. THUS IT IS A FUNCTION OF THE CLOCK RATE SET IN (6).

5.0 PROGRAM DESCRIPTION

5.1 CONTROL LOGIC TESTS

CONSISTS OF 32 SEPARATE TESTS TO ASSURE THE CONTROL LOGIC IS FUNCTIONING PROPERLY.

5.2 MISCELLANEOUS TESTS

- A. IOT SCOPE LOOP TEST - ENABLES IOT TO BE REPEATED FOR TROUBLESHOOTING.
- B. EXTERNAL ENABLE TEST - UTILIZES DK8/A REAL TIME CLOCK TO START CONVERSION. NOTE: THIS TEST CAN BE USED ONLY IF DK8/A IS PRESENT IN SYSTEM.
- C. DISPLAY CONVERTED VALUE IN AC - USED TO CALIBRATE CONVERTER. (SEE SETUP PROCEDURE OF AD8A).
- D. LAB8-A SYSTEM CHECKS - ASSURES RELIABILITY OF SYSTEM AS HOMOGENOUS UNIT.

5.3 ANALOG TESTS

- A. SUCCESSIVE READS TESTS - CHECKS FOR NOISE IN A-D BUFFER LOGIC.
- B. MONOTINICITY TEST - CHECKS THAT ALL SPECIFIED VALUES CAN BE CONVERTED.
- C. RESOLUTION ACCURACY TEST - SAMPLES A KNOWN VOLTAGE 1000 TIMES AND CHECKS THAT RESOLUTION IS WITHIN SPECIFICATION.
- D. MULTIPLEXER NOISE TEST - CHECKS FOR NOISE IN MPX, ENABLE, AND STATUS REGISTER.

6.0 ERROR REPORTS

6.1 LOGIC ERRORS

MESSAGE WILL BE TYPED OUT ONCE PER ERROR ON TELETYPE STATING NATURE OF FAILURE.

6.2 OTHER ERRORS

MESSAGE WILL BE TYPED OUT ON TELETYPEWRITER STATING NATURE OF FAILURE, THE PC AT THE ERROR LOCATION, AND TEMPA AND TEMPB (TWO WORDS DEFINED UNIQUELY FOR EACH TEST).

7.0 CONSOLE PACKAGE ADDENDUM

7.1 DESCRIPTION

THE CONSOLE PACKAGE HAS BEEN ADDED TO THIS DIAGNOSTIC TO ALLOW THE PROGRAM TO RUN WITH NO HARDWARE SWITCH REGISTER AND TO HAVE COMMUNICATIONS WITH THE DIAGNOSTIC VIA A TERMINAL. THE DIAGNOSTIC CAN BE RUN IN TWO MODES WITH THE CONSOLE PACKAGE . 1) RUNNING WITH THE CONSOLE PACKAGE ACTIVE - THIS ALLOWS THE OPERATOR CONTROL OF THE DIAGNOSTIC THROUGH THE TERMINAL. THE DIAGNOSTIC WILL ASK FOR THE VALUE OF THE PSEUDO SWITCH REGISTER, BEFORE CONTINUING WITH EXECUTION OF THE DIAGNOSTIC. ALL ERRORS AND PASS COMPLETES WILL BE PRINTED AT THE TERMINAL. NO HALTS WILL BE EXECUTED. 2) CONSOLE PACKAGE NOT ACTIVE-THIS WILL RESULT IN THE NORMAL STANDALONE OPERATION OF THE PROGRAM AS DISCRIBED IN SECTIONS 1 THROUGH 9 OF THIS DOCUMENT.

7.2 RESTRICTIONS

- 1) WHEN RUNNING THE CONSOLE PACKAGE SOME SUBTESTS MAY NOT BE EXECUTED.
- 2) RUNNING THE CONSOLE PACKAGE REQUIRES THAT THE PSEUDO SWITCH REGISTER BE USED.
- 3) ONCE RUNNING THE CONSOLE PACKAGE NON-ACTIVE AND NOW DESIRE TO RUN IT ACTIVE, ONE MUST RELOAD THE DIAGNOSTIC AND INITIALIZE FOR AN ACTIVE CONSOLE PACKAGE.

7.3 INITIALIZATION

FOR AN ACTIVE CONSOLE PACKAGE

- 1.) SET LOCATION 21 BIT0=0 TO INDICATE USE PSEUDO SWITCH REGISTER.
- 2.) SET LOCATION 21, BITS 7-11 TO MEMORY SIZE. SEE SECTION 8,10. (8K MINIMUM REQUIRED)
- 3.) SET LOCATION 22 BIT3=1 TO INDICATE CONSOLE PACKAGE ACTIVE.

FOR A NON-ACTIVE CONSOLE PACKAGE

- 1.) SET LOCATION 21 BIT0=1 TO INDICATE NOT TO USE PSEUDO SWITCH REGISTER, BUT TO USE HARDWARE SWITCHES.
- 2.) SET LOCATION 22 BIT3=0 TO INDICATE CONSOLE PACKAGE NOT ACTIVE.

CONTROL CHARACTERS

CONTROL CHARACTERS ARE USED TO GIVE THE OPERATOR THE ABILITY TO PERFORM THE FOLLOWING FUNCTIONS.

NOTE: THE PROGRAM WILL RESPOND TO THE CONTROL CHARACTER IN FIVE (5) SECONDS OR LESS.

CONTROL C

THIS RESTORES THE LOADER (PGS 37 OF FLD 0 & 1) AND STARTS IT AT LOC 7600 OF FLD 0.

CONTROL R

THIS WILL RESTART THE PROGRAM AND REASK THE SWITCH REGISTER QUESTION AS DESCRIBED IN SECTION 8.6.

CONTROL E

THIS WILL CONTINUE THE PROGRAM FROM AN ERROR IF ALLOWED BY THE DIAGNOSTIC OR FROM A WAITING STATEMENT.

CONTROL L

THIS WILL SWITCH THE TERMINAL MESSAGES FROM THE DISPLAY TO A LINE PRINTER. TO RESTORE THE MESSAGES ON THE TERMINAL CONTROL L MUST BE TYPED AGAIN. IF NO PRINTER IS AVAIBLE AND CONTROL L IS TYPED THE RESULT WILL BE THAT THE CONSOLE PACKAGE WILL WAIT FOR CONTROL C OR R. THE CONTROL L WILL OUTPUT TO THE LINE PRINTER AND THE PROGRAM WILL ATTEMPT TO CONTINUE AS IF A CONTROL E WAS TYPED IN.

CONTROL D

THIS WILL ALLOW THE ABILITY TO CHANGE THE SWITCH REGISTER DURING PROGRAM OPERATION. TYPING THIS CHARACTER WILL RESULT IN AN INTERROGATION OF THE SWITCH REGISTER QUESTION AS DESCRIBED IN SECTION 8.6.

CONTROL S

THIS WILL STOP PROGRAM EXECUTION AND WAIT IN A LOOP FOR A CONTINUE. THE ONLY WAY TO CONTINUE WILL BE TO TYPE A CONTROL Q, R OR C . THIS IS A NONPRINTING CHARACTER.

CONTROL Q

THIS IS TO CONTINUE A PROGRAM AFTER A CONTROL S IS TYPED. THIS IS A NONPRINTING CHARACTER.

7.5 WAITING MESSAGE

THE WAITING MESSAGE IS USED TO ALLOW THE OPERATOR TIME TO MAKE A DECISION AS TO WHAT CONTROL CHARACTER TO TYPE. THIS MESSAGE MAY APPEAR AT THE END OF PASS MESSAGE IF THE HALT ON PASS BIT IS SET. THE CONTROL CHARACTERS MAY NOW BE USED TO PERFORM THE NEEDED FUNCTION.

THE WAITING MESSAGE MAY BE PRINTED AFTER AN ERROR MESSAGE IF THE HALT ON ERROR BIT IS SET. HERE AGAIN THE CONTROL CHARACTERS MAY BE USED. THE WAITING MESSAGE MAY BE PRINTED IF OPERATOR INTERVENTION IS REQUIRED.

7.6 SWITCH REGISTER MESSAGE

THIS MESSAGE IS USED TO SETUP THE PSEUDO SWITCH REGISTER BEFORE PROGRAM EXECUTION TAKES PLACE. THE SWITCH REGISTER IS SETUP WHEN THE FOURTH CHARACTER IS ENTERED OR A CARRIAGE RETURN IS TYPED

SR=0000 4000

UNDER SCORING INDICATES OPERATOR RESPONSE

7.7 END OF PASS

AN INDICATION WILL BE GIVEN WHEN THE DIAGNOSTIC HAS MADE A SUCCESSFUL PASS. THE PRINT-OUT WILL INDICATE THE DIAGNOSTIC MAINDEC NUMBER THE WORD PASS AND A FOUR DIGIT PASS NUMBER. A PASS WILL BE A TIME PERIOD RATHER THAN A PROGRAM PASS OF THE DIAGNOSTIC. THE TIME PERIOD WILL BE IN THE RANGE OF ONE (1) TO FIVE (5) MINUTES. IF THE DIAGNOSTIC MAKES A PROGRAM PASS IN THE 1 TO 5 MINUTE RANGE THEN THE PASS COUNT WILL BE THE SAME AS THE NUMBER OF PROGRAM PASSES. IF THE PROGRAM MAKES A PROGRAM PASS IN LESS THAN ONE MINUTE THEN THE PASS COUNT WILL NOT BE THE SAME AS THE PASS COUNTER THE PASS COUNTER WILL REFLECT MORE THAN ONE PROGRAM PASS.

IF HALT AT END OF PASS IS SET THEN THE PASS MESSAGE WILL BE
PRINTED AND A WAITING STATEMENT WILL ALSO BE PRINTED.
A CONTROL CHARACTER IS NEEDED TO CONTINUE FROM THIS MESSAGE.
THE FORMAT OF THE END OF PASS MESSAGE IS

NAME PASS 0001

7.8 ERRORS

THE STANDARD ERROR REPORTS AS DESCRIBED IN SECTION 6
OF THIS DOCUMENT WILL BE USED.

7.9 SWITCH REGISTER SETTINGS

THE STANDARD SWITCH SETTINGS AS DESCRIBED IN SECTION 5
OF THIS DOCUMENT WILL BE USED.

7.10 PARAMETER CONTROL WORDS

THE CONSOLE PACKAGE USES THE LOCATIONS 20 21 22 FOR THE
FOLLOWING PURPOSES.

LOCATION 20
PSEUDO SWITCH REGISTER

LOCATION 21
HARDWARE IDENTIFIER 1

LOCATION 22
HARDWARE IDENTIFIER 2

LOCATION 0021

BIT ---	OCTAL VALUE -----	FUNCTION WHEN 0 -----	FUNCTION WHEN 1 -----
0	4000	USE PSEUDO SWITCHES	USE HARDWARE SWITCHES
1	2000	NO OPTION 1	HAS OPTION 1
2	1000	NO OPTION 2	HAS OPTION 2
3	400	NO 8A SIMULATOR	HAS 8A SIMULATOR
4	200	NO OPTION SIMULATOR	HAS OPTION SIMULATOR
5	100	NOT ON 8A XOR	ON 8A XOR
6	40	NOT PDP8-E TYPE CPU	PDP8-E TYPE CPU
7-11		8E MEMORY SIZE EX. 1K=00, 2K=01, 3K=02, 4K=03 8K=07, 12K=13, 16K=17, 20K=23 24K=27, 28K=33, 32K=37	

LOCATION 0022

BIT ---	OCTAL VALUE -----	FUNCTION WHEN 0 -----	FUNCTION WHEN 1 -----
0	4000	NOT ON ACT8A LINE	ON ACT 8A LINE
1	2000	NOT ON ACT 8E LINE	ON ACT 8E LINE
2	1000	NOT YET DEFINED	
3	400	DEACTIVE CONSOLE PACKAGE	ACTIVE CONSOLE PACKAGE

7.11 LOCATION CHANGES

THE FOLLOWING LOCATIONS CAN BE CHANGED TO MEET THE SPECIFIC NEED FOR MODIFICATION OF THE DIAGNOSTIC.

5650 IS THE LOCATION FOR THE VALUE OF THE NUMBER OF PROGRAM PASSED NEEDED TO PRINT THE END OF PASS MESSAGE.

6437 IS THE LOCATION SET TO FOUR (4) FILLER CHARACTERS AFTER A CRLF.

8.0 MODIFICATIONS

MODIFICATIONS WERE MADE TO THE DIAGNOSTIC AT THE SAME TIME (REV C) AS THE CONSOLE PKG WAS ADDED. THESE CHANGES ARE NOT RELATED TO THE CONSOLE PKG. EACH LINE OF CODE DELETED WAS EFFECTIVELY DELETED BY THE INSERTION OF THE EXPRESSION /*VB*/ AT THE BEGINNING OF THE LINE. EACH LINE OF CODE INSERTED WILL CONTAIN THE EXPRESSION /VB/.

9.0 LISTING

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1 /MAINDEC-08-DJADA-C A/D CONVERTER, MULTIPLEXER DIAGNOSTIC
2 /COPYRIGHT 1976, DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASS. 01754
3
4 /C8/ MODIFIED TO RUN WITH CONSOLE PACKAGE JANUARY 1976
5
6 /IOT DEFINITIONS
7 4520 ADCL= JMS I XADCL /CLEAR ALL A/D LOGIC
8 4521 ADLM= JMS I XADLM /LOAD MPX REG FROM AC8-11 CLA
9 4522 ADST= JMS I XADST /CLEAR FLAGS, START CONVERSION
10 4523 ADRB= JMS I XADRB /CLEAR DONE, READ A=D BUFFER INTO AC.
11 4524 ADSK= JMS I XADSK /SKIP ON A=D DONE, DO NOT CLEAR FLAG.
12 4525 ADSE= JMS I XADSE /SKIP ON TMG ERROR, DO NOT CLEAR FLAG.
13 4526 ADLE= JMS I XADLE /LOAD ENAB REG FROM AC 2=8, CLA.
14 4527 ADRS= JMS I XADRS /READ STATUS, ENAB, MPX REG INTO AC.
15 4530 CLOE= JMS I XCLOE /AC TO CLOCK ENABLE
16 4531 CLSK= JMS I XCLSK /SKIP ON CLOCK OVERFLOW
17 4532 CLZE= JMS I XCLZE /ONES IN AC CLEAR CLOCK ENABLE REGISTER
18 4533 CLSA= JMS I XCLSA /CLOCK STATUS TO AC, AC ONES CLEAR CLOCK STATUS REGISTER
19 4534 CLED= JMS I XCLED /CLOCK ENABLE TO AC
20 4535 CLAB= JMS I XCLAB /AC ONES TO CLOCK BUFFER
21 4536 DISD= JMS I XDISD /SKIP ON DISPLAY DONE
22 4537 DILX= JMS I XDILX /LOAD X
23 4540 DILY= JMS I XDILY /LOAD Y
24 4541 DIXY= JMS I XDIXY /INTENSIFY
25 4542 DILE= JMS I XDILE /LOAD DISPLAY ENABLE FROM AC
26
27 6007 CAF= 6007 /CLEAR ALL FLAGS
28
29 /MPX, ENABLE, STATUS REGISTER
30
31 / 0 AD DONE
32 / 1 TIMING ERROR
33 / 2 ENABLE INTERRUPT ON AD DONE
34 / 3 ENABLE INTERRUPT ON TIMING ERROR
35 / 4 ENABLE EXTERNAL AD START
36 / 5 AUTO-INCREMENT MODE
37 / 6 UNIPOLAR-BIPOLAR
38 / 7 NOT USED
39 / 8-11 MPX CHANNEL 0-17 OCTAL
40
41 /STARTING ADDRESS TEST
42
43 /200 NORMAL START FOR CONTROL LOGIC TESTS
44 /201 IOT SCOPE LOOP
45 /202 DISPLAY CONVERTED VALUE IN AC
46 /203 EXTERNAL ENABLE WITH REAL TIME CLOCK
47 /204 MONOTINICITY TEST
48 /205 RESOLUTION ACCURACY TEST
49 /206 SUCCESSIVE READS TEST
50 /207 MULTIPLEXER NOISE TEST
51 /210 LABB-A SYSTEM TEST
52
53 4553 LAS=JMS I XC8LAS /C8/
54 7402 HLT=7402 /C8/
55

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```

56
57
58 0000 0000 *0
59 0001 0000 0 JMP I RETURN
60 0001 5402
61 0002 0000 RETURN, 0
62 0005 *5
63 BADINT, /*C8*/HLT /UNEXPECTED INTERRUPT
64
65 0005 4475 C8ACTV C8ACTV
66 0006 4514 C8CALA, C8ERR /C8/UNEXPECTED INTERUPT.
67
68 0007 5777* JMP START
69 0010 *10
70 0010 0000 A10, 0 /AUTO INDEX REG
71 0011 0000 A11, 0 /AUTO INDEX REG
72
73
74 0017 *17
75 0017 2112 MSGPNT, ERMSG
76
77 0020 *20
78
79 0020 0000 PSR, 0 /C8/
80 0021 4000 HCW1, 4000 /C8/
81 0022 0000 HCW2, 0 /C8/
82
83 0023 0000 TWENT, 0
84 0024 4000 TWENT1, 4000
85 0025 0000 TWENT2, 0
86 0026 4000 SW0, 4000 /SWITCH REG 0 INHIBIT TYPEOUT
87 0027 2000 SW1, 2000 / 1 HALT ON ERROR
88 0030 1000 SW2, 1000 / 2 SCOPE LOOP OVERRIDE
89 0031 0400 SW3, 0400 / 3 CALIBRATION TEST HALT, ALL 1'S JUMPER INSTALLED
90 0032 0200 SW4, 0200 / 4 DETERMINE PROCESSOR CYCLE TIME, EXTERNAL ENABLE
91 0033 0100 SW5, 0100 / 5 SELECT TEST
92 0034 0040 SW6, 0040 / 6 UNIPOLAR ENABLE
93 0035 0000 TEMP0, 0 /STORAGE BUFFER 0
94 0036 0000 TEMPA, 0 /STORAGE BUFFER A
95 0037 0000 TEMPB, 0 / B
96 0040 0000 TEMPC, 0 / C
97 0041 0000 TEMPD, 0 / D
98 0042 0000 DELAY, 0 /DELAY BETWEEN 2 CONVERSIONS
99 0043 0000 CNTR1, 0 /MONOTINICITY COUNTER
100 0044 0000 TALLY, 0
101 0045 2236 ERR, ERTYP /ERROR REPORT ROUTINE
102 /*C8*/XCONVT, CONVT /DISPLAY CONVERTED VALUE
103 /*C8*/XINSTR, INSTR /IOT SCOPE LOOP
104 /*C8*/XMONOT, MONOT /MONOTINICITY TEST
105 0046 0207 K207, 207 /BELL CODE
106 0047 0212 K212, 212 /LINE FEED
107 0050 0215 K215, 215 /CARRIAGE RETURN
108 0051 7777 M1, 7777
109 0052 7776 M2, 7776
110 0053 7774 M4, 7774

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111 0054 7772 M6, 7772
112 0055 7740 M40, -40
113 0056 1000 K1000, 1000
114 0057 0077 K77, 0077
115 0060 0040 K40, 40
116 0061 0200 K200, 200
117 0062 2200 XMOVE, MOVE
118 /CB*/EXTBL, EXTL
119 0063 5577 XSTOR, STORAG=1
120 0064 3645 XCOMPR, COMPAR
121 /CB*/XRESOL, RESOL
122 /CB*/XNOISE, NOISE
123 /CB*/XGLIT, GLITCH
124 /CB*/XSVST, SVST
125 0065 3330 XPRLP, PRLP
126 0066 0240 BLANK, 240
127 /CB*/CHAR, 260
128
129 0067 0260 CHARA, 260 /CB/
130
131 0070 7777 ERSWIT, 7777
132 0071 0000 CHAN, 0
133 0072 2600 TAL, XTAL
134 0073 2676 SELECT, XSELEC
135 0074 3347 SETUP, XSETUP
136 /CB*/CHNL, 0
137 /CB*/ 1
138 /CB*/ 2
139 /CB*/ 3
140 /CB*/ 4
141 /CB*/ 5
142 /CB*/ 6
143 /CB*/K7, 7
144 /CB*/ 10
145 /CB*/ 11
146 /CB*/ 12
147 /CB*/ 13
148 /CB*/ 14
149 /CB*/ 15
150 /CB*/ 16
151 /CB*/ 17
152 /CB*/ 0
153 0075 4475 C8ACTV= JMS I . /CB*/CHECK FOR ACTIVE CONSOLE PACKAGE
154 0075 3737 ACTVCB
155
156 0102 *102 /CB*/PG 0, LOCS 102 THRU 117 ARE USED BY =
157 0120 *120 /CB*/ = THE CONSOLE PACKAGE (C8).
158
159 /IOT LINKS
160
161
162 0120 2400 XADCL, XXADCL
163 0121 2406 XADLM, XXADLM
164 0122 2414 XADST, XXADST
165 0123 2422 XADRB, XXADRB
    
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166 0124 2430 XADSK, XXADSK
167 0125 2440 XADSE, XXADSE
168 0126 2450 XADLE, XXADLE
169 0127 2456 XADRS, XXADRS
170 0130 2464 XCLOE, XXCLOE
171 0131 2472 XCLSK, XXCLSK
172 0132 2502 XCLZE, XXCLZE
173 0133 2510 XCLSA, XXCLSA
174 0134 2516 XCLED, XXCLED
175 0135 2524 XCLAB, XXCLAB
176 0136 2532 XDTSD, XXDTSD
177 0137 2542 XDILX, XXDILX
178 0140 2550 XDILY, XXDILY
179 0141 2556 XDIXY, XXDIXY
180 0142 2564 XDILE, XXDILE
181 0143 0530 FIRST, 0530
182 0144 0000 LAST, 0
183 0145 0530 NOW, 0530
184 0146 0130 CLKNOW, 0130
185 0147 0050 SCPNOW, 0050
186 0150 0000 CSNOW, 0
187 0151 0000 ERILSB, 0 /VB*/ERROR COUNTER.
188 0152 0000 TEMPLB, 0 /VB*/STORAGE FOR RESOLUTION DIFFERENCE.
189
190
191 0153 0760 XC8LAS, C8LAS /CB/
192
193 0154 0000 C8SVSR, 0 /CB*/SR SOMETIMES SAVED HERE.
194
195
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197
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201 0200 *200
202
203 0200 4777* JMS C8STAR /CB*/NORMAL START.
204 0201 4777* JMS C8STAR /CB*/IOT SCOPE LOOP OPTION.
205 0202 4777* JMS C8STAR /CB*/DISPLAY CONVERTED VALUE OPTION.
206 0203 4777* JMS C8STAR /CB*/EXTERNAL ENABLE TEST.
207 0204 4777* JMS C8STAR /CB*/MONOTINICITY TEST.
208 0205 4777* JMS C8STAR /CB*/ACCURACY TEST.
209 0206 4777* JMS C8STAR /CB*/SUCCESSIVE READS TEST.
210 0207 4777* JMS C8STAR /CB*/MPX NOISE TEST.
211 0210 4777* JMS C8STAR /CB*/LAB0-A SYSTEM CHECK.
212
213 /CB*/ JMP I START /NORMAL START
214 /CB*/ JMP I XINSTR /IOT SCOPE LOOP OPTION
215 /CB*/ JMP I XCONVT /DISPLAY CONVERTED VALUE OPTION
216 /CB*/ JMP I EXTBL /EXTERNAL ENABLE TEST
217 /CB*/ JMP I XMONOT /MONOTINICITY TEST
218 /CB*/ JMP I XRESOL /ACCURACY TEST
219 /CB*/ JMP I XNOISE /SUCCESSIVE READS TEST
220 /CB*/ JMP I XGLIT /MPX NOISE TEST
    
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221      /*C8*/ JMP I XSYST      /LAB8-A SYSTEM CHECK
222      START, /*C8*/HLT
223
224      0211 4475      C8ACTV
225      0212 4515      C8CALB, C8INQU      /C8/
226
227      0213 4553      LAS
228      0214 0033      AND      SWS      /SELECT SPECIFIC TEST?
229      0215 7440      SZA      /SKIP IF NO
230      0216 4473      JMS I SELECT      /YES
231
232
233      /HOUSEKEEPING
234      0217 4776      INITL, JMS      CLEAN      /RESET TO BASE IOT'S
235      0220 4775      JMS      MESSAGE
236      0221 5432      XLABEL
237      0222 1374      INITH, TAD      (ERMMSG-1
238      0223 3017      DCA      MSGPNT      /INITIALIZE ERROR POINTER
239      0224 6007      CAF
240
241
242      /TEST 0: CHECKS THAT ENABLE BIT2 CAN BE LOADED AND READ BACK
243
244      0225 4474      JMS I SETUP
245      0226 7300      ENA2, CLA CLL
246      0227 1176      TAD      [1000      /GET BITS AND
247      0230 4526      ADLE      /LOAD
248      0231 7450      SNA
249      0232 5235      JMP      .+3
250      0233 4445      JMS I ERR      /AC NOT CLEARED BY ADLE
251      0234 0226      ENA2
252      0235 7040      CMA
253      0236 4527      ADRS      /READ BACK
254      0237 7041      CIA
255      0240 1176      TAD      [1000      /CHECK FOR ONLY 2 SET
256      0241 7450      SNA
257      0242 5247      JMP      .+5
258      0243 4445      JMS I ERR      /WRONG BITS
259      0244 0226      ENA2
260      0245 5250      JMP      ENA3-1
261      0246 5226      JMS I ENA2
262      0247 4472      JMS I TAL      /DONE?
263
264
265      /TEST 1: CHECKS THAT ENABLE BIT3 CAN BE LOADED AND READ BACK
266
267      0250 4474      JMS I SETUP
268      0251 7300      ENA3, CLA CLL
269      0252 1175      TAD      [0400      /GET BITS AND
270      0253 4526      ADLE      /LOAD
271      0254 7450      SNA
272      0255 5260      JMP      .+3
273      0256 4445      JMS I ERR      /AC NOT CLEARED BY ADLE
274      0257 0251      ENA3
275      0260 7040      CMA

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276      0261 4527      ADRS      /READ BACK
277      0262 7041      CIA
278      0263 1175      TAD      [0400      /CHECK FOR ONLY 3 SET
279      0264 7450      SNA
280      0265 5272      JMP      .+5
281      0266 4445      JMS I ERR      /WRONG BITS
282      0267 0251      ENA3
283      0270 5273      JMP      ENA4-1
284      0271 5251      JMS I ENA3
285      0272 4472      JMS I TAL      /DONE?
286
287
288
289      /TEST 2: CHECKS THAT ENABLE BIT4 CAN BE LOADED AND READ BACK
290
291      0273 4474      JMS I SETUP
292      0274 7300      ENA4, CLA CLL
293      0275 1174      TAD      [0200      /GET BITS AND
294      0276 4526      ADLE      /LOAD
295      0277 7450      SNA
296      0300 5303      JMP      .+3
297      0301 4445      JMS I ERR      /AC NOT CLEARED BY ADLE
298      0302 0274      ENA4
299      0303 7040      CMA
300      0304 4527      ADRS      /READ BACK
301      0305 7041      CIA
302      0306 1174      TAD      [0200      /CHECK FOR ONLY 4 SET
303      0307 7450      SNA
304      0310 5315      JMP      .+5
305      0311 4445      JMS I ERR      /WRONG BITS
306      0312 0274      ENA4
307      0313 5316      JMP      ENA5-1
308      0314 5274      JMS I ENA4
309      0315 4472      JMS I TAL      /DONE?
310
311
312      /TEST 3: CHECKS THAT ENABLE BITS CAN BE LOADED AND READ BACK
313
314      0316 4474      JMS I SETUP
315      0317 7300      ENA5, CLA CLL
316      0320 1173      TAD      [0100      /GET BITS AND
317      0321 4526      ADLE      /LOAD
318      0322 7450      SNA
319      0323 5326      JMP      .+3
320      0324 4445      JMS I ERR      /AC NOT CLEARED BY ADLE
321      0325 0317      ENA5
322      0326 7040      CMA
323      0327 4527      ADRS      /READ BACK
324      0330 7041      CIA
325      0331 1173      TAD      [0100      /CHECK FOR ONLY 5 SET
326      0332 7450      SNA
327      0333 5340      JMP
328      0334 4445      JMS I .+5
329      0335 0317      JMS I ERR      /WRONG BITS
330      0336 5341      JMS I ENA5
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331 0337 5317      JMP ENA5
332 0340 4472      JMS I TAL          /DONE ?
333
334
335
336                /TEST 4: CHECKS THAT ENABLE BIT6 CAN BE LOADED AND READ BACK
337
338 0341 4474      JMS I SETUP
339 0342 7300      ENA6, CLA CLL
340 0343 1172      TAD [40           /GET BITS AND
341 0344 4526      ADLE            /LOAD
342 0345 7450      SNA
343 0346 5351      JMP             .+3
344 0347 4445      JMS I ERR       /AC NOT CLEARED BY ADLE
345 0350 0342      ENA6
346 0351 7040      CMA
347 0352 4527      ADRS           /READ BACK
348 0353 7041      CIA
349 0354 1172      TAD [40           /CHECK FOR ONLY 6 SET
350 0355 7450      SNA
351 0356 5363      JMP             .+5
352 0357 4445      JMS I ERR       /WRONG BITS
353 0360 0342      ENA6
354 0361 5773      JMP MUX8A
355 0362 5342      JMP ENA6
356 0363 4472      JMS I TAL       /DONE?
357 0364 5773      JMP MUX8A
358
359 0373 0400
360 0374 2111
361 0375 2322
362 0376 3000
363 0377 3400
364                PAGE
365
366                /TEST 5: CHECKS THAT MUX BIT8 CAN BE LOADED AND READ BACK
367
368 0400 4474      MUX8A, JMS I SETUP
369 0401 7300      MUX8, CLA CLL
370 0402 1171      TAD [10           /GET BITS AND
371 0403 4521      ADLM            /LOAD
372 0404 7450      SNA
373 0405 5210      JMP             .+3
374 0406 4445      JMS I ERR       /AC NOT CLEARED BY ADLM
375 0407 0401      MUX8
376 0410 7040      CMA
377 0411 4527      ADRS           /READ BACK
378 0412 7041      CIA
379 0413 1171      TAD [10           /CHECK FOR ONLY 8 SET
380 0414 7450      SNA
381 0415 5222      JMP             .+5
382 0416 4445      JMS I ERR       /WRONG BITS
383 0417 0401      MUX8
384 0420 5223      JMP MUX9-1

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385 0421 5201      JMP MUX8
386 0422 4472      JMS I TAL       /DONE?
387
388
389                /TEST 6: CHECKS THAT MUX BIT9 CAN BE LOADED AND READ BACK
390
391 0423 4474      JMS I SETUP
392 0424 7300      MUX9, CLA CLL
393 0425 1170      TAD [4           /GET BITS AND
394 0426 4521      ADLM            /LOAD
395 0427 7450      SNA
396 0430 5233      JMP             .+3
397 0431 4445      JMS I ERR       /AC NOT CLEARED BY ADLM
398 0432 0424      MUX9
399 0433 7040      CMA
400 0434 4527      ADRS           /READ BACK
401 0435 7041      CIA
402 0436 1170      TAD [4           /CHECK FOR ONLY 9 SET
403 0437 7450      SNA
404 0440 5245      JMP             .+5
405 0441 4445      JMS I ERR       /WRONG BITS
406 0442 0424      MUX9
407 0443 5246      JMP MUX10-1
408 0444 5224      JMP MUX9
409 0445 4472      JMS I TAL       /DONE?
410
411
412
413                /TEST 7: CHECKS THAT MUX BIT10 CAN BE LOADED AND READ BACK
414
415 0446 4474      JMS I SETUP
416 0447 7300      MUX10, CLA CLL
417 0450 1167      TAD [2           /GET BITS AND
418 0451 4521      ADLM            /LOAD
419 0452 7450      SNA
420 0453 5256      JMP             .+3
421 0454 4445      JMS I ERR       /AC NOT CLEARED BY ADLM
422 0455 0447      MUX10
423 0456 7040      CMA
424 0457 4527      ADRS           /READ BACK
425 0460 7041      CIA
426 0461 1167      TAD [2           /CHECK FOR ONLY 10 SET
427 0462 7450      SNA
428 0463 5270      JMP             .+5
429 0464 4445      JMS I ERR       /WRONG BITS
430 0465 0447      MUX10
431 0466 5271      JMP MUX11-1
432 0467 5247      JMP MUX10
433 0470 4472      JMS I TAL       /DONE?
434
435
436                /TEST 10: CHECKS THAT MUX BIT11 CAN BE LOADED AND READ BACK
437
438 0471 4474      JMS I SETUP
439 0472 7301      MUX11, CLA CLL IAC

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440 0473 4521 ADLM /LOAD
441 0474 7450 SNA
442 0475 5300 JMP ,+3
443 0476 4445 JMS I ERR /AC NOT CLEARED BY ADLM
444 0477 0472 MUX11
445 0500 7040 CMA
446 0501 4527 ADRS /READ BACK
447 0502 7041 CIA
448 0503 7001 IAC /CHECK FOR ONLY 11 SET
449 0504 7450 SNA
450 0505 5312 JMP ,+5
451 0506 4445 JMS I ERR /WRONG BITS
452 0507 0472 MUX11
453 0510 5351 JMP TSTJAM-1
454 0511 5272 JMP MUX11
455 0512 4472 JMS I TAL /DONE?
456
457
458 /TEST 11: TEST THAT ADCL CLEARS MUX AND ENABLE BITS
459 0513 4474 JMS I SETUP
460 0514 7240 TSTADC, CLA CMA /SET AC=7777
461 0515 4521 ADLM /LOAD MUX
462 0516 7240 CLA CMA /SET AC=7777
463 0517 4526 ADLE /LOAD ENABLES
464 0520 4520 ADCL /CLEAR ALL
465 0521 4527 ADRS /READ STATUS
466 0522 0377 AND (1777 /MASK
467 0523 7450 SNA /ANY SET?
468 0524 5331 JMP ,+5 /NO, NEXT TEST
469 0525 4445 JMS I ERR /YES, ERROR
470 0526 0514 TSTADC
471 0527 5332 JMP TSTCAF-1 /NEXT TEST
472 0530 5314 JMP TSTADC /LOOP ADR.
473 0531 4472 JMS I TAL /DONE?
474
475 /TEST 12: TEST THAT CAF CLEARS MUX AND ENABLE BITS
476 0532 4474 JMS I SETUP
477 0533 7240 TSTCAF, CLA CMA /SET AC=7777
478 0534 4521 ADLM /LOAD MUX
479 0535 7240 CLA CMA /SET AC=7777
480 0536 4526 ADLE /LOAD ENABLES
481 0537 6007 CAF /CLEAR ALL
482 0540 4527 ADRS /READ STATUS
483 0541 0377 AND (1777 /MASK
484 0542 7450 SNA /ANY SET?
485 0543 5350 JMP ,+5 /NO, NEXT TEST
486 0544 4445 JMS I ERR /YES, ERROR
487 0545 0533 TSTCAF
488 0546 5351 JMP TSTJAM-1 /NEXT TEST
489 0547 5333 JMP TSTCAF /LOOP ADR.
490 0550 4472 JMS I TAL /DONE?
491
492 /TEST 13: TEST THAT ADRB JAM TRANSFERS TO AC
493 0551 4474 JMS I SETUP
494 0552 7240 TSTJAM, CLA CMA /AC=7777

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495 0553 4523 ADRB /SHOULD CLEAR AC
496 0554 3036 DCA /SAVE AC
497 0555 7000 NOP
498 0556 4523 ADRB /READ WITH AC=0
499 0557 7041 CIA
500 0560 1036 TAO /TEMPA
501 0561 7450 SNA /NOT EQUAL ?
502 0562 5367 JMP ,+5
503 0563 4445 JMS I ERR /NO-ERROR
504 0564 0552 TSTJAM
505 0565 5776 JMP TSTDON-1
506 0566 5352 JMP TSTJAM
507 0567 4472 JMS I TAL
508 0570 5776 JMP TSTDON-1
509 0576 0600
510 0577 1777
511 0600 PAGE
512
513 /TEST 14: CHECK TO SET DONE FLAG AND CLEAR DONE FLAG
514 0600 4474 JMS I SETUP
515 0601 7200 TSTDON, CLA
516 0602 4522 ADST /CONVERT, RESULTS NOT NEEDED
517 0603 1166 TAD [-100
518 0604 3035 DCA TEMP0
519 0605 2035 ISZ TEMP0
520 0606 5205 JMP ,+1
521 0607 4524 ADSK
522 0610 7410 SKP
523 0611 5215 JMP ,+4
524 0612 4445 JMS I ERR /FLAG NOT SET
525 0613 0601 TSTDON
526 0614 5233 JMP TSTERR-1
527 0615 4524 ADSK
528 0616 7410 SKP
529 0617 5223 JMP ,+4
530 0620 4445 JMS I ERR /ADSK CLEARED DONE IN ERROR
531 0621 0601 TSTDON
532 0622 5233 JMP TSTERR-1
533 0623 4520 ADCL /CLEAR FLAG
534 0624 4524 ADSK /CHECK FOR FLAG
535 0625 5232 JMP ,+5 /FLAG CLEARED
536 0626 4445 JMS I ERR /FLAG NOT CLEARED
537 0627 0601 TSTDON
538 0630 5233 JMP TSTERR-1
539 0631 5201 JMP TSTDON
540 0632 4472 JMS I TAL
541
542 /TEST 15: CHECK TO SET TIMING ERROR FLAG AND CLEAR TIMING ERROR FLAG
543 0633 4474 JMS I SETUP
544 0634 7200 TSTERR, CLA
545 0635 4522 ADST /TWO A-D STARTS TO PRODUCE TIMING ERROR
546 0636 4522 ADST
547 0637 4525 ADSE /CHECK FOR TIMING ERROR FLAG
548 0640 7410 SKP

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549 0641 5244 JMP +3
550 0642 4445 JMS I ERR /FLAG NOT SET
551 0643 0634 TSTERR
552 0644 4525 ADSE
553 0645 7410 SKP
554 0646 5252 JMP +4
555 0647 4445 JMS I ERR
556 0650 0634 TSTERR
557 0651 5262 JMP TSTSR0-1
558 0652 4520 ADCL /CLEAR FLAG
559 0653 4525 ADSE /CHECK FLAG
560 0654 5261 JMP +5
561 0655 4445 JMS I ERR /FLAG NOT CLEARED
562 0656 0634 TSTERR
563 0657 5262 JMP TSTSR0-1
564 0660 5234 JMP TSTERR
565 0661 4472 JMS I TAL
566
567
568 /TEST 16: CHECK TO SET DONE FLAG AND READ BACK VIA STATUS REG
569 0662 4474 JMS I SETUP
570 0663 7200 TSTSR0, CLA
571 0664 4522 ADST /CONVERT, RESULTS NOT NEEDED
572 0665 1166 TAD [-100
573 0666 3035 DCA TEMP0
574 0667 2035 ISZ TEMP0
575 0670 5267 JMP -1
576 0671 4524 ADSK
577 0672 7410 SKP
578 0673 5277 JMP +4
579 0674 4445 JMS I ERR /FLAG NOT SET
580 0675 0663 TSTSR0
581 0676 5307 JMP TSTSR1-1
582 0677 4527 ADRS /READ STATUS
583 0700 7510 SPA /BIT 0 SET ?
584 0701 5306 JMP +5 /YES
585 0702 4445 JMS I ERR /FLAG FAILED TO READ INTO BIT 0
586 0703 0663 TSTSR0
587 0704 5307 JMP TSTSR1-1 /NEXT TEST
588 0705 5263 JMP TSTSR0
589 0706 4472 JMS I TAL
590
591 /TEST 17: CHECK TO SET TIMING ERROR FLAG AND READ BACK VIA STATUS REG
592 0707 4474 JMS I SETUP
593 0710 7200 TSTSR1, CLA
594 0711 4522 ADST /TWO A-D STARTS TO PRODUCE TIMING ERROR
595 0712 4522 ADST
596 0713 4525 ADSE /CHECK FOR TIMING ERROR FLAG
597 0714 7410 SKP
598 0715 5321 JMP +4
599 0716 4445 JMS I ERR /FLAG NOT SET
600 0717 0710 TSTSR1
601 0720 5332 JMP CLRDON-1
602 0721 4527 ADRS /READ STATUS
603 0722 0377 AND (2000 /MASK

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604 0723 7440 SZA /BIT SET ?
605 0724 5331 JMP +5 /YES
606 0725 4445 JMS I ERR /ERROR FLAG FAILED TO READ INTO STATUS REG
607 0726 0710 TSTSR1
608 0727 5332 JMP CLRDON-1 /NEXT TEST
609 0730 5310 JMP TSTSR1
610 0731 4472 JMS I TAL
611
612
613 /TEST 20: CHECK TO CLEAR DONE FLAG VIA CAF
614 0732 4474 JMS I SETUP
615 0733 7200 CLRDON, CLA
616 0734 4522 ADST /CONVERT, RESULTS NOT NEEDED
617 0735 1166 TAD [-100
618 0736 3035 DCA TEMP0
619 0737 2035 ISZ TEMP0
620 0740 5337 JMP -1
621 0741 4524 ADSK
622 0742 7410 SKP
623 0743 5347 JMP +4
624 0744 4445 JMS I ERR /FLAG NOT SET
625 0745 0733 CLRDON
626 0746 5776* JMP CLRERR-1
627 0747 6007 CAF /CLEAR FLAG
628 0750 4524 ADSK /CHECK FOR FLAG
629 0751 5356 JMP +5 /FLAG CLEARED
630 0752 4445 JMS I ERR /FLAG NOT CLEARED
631 0753 0733 CLRDON
632 0754 5776* JMP CLRERR-1
633 0755 5333 JMP CLRDON
634 0756 4472 JMS I TAL
635 0757 5776* JMP CLRERR-1
636
637 /CB/ *****
638
639 /CB/ ROUTINE TO READ SWITCH REGISTER, IF CONSOLE PKG IS ACTIVE
640 /CB/ THEN SWITCHES WILL BE READ VIA THE CONSOLE PKG, OTHERWISE
641 /CB/ THE HARDWARE FRONT PANEL SWITCHES WILL BE READ.
642
643 0760 0000 CBLAS, 0 /CB/
644 0761 7200 CLA /CB/
645 0762 1775* TAD C0F /CB/IS CONSOLE PKG ACTIVE?
646 0763 7640 SZA CLA /CB/SKP IF NO,
647 0764 5367 JMP C0SR /CB/
648 0765 7604 7604 /CB/(LAS) AC=HARD SR.
649 0766 5760 JMP I CBLAS /CB/RTN TO CALL+1,
650 0767 4503 C0SR, C0CKSN /CB/GET SR (PSUEDO OR HARD) VIA CONS, PKG,
651 0770 5760 JMP I CBLAS /CB/RTN TO CALL+1,
652
653 /CB/ *****
654
655 0775 3432
656 0776 1000
657 0777 2000

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658
659 /TEST 21: CHECK TO CLEAR TIMING ERROR FLAG VIA CAF
660 1000 4474 JMS I SETUP
661 1001 7200 CLRERR, CLA
662 1002 4522 ADST /TWO A-D STARTS TO PRODUCE TIMING ERROR
663 1003 4522 ADST
664 1004 4525 ADSE /CHECK FOR TIMING ERROR FLAG
665 1005 7410 SKP
666 1006 5211 JMP +3
667 1007 4445 JMS I ERR /FLAG NOT SET
668 1010 1001 CLRERR
669 1011 6007 CAF /CLEAR FLAG
670 1012 4525 ADSE /CHECK FLAG
671 1013 5220 JMP +5
672 1014 4445 JMS I ERR /FLAG NOT CLEARED
673 1015 1001 CLRERR
674 1016 5221 JMP STCLDO=1
675 1017 5201 JMP CLRERR
676 1020 4472 JMS I TAL
677
678 /TEST 22: TEST THAT ADST CLEARS DONE
679
680 1021 4474 JMS I SETUP
681 1022 7200 STCLDO, CLA
682 1023 4522 ADST /CONVERT
683 1024 4524 ADSE /WAIT FOR
684 1025 5224 JMP -1 /DONE
685 1026 4522 ADST /CLEAR FLAGS
686 1027 4524 ADSE /DONE SHOULD CLEAR
687 1030 5235 JMP +5 /DID CLEAR, OK
688 1031 4445 JMS I ERR /DONE DID NOT CLEAR
689 1032 1022 STCLDO
690 1033 5236 JMP STCLER=1 /NEXT TEST
691 1034 5222 JMP STCLDO /LOOP ADR
692 1035 4472 JMS I TAL /DONE?
693
694 /TEST 23: TEST THAT ADST CLEARS ERROR
695
696 1036 4474 JMS I SETUP
697 1037 7200 STCLER, CLA
698 1040 4522 ADST /CONVERT
699 1041 4522 ADST /CAUSE ERROR
700 1042 4524 ADSE
701 1043 5242 JMP -1
702 1044 4525 ADSE /MAKE SURE ERROR IS
703 1045 5244 JMP -1 /SET
704 1046 4522 ADST /CLEAR FLAGS
705 1047 4525 ADSE /SKIP IF ERROR DID NOT CLEAR
706 1050 5255 JMP +5 /IT DID CLEAR
707 1051 4445 JMS I ERR /ERROR FLAG DID NOT CLEAR VIA ADST
708 1052 1037 STCLER
709 1053 5777 JMP RBCLDO=1 /NEXT TEST
710 1054 5237 JMP STCLER /LOOP ADDRESS
711 1055 4472 JMS I TAL /DONE?
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713
714 /TEST 24: SET ERROR BY READING A/D BUFFER
715 1056 4474 JMS I SETUP
716 1057 7300 EOCERR, CLA CLL
717 1060 1376 TAD (=24 /SET UP COUNTER
718 1061 3040 DCA TEMPC /LOCATION
719 1062 3037 DCA TEMPB /CLEAR COUNTER
720 1063 4522 EOCER1, ADST /START CONVERSION
721 1064 4523 ADRB /READ BUFFER
722 1065 4523 ADRB
723 1066 4523 ADRB
724 1067 4523 ADRB
725 1070 4523 ADRB
726 1071 4523 ADRB
727 1072 4523 ADRB
728 1073 4523 ADRB
729 1074 4523 ADRB
730 1075 4523 ADRB
731 1076 4523 ADRB
732 1077 4523 ADRB
733 1100 4523 ADRB
734 1101 4523 ADRB
735 1102 4523 ADRB
736 1103 4523 ADRB
737 1104 4523 ADRB
738 1105 4523 ADRB
739 1106 4523 ADRB
740 1107 4523 ADRB
741 1110 4523 ADRB
742 1111 4523 ADRB
743 1112 4523 ADRB
744 1113 4523 ADRB
745 1114 4523 ADRB
746 1115 4523 EOCER2, ADRB
747 1116 4525 ADSE /SKIP IF ERROR
748 1117 7410 SKP
749 1120 2037 ISZ TEMPB /TIMING ERROR DETECTED
750 1121 7000 NOP
751 1122 2040 ISZ TEMPC /DONE ?
752 1123 5263 JMP EOCER1 /NO
753 1124 7300 CLA CLL
754 1125 1037 TAD TEMPB /GET NUMBER OF ERROR FLAGS
755 1126 7440 SZA / = 0
756 1127 5334 JMP +5 /NO
757 1130 4445 JMS I ERR /READING A/D BUFFER AND CONVERTING FAILED
758 1131 1057 EOCERR /TO SET ERROR F=F
759 1132 5775 JMP NOERCL=1 /NEXT TEST
760 1133 5257 JMP EOCERR /LOOP
761 1134 4472 JMS I TAL /DONE
762 1135 5775 JMP NOERCL=1
763 1175 1200
764 1176 7754
765 1177 1213
766 1200

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767
768
769
770 1200 4474      /TEST 25: TEST THAT ERROR DOES NOT SET AFTER ADCL
771 1201 4522      JMS I  SETUP
772 1202 4520      NOERCL, ADST      /START CONVERSION
773 1203 4522      ADCL      /CLEAR ALL
774 1204 4525      ADST      /START CONVERSION
775 1205 5212      ADSE      /ERROR SHOULD NOT BE SET
776 1206 4445      JMP      +5
777 1207 1201      JMS I  ERR      /ERROR FLAG SET, ADCL (CLR BUSY) FAILED
778 1210 5213      NOERCL
779 1211 5201      JMP      RBCLDO-1
780 1212 4472      JMS I  TAL      /DONE ?

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783
784 1213 4474      /TEST 26: TEST THAT ADRB CLEARS THE DONE FLAG
785 1214 7300      RBCLDO, JMS I  SETUP
786 1215 4522      CLA CLL
787 1216 4524      ADST      /CONVERT
788 1217 5216      ADSK      /WAIT FOR DONE
789 1220 4523      JMP      +5
790 1221 4524      ADRB      /READ BUFFER & CLEAR DONE
791 1222 5227      ADSK      /DID DONE CLEAR?
792 1223 4445      JMP      +5
793 1224 1214      JMS I  ERR      /YES,
794 1225 5230      RBCLDO      /NO, ADRB FAILED TO CLEAR DONE FLAG
795 1226 5214      JMP      CLADBU-1
796 1227 4472      JMS I  TAL      /NEXT TEST
797
798
799
800 1230 4474      /TEST 27: TEST THAT CAF CLEARS ADB REGISTER (UNIPOLAR)
801 1231 4522      CLADBU, JMS I  SETUP
802 1232 4524      ADST      /CONVERT
803 1233 5232      ADSK      /DONE ?
804 1234 6007      JMP      +5
805 1235 7200      CAF      /INITIALIZE
806 1236 1377      CLA
807 1237 4526      TAD      (40      /GET BIT 6
808 1240 4523      ADLE      /SET UNIPOLAR
809 1241 7041      ADRB      /READ BUFFER
810 1242 1376      CIA
811 1243 7450      TAD      (7000
812 1244 5251      SNA      /TEST FOR ZERO
813 1245 4445      JMP      +5
814 1246 1231      JMS I  ERR      /CAF FAILED TO CLEAR ADR BUFFER REGISTER
815 1247 5252      CLADBU
816 1250 5231      JMP      CLADBB-1
817 1251 4472      JMS I  TAL      /LOOP ADDRESS
818
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822
823 1252 4474      /TEST 28: TEST THAT CAF CLEARS ADB REGISTER (BIPOLAR)
824 1253 4522      CLADBB, JMS I  SETUP
825 1254 4524      ADST      /CONVERT
826 1255 5254      ADSK      /DONE ?
827 1256 6007      JMP      +5
828 1257 4523      CAF      /INITIALIZE
829 1260 7041      ADRB      /READ DATA
830 1261 1376      CIA
831 1262 7450      TAD      (7000
832 1263 5270      SNA      /#0
833 1264 4445      JMP      +5
834 1265 1253      JMS I  ERR      /CAF FAILED TO CLEAR ADR REG.
835 1266 5271      CLADBB
836 1267 5253      JMP      ALL18-1
837 1270 4472      JMS I  TAL      /NEXT TEST
838
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877 1330 4445 TST35, JMS I ERR /UNEXPECTED INTERRUPT OCCURRED
878 1331 1317 TST3
879 1332 5337 JMP DONINT-1
880 1333 6002 IOF /TURN INT OFF
881 1334 7410 SKP
882 1335 5317 JMP TST3 /LOOP BACK
883 1336 4472 JMS I TAL
884
885
886 /TEST 33: GENERATE INTERRUPT WITH A-D DONE FLAG
887 1337 4474 JMS I SETUP
888 1340 7200 DONINT, CLA
889 1341 4522 ADST /CONVERT
890 1342 4524 AD SK /DONE?
891 1343 5342 JMP /WAIT
892 1344 1164 TAD [DON1
893 1345 3002 DCA RETURN /RETURN POINTER
894 1346 1056 TAD K1000
895 1347 4526 ADLE /LOAD INTERRUPT ENABLE
896 1350 6001 ION
897 1351 7000 NOP
898 1352 6002 IOF
899 1353 4445 JMS I ERR /DID NOT INTERRUPT
900 1354 1340 DONINT
901 1355 5772 JMP ERRINT-1
902 1356 4520 DON1, ADCL /CLEAR WORLD
903 1357 7410 SKP
904 1360 5340 JMP DONINT
905 1361 4472 JMS I TAL
906 1362 5772 JMP ERRINT-1
907 1372 1400
908 1373 7770
909 1374 6000
910 1375 0400
911 1376 7000
912 1377 0040
913 1400

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914 /TEST 34: GENERATE INTERRUPT WITH TIMING ERROR FLAG
915 1400 4474 JMS I SETUP
916 1401 7200 ERRINT, CLA
917 1402 1163 TAD [TMG1
918 1403 3002 DCA RETURN
919 1404 4522 ADST /CAUSE ERROR HERE
920 1405 4522 ADST
921 1406 4524 AD SK /DONE?
922 1407 5206 JMP .-1
923 1410 4525 ADSE /TIMING ERROR?
924 1411 5210 JMP .-1
925 1412 7300 CLA CLL
926 1413 1056 TAD K1000
927 1414 7010 RAR
928 1415 4526 ADLE /LOAD INTERRUPT ENABLE
929 1416 6001 ION /INT ON
930 1417 7000 NOP

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931 1420 6002 IOF /INT OFF
932 1421 4445 JMS I ERR /DID NOT INTERRUPT
933 1422 1401 ERRINT
934 1423 5230 JMP AUTO-1
935 1424 4520 TMG1, ADCL /CLEAR WORLD
936 1425 7410 SKP
937 1426 5201 JMP ERRINT
938 1427 4472 JMS I TAL
939
940
941 /TEST 35: AUTO-INCREMENT MODE TEST
942 1430 4474 JMS I SETUP
943 1431 7300 AUTO, CLA CLL
944 1432 1162 TAD [CHNL-1
945 1433 3011 DCA A11
946 1434 4520 ADCL
947 1435 7200 AUTO1, CLA
948 1436 1411 TAD I A11 /CHANNEL N
949 1437 3036 DCA TEMPA
950 1440 1036 TAD TEMPA
951 1441 7040 CMA
952 1442 3037 DCA TEMPB
953 1443 1033 TAD SWS /AUTO-INCREMENT BIT
954 1444 4526 ADLE /LOAD ENABLE REG
955 1445 1036 TAD TEMPA /CHANNEL N
956 1446 4521 ADLM /LOAD MPX REG
957 1447 4522 ADST /START CONVERSION
958 1450 4524 AD SK /WAIT FOR
959 1451 5250 JMP .-1 /DONE FLAG
960 1452 4527 AD RS /READ STATUS
961 1453 0161 AND [17 /MASK OUT ALL BUT MPX REG
962 1454 3040 DCA TEMPC
963 1455 1036 TAD TEMPA /CHECK IF CHANNEL 17 INCREMENTED TO 0
964 1456 1160 TAD [7761
965 1457 7640 SZA CLA /IF CHANNEL 17 SKIP
966 1460 1037 TAD TEMPB /CHECK FOR CHANNEL N+1
967 1461 1040 TAD TEMPC
968 1462 7450 AUTO2, SNA
969 1463 5267 JMP .+4
970 1464 4445 JMS I ERR /WRONG CHANNEL
971 1465 1431 AUTO
972 1466 5275 JMP TST14-1
973 1467 1040 TAD TEMPC
974 1470 7440 SZA /LAST CHANNEL?
975 1471 5235 JMP AUTO1 /NO
976 1472 7410 SKP
977 1473 5231 JMP AUTO
978 1474 4472 JMS I TAL
979
980
981 /TEST 36: ROUTINE TO CHECK THAT CONVERSION CAN BE MADE IN 22 MICROSECS
982 1475 4474 JMS I SETUP
983 1476 7300 TST14, CLA CLL
984 1477 1377 TAD (=7

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986 1500 3035 DCA TEMP0
987 1501 4520 ADCL
988 1502 4522 ADST /CLEAR ALL LOGIC
989 1503 2035 ISZ /START CONVERSION
990 1504 5303 JMP TEMP0
991 1505 4524 JMP *-1
992 1506 7410 AD SK /CONVERSION MADE IN 22 MICROSECS.?
993 1507 5314 SKD /NO
994 1510 4445 JMS I ,+5 /YES
995 1511 1476 ERR /TIME OUT ERROR
996 1512 5776* JMP TIMDIF-1
997 1513 5276 JMP TST14
998 1514 4472 JMS I TAL
999 1515 5776* JMP TIMDIF-1
1000
1001 1576 1600
1002 1577 7771
1003 1600 PAGE
1004 /TEST 37: ENSURE A TIMING DIFFERENCE EXISTS BETWEEN
1005 /SAMPLING ON CURRENT CHANNEL AND SAMPLING
1006 /ON ANOTHER CHANNEL
1007
1008 1600 4474 JMS I SETUP
1009 1601 4553 TIMDIF, LAS
1010 1602 0061 AND K200 /CHECK PROCESSOR CYCLE TIME
1011 1603 7650 SNA CLA
1012 1604 5325 JMP FINISA /RETURN TO BEGINNING OF LOGIC TESTS
1013 1605 1777* TAD VADST
1014 1606 3227 DCA COD1
1015 1607 1777* TAD VADST
1016 1610 3256 DCA COD3
1017 1611 1776* TAD VADLM
1018 1612 3255 DCA COD2
1019 1613 4520 ADCL /SYNC
1020 1614 4522 ADST /CONVERT
1021 1615 3040 DCA TEMPC /CLEAR
1022 1616 3041 DCA TEMPD /TIMER
1023 1617 4524 AD SK /WAIT FOR DONE
1024 1620 5217 JMP *-1
1025 1621 4520 ADCL
1026 1622 1375 TAD (TIM1 /GET INTERRUPT RETURN
1027 1623 3002 DCA RETURN
1028 1624 1056 TAD K1000 /GET BIT 2
1029 1625 4524 ADLE /ENABLE INTERRUPTS
1030 1626 6001 ION
1031 1627 4522 COD1, ADST /CONVERT AND START TIMER
1032 1630 7001 TIM1, IAC
1033 1631 7001 IAC
1034 1632 7001 IAC
1035 1633 7001 IAC
1036 1634 7001 IAC
1037 1635 7001 IAC
1038 1636 7001 IAC
1039 1637 7001 IAC

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1040 1640 7001 IAC
1041 1641 7001 IAC
1042 1642 5230 JMP TIM1 /LOOP
1043
1044 1643 4475 C0CALC, C0ACTV
1045 1644 4514 CBERR /C0/DONE INTERRUPT FAILED.
1046 1645 7402 HLT /DONE INTERRUPT FAILED
1047 1646 3040 TIM1, DCA TEMPC
1048 1647 4523 ADRB /CLEARS AD DONE FLAG
1049 1650 7300 CLA CLL
1050 1651 1374 TAD (TIM2 /SET INTERRUPT RETURN
1051 1652 3002 DCA RETURN
1052 1653 7301 CLA CLL IAC /AC=1
1053 1654 6001 ION
1054 1655 4521 COD2, ADLM /LOAD MUX
1055 1656 4522 COD3, ADST /CONVERT CH1
1056 1657 7001 TIM1, IAC
1057 1660 7001 IAC
1058 1661 7001 IAC
1059 1662 7001 IAC
1060 1663 7001 IAC
1061 1664 7001 IAC
1062 1665 7001 IAC
1063 1666 7001 IAC
1064 1667 7001 IAC
1065 1670 7001 IAC
1066 1671 5257 JMP TIM2 /LOOP
1067
1068 1672 4475 C0CALD, C0ACTV
1069 1673 4514 CBERR /C0/
1070 1674 7402 HLT
1071 1675 3041 TIM2, DCA TEMPD
1072 1676 4523 ADRB /CLEARS AD DONE FLAG
1073 1677 7300 CLA CLL
1074 1700 1040 TAD TEMPC /GET CH0 TIME
1075 1701 7041 CIA /NEGATE
1076 1702 1041 TAD TEMPD /ADD CH1 TIME
1077 1703 7450 SNA /DIFFERENCE?
1078 1704 5312 JMP TIMERR /NO, ERROR
1079 1705 7510 SPA /CH0 > CH1
1080 1706 5312 JMP TIMERR /YES, ERROR
1081 1707 1052 TAD M2 /WITHIN 2
1082 1710 7500 SMA /YES, ERROR
1083 1711 5316 JMP ,+5 /NO
1084 1712 4445 TIMERR, JMS I ERR /NO TIME DIFFERENCE
1085 1713 1601 TIMDIF /TEST
1086 1714 5317 JMP FINIS /NEXT TEST
1087 1715 5201 JMP TIMDIF /LOOP
1088 1716 4472 JMS I TAL /DONE?
1089
1090 1717 4773* FINIS, JMS NEXTIO /CHANGE IOT'S
1091 1720 5772* JMP INITM /RESTART IF MORE
1092 1721 4553 LAS
1093 1722 0026 AND SW0 /SWITCH SET TO DELETE
1094 1723 7640 SZA CLA /TYPEOUT OF END LOGIC TEST

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1095 1724 5327 JMP .+3
1096 1725 4771* FINISA, JMS MESSAGE
1097 1726 5417 XEND
1098 1727 4475 C8ACTV
1099 1730 4502 C8PASS
1100 1731 5772* JMP INITH /RETURN TO BEGINNING OF LOGIC TESTS.
1101
1102
1103
1104
1105 /ROUTINE TO DISPLAY CONVERTED VALUE IN AC.
1106 1732 4770* CONVY, JMS CLEAN /INITIALIZE IOTS
1107 1733 4520 ADCL /CLEAR WORLD
1108 1734 3035 DCA TEMP0
1109 1735 4553 LAS /LOAD CHANNEL
1110
1111 1736 3154 DCA C8SVSR /C8/SAVE SR.
1112 1737 1154 TAD C8SVSR /C8/
1113
1114 1740 0060 AND K40
1115 1741 4526 /ADLE /LOAD UNIPOLAR BIT
1116 /*C8*/ LAS
1117
1118 1742 1154 TAD C8SVSR /C8/
1119
1120 1743 4521 ADLM /LOAD MPX REG
1121 1744 4522 ADST /CONVERT
1122 1745 4524 ADSK /DONE?
1123 1746 5345 JMP .-1 /WAIT
1124 1747 4523 ADRB /READ A-D BUFFER
1125 1750 2035 ISZ TEMP0 /STALL TO DISPLAY
1126 1751 5350 JMP .-1 /CONVERTED VALUE
1127 1752 2035 ISZ TEMP0 /IN AC FOR
1128 1753 5352 JMP .-1 /33 MILLISECONDS
1129 1754 3040 DCA TEMPC
1130 /*C8*/ LAS /CHECK IF HALT DESIRED
1131
1132 1755 1154 TAD C8SVSR /C8/CHECKIF HALT DESIRED.
1133
1134 1756 0031 AND SW3
1135 1757 7650 SNA CLA
1136 1760 5365 JMP .+5
1137 1761 1040 TAD TEMPC
1138
1139 1762 4475 C8ACTV
1140 1763 4514 C8CALE, C8ERR /C8/TYPE "CONTROL E" IF NOT DONE ADJUSTING.
1141 /C8/THIS IS NOT AN ERROR
1142
1143 1764 7402 HLT
1144 1765 5332 JMP CONVY /PRESS CONTINUE IF NOT DONE ADJUSTING
1145 1770 3000 /LOOP
1146 1771 2322
1147 1772 0222
1148 1773 3016
1149 1774 1675

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1150 1775 1646
1151 1776 2407
1152 1777 2415
2000 PAGE
1153
1154
1155 /ROUTINE TO CHECK FOR EXTERNAL ENABLE FROM REAL TIME CLOCK
1156 2000 4777* EXTL, JMS CLEAN /INITIALIZE IOTS
1157 2001 7200 CLA
1158 2002 4474 JMS I SETUP
1159 2003 1145 TAD NOW
1160 2004 3037 DCA TEMPB /IOT OF CURRENT A/D
1161 2005 1146 TAD CLKNOW
1162 2006 3036 DCA TEMPA /IOT OF CURRENT CLOCK
1163 2007 4520 ADCL /CLEAR ALL
1164 2010 4553 EXTL, LAS
1165 2011 0376 AND /CHECK UNIPOLAR AND EXT'L ENABLES
1166 2012 1032 TAD SW4 /LOAD EXTERNAL ENABLE
1167 2013 4526 ADLE /LOAD INTO ADC
1168
1169 2014 4475 C8ACTV
1170 2015 4507 C8CALF, C8SWIT /C8/
1171 2016 7402 HLT /GET CHANNEL
1172 2017 4553 LAS
1173 2020 0161 AND /17
1174 2021 4521 ADLM /LOAD CHANNEL FROM SW8-11
1175 2022 1375 TAD /4540 /LOAD CLOCK ENABLE REG
1176 2023 4530 CLOE /TRIGGER FROM RTC
1177 2024 7040 CMA
1178 2025 4532 CLZE
1179 2026 4531 CLSK /OCCURS ON OVERFLOW
1180 2027 5226 JMP .-1
1181 2030 4533 CLSA
1182 2031 7240 CLA CMA
1183 2032 4532 CLZE /STOP CLOCK
1184 2033 7200 CLA
1185 2034 1374 TAD /-100
1186 2035 3035 DCA TEMP0
1187 2036 2035 ISZ TEMP0 /TIME OUT
1188 2037 5236 JMP .-1
1189 2040 4524 ADSK
1190 2041 7410 SKP /CONVERSION NOT MADE
1191 2042 5246 JMP OV3
1192 2043 4773* JMS ERCOM
1193 2044 4644 EMSG22
1194 2045 7000 NOP
1195 2046 4523 OV3, ADRB
1196 2047 3041 DCA TEMPD /STORE CONVERSION
1197 2050 4553 LAS
1198 2051 0030 AND SW2 /LOOP?
1199 2052 7650 SNA CLA
1200 2053 5262 JMP EXTTE /YES
1201 2054 1041 TAD TEMPD /HALT WITH CONVERTED
1202
1203 2055 7421 MQL /C8/ALSO IN MQ REG.

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1204 2056 4475          C8ACTV
1205 2057 4514          C8CALG, C8ERR          /C8/CONVERTED VALUE DISPLAYED IN MQ,
1206 2060 7402          HLT          /VALUE IN AC.
1207 2061 7000          NOP
1208 2062 7240          EXTTE, CLA CMA
1209 2063 4532          CLZE          /CLEAR CLOCK ENABLE REG
1210 2064 7200          CLA
1211 2065 4520          ADCL          /CLEARS ALL LOGIC
1212 2066 1032          TAD          SW4
1213 2067 4526          ADLE          /LOAD EXT'L ENABLE INTO ADC
1214 2070 7240          CLA CMA
1215 2071 4535          CLAB          /SET THEN CLEAR
1216 2072 7200          CLA          /CLOCK BUFFER TO CHECK
1217 2073 4535          CLAB          /ERRONEOUS START PULSE FROM CLOCK
1218 2074 1372          TAD          (-6
1219 2075 3040          DCA          TEMPC
1220 2076 2040          ISZ          TEMPC
1221 2077 5276          JMP          *-1
1222 2100 4524          ADSK          /IF FLAG FOUND REPORT ERROR
1223 2101 5306          JMP          OVERR
1224 2102 4773          JMS          ERCOM
1225 2103 4644          MSG22
1226 2104 7000          NOP
1227 2105 4520          ADCL
1228 2106 7200          OVERR, CLA
1229 2107 1046          TAD          K207
1230 2110 4771          JMS          PRLP          /RING BELL
1231 2111 5210          OVL, JMP          EXT1
1232 2112 4334          ERMSG, MSG6
1233 2113 4334          MSG6
1234 2114 4334          MSG6
1235 2115 4334          MSG6
1236 2116 4334          MSG6
1237 2117 4444          MSG11
1238 2120 4444          MSG11
1239 2121 4444          MSG11
1240 2122 4444          MSG11
1241 2123 5065          MSG31
1242 2124 5343          MSG42
1243 2125 4311          MSG4
1244 2126 4200          MSG1
1245 2127 4232          MSG2
1246 2130 4732          MSG25
1247 2131 4765          MSG26
1248 2132 5022          MSG27
1249 2133 5043          MSG30
1250 2134 5113          MSG32
1251 2135 5132          MSG33
1252 2136 5152          MSG34
1253 2137 5177          MSG35
1254 2140 5221          MSG36
1255 2141 5243          MSG37
1256 2142 5243          MSG37
1257 2143 5265          MSG40
1258 2144 4270          MSG3

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1259 2145 4360          MSG7
1260 2146 4410          MSG10
1261 2147 4477          MSG13
1262 2150 4537          MSG14
1263 2151 5306          MSG41
1264 2152 0000          0
1265 2171 3330
1266 2172 7772
1267 2173 2713
1268 2174 7700
1269 2175 4540
1270 2176 0040
1271 2177 3000          PAGE
1272
1273
1274          /SUBROUTINE TO MOVE VARIABLE LENGTH DATA FIELDS
1275
1276 2200 0000          MOVE, 0
1277 2201 7300          CLA CLL
1278 2202 1400          TAD I          /GET "FROM ADDR" AND
1279 2203 3233          DCA FADDR          /STORE
1280 2204 2200          ISZ MOVE
1281 2205 1400          TAD I          /GET "TO ADDR" AND
1282 2206 3234          DCA TADDR          /STORE
1283 2207 2200          ISZ MOVE
1284 2210 1600          TAD I          /GET "MOVE COUNT" AND
1285 2211 3235          DCA MCTR          /STORE
1286 2212 2200          ISZ MOVE          /SETUP FOR EXIT
1287 2213 1777          MOVEA, TAD C8F          /C8/CONSOLE PKG ACTIVE?
1288 2214 7650          SNA CLA          /C8/SKP IF YES.
1289 2215 5223          JMP C8MOV8          /C8/
1290 2216 1200          TAD MOVE          /C8/IS BUFFER "STORAG" BEING MOVED?
1291 2217 7041          CIA          /C8/
1292 2220 1376          TAD (C8RESO          /C8/
1293 2221 7650          SNA CLA          /C8/SKP IF NO.
1294 2222 6211          CDF 10          /C8/DF=FIELD 1.
1295
1296
1297 2223 1633          C8MOV8, TAD I FADDR          /GET "FROM" WORD
1298 2224 3634          DCA I TADDR          /STORE AT "TO" LOCATION
1299
1300 2225 6201          CDF 00          /C8/DF=FLD 0.
1301
1302 2226 2233          ISZ FADDR          /+1 TO "FROM" ADDR
1303 2227 2234          ISZ TADDR          /+1 TO "TO" ADDR
1304 2230 2235          ISZ MCTR          /ALL WORDS MOVED?
1305 2231 5213          JMP MOVEA          /NO, RETURN
1306 2232 5600          JMP I MOVE          /YES, EXIT
1307 2233 0002          FADDR, 0
1308 2234 0000          TADDR, 0
1309 2235 0000          MCTR, 0
1310
1311
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1313          /ERROR TYPEOUT ROUTINE
1314
1315 2236 0000  ERTYP, 0
1316 2237 7200  CLA
1317 2240 1370  TAD IND
1318 2241 7640  SZA CLA
1319 2242 5270  JMP EOUT2 /TYPE ERROR MESSAGE ONE TIME ONLY
1320 2243 4553  LAS
1321 2244 0026  AND /SUPPRESS TYPEOUT?
1322 2245 7710  SPA CLA
1323 2246 5273  JMP EOUT1 /YES
1324 2247 1417  TAD I MSGPNT /GET POINTER FOR ERROR MESSAGE
1325 2250 3252  DCA EOUT
1326 2251 4322  JMS MESSAGE
1327 2252 7402  EOUT, HLT
1328 2253 4322  JMS MESSAGE /TYPE MESSAGE
1329 2254 5371  TXTPC
1330 2255 1236  TAD ERTYP /GET PC
1331 2256 1051  TAD M1
1332 2257 4775  JMS MESS /PRINT OCTAL PC #
1333 2260 1144  TAD LAST /TEST IF ADDITIONAL AD8A'S
1334 2261 7450  SNA
1335 2262 5267  JMP EOUT3 /NO MORE
1336 2263 4322  JMS MESSAGE
1337 2264 5374  TXTIOT
1338 2265 1145  TAD NOW /GET DEVICE CODE
1339 2266 4775  JMS MESS /TYPE IT
1340 2267 4774  EOUT3, JMS CRLF
1341 2270 7200  EOUT2, CLA
1342 2271 1370  TAD IND
1343 2272 7650  SNA CLA
1344 2273 2370  EOUT1, ISZ IND
1345 2274 4553  LAS
1346 2275 0027  AND SW1 /HALT ON ERROR SWITCH ON?
1347 2276 7650  SNA CLA /SKIP IF ON
1348 2277 5305  JMP SCOPE
1349 2300 1236  TAD ERTYP
1350 2301 1051  TAD M1
1351
1352 2302 4475  C8ACTV
1353 2303 4514  C8CALH, C8ERR /CB/
1354
1355 2304 7402  HLT /HALT WITH ERROR P.C. IN AC.
1356 2305 4553  SCOPE, LAS
1357 2306 0030  AND SW2 /OVERRIDE LOOP?
1358 2307 7640  SZA CLA
1359 2310 5320  JMP EXIT1
1360 2311 1636  TAD I ERTYP /NO
1361 2312 3317  DCA EXIT
1362 2313 1017  TAD MSGPNT
1363 2314 1051  TAD M1
1364 2315 3017  DCA MSGPNT
1365 2316 5717  JMP I EXIT
1366 2317 7402  EXIT, HLT
1367 2320 2236  EXIT1, ISZ ERTYP /YES

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1368 2321 5636  JMP I ERTYP
1369
1370
1371          /MESSAGE ROUTINE FOR LOGIC ERRORS
1372
1373 2322 0000  MESSAGE, 0
1374 2323 7240  CLA CMA
1375 2324 1722  TAD I MESSAGE
1376 2325 3010  DCA A10
1377 2326 2322  ISZ MESSAGE
1378 2327 1410  TAD I A10
1379 2330 3341  DCA MSRGHT
1380 2331 1341  TAD MSRGHT
1381 2332 7012  RTR
1382 2333 7012  RTR
1383 2334 7012  RTR
1384 2335 4342  JMS TYPECH
1385 2336 1341  TAD MSRGHT
1386 2337 4342  JMS TYPECH
1387 2340 5327  JMP MESSAGE+5
1388 2341 0000  MSRGHT, 0
1389 2342 0000  TYPECH, 0
1390 2343 0057  AND K77
1391 2344 7450  SNA
1392 2345 5722  JMP I MESSAGE
1393 2346 1055  TAD M40
1394 2347 7510  SPA
1395 2350 5353  JMP ,+3
1396 2351 1373  TAD (240
1397 2352 5366  JMP MTP
1398 2353 7001  IAC
1399 2354 7440  SZA
1400 2355 5360  JMP ,+3
1401 2356 1050  TAD K215
1402 2357 5366  JMP MTP
1403 2360 7001  IAC
1404 2361 7440  SZA
1405 2362 5365  JMP ,+3
1406 2363 1047  TAD K212
1407 2364 5366  JMP MTP
1408 2365 1372  TAD (336
1409 2366 4771  MTP, JMS PRLP
1410 2367 5742  JMP I TYPECH
1411 2370 0000  IND, 0
1412
1413
1414 2371 3330
1415 2372 0336
1416 2373 0240
1417 2374 3337
1418 2375 3131
1419 2376 3611
1420 2377 3432
          PAGE
1421 2400

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1422
1423
1424           /IOT SUBROUTINES
1425
1426 2400 0000 XXADCL, 0
1427 2401 6530 VADCL, 6530 /CLEAR ALL A/D LOGIC
1428 2402 5600 JMP I XXADCL
1429
1430 2403 4475 C8ACTV
1431 2404 4514 C8CALJ, C8ERR /C8/
1432 2405 7402 HLT
1433
1434 2406 0000 XXADLM, 0
1435 2407 6531 VADLM, 6531 /LOAD MPX REG
1436 2410 5606 JMP I XXADLM
1437
1438 2411 4475 C8ACTV
1439 2412 4514 C8CALK, C8ERR /C8/
1440 2413 7402 HLT
1441
1442 2414 0000 XXADST, 0
1443 2415 6532 VADST, 6532 /START CONVERSION
1444 2416 5614 JMP I XXADST
1445
1446 2417 4475 C8ACTV
1447 2420 4514 C8CALL, C8ERR /C8/
1448 2421 7402 HLT
1449
1450 2422 0000 XXADRB, 0
1451 2423 6533 VADRB, 6533 /READ A-D BUFFER
1452 2424 5622 JMP I XXADRB
1453
1454 2425 4475 C8ACTV
1455 2426 4514 C8CALM, C8ERR /C8/
1456 2427 7402 HLT
1457
1458 2430 0000 XXADSK, 0
1459 2431 6534 VADSK, 6534 /SKIP ON A-D DONE
1460 2432 7410 SKP
1461 2433 2230 ISZ XXADSK
1462 2434 5630 JMP I XXADSK
1463
1464 2435 4475 C8ACTV
1465 2436 4514 C8CALN, C8ERR /C8/
1466 2437 7402 HLT
1467
1468 2440 0000 XXADSE, 0
1469 2441 6535 VADSE, 6535 /SKIP ON A/D TIMING ERROR
1470 2442 7410 SKP
1471 2443 2240 ISZ XXADSE
1472 2444 5640 JMP I XXADSE
1473
1474 2445 4475 C8ACTV
1475 2446 4514 C8CALO, C8ERR /C8/
1476 2447 7402 HLT

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1477
1478 2450 0000 XXADLE, 0
1479 2451 6536 VADLE, 6536 /LOAD A/D ENABLE REGISTER
1480 2452 5650 JMP I XXADLE
1481
1482 2453 4475 C8ACTV
1483 2454 4514 C8CALP, C8ERR /C8/
1484 2455 7402 HLT
1485
1486 2456 0000 XXADRS, 0
1487 2457 6537 VADRS, 6537 /READ A/D STATUS REGISTER
1488 2460 5656 JMP I XXADRS
1489
1490 2461 4475 C8ACTV
1491 2462 4514 C8CALQ, C8ERR /C8/
1492 2463 7402 HLT
1493
1494 2464 0000 XXCLOE, 0
1495 2465 6132 VCLOE, 6132 /LOAD CLOCK ENABLE
1496 2466 5664 JMP I XXCLOE
1497
1498 2467 4475 C8ACTV
1499 2470 4514 C8CALR, C8ERR /C8/
1500 2471 7402 HLT
1501
1502 2472 0000 XXCLSK, 0
1503 2473 6131 VCLSK, 6131 /SKIP ON CLOCK OVERFLOW
1504 2474 7410 SKP
1505 2475 2272 ISZ XXCLSK
1506 2476 5672 JMP I XXCLSK
1507
1508 2477 4475 C8ACTV
1509 2500 4514 C8CALS, C8ERR /C8/
1510 2501 7402 HLT
1511
1512 2502 0000 XXCLZE, 0
1513 2503 6130 VCLZE, 6130 /ONES IN AC CLEAR CLOCK ENABLE REG
1514 2504 5702 JMP I XXCLZE
1515
1516 2505 4475 C8ACTV
1517 2506 4514 C8CALT, C8ERR /C8/
1518 2507 7402 HLT
1519
1520 2510 0000 XXCLSA, 0
1521 2511 6135 VCLSA, 6135 /CLOCK STATUS TO AC, AC ONES CLR CLK STATUS REG
1522 2512 5710 JMP I XXCLSA
1523
1524 2513 4475 C8ACTV
1525 2514 4514 C8CALU, C8ERR /C8/
1526 2515 7402 HLT
1527
1528 2516 0000 XXCLED, 0
1529 2517 6134 VCLED, 6134 /CLOCK ENABLE TO AC
1530 2520 5716 JMP I XXCLED
1531

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1532 2521 4475          C8ACTV
1533 2522 4514          C8CALV, C8ERR          /C8/
1534 2523 7402          HLT
1535
1536 2524 0000          XXCLAB, 0
1537 2525 6133          VCLAB, 6133          /AC ONES TO CLOCK BUFFER
1538 2526 5724          JMP I XXCLAB
1539
1540 2527 4475          C8ACTV
1541 2530 4514          C8CALW, C8ERR          /C8/
1542 2531 7402          HLT
1543
1544
1545 2532 0000          XXDISD, 0
1546 2533 6052          VDISD, 6052          /SKIP ON DISPLAY DONE
1547 2534 7410          SKP
1548 2535 2332          ISZ XXDISD
1549 2536 5732          JMP I XXDISD
1550
1551 2537 4475          C8ACTV
1552 2540 4514          C8CALX, C8ERR          /C8/
1553 2541 7402          HLT
1554
1555 2542 0000          XXDILX, 0
1556 2543 6053          VDILX, 6053          /LOAD SCOPE X-AXIS
1557 2544 5742          JMP I XXDILX
1558
1559 2545 4475          C8ACTV
1560 2546 4514          C8CALY, C8ERR          /C8/
1561 2547 7402          HLT
1562
1563 2550 0000          XXDILY, 0
1564 2551 6054          VDILY, 6054          /LOAD SCOPE Y-AXIS
1565 2552 5750          JMP I XXDILY
1566
1567 2553 4475          C8ACTV
1568 2554 4514          C8CALZ, C8ERR          /C8/
1569 2555 7402          HLT
1570
1571 2556 0000          XXDIXY, 0
1572 2557 6055          VDIXY, 6055          /INTENSIFY SCOPE
1573 2560 5756          JMP I XXDIXY
1574
1575 2561 4475          C8ACTV
1576 2562 4514          C8CAL0, C8ERR          /C8/
1577
1578 2563 7402          HLT
1579
1580 2564 0000          XXDILE, 0
1581 2565 6056          VDILE, 6056          /LOAD ENABLE FROM AC, CLEAR AC
1582 2566 5764          JMP I XXDILE
1583
1584 2567 4475          C8ACTV
1585 2570 4514          C8CAL1, C8ERR          /C8/
1586 2571 7402          HLT

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1587
1588
1589 2600 PAGE
1590
1591
1592 /ROUTINE TO CHECK IF TEST COMPLETED ITERATION
1593
1594
1595 2600 0000          XTAL, 0
1596
1597 2601 4553          LAS
1598 2602 0030          AND SW2          /LOOP OVERRIDE?
1599 2603 7640          SZA CLA
1600 2604 5230          JMP XTAL1          /YES
1601 2605 4553          LAS
1602 2606 0033          AND SW5          /TEST SELECTED?
1603 2607 7640          SZA CLA
1604 2610 5214          JMP XTAL3
1605 2611 2044          ISZ TALLY          /DONE WITH TEST?
1606 2612 7410          SKP
1607 2613 5230          JMP XTAL1          /NO
1608 2614 1070          XTAL3, TAD ERSWIT          /CHECK FOR ERROR
1609 2615 7640          SZA CLA          /ERROR THIS PASS?
1610 2616 5224          JMP XTAL2          /NO
1611 2617 1017          TAD MSGPNT          /GET MESSAGE POINTER
1612 2620 1051          TAD M1          /DECREMENT POINTER
1613 2621 3017          DCA MSGPNT          /RESTORE POINTER
1614 2622 1051          TAD M1
1615 2623 3070          DCA ERSWIT          /RESTORE ERROR INDICATOR
1616 2624 1200          XTAL2, TAD XTAL          /SET RETURN ADDRESS
1617 2625 1052          TAD M2
1618 2626 3200          DCA XTAL          /STORE RETURN ADDRESS
1619 2627 5000          JMP I XTAL
1620 2630 2017          XTAL1, ISZ MSGPNT
1621 2631 5000          JMP I XTAL
1622
1623 /POINTER FOR SELECTED TEST OPTION
1624 2632 0225          XTEST, ENA2=1
1625 2633 0250          ENA3=1
1626 2634 0273          ENA4=1
1627 2635 0316          ENA5=1
1628 2636 0341          ENA6=1
1629 2637 0400          MUX8=1
1630 2640 0423          MUX9=1
1631 2641 0446          MUX10=1
1632 2642 0471          MUX11=1
1633 2643 0513          TSTADC=1
1634 2644 0532          TSTCAF=1
1635 2645 0551          TSTJAM=1
1636 2646 0600          TSTDON=1
1637 2647 0633          TSTERR=1
1638 2650 0662          TSTSR0=1
1639 2651 0707          TSTSR1=1
1640 2652 0732          CLRDON=1
1641 2653 1000          CLRERR=1

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1642 2654 1021 STCLDO-1
1643 2655 1036 STCLER-1
1644 2656 1056 EOCERR-1
1645 2657 1200 NOERCL-1
1646 2660 1213 RBCLDO-1
1647 2661 1230 CLADBU-1
1648 2662 1252 CLADBB-1
1649 2663 1271 ALL1S-1
1650 2664 1316 TST3-1
1651 2665 1337 DONINT-1
1652 2666 1400 ERRINT-1
1653 2667 1430 AUTO-1
1654 2670 1475 TST14-1
1655 2671 1600 TIMDIF-1
1656 2672 0000 0
1657 2673 0000 0
1658 2674 0000 0
1659 2675 0000 0
1660
1661 /ROUTINE TO SELECT SPECIFIC LOGIC TEST SUBROUTINE
1662
1663 2676 0000 XSELEC, 0
1664 2677 4553 LAS /GET TEST
1665 2700 0377 AND (37
1666 2701 3035 DCA TEMP0 /BEGIN ADDR, OF TEST LIST
1667 2702 1376 TAD (XTEST
1668 2703 1035 TAD TEMP0
1669 2704 3312 DCA JMPLOC
1670 2705 1035 TAD TEMP0
1671 2706 1375 TAD (ERMSG /BEGIN ADDR, OF ERROR MSG, LIST
1672 2707 1051 TAD M1
1673 2710 3017 DCA MSGPNT /MSG, PTR, SET IN AUTO17
1674 2711 5712 JMP I JMPLOC /GO DO TEST
1675 2712 0000 JMPLOC, 0
1676
1677
1678 /ERROR HANDLER FOR OPEN LOOP TESTS
1679
1680 2713 0000 ERCOM, 0
1681 2714 1313 TAD ERCOM
1682 2715 1051 TAD M1
1683 2716 3362 DCA ERPC /ADDRESS OF ERROR
1684 2717 1713 TAD I ERCOM /GET MESSAGE ADDRESS
1685 2720 3326 DCA MSGADR
1686 2721 2313 ISZ ERCOM
1687 2722 4553 LAS
1688 2723 7110 SPA CLA /INHIBIT TYPEOUT?
1689 2724 5345 JMP ERCOM1 /YES=SKIP OVER
1690 2725 4774 JMS MESSAGE
1691 2726 0000 MSGADR, 0 /ERROR MESSAGE
1692 2727 4773 JMS CRLF
1693 2730 4774 JMS MESSAGE /PRINT PC =
1694 2731 5371 TXTPC
1695 2732 1362 TAD ERPC

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1697 2733 4772 JMS MESS /PRINT OCTAL PC #
1698 2734 4774 JMS MESSAGE
1699 2735 5403 TXTA /PRINT TEMPA =
1700 2736 1036 TAD TEMPA
1701 2737 4772 JMS MESS /PRINT TEMPA
1702 2740 4774 JMS MESSAGE
1703 2741 5411 TXTB /PRINT TEMPB =
1704 2742 1037 TAD TEMPB
1705 2743 4772 JMS MESS /PRINT TEMPB
1706 2744 4773 JMS CRLF
1707 2745 4553 ERCOM1, LAS
1708 2746 0027 AND SW1 /IS HALT=ON=ERROR SWITCH SET?
1709 2747 7650 SNA CLA /NO=RETURN
1710 2750 5357 JMP ERCLR
1711 2751 2313 ISZ ERCOM /GET "AFTER HALT" RETURN ADDRESS
1712 2752 1362 TAD ERPC /ERROR PC IN AC
1713
1714 2753 7421 MQL /C8/(ALSO IN MQ REG.)
1715 2754 4475 C8ACTV
1716 2755 4514 C8CAL2, C8ERR /C8/
1717 2756 7402 HLT
1718 2757 7300 ERCLR, CLA CLL
1719 2760 3362 DCA ERPC /CLEAR PC STORE AREA
1720 2761 5713 JMP I ERCOM /RETURN
1721 2762 0000 ERPC, 0
1722
1723
1724
1725 2772 3131 PAGE
1726 2773 3337
1727 2774 2322
1728 2775 2112
1729 2776 2632
1730 2777 0037
1731 3000
1732 /IOT REINITIALIZER ROUTINE
1733
1734 3000 0000 CLEAN, 0
1735 3001 7300 CLA CLL
1736 3002 1146 TAD CLKNOW /GET CLOCK IOT
1737 3003 3150 DCA CSNOW /LOAD INTO CURRENT
1738 3004 1377 TAD (CKIOT-1 /STARTING ADDRESS OF CLOCK TABLE
1739 3005 4236 JMS SETCS /REINITIALIZE CLOCK IOT
1740 3006 1147 TAD SCPNOW /GET SCOPE IOT
1741 3007 3150 DCA CSNOW /LOAD INTO CURRENT
1742 3010 1376 TAD (SPIOT-1 /STARTING ADDRESS OF SCOPE TABLE
1743 3011 4236 JMS SETCS /REINITIALIZE SCOPE IOT
1744 3012 1143 TAD FIRST /GET A/D BASE IOT
1745 3013 3145 DCA NOW /LOAD INTO CURRENT
1746 3014 4266 JMS SETIOT /LOAD THE IOT'S
1747 3015 5600 JMP I CLEAN /EXIT
1748
1749
1750 3016 0000 NEXTIO, 0

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1751 3017 7300 CLA CLL
1752 3020 1144 TAD LAST /ANY ADDITIONAL IOT'S
1753 3021 7450 SNA /END OF TABLE?
1754 3022 5234 JMP END /NO
1755 3023 7041 CIA /GET CURRENT IOT CODE
1756 3024 1145 TAD NOW /LAST ONE ?
1757 3025 7650 SNA CLA /YES
1758 3026 5234 JMP END /YES
1759 3027 1145 TAD NOW /GET CURRENT
1760 3030 1375 TAD (10 /UPDATE TO NEXT CODE
1761 3031 3145 DCA NOW /SAVE IT
1762 3032 4266 JMS SETIOT /CHANGE TO NEW IOT
1763 3033 7410 SKP /UPDATE RETURN
1764 3034 2216 END, ISZ NEXTIO /EXIT
1765 3035 5616 JMP I NEXTIO
1766
1767 3036 0000 SETCS, 0
1768 3037 3010 DCA A10 /STARTING ADDRESS OF TABLE
1769 3040 1410 SETCS1, TAD I A10 /GET VALUE
1770 3041 7450 SNA /END OF TABLE?
1771 3042 5636 JMP I SETCS /YES - RETURN
1772 3043 3035 DCA TEMP0 /NO
1773 3044 1435 TAD I TEMP0 /GET CURRENT IOT
1774 3045 0374 AND (7007 /MASK
1775 3046 1150 TAD CSNOW /REINITIALIZE IOT
1776 3047 3435 DCA I TEMP0 /STORE NEW IOT
1777 3050 5240 JMP SETCS1
1778 3051 2465 CKIOT, VCLOE /AC TO CLOCK ENABLE
1779 3052 2473 VCLSK /SKIP ON CLOCK OVERFLOW
1780 3053 2503 VCLZE /ONES IN AC CLEAR CLOCK ENABLE REGISTER
1781 3054 2511 VCLSA /CLOCK STATUS TO AC, AC ONES CLEAR CLOCK STATUS REG.
1782 3055 2517 VCLED /CLOCK ENABLE TO AC
1783 3056 2525 VCLAB /AC ONES TO CLOCK BUFFER
1784 3057 0000 0
1785 3060 2533 SPIOT, VOISD /SKIP ON DISPLAY DONE
1786 3061 2543 VOILX /LOAD SCOPE X-AXIS
1787 3062 2551 VOILY /LOAD SCOPE Y-AXIS
1788 3063 2557 VOIXY /INTENSIFY SCOPE
1789 3064 2565 VOILE /LOAD DISPLAY ENABLE FROM AC
1790 3065 0000 0
1791
1792 3066 0000 SETIOT, 0
1793 3067 7340 CLA CLL CMA
1794 3070 7000 NOP
1795 3071 7000 NOP
1796 3072 1373 TAD (TABIOT /GET SA OF TABLE
1797 3073 3010 DCA A10 /SAVE IT
1798 3074 1410 SETIOT1, TAD I A10 /GET A VALUE
1799 3075 7450 SNA /DONE ?
1800 3076 5305 JMP SETIOT2
1801 3077 3035 DCA TEMP0 /SAVE IT
1802 3100 1435 TAD I TEMP0 /GET CODE
1803 3101 0374 AND (7007 /MASK
1804 3102 1145 TAD NOW /ADD IOT CODE
1805 3103 3435 DCA I TEMP0 /SAVE IT

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1806 3104 5274 JMP SETIOT1 /LOOP
1807 3105 1372 SETIOT2, TAD (EOCER1 /GET POINTER FOR FORCED ERROR ROUTINE
1808 3106 3010 DCA A10 /LOAD AUTO-INDEX
1809 3107 1371 TAD (EOCER1-EOCER2 /GET LENGTH
1810 3110 3035 DCA TEMP0
1811 3111 1770 SEYI03, TAD VADRB /GET READ BUFFER IOT CODE
1812 3112 3410 DCA I A10 /SAVE IT
1813 3113 2035 ISZ TEMP0 /DONE ?
1814 3114 5311 JMP SETIOT3 /NO
1815 3115 5666 JMP I SETIOT /EXIT
1816
1817 3116 2401 TABIOT, VADCL /CLEAR ALL A/D LOGIC
1818 3117 2407 VADLM /LOAD MPX REGISTER, CLA
1819 3120 2415 VADST /CLEAR FLAGS, START CONVERSION
1820 3121 2423 VADRB /CLEAR DONE, READ A/D BUFFER INTO AC
1821 3122 2431 VADSK /SKIP ON A/D DONE
1822 3123 2441 VADSE /SKIP ON A/D TIMING ERROR
1823 3124 2451 VADLE /LOAD A/D ENABLE REGISTER
1824 3125 2457 VADRS /READ STATUS, ENABLE, MPX REGS. INTO AC
1825 3126 0000 0
1826 3127 0000 0
1827 3130 0000 0
1828
1829 3131 0000 /ROUTINE TO PRINT OCTAL NUMBER
1830 3132 3356 MESS, 0
1831 3133 1053 DCA MWORD /SAVE AC
1832 3134 3357 TAD M4
1833 3135 7100 DCA MCOUNT /COUNTER FOR PRINT LOOP
1834 3136 1356 TAD MWORD
1835 3137 7004 RAL /ROTATE 4 BITS TO LOSE LINK
1836 3140 7410 SKP
1837 3141 1356 MESS1, TAD MWORD
1838 3142 7006 RTL
1839 3143 7004 RAL /ROTATE NEXT 3 BITS
1840 3144 3356 DCA MWORD
1841 3145 1356 TAD MWORD
1842 3146 0767 AND K7
1843 /*CB*/ TAD CHAR
1844
1845 3147 1067 TAD CHARA /CB/
1846
1847 3150 4766 JMS PRLP
1848 3151 2357 ISZ MCOUNT /FINISHED PRINTING?
1849 3152 5341 JMP MESS1 /NO-GET NEXT CHARACTER
1850 3153 1066 TAD BLANK
1851 3154 4465 JMS I XPRLP /PRINT BLANK
1852 3155 5731 JMP I MESS
1853 3156 0000 MWORD, 0
1854 3157 0000 MCOUNT, 0
1855 3166 3330
1856 3167 3531
1857 3170 2423
1858 3171 7746
1859 3172 1063
1860 3173 3116

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1861 3174 7007
1862 3175 0010
1863 3176 3057
1864 3177 3050
1865 3200 PAGE
1866 /MONOTINICITY TEST
1867 3200 4777* MONOT, JMS CLEAN /INITIALIZE IOTS
1868 3201 7300 CLA CLL
1869 3202 1052 TAD M2
1870 3203 3042 DCA DELAY
1871 3204 3036 DCA TEMPB /CLEAR N AND
1872 3205 3037 DCA TEMPB /N+1 CONVERSION STORAGE
1873 3206 4520 ADCL /CLEAR ALL LOGIC
1874 3207 4553 LAS
1875 3210 0376 AND (40 /CHECK UNIPOLAR,BIPOLAR
1876 3211 4526 ADLE
1877 3212 4553 LAS
1878 3213 4521 ADLM /LOAD CHANNEL
1879 3214 4522 ADST /START CONVERSION
1880 3215 4524 ADSK /WAIT FOR DONE
1881 3216 5215 JMP *-1
1882 3217 4523 ADRB /READ A-D BUFFER
1883 3220 3036 DCA TEMPB /STORE NTH CONVERSION
1884 3221 2042 ISZ DELAY /DELAY BETWEEN 1ST&2ND CONVERSIONS
1885 3222 5221 JMP *-1
1886 3223 4522 CONT, ADST /START NEXT CONVERSION
1887 3224 4524 ADSK /WAIT FOR DONE
1888 3225 5224 JMP *-1
1889 3226 4523 ADRB /READ A-D BUFFER
1890 3227 3037 DCA TEMPB /SAVE DATA
1891 3230 1036 TAD TEMPB /SUBTRACT
1892 3231 7041 CIA /SUCCESSIVE CONVERSIONS
1893 3232 1037 TAD TEMPB
1894 3233 7510 SPA /DIFFERENCE>0?
1895 3234 7041 CIA /NO, TAKE ABSOLUTE VALUE
1896 3235 7450 SNA /DIFFERENCE 0?
1897 3236 5246 JMP OK /YES, OK,
1898 3237 1051 TAD M1
1899 3240 7650 SNA CLA
1900 3241 5246 JMP OK
1901 3242 4775* JMS ERCOM /DIFFERENCE>1
1902 3243 4671 EMSG23
1903 3244 7000 NOP
1904 3245 5200 JMP MONOT /RETURN LOCATION AFTER HALT
1905 3246 7300 OK, CLA CLL
1906 3247 1037 TAD TEMPB /N+1 CONVERSION BECOMES
1907 3250 3036 DCA TEMPB /N
1908 3251 4475 C8ACTV
1909 3252 4515 C8INQU
1910
1911 3253 5223 JMP CONT /GET N+1 CONVERSION
1912
1913
1914 /ROUTINE TO TEST FOR EQUALITY OF TWO SUCCESSIVE ADRB'S.

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1915
1916 3254 4777* NOISE, JMS CLEAN /INITIALIZE IOTS
1917 3255 7300 CLA CLL
1918 3256 1166 TAD [-100 /SET TALLY FOR 64 TIMES
1919 3257 3035 DCA TEMP0
1920 3260 4553 LAS
1921 3261 0376 AND (40 /CHECK UNIPOLAR ENABLE
1922 3262 4526 ADLE
1923 3263 1030 TAD SW2 /ENABLE DONE BIT
1924 3264 4521 ADLM /LOAD MPX REG
1925 3265 4522 ADST /CONVERT
1926 3266 4524 ADSK /DONE FLAG?
1927 3267 5266 JMP *-1 /NO
1928 3270 4523 ADRB /YES, READ AD BUFFER
1929 3271 3036 DCA TEMPB /STORE
1930 3272 4523 ADRB /RE-READ
1931 3273 3037 DCA TEMPB /STORE
1932 3274 1036 TAD TEMPB /COMPARE FOR EQUALITY
1933 3275 7041 CIA
1934 3276 1037 TAD TEMPB
1935 3277 7640 SZA CLA /TEMPA=TEMPB WITH LINK SET?
1936 3300 5302 JMP ER10 /NO
1937 3301 5306 JMP ER11 /YES=O,K,
1938 3302 4775* ER10, JMS ERCOM /ERROR ROUTINE
1939 3303 4622 EMSG21
1940 3304 5306 JMP ER11 /RETURN LOCATION IF DO NOT HALT
1941 3305 5254 JMP NOISE /RETURN LOCATION IF HALT
1942 3306 7300 ER11, CLA CLL
1943 3307 2035 ISZ TEMP0 /CONTINUE
1944 3310 5265 JMP NOISE1 /YES
1945 3311 4475 C8ACTV
1946 3312 4515 C8INQU
1947 3313 7200 CLA
1948 3314 1046 TAD K207
1949 3315 4330 JMS PRLP /RING BELL
1950 3316 5254 JMP NOISE /DO TEST AGAIN
1951
1952 /SCOPE LOOP FOR IOTS 6XXX.
1953 INSTR, /*C8*/HLT
1954
1955 3317 4475 C8ACTV
1956 3320 4507 C8CALI, C8SWIT /C8/SELECT IOT FROM SR 3-11.
1957 3321 4553 LAS
1958 3322 0374 AND (0777 /MASK OUT AC 0=2
1959 3323 1373 TAD (6000 /CREATE IOT
1960 3324 3325 DCA *-1
1961 3325 7402 HLT /LOCATION OF IOT
1962 3326 7000 NOP /POSSIBLE SKIP
1963 3327 5320 JMP INSTR+1
1964
1965 /PRINT ROUTINE
1966
1967 3330 0000 PRLP, 0
1968 3331 0046 TLS
1969 3332 0041 TSP /XMIT CHARACTER
/ WAIT FOR FLAG

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1970 3333 5332      JMP      *-1
1971 3334 6042      TCF              /CLEAR FLAG
1972 3335 7200      CLA              /RETURN
1973 3336 5730      JMP I PRLP
1974
1975 /CARRIAGE RETURN LINE FEED ROUTINE
1976
1977 3337 0000      CRLF, 0
1978 3340 7240      CLA CMA
1979 3341 0050      AND      K215   /CARRIAGE RETURN CODE
1980 3342 4330      JMS      PRLP   /PRINT ROUTINE
1981 3343 7240      CLA CMA
1982 3344 0047      AND      K212   /LINE FEED CODE
1983 3345 4330      JMS      PRLP   /PRINT ROUTINE
1984 3346 5737      JMP I CRLF      /RETURN
1985
1986 /ROUTINE TO CLEAR WORKING BUFFERS PRIOR TO TEST
1987
1988 3347 0000      XSETUP, 0
1989 3350 4402      JMS I XMOVE    /CLEAR WORK AREA
1990 3351 0035      TEMP0
1991 3352 0036      TEMP1
1992 3353 7773      =5
1993 3354 6002      IOF
1994 3355 6007      CAF
1995 3356 1372      TAD (BADINT
1996 3357 3002      DCA RETURN    /BAD INTERRUPT ADDRESS
1997
1998 3360 7040      CMA
1999 3361 3070      DCA ERSWIT
2000 3362 3764      DCA I XIND
2001 3363 5747      JMP I XSETUP
2002 3364 2370      XIND, IND
2003
2004 3372 0005
2005 3373 6000
2006 3374 0777
2007 3375 2713
2008 3376 0040
2009 3377 3000
2010
2011 PAGE
2012 /CB/ *****
2013
2014 /CB/ ROUTINE TO ENSURE THAT THE PROGRAM IS INITIALIZED FOR RUNNING
2015 /CB/ WITH OR WITHOUT THE CONSOLE PKG REGARDLESS OF THE START ADDRESS.
2016 CBSTAR, 0 /CB/
2017 CLA /CB/
2018 TAD CBIZF /CB/INIT ALREADY DONE?
2019 SNA CLA /CB/SKP IF YES,
2020 JMS CBIZ /CB/GO INITIALIZE,
2021 TAD CBSTAR /CB/RELATIVE TO THE ADDRESS OF THE CALL, =
2022 TAD (-201 /CB/ - DISPATCH TO THE PROPER STARTING =
2023 TAD (CBSTAB /CB/ - ADDRESS THRU TABLE 'CBSTAB'.
2024 DCA XCBSTA /CB/
2025 CBACTV

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2024 3412 4507      CBSTRT, C8SWIT /CB/
2025 3413 1616      TAD I XCBSTA /CB/
2026 3414 3217      DCA XCBSTA /CB/
2027 3415 5617      JMP I XCBSTA /CB/
2028 3416 0000      XCBSTA, 0 /CB/
2029 3417 0000      XCBSTA, 0 /CB/
2030 3420 0211      CBSTAB, START /SA 200 /CB/NORMAL START.
2031 3421 3317      INSTR /SA 201 /CB/IOT SCOPE LOOP OPTION.
2032 3422 1732      CONVT /SA 202 /CB/DISPLAY CONVERTED VALUE OPTION.
2033 3423 2000      EXTL /SA 203 /CB/EXTERNAL ENABLE TEST.
2034 3424 3200      MONOT /SA 204 /CB/MONOTONICITY TEST.
2035 3425 3600      RESOL /SA 205 /CB/ACCURACY TEST.
2036 3426 3254      NOISE /SA 206 /CB/SUCCESSIVE READS TEST.
2037 3427 3433      CLITCH /SA 207 /CB/MPX NOISE TEST.
2038 3430 4000      SYST /SA 210 /CB/LAB8-A SYSTEM CHECK.
2039
2040 3431 0000      CBIZF, 0 /CB/IF=7777, INIT HAS BEEN DONE.
2041 3432 0000      C8F, 0 /CB/IF=7777, CONSOLE PKG IS ACTIVE.
2042
2043 /CB/ *****
2044
2045 /ROUTINE TO CHECK FOR NOISE IN MULTIPLEXER
2046
2047 3433 4774*      GLITCH, JMS CLEAN /INITIALIZE IOTS
2048 3434 7300      CLA CLL
2049 3435 1166      TAD [-100
2050 3436 3035      DCA TEMP0
2051 3437 4553      LAS
2052 3440 0373      AND (40 /CHECK UNIPOLAR ENABLE
2053 3441 4526      ADLE
2054 3442 4553      LAS /OPERATOR TO SELECT CHANNEL
2055 3443 0161      AND [17
2056 3444 3040      DCA TEMP0
2057 3445 1040      TAD TEMP0
2058 3446 4521      ADLM
2059 3447 4522      ADST
2060 3450 4524      ADSK
2061 3451 5250      JMP *-1
2062 3452 4523      ADRB
2063 3453 3036      DCA TEMP1
2064 3454 4304      JMS RANCHN /GET RANDOM CHANNEL
2065 3455 1322      TAD CHNL
2066 3456 4521      ADLM
2067 3457 4527      ADRS /READ ENABLE, STATUS AND MPX
2068 3460 2035      ISZ TEMP0
2069 3461 5254      JMP CHNL1
2070 3462 7300      CLA CLL
2071 3463 4523      ADRB
2072 3464 3037      DCA TEMP0
2073 3465 1036      TAD TEMP1
2074 3466 7041      CIA
2075 3467 1037      TAD TEMP0
2076 3470 7640      SZA CLA
2077 3471 5273      JMP ER40

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2079 3472 5276 JMP OV2
2080 3473 4772 ER40, JMS ERCON /NOISE IN MULTIPLEXER
2081 3474 4706 EMSG24
2082 3475 7000 NOP
2083 3476 7300 OV2, CLA CLL /RETURN ADDR, AFTER HALT
2084 3477 1048 TAD K207
2085 3500 4771 JMS PRLP
2086
2087 3501 4475 C8ACTV
2088 3502 4515 C8INGU
2089
2090 3503 5233 JMP GLITCH
2091
2092 3504 0000 RANchn, 0
2093 3505 1320 TAD FSTNO
2094 3506 7006 RTL
2095 3507 3320 DCA FSTNO
2096 3510 1320 TAD FSTNO
2097 3511 1321 TAD SECNO
2098 3512 7006 RTL
2099 3513 1321 TAD SECNO
2100 3514 7012 RTR
2101 3515 0161 AND [17
2102 3516 3322 DCA CHNL
2103 3517 5704 JMP I RANchn
2104 3520 0437 FSTNO, 0437
2105 3521 2525 SECNO, 2525
2106
2107 3522 0000 CHNL, 0 /CB/
2108 3523 0001 1 /CB/
2109 3524 0002 2 /CB/
2110 3525 0003 3 /CB/
2111 3526 0004 4 /CB/
2112 3527 0005 5 /CB/
2113 3530 0006 6 /CB/
2114 3531 0007 K7, 7 /CB/
2115 3532 0010 10 /CB/
2116 3533 0011 11 /CB/
2117 3534 0012 12 /CB/
2118 3535 0013 13 /CB/
2119 3536 0014 14 /CB/
2120 3537 0015 15 /CB/
2121 3540 0016 16 /CB/
2122 3541 0017 17 /CB/
2123 3542 0000 0 /CB/
2124
2125
2126
2127 3571 3330
2128 3572 2713
2129 3573 0040
2130 3574 3000
2131 3575 3420
2132 3576 7577
2133 3577 7000

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2134 3600 PAGE
2135 /RESOLUTION ACCURACY TEST
2136 3600 4777 /ROUTINE TO PERFORM 1000(10) CONVERSIONS OF ANY GIVEN VOLTAGE ON SELECTED CHANNEL
2137 3601 4474 RESOL, JMS CLEAN /INITIALIZE IOTS
2138 3602 1063 JMS I SETUP
2139 3603 3011 TAD XSTOR
2140 3604 3776 DCA A11
2141 3605 4462 DCA STORAG
2142 3606 5600 JMS I XMOVE /CLEAR WORK AREA
2143 3607 5601 STORAG
2144 3610 6030 STORAG+1
2145 C8RESO, -1750 /CB/
2146
2147 3611 1157 TAD [-1750
2148 3612 3035 DCA TEMP0
2149 3613 4520 ADCL
2150 3614 4553 LAS
2151
2152 3615 3154 DCA C8SVSR /CB/SAVE SR.
2153 3616 1154 TAD C8SVSR /CB/
2154
2155 3617 0375 AND (40 /CHECK UNIPOLAR ENABLE
2156 3620 4526 ADLE
2157 /*C8*/ LAS /GET CHANNEL
2158
2159 3621 7200 CLA /CB/
2160 3622 1154 TAD C8SVSR /CB/GET CHANNEL.
2161
2162 3623 0161 AND [17
2163 3624 3071 DCA CHAN /STORE CHANNEL
2164 3625 1071 TAD CHAN
2165 3626 4521 ADLM
2166 3627 4522 RESOL1, ADST /LOAD CHANNEL
2167 3630 4524 ADST /START CONVERSION
2168 3631 5230 JMP *-1 /SKIP ON DONE
2169 3632 4523 ADRB /READ BUFFER
2170 3633 3036 DCA TEMP1
2171 3634 1774 TAD C8F /CB/
2172 3635 7640 SZA CLA /CB/SKP IF NO.
2173 3636 6211 CDF 10 /CB/DF=FIELD 1.
2174
2175
2176 3637 1036 TAD TEMP1
2177 3640 3411 DCA I A11 /PLACE IN TABLE
2178
2179 3641 6201 CDF 00 /CB/DF=FLO 0.
2180
2181 3642 2035 ISZ TEMP0 /DONE?
2182 3643 5227 JMP RESOL1 /NO
2183 3644 5464 JMP I XCOMPR /YES, NOW COMPARE CONVERSIONS
2184 /ROUTINE TO COMPARE FOR GREATER THAN + OR - 1 LSB DIFFERENCE IN 1000(10) CONVERSIONS
2185
2186 3645 7300 COMPAR, CLA CLL
2187 3646 1156 TAD [-1747

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2108 3647 3035 DCA TEMP0
2109 3650 1063 TAD XSTOR /POINTER FOR FIRST WORD
2190 3651 3011 DCA A11
2191
2192 3652 7200 CLA /C8/CONSOLE PKG ACTIVE?
2193 3653 1774* TAD C8F /C8/
2194 3654 7640 SZA CLA /C8/SKP IF NO.
2195 3655 6211 CDF 10 /C8/DF=FIELD 1.
2196 3656 1411 TAD I A11
2197
2198 3657 6201 CDF 00 /C8/DF=FLD 0.
2199 3660 3036 DCA TEMP1
2200
2201 3661 3151 DCA ER1LSB /VB/CLEAR ERROR COUNTER.
2202 3662 7300 COMPR1, CLA CLL
2203
2204 3663 1774* TAD C8F /C8/CONSOLE PKG ACTIVE?
2205 3664 7640 SZA CLA /C8/SKP IF NO.
2206 3665 6211 CDF 10 /C8/DF=FIELD 1.
2207
2208 3666 1411 TAD I A11
2209
2210 3667 6201 CDF 00 /C8/DF=FLD 0.
2211
2212 3670 3037 DCA TEMPB
2213 3671 1036 TAD TEMP1
2214 3672 7041 CIA
2215 3673 1037 TAD TEMPB
2216
2217
2218 3674 3152 DCA TEMP1B /VB/SAVE THE DIFFERENCE.
2219 3675 1152 TAD TEMP1B /VB/GET THE DIFFERENCE.
2220 3676 7450 SNA /VB/
2221 3677 5307 JMP AOK /VB/OK, TWO WORDS ARE EQUAL.
2222 3700 1373 TAD (-1 /VB/
2223 3701 7650 SNA CLA /VB/
2224 3702 5307 JMP AOK /VB/TWO WORDS ARE LESS THAN + OR - LSB.
2225 3703 1152 TAD TEMP1B /VB/GET THE DIFFERENCE.
2226 3704 1372 TAD (-1 /VB/
2227 3705 7640 SZA CLA /VB/
2228 3706 5332 JMP EROV5 /VB/ERROR-TWO WORDS ARE GREATER THAN + OR - LSB.
2229
2230
2231 /*VB*/ SZA /SKIP HERE
2232 /*VB*/ JMP .+4 /AND
2233 /*VB*/ SNL /HERE IF =
2234 /*VB*/ JMP .+2
2235 /*VB*/ JMP AOK
2236 /*VB*/ SZL
2237 /*VB*/ JMP .+5
2238 /*VB*/ CMA
2239 /*VB*/ SZA /SKIP HERE IF DIFFERENCE +1 LSB
2240 /*VB*/ SKP
2241 /*VB*/ JMP AOK
2242 /*VB*/ CLL

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2243 /*VB*/ RAR
2244 /*VB*/ SZA /SKIP HERE
2245 /*VB*/ JMP .+4 /AND
2246 /*VB*/ SNL /HERE IF DIFFERENCE =1 LSB
2247 /*VB*/ SKP
2248 /*VB*/ JMP AOK
2249 /*VB*/ CLA CLL /CHECK FOR SPECIAL CASE OF 7777 AND 0
2250 /*VB*/ TAD TEMP1
2251 /*VB*/ SZA /A=0?
2252 /*VB*/ SKP /NO
2253 /*VB*/ JMP .+4 /YES
2254 /*VB*/ CMA /A=7777?
2255 /*VB*/ SNA CLA
2256 /*VB*/ JMP OVS /SKIP OVER AND CONTINUE
2257 /*VB*/ JMS ERCOM /ERROR ROUTINE
2258 /*VB*/ MSG20
2259 /*VB*/ NOP /RETURN LOCATION IF DO NOT HALT
2260 /*VB*/ JMP RESOL /RETURN LOCATION IF HALT
2261 /*VB*/ OVS, TAD TEMPB /A =7777 OR 0
2262 /*VB*/ SZA /B=0?
2263 /*VB*/ JMP .+2 /NO
2264 /*VB*/ JMP AOK
2265 /*VB*/ CMA /B=7777?
2266 /*VB*/ SNA CLA
2267 /*VB*/ JMP AOK
2268 /*VB*/ JMS ERCOM /ERROR ROUTINE
2269 /*VB*/ MSG20
2270 /*VB*/ NOP
2271 /*VB*/ JMP RESOL
2272 3707 7300 AOK, CLA CLL
2273 3710 1037 TAD TEMPB
2274 3711 3036 DCA TEMP1
2275 3712 2035 ISZ TEMPB /DONE?
2276 3713 5262 JMP COMPR1
2277 3714 4771* JMS MESSAGE /VB/PRINT "END OF 1000 CONVERSIONS".
2278 3715 5537 HEAD13 /VB/
2279 3716 1151 TAD ER1LSB /VB/PRINT NO OF + OR - 1 LSB ERRORS.
2280 3717 4770* JMS MESS /VB/
2281 3720 4767* JMS CRLF /VB/
2282
2283 3721 2336 ISZ FIVHUN
2284 3722 5200 JMP RESOL
2285 3723 1366 TAD (-764 /COUNT OF 500(10).
2286 3724 3336 DCA FIVHUN
2287 3725 4771* JMS MESSAGE /VB/PRINT END OF TEST MESSAGE.
2288 3726 5555 HEAD14 /VB/
2289
2290 /*VB*/ TAD K207
2291 /*VB*/ JMS PRLP
2292 3727 4475 CBACTV
2293 3730 4515 CBINGU
2294 3731 5200 JMP RESOL /YES, REPEAT TEST
2295 3732 2151 EROV5, ISZ ER1LSB /VB/INCREMENT ERROR COUNTER.
2296 3733 4765* JMS ERCOM /VB/PRINT ERROR MESSAGE.
2297 3734 4571 MSG20 /VB/

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2298 3735 5307          JMP      AOK          /VB/
2299
2300 3736 7014          FIVHUN, =764
2301 3737 0000          ACTVC8, 0          /CB/
2302 3740 3353          DCA  ACSV          /SAVE THE AC
2303 3741 7010          RAR              /GET THE LINK
2304 3742 3354          DCA  LKSV          /SAVE IT
2305 3743 1022          TAD      22          /GET HARDWARE CONFIGURATION WORD 2
2306 3744 0364          AND  (400          /MASK BIT 3
2307 3745 7650          SNA  CLA          /SKIP IF CONSOLE ACTIVE
2308 3746 2337          ISZ  ACTVC8       /BUMP RETURN POINTER
2309 3747 1354          TAD  LKSV          /RESTORE THE LINK
2310 3750 7004          RAL
2311 3751 1353          TAD  ACSV          /RESTORE THE AC
2312 3752 5737          JMP  I ACTVC8     /RETURN
2313 3753 0000          ACSV, 0
2314 3754 0000          LKSV, 0
2315
2316 3764 0400
2317 3765 2713
2318 3766 7014
2319 3767 3337
2320 3770 3131
2321 3771 2322
2322 3772 0001
2323 3773 7777
2324 3774 3432
2325 3775 0040
2326 3776 5600
2327 3777 3000          4000
          PAGE
2328
2329 /LAB0-A SYSTEM CHECK
2330
2331 4000 0000          SYST, 0
2332 4001 4777          JMS  CLEAN        /INITIALIZE IOTS
2333 4002 4474          JMS  I  SETUP     /CLEAR WORK AREA
2334 4003 4520          ADCL              /CLEAR ALL LOGIC
2335
2336 4004 4475          C8CAL3, C8ACTV    /C8/NOT AN ERROR, ALLOWS OPERATOR TO CHANGE SWR
2337 4005 4514          C8ERR
2338 4006 7402          HLT
2339 4007 4553          LAS              /GET CLOCK FREQUENCY
2340 4010 0376          AND  (700
2341 4011 1375          TAD  (4040        /RATE AND ENABLE EXT'L
2342 4012 3040          DCA  TEMPC        /SAVE
2343 4013 1040          TAD  TEMPC
2344 4014 4530          CLOE             /START CLOCK
2345 4015 7040          CMA
2346 4016 4532          CLZE
2347 4017 7200          CLA
2348 4020 1032          TAD  SW4          /EXT START FOR A=D
2349 4021 3035          DCA  TEMP0
2350 4022 4774          JMS  MESSAGE     /TYPE OUT TEST INSTRUCTIONS
2351 4023 5472          AUTMSG

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2352
2353 4024 4475          C8CAL4, C8ACTV    /C8/NOT AN ERROR, ALLOWS OPERATOR TO CHANGE SWR
2354 4025 4514          C8ERR
2355 4026 7402          HLT
2356 4027 4553          LAS              /GET CHANNEL(S)
2357
2358 4030 3154          DCA  C8SVSR       /C8/SAVE SR.
2359 4031 1154          TAD  C8SVSR       /C8/
2360
2361 4032 0033          AND  SW5
2362 4033 7440          SZA
2363 4034 4342          JMS  LSTCHN       /SKIP IF NOT AUTO-INCREMENT
2364 /*C8*/          LAS              /CHECK FOR LAST CHANNEL
2365
2366 4035 7200          CLA
2367 4036 1154          TAD  C8SVSR       /C8/
2368 /C8/
2369 4037 0161          AND  [17
2370 4040 4521          ADLM             /LOAD CHANNEL
2371 4041 4553          LAS
2372 4042 0034          AND  SW6          /CHECK UNIPOLAR OR BIPOLAR
2373 4043 1035          TAD  TEMP0
2374 4044 4526          ADLE             /LOAD EXT ENABLE BIT IF PRESENT
2375 4045 1035          TAD  TEMP0
2376 4046 7650          SNA  CLA          /SKIP FOR EXTL ENABLE
2377 4047 5257          JMP  SYST1
2378 4050 1373          CLKST, TAD  (7001 /-X(MAX) TO RESET SWEEP
2379 4051 3036          DCA  TEMPA        /AND START INITIAL CONVERSION
2380 4052 4533          CLSA
2381 4053 4531          CLSK             /FROM REAL
2382 4054 5253          JMP  .-1          /TIME CLOCK
2383 4055 7240          CLA  CMA
2384 4056 4532          CLZE             /STOP CLOCK
2385 4057 7200          SYST1, CLA
2386 4060 7410          SKP
2387 4061 4522          STCONV, ADST     /START CONVERSION HERE FOR ALL VALUES
2388 4062 4524          ADSK             /OTHER THAN -X(MAX)
2389 4063 5262          JMP  .-1
2390 4064 4527          ADRS
2391 4065 0161          AND  [17
2392 4066 1037          TAD  TEMPB
2393 4067 7001          IAC
2394 4070 7440          SZA
2395 4071 5273          JMP  .+2
2396 4072 4521          ADLM
2397 4073 4475          C8ACTV
2398 4074 4515          C8INQU
2399 4075 7300          CLA  CLL
2400 4076 4523          ADRB             /GET Y VALUE
2401 4077 4540          DILY
2402 4100 7200          CLA
2403 4101 1036          TAD  TEMPA
2404 4102 4537          DILX
2405 4103 7001          IAC             /GET NEXT X VALUE
2406 4104 3036          DCA  TEMPA

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2407 4105 1036 TAD TEMPA
2408 4106 1373 TAD (7001
2409 4107 7640 SZA CLA /SKIP IF +X(MAX)
2410 4110 7410 SKP
2411 4111 5324 JMP RESTR
2412 4112 4536 DISD
2413 4113 5312 JMP .-1
2414 4114 4541 DIXY
2415 4115 1053 TAD M4 /TIME OUT TO ALLOW
2416 4116 3363 DCA TEMPX /TRACE TO RETURN TO 1001(X)
2417 4117 2363 ISZ TEMPX /AND SETTLE
2418 4120 5317 JMP .-1
2419
2420 4121 4553 LAS /C8/DON'T WANT SR, JUST FUDGE A =
2421 4122 7200 CLA /C8/ = CHECK FOR CONTROL CHAR.
2422
2423 4123 5261 JMP STCONV
2424 4124 1040 RESTR, TAD TEMPX /TO RESTART CLOCK
2425 4125 4530 CLOE
2426 4126 7040 CMA
2427 4127 4532 CLZE
2428 /C8*/ LAS
2429
2430 4130 7200 CLA /C8/
2431 4131 1154 TAD C8SVSR /C8/
2432
2433 4132 0033 AND SW5 /A-I MODE
2434 4133 7640 SZA CLA /SKIP IF NO
2435 4134 5250 JMP CLKST
2436 /*C8*/ LAS
2437
2438 4135 7200 CLA /C8/
2439 4136 1154 TAD C8SVSR /C8/
2440
2441 4137 0161 AND [17 /TO CHANGE CHANNEL
2442 4140 4521 ADLM
2443 4141 5250 JMP CLKST /GO
2444 4142 0000 LSTCHN, 0 /CHECK FOR LAST CHANNEL
2445 /*C8*/ LAS
2446
2447 4143 7200 CLA /C8/
2448 4144 1154 TAD C8SVSR /C8/
2449 /IF AUTO INCREMENT MODE
2450 4145 0161 AND [17
2451 4146 7040 CMA
2452 4147 3037 DCA TEMPB
2453 4150 2342 ISZ LSTCHN
2454 4151 2342 ISZ LSTCHN
2455 /*C8*/ LAS
2456
2457 4152 7200 CLA /C8/
2458 4153 1154 TAD C8SVSR /C8/
2459
2460 4154 0033 AND SW5
2461 4155 7650 SNA CLA /SKIP IF AUTO INCREMENT MODE

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2462 4156 5362 JMP .+4
2463 4157 1032 TAD SW4
2464 4160 1033 TAD SW5
2465 4161 3035 DCA TEMP0
2466 4162 5742 JMP I LSTCHN
2467 4163 0000 TEMPY, 0
2468
2469
2470
2471
2472
2473 4173 7001
2474 4174 2322
2475 4175 4040
2476 4176 0700
2477 4177 3000
2478 PAGE
2479 /CONTROL LOGIC ERROR MESSAGES
2480
2480 4200 3736 EMSG1, TEXT "A"DONE FLAG NOT SET THEN CLEARED OR SKIP FAILURE,"
4201 0417
4202 1605
4203 4006
4204 1401
4205 0740
4206 1617
4207 2440
4210 2305
4211 2440
4212 2410
4213 0516
4214 4003
4215 1405
4216 0122
4217 0504
4220 4017
4221 2240
4222 2313
4223 1120
4224 4006
4225 0111
4226 1425
4227 2205
4230 3736
4231 0000
2481 4232 3736 EMSG2, TEXT "A"TIMING ERROR FLAG NOT SET THEN CLEARED OR SKIP FAILURE,"
4233 2411
4234 1511
4235 1607
4236 4005
4237 2222
4240 1722
4241 4006
4242 1401
4243 0740

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	4244	1617		
	4245	2440		
	4246	2305		
	4247	2440		
	4250	2410		
	4251	0516		
	4252	4003		
	4253	1405		
	4254	0122		
	4255	0504		
	4256	4017		
	4257	2240		
	4260	2313		
	4261	1120		
	4262	4006		
	4263	0111		
	4264	1425		
	4265	2205		
	4266	3736		
	4267	0000		
2482	4270	3736	MSG3, TEXT	"_UNEXPECTED INTERRUPT OCCURRED_"
	4271	2516		
	4272	0530		
	4273	2005		
	4274	0324		
	4275	0504		
	4276	4011		
	4277	1624		
	4300	0522		
	4301	2225		
	4302	2024		
	4303	4017		
	4304	0303		
	4305	2522		
	4306	2205		
	4307	0437		
2483	4310	3600	MSG4, TEXT	"_ADRB FAILED TO JAM TRANSFER TO AC_"
	4311	3736		
	4312	0104		
	4313	2202		
	4314	4006		
	4315	0111		
	4316	1405		
	4317	0440		
	4320	2417		
	4321	4012		
	4322	0115		
	4323	4024		
	4324	2201		
	4325	1623		
	4326	0605		
	4327	2240		
	4330	2417		
	4331	4001		
	4332	0337		

2484	4333	3600	MSG6, TEXT	"_ENABLE REGISTER NOT PROPERLY LOADED_"
	4334	3736		
	4335	0516		
	4336	0102		
	4337	1405		
	4340	4022		
	4341	0507		
	4342	1123		
	4343	2405		
	4344	2240		
	4345	1617		
	4346	2440		
	4347	2022		
	4350	1720		
	4351	0522		
	4352	1431		
	4353	4014		
	4354	1701		
	4355	0405		
	4356	0437		
	4357	3600		
2485	4360	3736	MSG7, TEXT	"_FAILED TO GENERATE INTERRUPT WITH DONE FLAG_"
	4361	0601		
	4362	1114		
	4363	0504		
	4364	4024		
	4365	1740		
	4366	0705		
	4367	1605		
	4370	2201		
	4371	2405		
	4372	4011		
	4373	1624		
	4374	0522		
	4375	2225		
	4376	2024		
	4377	4027		
	4400	1124		
	4401	1040		
	4402	0417		
	4403	1605		
	4404	4006		
	4405	1401		
	4406	0737		
	4407	3600		
2486	4410	3736	MSG10, TEXT	"_FAILED TO GENERATE INTERRUPT WITH TIMING ERROR FLAG_"
	4411	0601		
	4412	1114		
	4413	0504		
	4414	4024		
	4415	1740		
	4416	0705		
	4417	1605		
	4420	2201		
	4421	2405		

	4422	4011		
	4423	1624		
	4424	0522		
	4425	2225		
	4426	2024		
	4427	4027		
	4430	1124		
	4431	1040		
	4432	2411		
	4433	1511		
	4434	1607		
	4435	4005		
	4436	2222		
	4437	1722		
	4440	4006		
	4441	1401		
	4442	0737		
	4443	3600		
2487	4444	3736	MSG11, TEXT	"_FAILED TO LOAD AND READ MPX REG BITS AND CLEAR AC_"
	4445	0601		
	4446	1114		
	4447	0504		
	4450	4024		
	4451	1740		
	4452	1417		
	4453	0104		
	4454	4001		
	4455	1604		
	4456	4022		
	4457	0501		
	4460	0440		
	4461	1520		
	4462	3040		
	4463	2205		
	4464	0740		
	4465	0211		
	4466	2423		
	4467	4001		
	4470	1604		
	4471	4003		
	4472	1405		
	4473	0122		
	4474	4001		
	4475	0337		
	4476	3600		
2488	4477	3736	MSG13, TEXT	"_FAILED TO LOAD AND READ ALL CHANNELS IN AUTO-INCREMENT MODE_"
	4500	0601		
	4501	1114		
	4502	0504		
	4503	4024		
	4504	1740		
	4505	1417		
	4506	0104		
	4507	4001		
	4510	1604		

	4511	4022		
	4512	0501		
	4513	0440		
	4514	0114		
	4515	1440		
	4516	0310		
	4517	0116		
	4520	1605		
	4521	1423		
	4522	4011		
	4523	1640		
	4524	0125		
	4525	2417		
	4526	5511		
	4527	1603		
	4530	2205		
	4531	1505		
	4532	1624		
	4533	4015		
	4534	1704		
	4535	0537		
	4536	3600		
2489	4537	3736	MSG14, TEXT	"_FAILED TO COMPLETE CONVERSION IN SPECIFIED TIME_"
	4540	0601		
	4541	1114		
	4542	0504		
	4543	4024		
	4544	1740		
	4545	0317		
	4546	1520		
	4547	1405		
	4550	2405		
	4551	4003		
	4552	1716		
	4553	2605		
	4554	2223		
	4555	1117		
	4556	1640		
	4557	1116		
	4560	4023		
	4561	2005		
	4562	0311		
	4563	0611		
	4564	0504		
	4565	4024		
	4566	1115		
	4567	0537		
	4570	3600		
2490	4571	3736	MSG20, TEXT	"_FAILED TO RESOLVE CONVERSIONS TO + OR - 1 LSB_"
	4572	0601		
	4573	1114		
	4574	0504		
	4575	4024		
	4576	1740		
	4577	2205		

	4600	2317		
	4601	1426		
	4602	0540		
	4603	0317		
	4604	1626		
	4605	0522		
	4606	2311		
	4607	1716		
	4610	2340		
	4611	2417		
	4612	4053		
	4613	4017		
	4614	2240		
	4615	5540		
	4616	6140		
	4617	1423		
	4620	0237		
2491	4621	3600	EMSG21, TEXT	"_TWO SUCCESSIVE READS NOT EQUAL_"
	4622	3736		
	4623	2427		
	4624	1740		
	4625	2325		
	4626	0303		
	4627	0523		
	4630	2311		
	4631	2605		
	4632	4022		
	4633	0501		
	4634	0423		
	4635	4016		
	4636	1724		
	4637	4005		
	4640	2125		
	4641	0114		
	4642	3736		
2492	4643	0000	EMSG22, TEXT	"_ERRONEOUS EXTERNAL ENABLE FROM CLOCK_"
	4644	3736		
	4645	0522		
	4646	2217		
	4647	1605		
	4650	1725		
	4651	2340		
	4652	0530		
	4653	2405		
	4654	2216		
	4655	0114		
	4656	4005		
	4657	1601		
	4660	0214		
	4661	0540		
	4662	0622		
	4663	1715		
	4664	4003		
	4665	1417		
	4666	0313		

	4667	3736		
2493	4670	0000	EMSG23, TEXT	"_MONOTONICITY FAILURE_"
	4671	3736		
	4672	1517		
	4673	1617		
	4674	2411		
	4675	1611		
	4676	0311		
	4677	2431		
	4700	4006		
	4701	0111		
	4702	1425		
	4703	2205		
2494	4704	3736	EMSG24, TEXT	"_NOISE IN MULTIPLEXER AND A-D BUFFER_"
	4705	0000		
	4706	3736		
	4707	1617		
	4710	1123		
	4711	0540		
	4712	1116		
	4713	4015		
	4714	2514		
	4715	2411		
	4716	2014		
	4717	0530		
	4720	0522		
	4721	4001		
	4722	1604		
	4723	4001		
	4724	5504		
	4725	4002		
	4726	2506		
	4727	0605		
	4730	2237		
	4731	3600		
2495	4732	3736	EMSG25, TEXT	"_DONE FLAG FAILED READ BACK IN BIT 0 OF STATUS REG_"
	4733	0417		
	4734	1605		
	4735	4006		
	4736	1401		
	4737	0740		
	4740	0601		
	4741	1114		
	4742	0504		
	4743	4022		
	4744	0501		
	4745	0440		
	4746	0201		
	4747	0313		
	4750	4011		
	4751	1640		
	4752	0211		
	4753	2440		
	4754	6040		
	4755	1706		

4756 4023
4757 2401
4760 2425
4761 2340
4762 2205
4763 0737
2496 4764 3600
4765 3736 MSG26, TEXT "A"ERROR FLAG FAILED TO READ BACK IN BIT 1 OF STATUS REG_A"
4766 0522
4767 2217
4770 2240
4771 0614
4772 0107
4773 4006
4774 0111
4775 1405
4776 0440
4777 2417
5000 4022
5001 0501
5002 0440
5003 0201
5004 0313
5005 4011
5006 1640
5007 0211
5010 2440
5011 6140
5012 1706
5013 4023
5014 2401
5015 2425
5016 2340
5017 2205
5020 0737
2497 5021 3600
5022 3736 MSG27, TEXT "A"CAF FAILED TO CLEAR DONE FLAG_A"
5023 0301
5024 0640
5025 0601
5026 1114
5027 0504
5030 4024
5031 1740
5032 0314
5033 0501
5034 2240
5035 0417
5036 1605
5037 4006
5040 1401
5041 0737
2498 5042 3600
5043 3736 MSG30, TEXT "A"CAF FAILED TO CLEAR ERROR FLAG_A"
5044 0301

5045 0640
5046 0601
5047 1114
5050 0504
5051 4024
5052 1740
5053 0314
5054 0501
5055 2240
5056 0522
5057 2217
5060 2240
5061 0614
5062 0107
5063 3736
5064 0000
2499 5065 3736 MSG31, TEXT "A"ADCL FAILED TO CLEAR MUX OR ENABLE BITS_A"
5066 0104
5067 0314
5070 4006
5071 0111
5072 1405
5073 0440
5074 2417
5075 4003
5076 1405
5077 0122
5100 4015
5101 2530
5102 4017
5103 2240
5104 0516
5105 0102
5106 1405
5107 4002
5110 1124
5111 2337
5112 3600
2500 5113 3736 MSG32, TEXT "A"ADST FAILED TO CLEAR DONE_A"
5114 0104
5115 2324
5116 4006
5117 0111
5120 1405
5121 0440
5122 2417
5123 4003
5124 1405
5125 0122
5126 4004
5127 1716
5130 0537
2501 5131 3600
5132 3736 MSG33, TEXT "A"ADST FAILED TO CLEAR ERROR_A"
5133 0104

	5134	2324		
	5135	4006		
	5136	0111		
	5137	1405		
	5140	0440		
	5141	2417		
	5142	4003		
	5143	1405		
	5144	0122		
	5145	4005		
	5146	2222		
	5147	1722		
	5150	3736		
	5151	0000		
2502	5152	3736	MSG34, TEXT	"_ADRB AT EOC FAILED TO SET ERROR FLAG_"
	5153	0104		
	5154	2202		
	5155	4001		
	5156	2440		
	5157	0517		
	5160	0340		
	5161	0601		
	5162	1114		
	5163	0504		
	5164	4024		
	5165	1740		
	5166	2305		
	5167	2440		
	5170	0522		
	5171	2217		
	5172	2240		
	5173	0614		
	5174	0107		
	5175	3736		
2503	5176	0000	MSG35, TEXT	"_TIMING ERROR FLAG SET IN ERROR_"
	5177	3736		
	5200	2411		
	5201	1511		
	5202	1607		
	5203	4005		
	5204	2222		
	5205	1722		
	5206	4006		
	5207	1401		
	5210	0740		
	5211	2305		
	5212	2440		
	5213	1116		
	5214	4005		
	5215	2222		
	5216	1722		
	5217	3736		
	5220	0000		
2504	5221	3736	MSG36, TEXT	"_ADRB FAILED TO CLEAR DONE FLAG_"
	5222	0104		

	5223	2202		
	5224	4006		
	5225	0111		
	5226	1405		
	5227	0440		
	5230	2417		
	5231	4003		
	5232	1405		
	5233	0122		
	5234	4004		
	5235	1716		
	5236	0540		
	5237	0614		
	5240	0107		
	5241	3736		
	5242	0000		
2505	5243	3736	MSG37, TEXT	"_CAF FAILED TO CLEAR DATA BUFFER_"
	5244	0301		
	5245	0640		
	5246	0601		
	5247	1114		
	5250	0504		
	5251	4024		
	5252	1740		
	5253	0314		
	5254	0501		
	5255	2240		
	5256	0401		
	5257	2401		
	5260	4002		
	5261	2506		
	5262	0605		
	5263	2237		
	5264	3600		
2506	5265	3736	MSG40, TEXT	"_DATA BUFFER NOT EQUAL TO 1777_"
	5266	0401		
	5267	2401		
	5270	4002		
	5271	2506		
	5272	0605		
	5273	2240		
	5274	1617		
	5275	2440		
	5276	0521		
	5277	2501		
	5300	1440		
	5301	2417		
	5302	4061		
	5303	6767		
	5304	6737		
	5305	3600		
2507	5306	3736	MSG41, TEXT	"_NO CONVERSION TIME DIFFERENCE AFTER CHANGING CHANNELS_"
	5307	1617		
	5310	4003		
	5311	1716		

	5312	2605		
	5313	2223		
	5314	1117		
	5315	1640		
	5316	2411		
	5317	1505		
	5320	4004		
	5321	1106		
	5322	0605		
	5323	2205		
	5324	1603		
	5325	0540		
	5326	0106		
	5327	2405		
	5330	2240		
	5331	0310		
	5332	0116		
	5333	0711		
	5334	1607		
	5335	4003		
	5336	1001		
	5337	1616		
	5340	0514		
	5341	2337		
	5342	3600		
2508	5343	3736	EMSG42, TEXT	"_CAF FAILED TO CLEAR MUX OR ENABLE BITS_"
	5344	0301		
	5345	0640		
	5346	0601		
	5347	1114		
	5350	0504		
	5351	4024		
	5352	1740		
	5353	0314		
	5354	0501		
	5355	2240		
	5356	1525		
	5357	3040		
	5360	1722		
	5361	4005		
	5362	1601		
	5363	0214		
	5364	0540		
	5365	0211		
	5366	2423		
	5367	3736		
	5370	0000		
2509	5371	2003	TXTPC, TEXT	"PC = "
	5372	4075		
	5373	4000		
2510	5374	4040	TXTIOT, TEXT	" IOT CODE = "
	5375	1117		
	5376	2440		
	5377	0317		
	5400	0405		

	5401	4075		
	5402	4000		
2511	5403	4040	TXTA, TEXT	" TEMPA = "
	5404	2405		
	5405	1520		
	5406	0140		
	5407	7540		
	5410	0000		
2512	5411	4040	TXTB, TEXT	" TEMPB = "
	5412	2405		
	5413	1520		
	5414	0240		
	5415	7540		
	5416	0000		
2513			/END OF LOGIC TEST TYPESTRING	
2514	5417	3736	XEND, TEXT	"_END OF LOGIC TEST_"
	5420	0516		
	5421	0440		
	5422	1706		
	5423	4014		
	5424	1707		
	5425	1103		
	5426	4024		
	5427	0523		
	5430	2437		
	5431	3600		
2515			/HEADER MESSAGE	
2516	5432	3736	XLABEL, TEXT	"_AD8A A TO D CONVERTER/MULTIPLEXER DIAGNOSTIC MD-08-DJADA-C_"
	5433	0104		
	5434	7001		
	5435	4001		
	5436	4024		
	5437	1740		
	5440	0440		
	5441	0317		
	5442	1626		
	5443	0522		
	5444	2405		
	5445	2257		
	5446	1525		
	5447	1424		
	5450	1120		
	5451	1405		
	5452	3005		
	5453	2240		
	5454	0411		
	5455	0107		
	5456	1617		
	5457	2324		
	5460	1103		
	5461	4015		
	5462	0455		
	5463	6070		
	5464	5504		
	5465	1201		

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5466 0401
5467 5503
5470 3736
5471 0000
2517 5472 3736 AUTHMSG, TEXT  "┌"SET SW5 (AUTO=INC), # OF CHANS IN SW8=11, OR SET SW8=11 (SINGLE CHAN)┐"
5473 2305
5474 2440
5475 2327
5476 6540
5477 5001
5500 2524
5501 1755
5502 1116
5503 0351
5504 5440
5505 4340
5506 1706
5507 4003
5510 1001
5511 1623
5512 4011
5513 1640
5514 2327
5515 7055
5516 6161
5517 5440
5520 1722
5521 4023
5522 0524
5523 4023
5524 2770
5525 5561
5526 6140
5527 5023
5530 1116
5531 0714
5532 0540
5533 0310
5534 0116
5535 5137
5536 3600
2518
2519 5537 3736 HEAD13, TEXT  "┌"END OF 1000 CONVERSIONS┐" /VB/
5540 0516
5541 0440
5542 1706
5543 4061
5544 6060
5545 6040
5546 0317
5547 1626
5550 0522
5551 2311
5552 1716
5553 2337

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2520 5554 3600 HEAD14, TEXT  "┌"END OF TEST┐" /VB/
5555 3736
5556 0516
5557 0440
5560 1706
5561 4024
5562 0523
5563 2437
5564 3600
2521
2522
2523
2524 /C8*/PAGE
2525
2526 5600 *5600 /C8/
2527
2528 /TABLE OF CONVERSION VALUES/
2529 5600 0000 STORAG, 0
2530
2531
2532 /C8*/$
2533
2534
2535 /C8/ THE TABLE OF CONVERSION VALUES (BUFFER "STORAG" ABOVE) ALWAYS
2536 /C8/ RESIDES STARTING AT LOC 5600. SO DOES THE CONSOLE PACKAGE
2537 /C8/ ROUTINES (FOLLOWING).
2538
2539 /C8/ IF THE PROGRAM IS RUN WITHOUT THE CONSOLE PKG ACTIVE THEN
2540 /C8/ BUFFER "STORAG" WILL BE IN FIELD 0. (CONSOLE PKG CODE
2541 /C8/ WILL BE LOST.)
2542
2543 /C8/ IF THE PROGRAM IS RUN WITH THE CONSOLE PKG ACTIVE THEN THE
2544 /C8/ BUFFER "STORAG" WILL BE IN FIELD 1. THE CONSOLE PKG WILL
2545 /C8/ RESIDE IN FIELD 0.
2546
2547
2548
2549
2550 /CONSOL SRC =V2=R1= CONSOLE PACKAGE
2551 / REV 1 -DATE NOV.10,1975
2552 /1. IN XC8PAS REMOVE THE CLA WHICH WAS THE FIRST ENTRY IN THE
2553 /SUBROUTINE, THE CLA WOULD DESTROY THE AC ON A CALL TO XC8PAS.
2554 /2. CONTROL C (CNTRLC)
2555 /PUT A CLEAR THE SOFTWARE FLAG C8SWST BY ADDING A DCA C8SWST
2556 /THIS WILL CLEAR THE FLAG TO ALLOW MULTIPLE ENTRIES IN TO
2557 /XC8PSM FOR CHANGING THE SWITCH REGISTER.
2558
2559
2560 /LAS= CALL C8CKSM OR JMS XC8SM
2561 /THIS WILL READ THE SWITCH REGISTER FROM THE PLACE SPECIFIED
2562 /BY LOCATION 20 BIT 0.
2563
2564
2565 /THE PROGRAM SHOULD CHECK FOR A CONTROL CHARACTER FROM THE TERMINAL
2566 /EVERY FIVE(5) SECONDS OR SOONER.

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2567
2568 /LOCATIONS THAT NEED TO BE SET UP FOR USING THE CONSOLE PACKAGE.
2569
2570 /CNTVAL IN XC8PASS THIS LOCATION DETERMINES THE NUMBER OF
2571 /PROGRAM COMPLETIONS THAT ARE NEEDED BEFORE THE PASS MESSAGE IS TYPED
2572 /THE VALUE SHOULD PUT THE PASS MESSAGE OUT IN THE RANGE OF 1 TO 5 MINUTES.
2573 /THIS SHOULD BE A POSITIVE NUMBER.
2574
2575 /C8STR THIS IS FOUND IN CNTRL ROUTINE CONTROL R PART
2576 /IT IS THE RETURN WHEN CONTROL R IS ENTERED (RESTART PROGRAM)
2577 /THE RETURN JUMPS TO X0DSW WHICH CONTAINS C8STR SO PUT THE LABEL C8STR
2578 /WHERE YOU WANT TO RESTART THE PROGRAM.
2579
2580
2581 /SETUP1 IN XC8ERR THIS IS THE MASK BIT FOR HALT ON ERROR
2582 /PLACE THE CORRECT BIT IN THIS LOCATION FOR HALTING ON ERRORS.
2583
2584 /SETUP2 IN XC8PASS THIS IS THE MASK FOR HALT AT END OF PASS.
2585
2586 /THE CALL TABLE IS A CONDITIONAL ASSEMBLY.
2587 /TO ASSEMBLE THE CALL REMOVE THE / BEFORE CONSOL=0.
2588 /IN COMBINING THE CONSOL PACKAGE TO A DIAGNOSTIC.
2589 /THE CALL TABLE IS TO BE AT THE BEGINNING OF A PROGRAM.
2590
2591
2592 0000 CONSOL=0
2593 6661 PSKF= 6661
2594 6662 PCLF= 6662
2595 6663 PSKE= 6663
2596 6664 PSTB= 6664
2597 6665 PSIE= 6665
2598 6004 GTF= 6004
2599 7701 ACL= 7701
2600 6007 CAF= 6007
2601 7421 MQL= 7421
2602 7501 MQA= 7501
2603
2604
2605 IFDEF CONSOL <
2606
2607
2608 0102 *102
2609
2610 4502 C8PASS= JMS I .
2611 0102 5600 XC8PAS /C8 PASS COMPLETION ROUTINE
2612 4503 C8CKSW= JMS I .
2613 0103 5660 XC8SW /CHECK SW REG SETTING
2614 4504 C8TTYI= JMS I .
2615 0104 5670 XC8TTY /FETCH CONSOL CHAR
2616 4505 C8CNTR= JMS I .
2617 0105 6000 XC8CNT /CHECK FOR CONTROL CHAR
2618 4506 C8PRNT= JMS I .
2619 0106 5701 XC8PNT /C8 PRINT A BUFFER
2620 4507 C8SWIT= JMS I .
2621 0107 6255 XC8PSW /SET UP PSEUDO SW, REG

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2622 4510 C8OCTA= JMS I .
2623 0110 6400 XC8OCT /CONVERT TO ASCII AND PRINT
2624 4511 C8CRLF= JMS I .
2625 0111 6423 XC8CRL /DO A CARRIGE RETUR + LINE FEED
2626 4512 C8ECHO= JMS I .
2627 0112 6463 XC8ECH /CHECK INPUT CHAR
2628 4513 C8TYPE= JMS I .
2629 0113 6477 XC8TYP /C8 PRINT ONE CHAR
2630 4514 CBERR= JMS I .
2631 0114 6607 XC8ERR /C8 ERROR HANDLER
2632 4515 C8INQU= JMS I .
2633 0115 6235 XC8INQ /LOOK FOR OPERATOR INTERVENTION
2634 4516 C8CKPA= JMS I .
2635 0116 6441 XC8CKP /CHECK IF CONTROL CHAR
2636 4517 C8PAUS= JMS I .
2637 0117 5735 XC8PAU /IF CONSOL PACKAGE RETURN CALL PLUS ONE
2638 /IF NOT USING CONSOL REPLACE CALL WITH
2639 /A HLT AND THEN GO TO THE HALT
2640
2641 /*****
2642 /*20 /PSEUDO SWITCH REGISTER
2643
2644
2645 /*21 /HARDWARE INDICATORS
2646 /4000=USE FRONT PANEL SWITCH REGISTER
2647 /0000=USE THE PSEUDO SWITCH REGISTER LOC.20
2648
2649 /*22 /SYSTEM CONFIGURATION
2650 /4000=CONSOL PACKAGE SET ACTIVE
2651 /0000=CONSOLE PACKAGE SET DEACTIVE
2652
2653 /*23 /RESERVED FOR FUTURE USE
2654
2655 5600 *5600
2656 /*****
2657 /C8PASS
2658 /THIS IS CALLED AT THE END OF EACH PROGRAM COMPLETION
2659 /THE VALUE OF** CNTVAL** WILL BE DETERMINED BY THE TIME IT TAKES
2660 /THE PROGRAM TO COMPLETE THIS MANY C8PASS TO BE IN THE 1 TO 4 MINUTE
2661 /RANGE
2662 / C8PASS=JMS XC8PAS
2663 /EX. OF CALL C8PASS
2664 / / HLT /HALT IF NON CONSOL PACKAGE
2665 / / JMP START1 /CONTINUE RUNNING THIS PROGRAM
2666
2667
2668 /RETURN TO LOCATION CALL PLUS ONE WITH THE AC=0 IF NON CONSOL PACKAGE AND HLT
2669 /IF CONTINUE TO RUN THEN RETURN TO CALL PLUS2 AC=0
2670 /THE LOCATION SETUP2 IS THE MASK BIT FOR THE HALT AT END OF PASS
2671 /CHECK THAT IT IS CORRECT FOR THE CURRENT PROGRAM
2672
2673 /CALLS USED BY XC8PAS ARE CHKCLA=XC8CRLF=XC8OCTA=XC8SW=XC8PNT=XC8INQ=
2674
2675
2676 5600 0000 XC8PAS, 0

```

```

2677 5601 4777* JMS CHKCLA /IS WORD 22 BIT 3 ACTIVE CONSOLE?
2678 5602 5211 JMP DOPACK /IS CLASSIC
2679 5603 4776* JMS C8GET /GET THE REGISTERS
2680 5604 4260 JMS XC8SW /DEACTIVE CONSOL CHECK SR SETTING
2681 5605 0375 AND (400 /FOR HALT ON END OF C8PASS
2682 5606 7640 SZA CLA /I= HALT 0 CONTINUE
2683 5607 5600 JMP I XC8PAS /GO TO HALT
2684 5610 5227 JMP C8BY1 /CONTINUE ON RUNNING PROGRAM
2685 5611 4230 DOPACK, JMS CKCOUT /CLASS CHECK C8PASS COUNT
2686 5612 5227 JMP C8BY1 /C8PASS COUNT NOT DONE REDD PROGRAM
2687 5613 2246 ISZ PASCNT /C8PASS COUNT DONE SET C8PASS COUNT
2688 5614 4774* JMS XC8CRLF
2689 5615 4301 JMS XC8PNT /C8PRNT BUFFER
2690 5616 5651 MESPAS /
2691 5617 1246 TAD PASCNT /GET NUMBER
2692 5620 4773* JMS XC8OCTA /CONVERT IT TO ASCII
2693 5621 4774* JMS XC8CRLF /DO A CARRIAGE RETURN
2694 5622 4776* JMS C8GET /RESTORE REGISTERS
2695 5623 4260 JMS XC8SW /CHECK A HALT AT END OF C8PASS
2696 5624 0375 SETUP2, AND (400 /MASK BIT
2697 5625 7640 SZA CLA /HALT #1 NO SKIP CONTINUE #0
2698 5626 4772* JMS XC8INQ /STOP PROGRAM EXECUTION=LOOK FOR INPUT
2699 5627 5600 C8BY1, JMP I XC8PAS
2700 5630 0000 CKCOUT, 0
2701 5631 1247 TAD DOSET /CHECK IF SET UP NEEDED
2702 5632 7640 SZA CLA /0=SET UP C8PASS COUNT VALUE
2703 /1=C8PASS COUNT VALUE OK
2704 JMP NOSET /C8PASS COUNT VALUE OK
2705 TAD CNTVAL /GET COUNT VALUE FOR THIS PROG
2706 5635 7040 CMA /SET TO NEGATIVE
2707 5636 3245 DCA DOCNT /STORE IN HERE
2708 5637 2247 ISZ DOSET /INDICATE VALUE SET UP
2709 5640 2245 NOSET, ISZ DOCNT /COUNT THE NUMBER OF PASSES
2710 5641 5227 JMP C8BY1 /EXIT FOR ANOTHER PASS
2711 5642 3247 DCA DOSET /SET TO C8PRNT C8PASS
2712 5643 2230 ISZ CKCOUT /BUMP RETURN FOR
2713 5644 5630 JMP I CKCOUT /C8PASS C8TYPE OUT
2714 DOCNT, 0
2715 PASCNT, 0 /
2716 DOSET, 0
2717 CNTVAL, 0
2718 5651 0412 MESPAS, TEXT "DJADAC PASS "
5652 0104
5653 0103
5654 4040
5655 2001
5656 2323
5657 4000

```

2719
2720
2721
2722
2723
2724
2725

/*
/C8CKSW

```

2726 /THIS ROUTINE CAN BE USED INPLACE OF A READ THE SWITCHES LAS.
2727 /ROUTINE THAT WILL CHECK WHERE TO READ THE
2728 /C8 SWITCHES FROM IE, FROM PANEL OR PSEUDO SWITCH REGISTER
2729 /THE SELECTION IS DETERMINED BY THE STATE OF BIT 0 IN LOCATION 21.
2730
2731 /C8CKSW= JMS XC8SW
2732 /EX. JMS XC8SW /READ THE C8SWIT REGISTER
2733 /RETURN WITH THE CONTENTS OF SWITCH REGISTER
2734
2735 /RETURN TO NEXT LOCATION FOLLOWING CALL WITH THE AC= TO VALUE OF C8SWIT SETTING
2736
2737 /CALLS USED ARE-XC8CKPA-
2738
2739
2740
2741 5660 0000 XC8SW, 0
2742 5661 4771* JMS XC8CKPA /GO CHECK THE IF ANY CONTRL
2743 5662 7000 NOP
2744 5663 1021 TAD 21 /GET WD FOR INDICATOR
2745 5664 7710 SPA CLA /CHECK IF FROM PANEL 4000
2746 5665 7614 7614 /DO LAS AND SKIP GET FROM PANEL WITH LAS
2747 5666 1020 TAD 20 /PSEUDO SWITCH
2748 5667 5660 JMP I XC8SW /EXIT WITH STATUS BIT IN AC.
2749
2750
2751
2752
2753
2754 /C8TTYI
2755 /THIS ROUTINE WILL LOOK FOR A INPUT FROM THE TERMINAL
2756 /AND REMOVE ANY PARITY BITS, THEN MAKE IT 8 BIT ASCII.
2757 / C8TTYI= JMS XC8TTY
2758 /EX. JMS XC8TTYI /READ CHAR FROM THE CONSOL DEVICE
2759 / / /RETURN TO CALL PLUS ONE AC CONTAINS THE CHAR
2760
2761 /CALLS USED =NONE- BUT C8CHAR IS OFF PAGE AND IN ROUTINE CALLED XC8ECHO
2762
2763 /
2764 /
2765 5670 0000 XC8TTY, 0
2766 5671 6031 KSF /LOOK FOR KEYBOARD FLAG
2767 5672 5271 JMP ,=1
2768 5673 6036 KRB /GET CHAR
2769 5674 0370 AND (177 /MASK FOR 7 BITS
2770 5675 1367 TAD (200 /ADD THE EIGHTH BIT
2771 5676 3766* DCA C8CHAR /STORE IT
2772 5677 1766* TAD C8CHAR
2773 5700 5670 JMP I XC8TTY /EXIT
2774
2775
2776
2777
2778
2779
2780

```

/*
/C8PRNT


```

2781 /THIS ROUTINE WILL TYPE THE CONTENTS OF THE C8 PRINT BUFFER. THE LOCATION
2782 /OF THE BUFFER WILL BE IN THE ADDR8 FOLLOWING THE CALL. PRINTING OF THE BUFFER
2783 /WILL STOP WHEN A 00 CHAR IS DETECTED. CHARACTERS ARE PACKED 2 PER WORD.
2784 /
2785 C8PRNT= JMS XC8PNT
2786 /
2787 /EX. JMS XC8PNT /C8PRNT THE CONTENTS OF THE FOLLOWING BUFFER
2788 / MESS77 /LOCATION OF C8PRNT BUFFER
2789 /
2790 /C8PRNT WILL USE THE LOCATION FOLLOWING THE CALL AS THE POINTER FOR THE
2791 /C8PRNT ROUTINE. RETURN TO CALL PLUS TWO WITH AC= 0
2792 /
2793 /CALLS USED ARE-XC8TYPE-XC8PNT
2794 /
2795
2796
2797
2798 5701 0000 XC8PNT, 0
2799 5702 7300 CLA CLL
2800 5703 1701 TAD I XC8PNT /GET C8PRNT BUFFERS STARTING LOCATION
2801 5704 3334 DCA PTSTOR /STORE IN PTSTOR
2802 5705 2301 ISZ XC8PNT /BUMP RETURN
2803 5706 1734 C8D01, TAD I PTSTOR /GET DATA WORD
2804 5707 0365 AND (7700 /MASK FOR LEFT BYTE
2805 5710 7450 SNA /CHECK IF 00 TERMINATE
2806 5711 5701 JMP I XC8PNT /EXIT
2807 5712 7500 SMA /IS AC MINUS
2808 5713 7020 CML /MAKE CHAR A 300 AFTER ROTATE
2809 5714 7001 IAC /MAKE CHAR A 200 AFTER ROTATE
2810 5715 7012 RTR
2811 5716 7012 RTR
2812 5717 7012 RTR /PUT CHAR IN BITS 4-11 MAKE IT 8 BIT ASCII
2813 5720 4764 JMS XC8TYPE /C8PRNT IT ON CONSOLE
2814 5721 1734 TAD I PTSTOR /GET DATA WORD
2815 5722 0363 AND (0077 /MASK FOR RIGHT BYTE
2816 5723 7450 SNA /CHECK IF 00 TERMINATOR
2817 5724 5701 JMP I XC8PNT //EXIT
2818 5725 1362 TAD (3740 /ADD FUDGE FACTOR TO DETERMINE IF 200
2819 5726 7500 SMA /OR 300 IS TO BE ADD TO CHAR
2820 5727 1361 TAD (100 /ADD 100
2821 5730 1360 TAD (240 /ADD 200
2822 5731 4764 JMS XC8TYPE /C8TYPE ONLY BITS 4-11
2823 5732 2334 ISZ PTSTOR /BUMP POINTER FOR NEXT WORD
2824 5733 5306 JMP C8D01 /DO AGAIN
2825 5734 0000 PTSTOR, 0 /STOR FOR C8PRNT BUFFER
2826 /*****
2827
2828
2829 /C8PAUS
2830 /THIS ROUTINE WILL CHECK IF THE CONSOL PACKAGE IS ACTIVE, IF ACTIVE
2831 /IT WILL RETURN TO CALL PLUS ONE AC= 0. AND DO THAT INSTRUCTION.
2832 /IF THE CONSOL PACKAGE IS NOT ACTIVE THE CALL WILL BE REPLACED
2833 /WITH A 7402 HALT AND THEN RETURN TO THE HALT.
2834 /
2835 C8PAUS= JMS XC8PAU

```

```

2836 /
2837 /
2838 /EX. JMS XC8PAUS /CHECK IF ON ACTIVE CONSOL IF NOT HALT HERE
2839 / ANYTHING /RETURN HERE IF ON ACTIVE CONSOL
2840 /
2841 /
2842 /
2843 /CALLS USED ARE -CHKCLA-
2844 /
2845
2846
2847 5735 0000 XC8PAU, 0
2848 5736 7300 CLA CLL
2849 5737 4777 JMS CHKCLA /CHECK LOG 22 BIT 3 CONSOLE BIT
2850 5740 5346 JMP C8D03 /GO DO CONSOL PART RETURN CALL +1
2851 5741 7040 CMA /DEACTIVE CONSOLE PACKAGE PUT HLT IN CALL
2852 5742 1335 TAD XC8PAU /GET CORRECT RETURN ADDR8
2853 5743 3335 DCA XC8PAU /SET UP RETURN
2854 5744 1357 TAD (7402 /GET CODE FOR HLT
2855 5745 3735 DCA I XC8PAU /PUT HLT IN CALL LOCATION
2856 5746 5735 C8D03, JMP I XC8PAU /GO TO HALT OR RETURN TO NEXT LOCATION
2857 /
2858 /
2859 5757 7402
2860 5760 0240
2861 5761 0100
2862 5762 3740
2863 5763 0077
2864 5764 6477
2865 5765 7700
2866 5766 6475
2867 5767 0200
2868 5770 0177
2869 5771 6441
2870 5772 6235
2871 5773 6400
2872 5774 6423
2873 5775 0400
2874 5776 6224
2875 5777 6600
2876 PAGE
2877 /*****
2878
2879 /C8CNTR
2880 /THIS ROUTINE WILL CHECK FOR THE PRESENCE OF CONTROL CHARACTERS
2881 /IT WILL CHECK FOR THE FOLLOWING CHAR C-R-Q-L-S
2882 / C8CNTR= JMS XC8CNT
2883 /
2884 /EX. JMS XC8CNTR /CHECK FOR CONTROL CHARACTER
2885 / JMP ANYTHING /LOC FOLLOWING CALL IS FOR CONTINUING THE PROGRAM
2886 / JMP ANYTHING /LOC. IS FOR RETURN IF INMODE SET AND NOT CNTRL CHAR
2887 /
2888 /
2889 /RETURN IS TO CALL PLUS ONE IF CONTINUE

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2890 /RETURN IS TO CALL PLUS TWO IF INMODE SET AND NOT CONTROL CHAR
2891 /RETURN IS TO CALL PLUS TWO IF INMODE IS NOT SET AND NO
2892 /CONTROL CHAR ..THIS WILL PRINT THE CHARACTER AND A ?
2893 /CLEAR THE AC AND RETURN CALL+2.
2894
2895 /CALLS USED ARE=CHKCLA-XC8TYPE-XC8CRLF-C8GET-UPAROW-XC8TYI-XC8PSW=
2896 /
2897 /
2898 /
2899 0000 0000 XC8CNT, 0
2900 0001 3777* DCA ACSAVE /SAVE THE AC
2901 0002 4776* JMS CHKCLA /CHECK LOC.22 BITS FOR CONSOLE BIT
2902 0003 5206 JMP ,+3 /ON ACTIVE CONSOLE
2903 0004 1777* TAD ACSAVE /DEACTIVE CONSOLEGET AC FOR RETURN
2904 0005 5600 JMP I XC8CNT /EXIT NOT ON ACTIVE CONSOLE
2905 0006 6004 GTF
2906 0007 3775* DCA FLSAVE
2907 0010 7501 MQA
2908 0011 3774* DCA MQSAVE /SAVE THE MQ
2909 0012 3255 DCA INDEXA /SET DISPLACEMENT INTO TABLE B
2910 0013 1257 TAD XTABLA /GET ADDR OF TABLE A
2911 0014 3256 DCA GETDAT /CONTAINS POINTER TO CONTROL CHAR
2912 0015 1656 REDOA, TAD I GETDAT /GET CONTROL CHAR FROM TABLE
2913 0016 7450 SNA /CHECK FOR A 0 END OF TABLE
2914 0017 5226 JMP DONEA /END OF TABLE NO CONTROL CHAR
2915 0020 1773* TAD C8CHAR /COMPARE CHAR TO CONTROL CHAR
2916 0021 7650 SNA CLA /0 IF MATCH
2917 0022 5243 JMP GOITA /MATCH
2918 0023 2255 ISZ INDEXA /NO MATCH NOT END OF TABLE REDO
2919 0024 2256 ISZ GETDAT /BUMP INDEX FOR EXIT WHEN CONTROL FOUND
2920 0025 5215 JMP REDOA /BUMP GETDAT FOR COMPARE OF NEXT CNTRL CHAR.
2921 0026 1772* DONEA, TAD INMODE /CHECK IF PROGRAM EXPECTS CHAR
2922 0027 7640 SZA CLA /1=CHAR EXPECTED 0= NO CHAR EXPECTED
2923 0030 5240 JMP EXITA /CHAR EXPECTED
2924 0031 1773* TAD C8CHAR /GET CHAR - NOT CONTROL + NOT EXPECTED
2925 0032 4771* JMS XC8TYPE /C8PRNT CHAR
2926 0033 1370 TAD (277 /GET CODE FOR "?
2927 0034 4771* JMS XC8TYPE
2928 0035 4767* JMS XC8CRLF
2929 0036 2200 ISZ XC8CNT /BUMP RETURN
2930 0037 5600 JMP I XC8CNT /EXIT CALL+2
2931 0040 2200 EXITA, TAD XC8CNT /BUMP RETURN FOR MAIN PROGRAM CHECK OF CHAR
2932 0041 1773* TAD C8CHAR /PUT CHAR IN AC.
2933 0042 5600 JMP I XC8CNT /EXIT
2934 0043 1773* GOITA, TAD C8CHAR /GET THE CONTENTS OF CHAR
2935 0044 1366 TAD (100 /ADD 100 TO FORM A GOOD ASCII CHARACTER
2936 0045 3773* DCA C8CHAR /RESTORE COFFECT CHAR
2937 0046 1260 TAD XTABLB /GET START OF TABLE B
2938 0047 1255 TAD INDEXA /GET NOW FAR INTO TABLE
2939 0050 3254 DCA GOTOA /STORE IT
2940 0051 1654 TAD I GOTOA /GET THE ROUTINE STARTING ADDRESS
2941 0052 3254 DCA GOTOA /STORE IT IN HERE
2942 0053 5654 JMP I GOTOA /GOTO CONTROL CHAR ROUTINE
2943 0054 0000 GOTOA, 0000 /ADD OF CNTRL ROUTINE TO EXECUTE
2944 0055 0000 INDEXA, 0000 /DISPLACEMENT INTO CNTRL TABLE
    
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2945 0056 0000 GETDAT, 0000 /LOCATION OF ADDR OF CONTROL CHAR.
2946 0057 6061 XTABLA, TABLA /ADDRS OF TABLEA
2947 0060 6071 XTABLB, TABLB /ADDRS OF TABLEB
2948 0061 7575 TABLA, 7575 /CNTRL C BACK TO MONITOR 203
2949 0062 7564 7564 /CNTRL L SWITCH ERROR PRINTING DEVICE 214
2950 0063 7557 7557 /CNTRL Q START DISPLAYING CHAR, AGAIN 221
2951 0064 7556 7556 /CNTRL R BACK TO BEGINNING OF PROGRAM 222
2952 0065 7555 7555 /CNTRL S STOP SENDING CHAR TO DISPLAY WAIT FOR CNTRL Q 223
2953 0066 7573 7573 /CNTRL E CONTINUE WITH PROGRAM 205
2954 0067 7574 7574 /CONTROL D CHANGE SWITCH REGISTER ON FLY
2955 0070 0000 0000
2956
2957 0071 6147 TABLB, CNTRLC
2958 0072 6136 CNTRLL
2959 0073 6100 CNTRLQ
2960 0074 6111 CNTRLR
2961 0075 6120 CNTRLS
2962 0076 6144 CNTRLE
2963 0077 6200 CNTRLD
2964 /
2965 /CONTROL Q
2966 /START SENDING CHAR, TO THE DISPLAY
2967 /THIS WILL RETURN CONTROL TO CALL THAT WAS SET BY
2968 /THE CALL FOR CONTROL S.
2969 /
2970 0100 3772* CNTRLQ, DCA INMODE /SET SOFT FLAG FOR UNEXPECTED CHAR
2971 0101 1334 TAD C8SETS /CHECK IF CONTROL S TYPED IN
2972 0102 7640 SZA CLA
2973 0103 5306 JMP BYRETR /CONTROL S TYPED IN
2974 0104 4765* JMS C8GET /NO CONTROL S TYPED PREVIOUSLY
2975 0105 5600 JMP I XC8CNTR /LEAVE VIA CNTR ENTRY ADDRESS
2976 0106 3334 BYRETR, DCA C8SETS /CLEAR THE SOFT FLAG
2977 0107 4765* JMS C8GET /RESTORE REGISTERS
2978 0110 5735 JMP I C8RETR /EXIT TO ADDRESS SET BY CONTROL S
2979 /
2980 /
2981 /CONTROL R
2982 /GO TO THE QUESTION C8SWIT
2983 0111 3764* CNTRLR, DCA TTYLPT /CLEAR THE TYPE FLAG SET TO TTY
2984 0112 3334 DCA C8SETS /CLEAR SOFT FLAG FOR CNTRL S
2985 0113 3772* DCA INMODE
2986 0114 4763* JMS UPAROW /PRINT THE " AND C8CHAR
2987 0115 3762* C8BY4, DCA C8SWST /CLEAR FLAG FOR CNTRL D OR R
2988 0116 5717 JMP I XDO5W /GO TO ADDR OF C8SWIT
2989 0117 3412 XDO5W, C8STRT /DO5W IS LABEL FOR C8SWIT QUESTION
2990 /
2991 /
2992 /CONTROL S
2993 /STOP SENDING CHAR, TO DISPLAY UNTIL A ^Q IS RECEIVED
2994 /
2995 /
2996 0120 1334 CNTRLS, TAD C8SETS /IF1 DO NOT STORE IN C8RETR
2997 0121 7640 SZA CLA
2998 0122 5326 JMP C8D07 /DONT SET UP C8RETR
2999 0123 7001 IAC /MAKE RETURN CALL PLUS 2
    
```

```

3000 6124 1200 TAD XC8CNT /GET RETURN FOR THIS CALL
3001 6125 3335 DCA C8RETR /STORE IT HERE FOR USE BE CNTRL Q
3002 6126 2334 C8D07, ISZ C8SETS /SET FLAG TO SAVE CALL
3003 6127 4761 JMS XC8TTYI /LOOK FOR THE INPUT
3004 6130 4765 JMS C8GET /GET REGISTERS
3005 6131 4200 JMS XC8CNTR /CHECK FOR THE CONTROL CHAR
3006 6132 7200 CLA /
3007 6133 5320 JMP CNTRLS /IF NOT A CNTRL Q R C REASK
3008 6134 0000 C8SETS, 0
3009 6135 0000 C8RETR, 0
3010 /
3011 /SWITCH OUTPUT FROM ONE OUTPUT DEVICE TO ANOTHER - THE TWO OUTPUTS ARE THE
3012 /CONSOLE AND THE PRINTER WITH DEVICE CODE 66.
3013 /
3014 /
3015 6136 1764 CNTRLL, TAD TTYLPT /GET PRESENT C8SWIT INDICATOR
3016 6137 7040 CMA /COMPLEMENT IT
3017 6140 3764 DCA TTYLPT /STOR NEW C8SWIT
3018 6141 4763 JMS UPAROW /C8PRNT " AND CHAR ON NEW DEVICE
3019 6142 4765 JMS C8GET /RESTORE THE REGISTERS
3020 6143 5600 JMP I XC8CNT /EXIT
3021 /
3022 /CONTROL E
3023 /CONTINUE RUNNING FROM A INQUIRE OR ERROR
3024 /
3025 /
3026 6144 4763 CNTRLE, JMS UPAROW /PRINT THE CONTROL CHAR
3027 6145 4765 JMS C8GET /GET THE REGISTERS
3028 6146 5600 JMP I XC8CNT /RETURN TO CALL PLUS ONE
3029 /
3030 /CONTROL C
3031 /RETURN TO MONITOR CONTROL C
3032 6147 3764 CNTRLC, DCA TTYLPT /CLEAR THE LPT FLAG TO PRINT ON DISPLAY
3033 6150 3762 DCA C8SWST /CLEAR THE FLAG FOR MULTIPLE ENTRIES
3034 /INTO C8SWIT
3035 /C8PRNT " AND LETTER IN CHAR
3036 6151 4763 JMS UPAROW
3037 6152 6203 CDF CIF /GO TO 0 FLD
3038 6153 6007 CAF /CLEAR THE WORLD
3039 6154 5760 JMP I (7600) /GO TO DIAGNOSTIC MONITOR
3040 /*****
3041 /
3042 /
3043 /
3044 6160 7600
3045 6161 5670
3046 6162 6344
3047 6163 6215
3048 6164 6521
3049 6165 6224
3050 6166 8100
3051 6167 6423
3052 6170 0277
3053 6171 6477
3054 6172 6476

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3055 6173 6475
3056 6174 6713
3057 6175 6714
3058 6176 6600
3059 6177 6712 6200
3060 PAGE
3061 /
3062 /CONTROL D
3063 /CHANGE THE SWITCH REGISTER ANYTIME CNTRL D AND RETURN TO
3064 /THE PROGRAM RUNNING.
3065 /
3066 /
3067 6200 4215 CNTRLD, JMS UPAROW
3068 6201 1213 TAD C8SETD /CHECK IF THE RETURN ADDRS IS SAFE
3069 6202 7640 SZA CLA
3070 6203 5207 JMP C8D011 /DO NOT CHANGE THE RETURN ADDRS
3071 6204 1777 TAD XC8CNT /GET THE RETURN ADDRS AND SAVE IT
3072 6205 3214 DCA C8RETR /SAVE THE RETURN HERE
3073 6206 2213 ISZ C8SETD /INDICATE RETURN SAVED DONT DISTROY
3074 6207 4255 C8D011, JMS XC8PSW /GO CHANGE THE SWITCH REGISTER
3075 6210 3213 DCA C8SETD /CLEAR THE FLAG
3076 6211 4224 JMS C8GET /RESTORE THE AC MQ LINK ETC
3077 6212 5614 JMP I C8RETR /RETURN TO THE PROGRAM
3078 /
3079 6213 0000 C8SETD, 0
3080 6214 0000 C8RETR, 0
3081 /
3082 /
3083 /THIS WILL TYPE A UP ARROW AND THE CHAR IN C8CHAR.
3084 /
3085 /
3086 6215 0000 UPAROW, 0 /C8PRNT THE " " AND THE CHAR C8TYPED IN
3087 6216 1376 TAD (336 /CODE FOR "
3088 6217 4775 JMS XC8TYPE
3089 6220 1774 TAD C8CHAR /C8TYPE THE CHAR
3090 6221 4775 JMS XC8TYPE
3091 6222 4773 JMS XC8CRLF
3092 6223 5615 JMP I UPAROW /EXIT
3093 /
3094 /
3095 /*****
3096 /
3097 /
3098 6224 0000 C8GET, 0
3099 6225 7200 CLA
3100 6226 1772 TAD MQSAVE /RESTORE MQ
3101 6227 7421 MQL
3102 6230 1771 TAD FLSAVE /RESTORE THE LINK
3103 6231 7004 RAL
3104 6232 7200 CLA
3105 6233 1770 TAD ACSAVE /RESTORE THE AC
3106 6234 5624 JMP I C8GET /GET THE REGISTERS
3107 /
3108 /

```

```

3109
3110
3111
3112 /*****
3113 /C8INGU
3114 /AND THE PROGRAM IS EXPECTING A WAITING
3115 /IF CONTINUE FROM CONTROL CHAR RETURN IS CALL PLUS ONE
3116 /IF NO CONTROL CHAR ENTERED THEN WAITING IS REPRINTED
3117 /AND PROGRAM WAITS FOR A CONTROL CHAR AGAIN,
3118
3119 / C8INGU = JMS XC8ING
3120
3121 /EX. JMS XC8ING /CB WILL PRINT A WAITINGAND WAIT FOR INPUT
3122 / DO ANYTHING /RETURN IS CALL PLUS ONE AC #0 CONTINUE
3123
3124 /CALLS USED ARE -CHKCLA=XC8PNT=XC8TYI=C8GET=XC8CNTR=
3125
3126
3127 6235 0000 XC8ING, 0
3128 6236 4767* JMS CHKCLA /CHECK LOC 22 BIT 3 CONSOLE BIT
3129 6237 7410 SKP /ACTIVE CONSOLE PACKAGE
3130 6240 5635 JMP I XC8ING /NOT CONSOLE LEAVE
3131 6241 4766* JMS XC8PNT
3132 6242 6250 WATMES /INQUIR WAITTING
3133 6243 4765* JMS XC8TYI /GET CHARACTER
3134 6244 4224 JMS C8GET
3135 6245 4777* JMS XC8CNTR /CHECK IF CONTROL CHARACTER
3136 6246 5835 JMP I XC8ING /EXIT AND CONTINUE
3137 6247 5236 JMP XC8ING+1 /REASK
3138 6250 2701 WATMES, TEXT "WAITING "
3139 6251 1124
3140 6252 1116
3141 6253 0740
3142 6254 0000

3139
3140
3141 /*****
3142
3143 /C8SWIT
3144
3145 /ROUTINE WILL CHECK IF CONSOL IS ACTIVE IF IT IS ACTIVE DISPLAY
3146 /SW QUESTION , IF NOT ACTIVE IT WILL NOT PRINT THE SW QUESTION BUT
3147 /RETURN TO CALL PLUS ONE AC=0,
3148 /C8SWIT WILL SET UP THE PSEUDO SWITCH
3149 /REGISTER WITH THE NEW DATA ENTERED
3150 /
3151 / C8SWIT = JMS XC8PSW
3152
3153 /EX. JMS XC8PSW /SET UP PSEUDO C8SWIT REGISTER IF
3154 /ON THE CONSOL PACKAGE, RETURN IS CALL PLUS ONE AC = 0
3155
3156 /CALLS USED ARE -CHKCLA=XC8PSW=XC8PNT=XC8OCTA=XC8TYPE=
3157
3158
3159 6255 0000 XC8PSW, 0

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3160 6256 4767* JMS CHKCLA /CHECK LOC 22 BIT 3 CONSOLE BIT
3161 6257 7410 SKP /ACTIVE CONSOLE
3162 6260 5655 JMP I XC8PSW /DEACTIVE CONSOLE PACKAGE
3163
3164 6261 1344 TAD C8SWST /RETURN WITHOUT ASKING PSEUDO SWITCH
3165 6262 7640 SZA CLA /IS THE SOFT FLAG SET FOR SWITCH?
3166 6263 5764* JMP C8BY4 /SKIP IF ONE ENTRY AT ATIME OK
3167 6264 2344 ISZ C8SWST /SECOND ENTRY WITH OUT A EXIT GO TO SW QUESTION
3168 6265 4766* C8RDPS, JMS XC8PNT /FIRST ENTRY SET FLAG
3169 6266 6346 MESA /C8PRNT SR=
3170 6267 1020 TAD Z0 /GET CONTENTS OF SW
3171 6270 4763* JMS XC8OCTA /CONVERT IT TO ASCII
3172 6271 1362 TAD (40 /GET SPACE
3173 6272 4775* JMS XC8TYPE
3174 6273 2761* ISZ INMODE /SET FLAG FOR CHAR EXECTED
3175 6274 4760* JMS XC8ECHO /LOOK FOR INPUT
3176 6275 4314 JMS TSTCHA /NOT CONTROL TEST IT IS LEGAL
3177 6276 1774* TAD C8CHAR /STORE NEW CHAR IN SW REG
3178 6277 3020 DCA Z0
3179
3180 6300 1357 TAD (-3 /GET A MINUS 3
3181 6301 3345 DCA TMPCNT /STORE IN TEMP COUNT
3182 6302 4760* GETCH1, JMS XC8ECHO /GET NEXT CHAR
3183 6303 4314 JMS TSTCHA /CHECK IF CR + GOOD CHAR
3184 6304 1020 TAD Z0 /GET C8SWIT REGISTER
3185 6305 7106 RTL CLL /ROTATE IT LEFT 3 PLACES
3186 6306 7004 RAL
3187 6307 1774* TAD C8CHAR /GET CHAR + ADD IT TO PREVIOUS CONTENTS
3188 6310 3020 DCA Z0 /SAVE NEW CONTENTS
3189 6311 2345 ISZ TMPCNT /BUMP COUNT
3190 6312 5302 JMP GETCH1 /JMP BACK + GET NEXT CHAR
3191 6313 5341 JMP ENDIT /END 4 CHAR C8TYPED IN
3192 6314 0000 TSTCHA, 0
3193 6315 7041 CIA /CMPL CHAR IN AC
3194 6316 1356 TAD (215 /TEST IF IT IS A CARRIAGE RETURN
3195 6317 7650 SNA CLA /SKIP IN NOT CR,
3196 6320 5341 JMP ENDIT /WAS CARRIAGE RETURN
3197 6321 1774* TAD C8CHAR /NOT CR, GET CHAR
3198 6322 1355 TAD (-260 /CHECK IF IT IS IN RANGE
3199 6323 7710 SPA CLA /IF NOT POSITIVE CBERR CHAR SMALLER THEN 260
3200 6324 5335 JMP ERR1 /CBERR = CHAR TOO SMALL
3201 6325 1774* TAD C8CHAR /GET CHAR
3202 6326 1354 TAD (-270 /GET A -270 + CHECK IF IT IS LARGER THEN 7
3203 6327 7700 SNA CLA /SKIP IF LESS THEN 7
3204 6330 5335 JMP ERR1 /CBERR ON CHAR NOT IN RANGE
3205 6331 1774* TAD C8CHAR /GET CHAR
3206 6332 0353 AND (7 /MASK FOR RIGHT BYTE
3207 6333 3774* DCA C8CHAR /STORE IN CHAR
3208
3209 6334 5714 JMP I TSTCHA /GET CHAR IN AC
3210 6335 1352 ERR1, TAD (277 /EXIT
3211 6336 4775* JMS XC8TYPE /C8PRNT
3212 6337 4773* JMS XC8CRLF /?
3213 6340 5265 JMP C8RDPS /
3214 6341 4773* ENDIT, JMS XC8CRLF /EXIT + ASK AGAIN
/DO A CR LF

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3215 6342 3344          DCA  C88WST      /CLEAR THE PSW ENTRY FLAG
3216 6343 5655          JMP I  XC8PSW      /EXIT ROUTINE
3217 6344 0000          C88WST, 0
3218
3219 6345 0000          TPCNT, 0
3220 6346 2322          MESA,  TEXT      "SR= "
      6347 7540
      6350 0000

3221
3222
3223 6352 0277
3224 6353 0007
3225 6354 7510
3226 6355 7520
3227 6356 0215
3228 6357 7775
3229 6360 6463
3230 6361 6476
3231 6362 0040
3232 6363 6400
3233 6364 6115
3234 6365 5670
3235 6366 5701
3236 6367 6600
3237 6370 6712
3238 6371 6714
3239 6372 6713
3240 6373 6423
3241 6374 6475
3242 6375 6477
3243 6376 0336
3244 6377 6000          PAGE
      6400          /C8OCTA
3245
3246          /C8OCTA
3247
3248          /OCTAL TO ASCII CONVERSION
3249          /THIS ROUTINE WILL TAKE THE OCTAL NUMBER IN THE AC AND CONVERT IT TO ASCII
3250          /THE RESULT WILL BE PRINTED ON THE CONSOL TERMINAL
3251          /      C8OCTA= JMS XC8OCT
3252          /
3253          /EX.  JMS  XCROCTA      /AC CONTAINS NUMBER TO BE CHANGE
3254          /      RETURN IS TO CALL PLUS ONE AC=0
3255          /
3256          /CALLS USED ARE -XC8TYPE-
3257
3258
3259 6400 0000          XC8OCT, 0
3260 6401 7106          CLL  RTL
3261 6402 7006          RTL
3262 6403 3221          DCA  C8TMP1      /POSITION THE FIRST CHAR FOR PRINTING
3263 6404 1377          TAD  (=4        /SAVE CORRECT POSITIONED WORD HERE
3264 6405 3222          DCA  C8CKP
3265 6406 1221          C8DO4, TAD  C8TMP1      /STORE COUNTER IN HERE
3266 6407 0376          AND  (0007      /GET FIRST NUMBER
                          /MASK

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3267 6410 1375          TAD  (260        /ADD THE PRINT CONSTANT
3268 6411 4277          JMS  XC8TYPE      /TYPE THE NUMBER
3269 6412 1221          TAD  C8TMP1
3270 6413 7006          RTL
3271 6414 7004          RAL
3272 6415 3221          DCA  C8TMP1      /PUT NEXT NUMBER IN POSITION
3273 6416 2222          ISZ  C8CKP      /STORE IT
3274 6417 5206          JMP  C8DO4      /DONE YET WITH FOUR NUMBERS
3275 6420 5600          JMP  C8DO4      /NOT YET DO MORE
3276 6421 0000          JMP I  XC8OCT      /DONE WITH FOUR
3277 6422 0000          C8TMP1, 0
                          C8CKP, 0

3278
3279
3280
3281
3282
3283          /*****
3284          /C8CRLF
3285          /C8TYPE CR AND LF WITH FILLERS FOLLOWING EACH LF AND CR
3286          /
3287          /      C8CRLF= JMS XC8CRLF
3288          /
3289          /EX.  JMS  XC8CRLF      /C8PRNT A CR AND LF WITH FILL
3290          /      RETURN TO CALL PLUS ONE AC =0
3291          /CALLS USED ARE -XC8TYPE-
3292
3293
3294 6423 0000          XC8CRLF, 0
3295 6424 7300          CLA  CLL
3296 6425 1374          TAD  (215        /GET CODE FOR CR
3297 6426 4277          JMS  XC8TYPE
3298 6427 1237          TAD  FILLER
3299 6430 7040          CMA
3300 6431 3240          DCA  FILCNT      /STORE FILLER IN HERE
3301 6432 1373          TAD  (212        /GET CODE FOR LF
3302 6433 4277          C8DO2, JMS  XC8TYPE
3303 6434 2240          ISZ  FILCNT      /CHECK ON FILLER CHAR
3304 6435 5233          JMP  C8DO2      /TYPE A NON PRINTING CHAR
3305 6436 5623          JMP I  XC8CRLF      /EXIT
3306 6437 0004          FILLER, 0004      /FILLER SET FOR 4 CHAR
3307 6440 0000          FILCNT, 0      /COUNTER FOR FILL

3308
3309          /*****
3310          /C8CKPA
3311          /THIS ROUTINE WILL CHECK IF A CHARACTER WAS ENTERED FROM THE
3312          /TERMINAL. IF THE FLAG IS SET AND THE CONSOLE PACKAGE IS
3313          /ACTIVE A CHECK IS MADE TO DETERMINE IF IT IS A CONTROL CHAR.
3314          /IF IT WAS A CONTROL CHAR THEN ITS CONTROL FUNCTION IS PERFORMED.
3315          /IF NOT A CONTROL CHARACTER OR A CONTROL E-D-L-D- IT WILL DO
3316          /THE CONTROL FUNCTION AND RETURN TO CALL PLUS 2.
3317          /A NON CONTROL CHARACTER WILL BE PRINTED AND A "?" IT WILL RETURN TO
3318          /CALL PLUS 2.
3319          /IF NO FLAG IS SET OR THE CONSOL IS NOT ACTIVE THE RETURN IS TO
3320          /CALL PLUS 1.
3321

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3322
3323 / C8CKPA= JMS XC8CKP
3324
3325
3326 /EX. JMS XC8CKPA /CALL TO CHECK IF CONTROL CHAR SET
3327 / ANYTHING(SKIP) /RETURN IF NOT FLAG OR NOT CONSOLE ACTIVE
3328 / ANYTHING(JMP EXIT SKIP CHAIN) /RETURN IF NOT CONTROL OR CONTINUE CONTROL
3329
3330
3331 /CALLS USED ARE -XC8TTYI-XC8CNTR-C8GET-
3332
3333
3334 6441 0000 XC8CKP, 0
3335 6442 3772 DCA ACSAVE /SAVE THE AC
3336 6443 6004 GTF /SAVE THE FLAGS
3337 6444 3771 DCA FLSAVE /SAVE THE FLAGS
3338 6445 7501 MGA /PUT MQ IN AC
3339 6446 3770 DCA MQSAVE /SAVE THE MQ
3340 6447 6031 KSF /CHECK THE KEYBOARD FLAG
3341 6450 5261 JMP C8BY3 /EXIT TO CALL PLUS 1
3342 6451 4767 JMS CHKCLA /CHECK LOC 22 BIT 3 CONSOLE BIT
3343 6452 7410 SKP /ACTIVE CONSOLE PACKAGE
3344 6453 5261 JMP C8BY3 /EXIT TO CALL PLUS 1
3345 6454 4766 JMS XC8TTYI /GET THE CHAR
3346 6455 4765 JMS C8GET /GET THE FLAGS
3347 6456 4764 JMS XC8CNTR /CHECK IF CONTROL CHAR.
3348 6457 7000 NOP /RETURN IF A CONTINUE CHAR.
3349 6460 2241 ISZ XC8CKP /BUMP RETURN FOR CALL PLUS 2
3350 6461 4765 C8BY3, JMS C8GET /GET REGISTERS
3351 6462 5641 JMP I XC8CKP /SAY GOOD BY
3352
3353 //*****
3354
3355 /C8ECHO
3356 /THIS ROUTINE WILL LOOK FOR A CHAR FROM THE KEYBOARD, STORE IT IN LOCATION CHAR
3357 /CHECK IF IT WAS A CONTROL CHARACTER - SET INMODE = PRINT CHARACTER
3358
3359 / C8ECHO = JMS XC8ECHO
3360 /EX. JMS XC8ECHO /LOOK FOR CONSOLE CHAR C8PRNT IT
3361 /RETURN CALL PLUS ONE AC = CHAR C8TYPED IN
3362
3363 /CALLS USED ARE -XC8TTYI-XC8CNTR-C8GET-XC8ECHO-XC8TTYPE
3364
3365 /
3366 6463 0000 XC8ECHO, 0
3367 6464 4766 JMS XC8TTYI /WAIT FOR CHAR FROM KEYBOARD
3368 6465 4765 JMS C8GET /RESTORE THE REGISTERS
3369 6466 2276 ISZ INMODE /SET INMODE IDENTIFYING THIS AS A EXPECTED CHAR
3370 6467 4764 JMS XC8CNTR /GO CHECK IF IT IS A CONTROL CHAR
3371 6470 5663 JMP I XC8ECHO /WAS A CONTROL CHAR - CONTINUE RUNNING
3372 6471 4277 JMS XC8TTYPE /NOT A CONTROL CHAR C8PRNT IT
3373 6472 3276 DCA INMODE /CLEAR FLAG THAT CHAR EXPECTED
3374 6473 1275 TAD C8CHAR /GET CHAR IN AC
3375 6474 5663 JMP I XC8ECHO /EXIT
3376 6475 0000 C8CHAR, 0
    
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3377 6476 0000 INMODE, 0
3378
3379 /*****
3380
3381 /C8TTYPE
3382 /THIS ROUTINE WILL C8PRNT ON THE CONSOLE OR THE LPT WITH DEVICE CODE 66.
3383 /
3384 / C8TTYPE= JMS XC8TYP
3385
3386 /EX. JMS XC8TTYPE /C8PRNT THE CHAR IN THE AC.
3387 / /RETURN CALL PLUS ONE AC =0000
3388 /DO NOT CLEAR THE LINK IN THIS ROUTINE NEEDED BYC8OCT
3389
3390 /CALLS USED ARE -C8HANG-XC8CNTR-XC8PNT-XC8CRLF-XC8INQU-
3391
3392
3393 6477 0000 XC8TYP, 0
3394 6500 3320 DCA PNTBUF /STORE CHAR
3395 6501 1321 TAD TTYLPT /CHECK 0=TTY 7777=LPT
3396 6502 7640 SZA CLA
3397 6503 5312 JMP XDOLPT /DO OUT PUT ON LPT
3398 6504 1320 TAD PNTBUF
3399 6505 6046 TLS
3400 6506 6041 TSF
3401 6507 5306 JMP .-1
3402 6510 6042 TCF
3403 6511 5316 JMP C8BY5
3404 6512 1320 XDOLPT, TAD PNTBUF /GET CHAR
3405 6513 6666 PSTB PCLF /C8PRNT IT
3406 6514 4322 JMS C8HANG /CHECK KEYBOARD IF HUNG
3407 6515 6662 PCLF /CLEAR THE FLAG
3408 6516 7600 C8BY5, 7600 /CLEAR THE AC
3409 6517 5677 JMP I XC8TYP /EXIT
3410 6520 0000 PNTBUF, 0
3411 6521 0000 TTYLPT, 0
3412
3413
3414 6522 0000 C8HANG, 0
3415 6523 7200 CLA /
3416 6524 1316 TAD C8BY5 /GET CONSTANT 7600
3417 6525 3320 DCA PNTBUF /PNTBUF IS NOW A COUNTER
3418 6526 6661 SKPF /SKIP ON PRINTER DONE
3419 6527 7410 SKP /NOT DONE YET
3420 6530 5722 JMP I C8HANG /SAW FLAG DONE
3421 6531 2345 ISZ C8CONT /FIRST COUNTER FAST ONE
3422 6532 5326 JMP .=4 /CHECK IF FLAG SET YET
3423 6533 2320 ISZ PNTBUF /MADE 4096 COUNTS ON FAST COUNTER
3424 6534 5331 JMP .=3 /KEEP IT UP FOR 5 SEC
3425 6535 1764 TAD XC8CNTR /GET THE RETURN ADDRESS IN CONTROL
3426 6536 3322 DCA C8HANG /SAVE IT IN HANG
3427 6537 3321 DCA TTYLPT /ALLOW PRINTING ON TTY
3428 6540 4763 JMS XC8PNT
3429 6541 6546 MESHANG /LPT ERROR
3430 6542 4223 JMS XC8CRLF
3431 6543 4762 JMS XC8INGU /PRINT WAITING
    
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3432 6544 5722      JMP I   C8HANG      /CONTINUE TO SAVE ADDRESS
3433 6545 0000      C8CONT, 0          /COUNTER FOR TIMER
3434 6546 1420      MESHANG,TEXT      "LPT ERROR"
      6547 2440
      6550 0522
      6551 2217
      6552 2200

3435
3436 6562 6235
3437 6563 5701
3438 6564 0000
3439 6565 6224
3440 6566 5670
3441 6567 6600
3442 6570 6713
3443 6571 6714
3444 6572 6712
3445 6573 0212
3446 6574 0215
3447 6575 0260
3448 6576 0007
3449 6577 7774
      6600

3450 PAGE
3451 /*****
3452 /*****
3453 /THIS ROUTINE WILL CHECK LOCATION 22 THE HARD WARE CONFIG WORD,
3454 /TO SEE IF THE CONSOLE BIT 3 (400) IS SET IF SET THEN RETURN
3455 /TO CALL PLUS TWO FO A ACTIVE CONSOLE PACKAGE AC=0
3456 /IF NOT SET THEN TO CALL PLUS ONE FOR A DEACTIVE CONSOLE PACKAGE.
3457
3458
3459 6600 0000      CHKCLA, 0
3460 6601 7200      CLA
3461 6602 1022      TAD      22          /GET THE COTENTA OF LOCATION 22
3462 6603 0377      AND      (400        /MASK FOR BIT 3 (400
3463 6604 7650      SNA CLA          /
3464 6605 2200      ISZ      CHKCLA      /ACTIVE CONSOLE PACKAGE RETURN
3465
3466 6606 5600      JMP I   CHKCLA      /CALL PLUS ONE (1) FOR ACTIVE
3467
3468
3469
3470
3471 /CBERR
3472 /THIS ROUTINE WILL DETERMINE WHAT TO DO WHEN A CBERR IS ENCOUNTERED
3473 /WILL CHECK IF CLASSIC SYSTEM, WILL CHECK C8SWIT REGISTERS.
3474 /EX,   JMS      XCBERR      /GO TO CBERR CALL IF NOT CONSOLE
3475 /      JMS      XCBERR      /RETURN IS CALL PLUS ONE AC =0000
3476
3477 /CALLS USED ARE -CHKCLA-XCBCLRF-XC8SW-XC8INQU-XC8PNT-XC8OCTA-
3478
3479 6607 0000      XCBERR, 0
3480 6610 6002      IOF
3481 6611 3312      DCA      ACSAVE      /SAVE AC

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3482 6612 6004      GTF
3483 6613 3314      DCA      FLSAVE      /SAVE THE FLAGS
3484 6614 7501      MGA
3485 6615 3313      DCA      MQSAVE      /SAVE THE MQ
3486 6616 7340      CLA CLL CMA      /SUBTRACT A 1 FOR TRUE LOCATION
3487 6617 1207      TAD      XCBERR      /GET RETURN LOCATION
3488 6620 3311      DCA      PCSAVE      /SAVE ADD OF CBERR CALL
3489 6621 4200      JMS      CHKCLA      /CHECK LOC,22 BIT 3 CONSOLE BIT
3490 6622 7410      SKP
3491 6623 5262      JMP      C8BY2      /ACTIVE CONSOLE PACKAGE
3492 6624 4776*     JMS      CBGET      /NOT CLASSIC SYSTEM
3493 6625 4775*     JMS      XCB8W      /RESTORE REGISTERS
3494
3495 6626 0374      SETUP1, AND      (0000      /CHECK SWITCH REG FOR BIT THAT INDICATES
3496
3497
3498
3499 6627 7640      SZA CLA          /NO ERROR MESSAGE
3500 6631 4773*     JMS      XCBCLRF      /MASK FOR BIT FOR NO ERROR PRINTING
3501 6632 4772*     JMS      XCBPNT      /IF THIS ERROR MESSAGE IS TO ALWAYS
3502 6633 6665      ERRMES          /BE PRINTED LEAVE AND VALUE AT 0000
3503 6634 4772*     JMS      XCBPNT      /SKIP IF BIT IS 0 PRINT ERROR MESSAGE
3504 6635 6675      MESPC          /DO NOT PRINT
3505 6636 1311      TAD      PCSAVE
3506 6637 4771*     JMS      XCB8OCTA      /PRINT THE PC STATEMENT
3507 6640 4772*     JMS      XCBPNT      /CONVERT 4 DIGIT PC TO ASCII
3508 6641 6700      MESAC          /PRINT THE AC MESS
3509 6642 1312      TAD      ACSAVE
3510 6643 4771*     JMS      XCB8OCTA      /PRINT THE PC STATEMENT
3511 6644 4772*     JMS      XCBPNT
3512 6645 6703      MESMQ          /PRINT MQ
3513 6646 1313      TAD      MQSAVE
3514 6647 4771*     JMS      XCB8OCTA      /PRINT THE PC STATEMENT
3515 6650 4772*     JMS      XCBPNT
3516 6651 6706      MESFL          /PRINT FL
3517 6652 1314      TAD      FLSAVE
3518 6653 4771*     JMS      XCB8OCTA      /PRINT THE PC STATEMENT
3519 6654 4773*     JMS      XCBCLRF      /PRINT THE PC STATEMENT
3520 6655 4776*     C8D010, JMS      CBGET      /RESTORE REGISTERS
3521 6656 4775*     JMS      XCB8W      /CHECK SWITCH REGISTER
3522 6657 7710      SPA CLA          /SKIP IF BIT 0 NOT SET
3523 6660 5262      JMP      C8BY2      /LEAVE
3524 6661 4770*     JMS      XCB8INQ      /GO TO THE INQUIRE ROUTINE
3525 6662 2207      C8BY2, ISZ      XCBERR
3526 6663 4776*     JMS      CBGET      /GET THE REGISTERS
3527 6664 5607      JMP I   XCBERR
3528 6665 0412      ERRMES, TEXT      "DJADAC FAILED "
      6666 0104
      6667 0103
      6670 4040
      6671 0601
      6672 1114
      6673 0504
      6674 4000
3529 6675 4040      MESPC, TEXT      " PC:"

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6676 2003
6677 7200
3530 6700 4040 MESAC, TEXT " AC:"
6701 0103
6702 7200
3531 6703 4040 MESMQ, TEXT " MQ:"
6704 1521
6705 7200
3532 6706 4040 MESFL, TEXT " FL:"
6707 0614
6710 7200
3533 6711 7777 PCSAVE, 7777
3534 6712 7777 ACSAVE, 7777
3535 6713 7777 MQSAVE, 7777
3536 6714 7777 FLSAVE, 7777
3537 6770 6235
3538 6771 6400
3539 6772 5701
3540 6773 6423
3541 6774 0000
3542 6775 5660
3543 6776 6224
3544 6777 0400
7000
PAGE /C8/
3545
3546 /C8/ ROUTINE TO INITIALIZE FOR RUNNING EITHER WITH OR WITHOUT
3547 /C8/ THE CONSOLE PACKAGE.
3548
3549 7000 0000 CBIZ, 0 /C8/
3550 7001 1022 TAD HCW2 /C8/CONSOLE PKG CALLED FOR?
3551 7002 0377 AND (400 /C8/
3552 7003 7650 SNA CLA /C8/SKP IF YES.
3553 7004 5220 JMP CBIZN /C8/GO INIT FOR NO CONSOLE PKG.
3554 7005 1021 TAD HCW1 /C8/IS THERE ENOUGH CORE (8K OR MORE)?
3555 7006 0376 AND (34 /C8/
3556 7007 7650 SNA CLA /C8/SKP IF YES.
3557 7010 5216 JMP CBIZER /C8/
3558 7011 7040 CMA /C8/
3559 7012 3775 DCA C8F /C8/SET CONSOLE PKG ACTIVE FLAG.
3560 7013 7040 CMA /C8/
3561 7014 3774 DCA CBIZF /C8/SET INIT ALREADY DONE FLAG.
3562 7015 5600 JMP I CBIZ /C8/RTN TO CALL+1.
3563
3564 /C8/ TO RUN WITHOUT CONSOLE PKG, HCW2, BIT 3 MUST = 0.
3565
3566 /C8/ TO RUN WITH CONSOLE PKG, HCW2, BIT 3 MUST = 1 -AND-
3567 /C8/ HCW1, BITS 7-11 MUST INDICATE 8K OR MORE.
3568
3569 /C8/ MAKE ADJUSTMENTS AND RESTART (AT ANY LEGAL START ADDRESS).
3570
3571 /C8/ ****WARNING*** AN ATTEMPT TO RUN THE PROGRAM, WITH THE
3572 /C8/ CONSOLE PKG, IN 4K WILL RESULT IN UNSPECIFIED
3573 /C8/ PROGRAM ACTION.
3574
3575 7016 7402 CBIZER, HLT /C8/SEE ABOVE COMMENTARY.

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3576 7017 5216 JMP CBIZER /C8/NO CONTINUE.
3577 7020 7040 CBIZN, CMA /C8/
3578 7021 3774 DCA CBIZF /C8/SET "INIT ALREADY DONE" FLAG.
3579 7022 1373 TAD (CBTABB-1 /C8/NEGATE ALL CALLS TO THE CONSOLE -
3580 7023 3010 DCA 10 /C8/ - PKG BY REPLACING THEM WITH A
3581 7024 1372 CBIZNA, TAD (7402 /C8/ - HLT INSTRUCTION.
3582 7025 3410 DCA I 10 /C8/
3583 7026 1010 TAD 10 /C8/ALL CALLS NEGATED?
3584 7027 7041 CMA IAC /C8/
3585 7030 1371 TAD (CBTABE-1 /C8/
3586 7031 7640 SZA CLA /C8/SKP IF YES.
3587 7032 5224 JMP CBIZNA /C8/
3588 7033 5600 JMP I CBIZ /C8/RTN TO CALL+1.
3589
3590 7034 0006 CBTABB, CBICAL /C8/
3591 7035 0212 CBICALB /C8/
3592 7036 1644 CBICALC /C8/
3593 7037 1673 CBICALD /C8/
3594 7040 1763 CBICALE /C8/
3595 7041 2015 CBICALF /C8/
3596 7042 2057 CBICALG /C8/
3597 7043 2303 CBICALH /C8/
3598 7044 3320 CBICALI /C8/
3599 7045 2404 CBICALJ /C8/
3600 7046 2412 CBICALK /C8/
3601 7047 2420 CBICALL /C8/
3602 7050 2426 CBICALM /C8/
3603 7051 2436 CBICALN /C8/
3604 7052 2446 CBICALO /C8/
3605 7053 2454 CBICALP /C8/
3606 7054 2462 CBICALQ /C8/
3607 7055 2470 CBICALR /C8/
3608 7056 2500 CBICALS /C8/
3609 7057 2506 CBICALT /C8/
3610 7060 2514 CBICALU /C8/
3611 7061 2522 CBICALV /C8/
3612 7062 2530 CBICALW /C8/
3613 7063 2540 CBICALX /C8/
3614 7064 2546 CBICALY /C8/
3615 7065 2554 CBICALZ /C8/
3616 7066 2562 CBICAL0 /C8/
3617 7067 2570 CBICAL1 /C8/
3618 7070 2755 CBICAL2 /C8/
3619 7071 4005 CBICAL3 /C8/
3620 7072 4025 CBICAL4 /C8/
3621
3622 CBTABE, /C8/
3623
3624 7171 7072 $$$
3625 7172 7402
3626 7173 7033
3627 7174 3431
3628 7175 3432
3629 7176 0034
3630 7177 0400

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3631	0156	0031
3632	0157	0030
3633	0160	7761
3634	0161	0017
3635	0162	3521
3636	0163	1424
3637	0164	1356
3638	0165	1330
3639	0166	7700
3640	0167	0002
3641	0170	0004
3642	0171	0010
3643	0172	0040
3644	0173	0100
3645	0174	0200
3646	0175	0400
3647	0176	1000
3648	0177	0211

0000	11100111	11000001	11111111	11111111	11111111	11111111	11111111	11111100
0100	00111111	11111111	11111111	11111111	11111111	11111011	11111111	11111111
0200	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
0300	11111111	11111111	11111111	11111111	11111111	11111111	11111000	00011111
0400	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
0500	11111111	11111111	11111111	11111111	11111111	11111111	11111111	10000011
0600	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
0700	11111111	11111111	11111111	11111111	11111111	11111111	11111111	10000111
1000	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
1100	11111111	11111111	11111111	11111100	00000000	00000000	00000000	00000111
1200	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
1300	11111111	11111111	11111111	11111111	11111111	11111111	11100000	00111111
1400	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
1500	11111111	11111100	00000000	00000000	00000000	00000000	00000000	00000011
1600	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
1700	11111111	11111111	11111111	11111111	11111111	11111111	11111100	11111111
2000	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
2100	11111111	11111111	11111111	11111111	11111111	11100000	00000000	01111111
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	11000000
2600	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
2700	11111111	11111111	11111111	11111111	11111111	11111111	11100000	00111111
3000	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
3100	11111111	11111111	11111111	11111111	11111111	11111111	00000011	11111111
3200	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
3300	11111111	11111111	11111111	11111111	11111111	11111111	11110000	00111111
3400	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
3500	11111111	11111111	11111111	11111111	11100000	00000000	00000000	01111111
3600	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
3700	11111111	11111111	11111111	11111111	11111111	11111000	00001111	11111111

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4000 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
4100 11111111 11111111 11111111 11111111 11111111 11111111 11110000 00011111
4200 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
4300 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
4400 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
4500 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
4600 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
4700 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111

5000 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
5100 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111

5200 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
5300 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111

5400 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
5500 11111111 11111111 11111111 11111111 11111111 11111111 11110000 00000000

5600 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
5700 11111111 11111111 11111111 11111111 11111110 00000001 11111111 11111111

6000 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
6100 11111111 11111111 11111111 11111111 11111111 11111000 11111111 11111111

6200 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
6300 11111111 11111111 11111111 11111111 11111111 10111111 11111111 11111111

6400 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
6500 11111111 11111111 11111111 11111111 11111111 11000000 00111111 11111111

6600 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
6700 11111111 11111000 00000000 00000000 00000000 00000000 00000000 11111111

7000 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11100000
7100 00000000 00000000 00000000 00000000 00000000 00000000 00000000 01111111

7200
7300

7400
7500

7600
7700

```

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A10 0010 C8CALR 2470 C8SWST 6344 DOCNT 5645
A11 0011 C8CALR 2500 C8TABB 7034 DON1 1356
ACL 7701 C8CALT 2506 C8TABE 7073 DONEA 6026
ACSAVE 6712 C8CALU 2514 C8TMP1 6421 DONINT 1340
ACSV 3753 C8CALV 2522 C8TTYI 4504 DOPACK 5611
ACTVCG 3737 C8CALW 2530 C8TYPE 4513 D0SET 5647
ADCL 4520 C8CALX 2540 CAF 6007 EMSG1 4200
ADLE 4526 C8CALY 2546 CHAN 0071 EMSG10 4410
ADLM 4521 C8CALZ 2554 CHAR 0067 EMSG11 4444
ADRB 4523 C8CHAR 6475 CHKCLA 6600 EMSG13 4477
ADRS 4527 C8CKP 6422 CHNL 3522 EMSG14 4537
ADSE 4525 C8CKPA 4516 CHNL1 3454 EMSG2 4232
ADSK 4524 C8CKSW 4503 CKCOUT 5630 EMSG20 4571
ADST 4522 C8CNTR 4505 CKIOT 3051 EMSG21 4622
ALL1S 1272 C8CONT 6545 CLAB 4535 EMSG22 4644
ALL1SA 1315 C8CRLF 4511 CLADBB 1253 EMSG23 4671
AOK 3707 C8D01 5706 CLADBU 1231 EMSG24 4706
AUTMSG 5472 C8D010 6655 CLEAN 3000 EMSG25 4732
AUTO 1431 C8D011 6207 CLED 4534 EMSG26 4765
AUT01 1435 C8D02 6433 CLKNOW 0146 EMSG27 5022
AUT02 1462 C8D03 5746 CLKST 4050 EMSG3 4270
BADINT 0005 C8D04 6406 CLOE 4530 EMSG30 5043
BLANK 0066 C8D07 6126 CLRDON 0733 EMSG31 5065
BYRETR 6106 C8ECHO 4512 CLRERR 1001 EMSG32 5113
C8ACTV 4475 C8ERR 4514 CLSA 4533 EMSG33 5132
C8BY1 5627 C8F 3432 CLSK 4531 EMSG34 5152
C8BY2 6662 C8GET 6224 CLZE 4532 EMSG35 5177
C8BY3 6461 CRHANG 6522 CNTR1 0043 EMSG36 5221
C8BY4 6115 C8INGU 4515 CNTRLC 6147 EMSG37 5243
C8BY5 6516 C8IZ 7000 CNTRLD 6200 EMSG4 4311
C8CAL0 2562 C8IZER 7016 CNTRLE 6144 EMSG40 5265
C8CAL1 2570 C8IZF 3431 CNTRLL 6136 EMSG41 5306
C8CAL2 2755 C8IZN 7020 CNTRLQ 6100 EMSG42 5343
C8CAL3 4005 C8IZNA 7024 CNTRLR 6111 EMSG6 4334
C8CAL4 4025 C8LAS 0760 CNTRLR 6120 EMSG7 4360
C8CALA 0006 C8MOV8 2223 CNTVAL 5650 ENA2 0226
C8CALB 0212 C8OCTA 4510 COD1 1627 ENA3 0251
C8CALC 1644 C8PASS 4502 COD2 1655 ENA4 0274
C8CALD 1673 C8PAUS 4517 COD3 1656 ENA5 0317
C8CALE 1763 C8PRNT 4506 COMPAR 3645 ENA6 0342
C8CALF 2015 C8RDP8 6265 COMPRI 3662 END 3034
C8CALG 2057 C8RESO 3611 CONSOL 0000 ENDER1 6341
C8CALH 2303 C8RETD 6214 CONT 3223 EOCER1 1063
C8CALI 3320 C8RETR 6135 CONVT 1732 EOCER2 1115
C8CALJ 2404 C8SETD 6213 CRLF 3337 EOCERR 1057
C8CALK 2412 C8SETS 6134 CSNOW 0150 EOUT 2252
C8CALL 2420 C8SR 0767 DELAY 0042 EOUT1 2273
C8CALM 2426 C8STAB 3420 DILE 4542 EOUT2 2270
C8CALN 2436 C8STAR 3400 DILX 4537 EOUT3 2267
C8CALO 2446 C8STRY 3412 DILY 4540 ER10 3302
C8CALP 2454 C8SV8R 0154 DISD 4536 ER11 3306
C8CALQ 2462 C8SWIT 4507 DIXY 4541 ER1L8B 0151

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ER40	3473	K7	3531	PCSAVE	6711	TEMPB	0037
ERCLR	2757	K77	0057	PNTBUF	6520	TEMPC	0040
ERCOM	2713	LAS	4553	PRLP	3330	TEMPO	0041
ERCOM1	2745	LAST	0144	PSIE	6665	TEMPLB	0152
ERMMSG	2112	LKSV	3754	PSKE	6663	TEMPX	4163
EROV5	3732	LSTCHN	4142	PSKF	6661	TM1	1646
ERPC	2762	M1	0051	PSR	0020	TM2	1675
ERR	0045	M2	0052	PSTB	6664	TMIDIF	1601
ERR1	6335	M4	0053	PTSTOR	5734	TMERR	1712
ERRINT	1401	M40	0055	RANCHN	3504	TM1L1	1630
ERRMES	6665	M6	0054	RBCLDO	1214	TM1L2	1657
ERSWIT	0070	MCOUNT	3157	REDOA	6015	TMG1	1424
ERTYP	2236	MCTR	2235	RESOL	3600	TMPCNT	6345
EXIT	2317	MESA	6346	RESOL1	3627	TST14	1476
EXIT1	2320	MESAC	6700	RESTR	4124	TST3	1317
EXITA	6040	MESAGE	2322	RETURN	0002	TST38	1330
EXT1	2010	MESFL	6706	SCOPE	2305	TSTADC	0514
EXTL	2000	MESHAN	6546	SCPNDW	0147	TSTCAF	0533
EXTTE	2062	MESMQ	6703	SECNO	3521	TSTCHA	6314
FADDR	2233	MESPAS	5651	SELECT	0073	TSTDON	0601
FILCNT	6440	MESPC	6675	SETCS	3036	TSTERR	0634
FILLER	6437	MESS	3131	SETCS1	3040	TSTJAM	0552
FINIS	1717	MESS1	3141	SETIO1	3074	TSTSR0	0663
FINISA	1725	MONOT	3200	SETIO2	3105	TSTSR1	0710
FIRST	0143	MOVE	2200	SETIO3	3111	TTYLPT	6521
FIVMUN	3736	MOVEA	2213	SETIOT	3066	TWENT	0023
FLSAVE	6714	MOA	7501	SETUP	0074	TWENT1	0024
FSTNO	3520	MOQ	7421	SETUP1	6626	TWENT2	0025
GETCH1	6302	MOSAVE	6713	SETUP2	5624	TXTA	5403
GETDAT	6056	MSGADR	2726	SPIOT	3060	TXTB	5411
GLITCH	3433	MSGPNT	0017	START	0211	TXTIOT	5374
GOITA	6043	MSRGHT	2341	STCLDO	1022	TXTPC	5371
GOTDA	6054	MTP	2366	STCLER	1037	TYPECH	2342
GTF	6004	MUX10	0447	STCONV	4061	UPAROW	6215
HCW1	0021	MUX11	0472	STORAG	5600	VADCL	2401
HCW2	0022	MUX8	0401	SW0	0026	VADLE	2451
HEAD13	5537	MUX8A	0400	SW1	0027	VADLM	2407
HEAD14	5555	MUX9	0424	SW2	0030	VADRB	2423
HLT	7402	MWORD	3156	SW3	0031	VADRS	2457
IND	2370	NEXTIO	3016	SW4	0032	VADSE	2441
INDEXA	6055	NOERCL	1201	SW5	0033	VADSK	2431
INITI	0217	NOISE	3254	SW6	0034	VADST	2415
INITM	0222	NOISE1	3265	SYST	4000	VCLAB	2525
INMODE	6476	NOSET	5640	SYST1	4057	VCLEL	2517
INSTR	3317	NOW	0145	TABIOT	3116	VCLOE	2465
JMPLC	2712	OK	3246	TABLA	6061	VCLSA	2511
K1000	0056	OV2	3476	TABLB	6071	VCLSK	2473
K200	0061	OV3	2046	TADDR	2234	VCLZE	2503
K207	0046	OVERR	2106	TAL	0072	VDILE	2565
K215	0050	OVL	2111	TALLY	0044	VDILX	2543
K40	0060	PASCNT	5646	TEMP0	0035	VDISY	2551
		PCLF	6662	TEMPA	0036	VDISL	2533

VDIXY	2557	XTAL1	2630
WATHES	6250	XTAL2	2624
XADCL	0120	XTAL3	2614
XADLE	0126	XFST	2632
XADLM	0121	XXADCL	2400
XADRB	0123	XXADLE	2450
XADRS	0127	XXADLM	2406
XADSE	0125	XXADRB	2422
XADSK	0124	XXADRS	2456
XADST	0122	XXADSE	2440
XC8CKP	6441	XXADSK	2430
XC8CNT	6000	XXADST	2414
XC8CRL	6423	XXCLAB	2524
XC8ECH	6423	XXCLEL	2516
XC8ERR	6607	XXCLOE	2464
XC8INQ	6235	XXCLSA	2510
XC8LAS	0153	XXCLSK	2472
XC8OCT	6400	XXCLZE	2502
XC8PAS	5600	XXDILE	2564
XC8PAU	5735	XXDILX	2542
XC8PNT	5701	XXDILY	2550
XC8PSW	6255	XXDISD	2532
XC8SA	3417	XXDIXY	2556
XC8STA	3416		
XC8SW	5660		
XC8TTY	5670		
XC8TYP	6477		
XCLAB	0135		
XCLEL	0134		
XCLOE	0130		
XCLSA	0133		
XCLSK	0131		
XCLZE	0132		
XCOMP	0064		
XDILE	0142		
XDILX	0137		
XDILY	0140		
XDISD	0136		
XDIXY	0141		
XDOLPT	6512		
XDOSW	6117		
XEND	5417		
XIND	3364		
XLABEL	5432		
XMOVE	0062		
XPRLP	0065		
XSELEC	2676		
XSETUP	3347		
XSTOR	0063		
XTABLA	6057		
XTABLB	6060		
XTAL	2600		

ERRORS DETECTED: 0
 LINKS GENERATED: 184
 RUN-TIME: 20 SECONDS
 3K CORE USED

A10	70#	1376	1376	1768	1769	1797	1798	1808	1812								
A11	71#	945	948	2139	2177	2190	2196	2208									
ACL	2599#																
ACSAVE	2900	2903	3105	3335	3481	3509	3534#										
ACSV	2302	2311	2313#														
ACTVCB	154	2301#	2308	2312													
ADCL	7#	464	533	558	772	902	935	946	987	1019	1025	1107	1163	1211			
	1227	1873	2149	2334													
ADLE	13#	247	270	294	317	341	463	480	807	852	895	928	954	1029			
	1115	1167	1213	1876	1922	2054	2156	2374									
ADLM	8#	371	394	418	440	461	478	956	1054	1120	1174	1878	1924	2059			
	2067	2165	2370	2396	2442												
ADRB	10#	495	498	721	722	723	724	725	726	727	728	729	730	731			
	732	733	734	735	736	737	738	739	740	741	742	743	744	745			
	746	789	808	828	853	1048	1072	1124	1195	1882	1889	1928	1930	2063			
	2072	2169	2400														
ADRS	14#	253	276	300	323	347	377	480	424	446	465	482	582	682			
	960	2068	2398														
ADSE	12#	547	552	559	596	664	670	702	785	747	774	923					
ADSK	11#	521	527	534	576	621	628	683	686	780	787	798	802	825			
	844	890	921	958	991	1023	1122	1189	1222	1880	1887	1926	2061	2167			
	2388																
ADST	9#	516	545	546	571	594	595	616	662	663	682	685	698	699			
	704	720	771	773	786	801	824	843	889	919	920	957	988	1020			
	1031	1055	1121	1879	1886	1925	2060	2166	2387								
ALL18	835	843#	859	861	1649												
ALL18A	849	862#															
AOK	2221	2224	2272#	2298													
AUTMSG	2351	2517#															
AUTO	934	943#	971	977	1653												
AUTO1	947#	975															
AUTO2	968#																
BADINT	63#	1995															
BLANK	126#	1850															
BYRETR	2973	2976#															
CBACTV	65	153#	224	1044	1068	1098	1139	1169	1204	1352	1430	1438	1446	1454			
	1464	1474	1482	1490	1498	1508	1516	1524	1532	1540	1551	1559	1567	1575			
	1584	1715	1988	1945	1955	2023	2087	2292	2336	2353	2397						
CBBY1	2684	2686	2699#	2710													
CBBY2	3491	3523	3525#														
CBBY3	3341	3344	3350#														
CBBY4	2987#	3166															
CBBY5	3403	3408#	3416														
C8CAL0	1576#	3616															
C8CAL1	1585#	3617															
C8CAL2	1716#	3618															
C8CAL3	2337#	3619															
C8CAL4	2354#	3620															
C8CALA	66#	3590															
C8CALB	225#	3591															
C8CALC	1045#	3592															
C8CALD	1069#	3593															
C8CALE	1140#	3594															

HEAD13	2278	2519#														
HEAD14	2288	2520#														
MLT	54#	1046	1070	1143	1171	1206	1327	1355	1366	1432	1440	1440	1456	1466		
	1476	1484	1492	1500	1510	1518	1526	1534	1542	1553	1561	1569	1578	1586		
	1717	1961	2338	2355	3575											
IND	1317	1342	1344	1411#	2001											
INDEXA	2909	2918	2938	2944#												
INITL	234#															
INITM	237#	1091	1100													
INMODE	2921	2970	2985	3174	3369	3373	3377#									
INSTR	1953#	1963	2031													
JMPLOC	1669	1674	1675#													
K1000	113#	894	926	1028												
K200	116#	1010														
K207	105#	1229	1948	2084												
K212	106#	1406	1982													
K215	107#	1401	1979													
K40	115#	1114														
K7	1842	2114#														
K77	114#	1390														
LAS	53#	227	846	1089	1092	1109	1164	1172	1197	1320	1345	1356	1597	1601		
	1664	1688	1707	1874	1877	1920	1957	2052	2055	2150	2339	2356	2371	2420		
LAST	182#	1333	1752													
LKSV	2304	2309	2314#													
LSTCHN	2363	2444#	2453	2454	2466											
M1	108#	1331	1350	1363	1612	1614	1672	1683	1898							
M2	109#	1081	1617	1869												
M4	110#	1831	2415													
M40	112#	1393														
M6	111#															
MCOUNT	1832	1848	1854#													
MCTR	1285	1304	1309#													
MESA	3169	3220#														
MESAC	3508	3530#														
MESSAGE	235	1096	1326	1328	1336	1373#	1375	1377	1387	1392	1691	1694	1698	1702		
	2277	2287	2350													
MESFL	3516	3532#														
MESHAN	3429	3434#														
MESMQ	3512	3531#														
MESPAS	2690	2718#														
MESPC	3504	3529#														
MESS	1332	1339	1697	1701	1705	1829#	1852	2280								
MESS1	1837#	1849														
MONOT	1867#	1904	2034													
MOVE	117	1276#	1278	1280	1281	1283	1284	1286	1290	1306						
MOVEA	1287#	1305														
MQA	2602#	2907	3338	3484												
MQL	1203	1714	2601#	3101												
MQSAVE	2908	3100	3339	3495	3513	3535#										
MSGADR	1606	1692#														
MSGPMT	75#	238	1324	1362	1364	1611	1613	1620	1673							
MSRGHT	1379	1380	1385	1388#												
MTP	1397	1402	1407	1409#												

MUX10	407	416#	422	430	432	1631										
MUX11	431	439#	444	452	454	1632										
MUX8	369#	375	383	385	1629											
MUX8A	354	357	368#													
MUX9	384	392#	398	406	408	1630										
MWORD	1830	1834	1837	1840	1841	1853#										
NEXTIO	1090	1750#	1764	1765												
NOERCL	750	762	771#	777	779	1645										
NOISE	1916#	1941	1950	2036												
NOISE1	1925#	1944														
NOSET	2704	2709#														
NOW	183#	1159	1338	1745	1756	1759	1761	1804								
OK	1897	1900	1905#													
OV2	2079	2083#														
OV3	1191	1195#														
OVERR	1223	1228#														
OVL	1231#															
PASCNT	2687	2691	2715#													
PCLF	2594#	3405	3407													
PCSAVE	3488	3505	3533#													
PNTBUF	3394	3398	3404	3410#	3417	3423										
PRLP	125	1230	1409	1847	1949	1967#	1973	1980	1983	2085						
PSIE	2597#															
PSKE	2595#															
PSKF	2593#	3418														
PSR	79#															
PSTB	2596#	3405														
PTSTOR	2801	2803	2814	2823	2825#											
RANCMN	2065	2092#	2103													
RBCLDO	709	778	785#	793	795	1646										
REDOA	2912#	2920														
RESOL	2035	2136#	2284	2294												
RESOL1	2166#	2182														
RESTR	2411	2424#														
RETURN	60	61#	870	893	910	1027	1051	1996								
SCOPE	1348	1356#														
SCPNO#	185#	1740														
SECNO	2097	2099	2105#													
SELECT	134#	230														
SETCS	1739	1743	1767#	1771												
SETCS1	1769#	1777														
SETIO1	1798#	1806														
SETIO2	1800	1807#														
SETIO3	1811#	1814														
SETIO7	1746	1762	1792#	1815												
SETUP	135#	244	267	291	314	330	368	391	415	438	459	476	493	514		
	543	569	592	614	660	680	696	715	770	784	800	823	842	867		
	887	915	942	983	1008	1158	2137	2333								
SETUP1	3495#															
SETUP2	2696#															
SPIOT	1742	1785#														
START	68	222#	2030													
STCLDO	674	681#	689	691	1642											

.L2371	1409	1414#				
.L2372	1408	1415#				
.L2373	1396	1416#				
.L2374	1340	1417#				
.L2375	1332	1339	1418#			
.L2376	1292	1419#				
.L2377	1207	1420#				
.L2772	1697	1701	1705	1725#		
.L2773	1693	1706	1726#			
.L2774	1691	1694	1698	1702	1727#	
.L2775	1671	1728#				
.L2776	1667	1729#				
.L2777	1665	1730#				
.L3166	1847	1855#				
.L3167	1842	1856#				
.L3170	1811	1857#				
.L3171	1809	1858#				
.L3172	1807	1859#				
.L3173	1796	1860#				
.L3174	1774	1803	1861#			
.L3175	1760	1862#				
.L3176	1742	1863#				
.L3177	1738	1864#				
.L3372	1995	2003#				
.L3373	1959	2004#				
.L3374	1958	2005#				
.L3375	1901	1938	2006#			
.L3376	1875	1921	2007#			
.L3377	1867	1916	2008#			
.L3571	2085	2127#				
.L3572	2080	2128#				
.L3573	2053	2129#				
.L3574	2048	2130#				
.L3575	2021	2131#				
.L3576	2020	2132#				
.L3577	2018	2133#				
.L3764	2306	2316#				
.L3765	2296	2317#				
.L3766	2285	2318#				
.L3767	2281	2319#				
.L3770	2280	2320#				
.L3771	2277	2267	2321#			
.L3772	2226	2322#				
.L3773	2222	2323#				
.L3774	2171	2193	2204	2324#		
.L3775	2155	2325#				
.L3776	2140	2326#				
.L3777	2136	2327#				
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