[redacted]
#19

IDENTIFICATION

PRODUCT CODE: MAINDEC-08-DHLAA-B-D

PRODUCT NAME: DECWRITER (LA30) CONTROL - EXERCISER TEST

DATE CREATED: DECEMBER, 1973

MAINTAINER: DIAGNOSTIC ENGINEERING

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REVISED: M. STURAK

1. ABSTRACT

THE LA30 DECWRITER IS CAPABLE OF SELECTABLE 110, 150, AND 300 BAUD PRINT RATES.

IF THE DECWRITER IS AN LA30S (INDICATE SO WITH AC SWITCH 4 = 1) FILL (NON PRINTING) CHARACTERS WILL BE ISSUED AFTER A CARRIAGE RETURN IF OPERATING AT A 300 BAUD PRINT RATE (STARTING ADDRESS 201).

ITEMS 12,13, AND 14 (TIMING TESTS) ARE NOT APPLICABLE FOR A LA30 SERIAL LINE INTERFACE DECWRITER, AND ARE ABORTED WHEN AC SW 4 = 1.

ITEM 4 PRINTS A MAXIMUM AND A MINIMUM OF 80 COMUMNS WHEN THE LA30 IS SERIAL LINE INTERFACED, THEREFORE THE TYPEOUT:

" MAXIMUM COLUMNS IN LINE = 80 "

SHOULD ALWAYS OCCUR BECAUSE THERE IS NO DIAGNOSTIC TESTING.

THIS CONTROL/EXERCISER PROGRAM CHECKS THE FOLLOWING FUNCTIONS OF A LA30 OR LA30S DECWRITER,

BASIC IOT TESTS

1. BASIC INPUT IOT TESTS
2. BASIC OUTPUT IOT TESTS

PRINTER TESTS

3. CARRIAGE RETURN FROM ANY COLUMN--CARRIAGE RETURN TEST
4. CHECKS FOR 80 PRINT COLUMNS--80 COLUMN LINE TEST
5. LINE FEED DEPENDABILITY--LINE FEED QUALITY TEST
6. CHARACTER PRINT DEPENDABILITY--CHARACTER PRINT TEST
7. PRINTER HEAD EXERCISER--SWIRL PRINT PATTERN TEST
8. PRINTER HEAD STEP-OVER TEST
9. PREVENTION OF OVER-PRINTING--OVER-PRINT TEST
10. CARRIAGE SPACE TEST
11. CHECKS FOR ILLEGAL CHARACTER PRINT--NON-PRINTING CHARACTER

TIMING TESTS

12. ACTUAL PRINT TIME BETWEEN CHARACTERS--LA30 PRINT RATE TEST
13. CARRIAGE RETURN TIME TEST
14. LINE FEED RATE TEST

OPERATOR TESTS AND EXERCISES

15. ECHO TEST
16. LINE ECHO TEST--ECHO UP TO 80 CHARACTERS
17. CHECK THE ONE KEY "ROLL-OVER" FUNCTION--ROLL-OVER TEST

SPECIAL OPERATOR EXERCISE FOR LA30 SERIAL LINE INTERFACE ONLY

1. CARRIAGE RETURN LINE EXERCISE

2. REQUIREMENTS

2.1 EQUIPMENT

1. ANY OF THESE PROCESSORS: PDP-8, 8/I, 8/L, 8/E, 8/S, OR PDP-12
2. DECWRITER (LA30 OR LA30S)
3. A DC02 OR A PT08 (OPTIONAL)

2.2 STORAGE

THIS PROGRAM USES FROM 0 TO 4400 (OCTAL) FOR THE TESTS AND FROM 5000 TO 6600 (OCTAL) FOR STORAGE OF THE MESSAGES. THE PROGRAM MUST RESIDE IN FIELD 0 ONLY.

2.3 PRELIMINARY PROGRAMS

BASIC INSTRUCTION TESTS

3. LOADING PROCEDURE

LOAD THE PROGRAM WITH THE STANDARD BINARY LOADER METHOD USING A TTY OR A HIGH SPEED READER. REFER TO THE "USERS HANDBOOK" FOR USE OF THE BINARY LOADER.

4. STARTING PROCEDURES

4.1 CONTROL SWITCH SETTINGS

SW00 = 1	INHIBIT ERROR HALT
SW00 = 0	ERROR HALT
SW01 = 1	INHIBIT ERROR MESSAGE PRINT OUT
SW01 = 0	PRINT ERROR MESSAGE
SW02 = 1	LOOP ON THE CURRENT TEST
SW02 = 0	DON'T LOOP
SW03 = 1	REPEAT THE CURRENT TEST SECTION
SW03 = 0	NORMAL TEST FLOW
SW04 = 1	LA30 HAS SERIAL LINE INTERFACE
SW04 = 0	LA30 HAS PARALLEL LINE INTERFACE

PROCESSOR SELECTION SWITCHES

05-06

00	PDP-8, OR PDP-8/I
01	PDP-8/L, OR PDP-12
10	PDP-8/E
11	PDP-8/S

TEST INHIBIT SWITCHES

SW08 = 1	INHIBIT BASIC IOT TEST
SW08 = 0	DO THE BASIC IOT TEST
SW09 = 1	INHIBIT THE PRINTER TESTS
SW09 = 0	DO THE PRINT TESTS
SW10 = 1	INHIBIT THE TIMING TESTS
SW10 = 0	DO THE TIMING TESTS
SW11 = 1	INHIBIT THE OPERATORS' TESTS
SW11 = 0	DO THE OPERATORS TESTS

NORMAL TESTING IS WITH ALL AC SWITCHES = 0 EXCEPT, HOWEVER, IF THE LA30 IS SERIAL THEN THE AC SWITCHES WOULD = 200.

4.2 STARTING ADDRESS

200 - LA30P (ALL BAUD RATES)
LA30S (110, OR 150 BAUD)

201 - LA30S (300 BAUD)

204 - RESTART RETAINING PARAMETERS SELECTED VIA STARTING ADDRESS 200 OR 201.

4200 - SPECIAL OPERATOR EXERCISE (LA30S)

4.3 OPERATOR ACTION

LOAD ADDRESS 200, OR 201
PRESS START

THE PROGRAM WILL HALT AT ADDRESS 3116 WITH THE AC = 7777.

[FOR A PDP-8/E: START = CLEAR, THEN CONT.]

4.3.1 START-UP QUESTION #1:

? IS THE DECWRITER IN THE CONSOLE TTY POSITION ?

(YES) PUT THE OCTAL NUMBER 0304 IN THE SWITCHES AND PRESS "CONT". GO TO PARAGRAPH 4.3.4.

(NO) GO IMMEDIATELY TO START-UP QUESTION #2.

4.3.2 START-UP QUESTION #2:

? ARE YOU TESTING THE DECWRITER WITH A DC02 ?

(YES) SELECT A "DC02 GROUP" AND A "DC02 STATION" FROM THE "DC02" TABLE AND PUT THE VALUE IN THE SWITCHES. PRESS "CONT" AND GO TO PARAGRAPH 4.3.4.

IF A "GROUP" IS NOT SELECTED (AC SWITCHES 08 THRU 11 = 0) THE PROGRAM WILL ASSUME A DC02 IS NOT AVAILABLE.

(NO) SET THE SWITCHES = 0000 THEN PRESS "CONT". GO IMEDIATELY TO START-UP QUESTION #3.

4.3.3 START-UP QUESTION #3:

THE PROGRAM IS HALTED AT MEMORY ADDRESS 3147.

? WHAT ARE THE DEVICE CODES FOR THE STATION UNDER TEST ?

CONFIGURE A DEVICE CODE FROM THE PT08 "DEVICE CODE TABLE" INTO THE AC SWITCHES. PRESS "CONT" AND GO TO PARAGRAPH 4.3.4.

4.3.4 THE PROGRAM WILL HALT AT ADDRESS 0401 WITH THE AC = 0000.
AT THIS TIME, SELECT THE DESIRED SWITCH OPTIONS-INCLUDING ONE OF THE "PROCESSOR SELECTION SWITCHES"-THEN PRESS "CONT".
(SEE SECTION 4.1 FOR SELECTION OF SWITCHES)

THE TITLE OF THE DIAGNOSTIC WILL BE PRINTED ON THE DECWRITER IMMEDIATELY FOLLOWED BY THE SELECTED TESTS. IF THE PROCESSOR IS UNABLE TO COMMUNICATE (RETURN A PRINT DONE FLAG) THE PROGRAM WILL HALT AT ADDRESS 1411. CONTINUATION OF THE TEST FROM THIS ERROR HALT WILL PROVIDE NO USEFULL DATA.

NOTE: ONLY ONE STATION MAY BE SELECTED FOR TESTING
EVEN THOUGH MANY STATIONS ARE AVAILABLE.

```
*****************************************************************************
*
*                        DC02 TABLES:
*
*       SELECT SWITCH 00 THRU 07 FOR THE "DC02 STATION"
*                SW00 = STATION #1
*                SW01 = STATION #2
*                SW02 = STATION #3
*                SW03 = STATION #4
*       SELECT SWITCH 04 THRU 07 FOR A DC02-F
*                SW04 = STATION #5
*                SW05 = STATION #6
*                SW06 = STATION #7
*                SW07 = STATION #8
*       SELECT SWITCH 08 THRU 11 FOR THE "DC02 GROUP"
*                SW08 = GROUP #1 CONTROL FOR STATIONS 1  TO 8
*                SW09 = GROUP #2 CONTROL FOR STATIONS 9  TO 16
*                SW10 = GROUP #3 CONTROL FOR STATIONS 17 TO 24
*                SW11 = GROUP #4 CONTROL FOR STATIONS 25 TO 32
*
*****************************************************************************
*
*                        PT08 DEVICE CODE TABLE:
*
*               STATION #1                      4041
*               STATION #2                      4243
*               STATION #3                      4445
*               STATION #4                      4647
*               STATION #5                      1112
*
*****************************************************************************
```

5. ERRORS

5.1 ERROR DESCRIPTION AND RECOVERY

THE FIRST ERROR HALT AT ADDRESS 1411 INDICATES THE PROCESSOR IS UNABLE TO RECEIVE A PRINT DONE FLAG (CHECK BY A TSF IOT) FROM THE LA30 150 MILLI-SECONDS AFTER SENDING A PRINT COMMAND (TLS).

THE NORMAL ERROR HALT IS AT ADDRESS 0324 (IF SW00 = 0) WITH THE CONTENTS OF THE AC EQUIVALENT TO THE STARTING ADDRESS OF THE TEST IN ERROR, PRESS "CONT" TO GET AN ERROR TYPEOUT (IF SW01 = 0) AND TO CONTINUE WITH THE TEST.

THE DECWRITER IOTS ARE SUB-ROUTINED WITH A HALT FOLLOWING THEM TO TRAP FAULTY IOTS. THE "TRAP" HALTS ARE:

SPF TRAP = 1110	KRS TRAP = 1153
TCF TRAP = 1121	KRB TRAP = 1157
TPC TRAP = 1125	KCF TRAP = 1163
TLS TRAP = 1136	KIE TRAP = 1167
KCC TRAP = 1147	

6. RESTRICTIONS

A. THE PROGRAM MUST RESIDE ON FIELD 0
B. NO DEVICE IN THE SYSTEM THAT WILL GIVE UNWANTED INTERRUPTS
C. ONLY ONE LA30 SELECTED FOR TESTING

7. EXECUTION TIME

DEPENDS ON THE TEST SELECTION

8. TEST DESCRIPTIONS

8.1 BASIC INPUT IOT TESTS

8.1.1 KCC TEST

ISSUE A KCC WITH THE AC = 7777, AC SHOULD GO TO 0000. TEST IS EXECUTED 100 (DEC.) TIMES.

8.1.2 KSF TEST

SET THE AC = 7777 AND ISSUE A KCC, WAIT FOR 50 MSEC. THEN CHECK THE FLAG (KSF) FOR A SKIP CONDITION.

8.2 BASIC OUTPUT IOT TEST

8.2.1 TLS TEST

ISSUE A TLS AND WAIT 150 MSEC. FOR THE FLAG TO SET. SKIP ON THE FLAG (TSF).

8.2.2 TCF TEST

ISSUE A TCF TO CLEAR THE FLAG. SKIP ON THE FLAG TO VERIFY THAT NO SKIP OCCURED WITH THE FLAG = 0.

8.2.3 TCF TEST 2

ISSUE A TLS TO SET THE FLAG THEN CLEAR THE FLAG WITH A TCF. SKIP ON THE FLAG = 1 -- NO SKIP SHOULD OCCUR.

8.2.4 PRINTER FLAG INTERRUPT TEST

CHECK TO MAKE SURE THAT THE PRINTER FLAG WILL CAUSE INTERRUPTS.

8.2.5 8E IOT TEST

CHECK THE SPF AND SPI IOTS USING THE SAME METHOD AS IN THE TESTS ABOVE.

8,3 PRINTER TESTS

PRESS A "RUBOUT" TO EXIT ANY OF THESE TESTS INDIVIDUALLY.

8,3,1 CARRIAGE RETURN TEST

CHECK THE ABILITY OF THE CARRIAGE TO RETURN TO THE LEFT MARGIN FROM ANY COLUMN.

8,3,2 80 COLUMN LINE TEST

STARTING AT THE LEFT MARGIN, PRINT A CHARACTER AND CHECK FOR A MARGIN FLAG. TRY TO PRINT 80 COLUMNS AND PRINT THE ACTUAL AMOUNT OF COLUMNS BEFORE THE MARGIN FLAG IS FOUND.

A MARGIN FLAG DOES NOT EXIST FOR A LA30 SERIAL LINE, THEREFORE, ALWAYS 80 COLUMNS ARE TYPED.

COLUMNS 00 THRU 69 WILL CONTAIN "X",
COLUMNS 70 THRU 79 WILL CONTAIN AN INCREMENTAL COUNT FROM 0 TO 9.

8,3,3 LINE FEED QUALITY TESTS

8,3,3,1 (PART 1)

START AT THE LEFT MARGIN AND PRINT A BACKSLASH FOLLOWED BY A LINE FEED. THE RESULT SHOULD APPEAR TO BE A DIAGONAL LINE STARTING AT THE LEFT MARGIN AND ENDING AT THE RIGHT MARGIN.

8,3,3,2 (PART 2)

THIS TEST PRINTS A SERIES OF ALTERNATING FORWARD SLASHES, AND BACK SLASHES EACH FOLLOWED BY A CARRIAGE RETURN AND LINE FEED; SWEEPING FROM A FAST LINE FEED RATE TO A SLOW LINE FEED RATE.

THIS IS INTENDED AS A WORST CASE TEST FOR ADJUSTMENT OF THE LINE FEED SELENOID.

8,3,4 CHARACTER PRINT TEST

PRINT ONE LINE OF EVERY PRINTABLE CHARACTER STARTING WITH THE "SPACE" CODE--0240.

8,3,5 SWIRL PRINT PATTERN TEST

PRINT 64 LINES OF A SWIRLING PATTERN THAT CONTAINS EVERY PRINTABLE CHARACTER. THIS TEST IS TO EXERCISE EACH THE PRINT HEAD. THIS TEST IS DONE AT A RANDOM PRINT SPEED TO SIMULATE REAL TIME USE.

8,3,6 PRINTER HEAD STEP-OVER TEST

PRINT 78 CHARACTERS (X CODE). AFTER EACH CHARACTER IS PRINTED WAIT FOR THE PRINTER HEAD TO STEP OUT OF THE WAY (STEPS TWICE TO THE RIGHT AFTER A ONE SECOND DELAY) THEN PRINT THE NEXT CHARACTER.

8.3.7 OVER-PRINT TEST

THIS TEST WILL ISSUE A DOUBLE TLS FOR EACH TIME A CHARACTER IS PRINTED, TRYING TO MAKE THE PRINTER TO PRINT A SECOND TIME WITHOUT WAITING FOR THE READY FLAG.

8.3.8 CARRIAGE SPACE TEST

PRINT A LINE OF ALTERNATING O'S, FILL IN THE BLANK SPACES WITH X'S BY SPACING OUT TO THE CORRECT PLACE FOR EACH BLANK SPACE TO BE FILLED.

8.3.9 NON-PRINTING CHARACTER TEST

TRY TO PRINT A TABLE OF NON-PRINTING CHARACTERS, ERRORS ARE TO BE VISUALLY NOTED.

8.4 TIMING TESTS (NOT APPLICABLE FOR LA30S)

NOTE: REFERENCE THE LA30 ENGINEERING SPECIFICATION FOR LA30 TIMING PARAMETERS.

8.4.1 CHARACTER PRINT RATE

CALCULATE THE PRINT TIME BETWEEN CHARACTERS BY PRINTING 100 CHARACTERS AND MEASURING THE TIME, COMPARE THIS VALUE TO A KNOWN CONSTANT. PRINT THE RESULTS ON THE DECWRITER.

8.4.2 CARRIAGE RETURN TIME

MEASURE THE CARRIAGE TIME FOR 10 DIFFERENT PLACES ON THE CARRIAGE. CALCULATE THE AVERAGE AND THE MAXIMUM RETURN TIME. PRINT THE RESULTS.

8.4.3 LINE FEED RATE TEST

PRINT AS MANY LINE FEEDS IN ONE SECOND AS POSSIBLE. PRINT THE RESULTS.

8.5 OPERATORS' TESTS

[PRESS A "RUBOUT" TO EXIT ANY OF THESE TESTS INDIVIDUALY.]

8.5.1 SINGLE CHARACTER ECHO TEST

ECHO A CHARACTER AND ITS OCTAL NUMBER WHEN A KEY ON THE DECWRITER IS STRUCK.

8.5.2 LINE ECHO

ECHO UP TO 80 CHARACTERS WHEN TYPED IN FROM THE KEYBOARD. EXIT THE TEST WITH A "RUBOUT". RETYPE THE LINE BY TYPING A "CR". CHANGE THE LINE BY TYPING A "CTRL C".

8.5.3 CHARACTER ROLL-OVER-HOLD TEST

1. DEPRESS TWO DIFFERENT CHARACTERS ON THE DECWRITER KEYBOARD.

(THE PROGRAM WILL ACKNOWLEDGE YOUR SELECTION WITH AN APPROPRIATE MESSABE).

NOTE: THE KEYBOARD ROM IS SCANNING .

2. PRESS THE 1ST CHARACTER AND HOLD.

NOTE: THE ROM IS STOPPED AT THE 1ST CHARACTER.

3. WHILE STILL DEPRESSING THE 1ST CHARACTER, PRESS THE 2ND AND HOLD.

NOTE: THE ROM SHOULD STILL BE STOPPED AT THE 1ST CHARACTER.

4. WHILE STILL DEPRESSING BOTH CHARACTERS, RELEASE THE 1ST.

NOTE: THE ROM SHOULD SCAN TO THE 2ND CHARACTER AND STOP.

5. WHILE STILL DEPRESSING THE 2ND CHARACTER, PRESS THE 1ST AND HOLD.

NOTE: THE ROM SHOULD STILL BE STOPPED AT THE 2 ND CHARACTER.

6. WHILE STILL DEPRESSING BOTH CHARACTERS, RELEASE THE 2ND.

NOTE: THE ROM SHOULD SCAN TO THE 1ST CHARACTER AND STOP.

(REPEAT STEPS 3 THRU 6 UNTIL TIRED).

8.5.4 SPECIAL OPERATOR EXERCISE

THIS EXERCISE IS APPLICABLE FOR THE LA30S OPERATING MAINLY AT 300 BAUD AND TO BE USED IN DEBUGGING A FAULTY LA30.

THIS EXERCISE WAS NOT DESIGNED TO BE EXECUTED AS PART OF THE NORMAL LA30 TEST FLOW.

FIRST FOLLOW THE NORMAL SYSTEM INITIALIZATION AS DECLARED IN PARAGRAPHS:

4.3
4.3.1 (IF APPLICABLE)
4.3.2 (IF APPLICABLE)
4.3.4

LOAD ADDRESS 4200
PRESS START WITH THE AC SWITCHES = 0000

THE PROGRAM WILL HALT.

SET IN AC SWITCHES 5 THRU 11 THE NUMBER OF CHARACTERS PER LINE TO BE TYPED.

SET IN AC SWITCHES 0 THRU 4 THE NUMBER OF NULL "FILL" CHARACTERS TO BE ISSUED AFTER A CARRIAGE RETURN.

PRESS "CONT".

BOTH THE FILL CHARACTERS AND THE LINE LENGTH ARE VARIABLE AT RUNTIME, HOWEVER, IF AT ANYTIME THE LINE LENGTH IS ZERO (AC SWITCHES 5 THRU 11 = 0) THE PROGRAM WILL HALT. TO RESUME EXERCISING AT THIS POINT, PRESS "CONT" WITH A VALUE OTHER THAN ZERO IN AC SWITCHES 5 THRU 11.

9. LISTING

```
                    /MAINDEC-08-DHLAA-B
                    /
                    /
                    /COPYRIGHT 1971,1973 DIGITAL EQUIPMENT CORP.,MAYNARD,MASS. 01756
                    /
                    /
                    /SUPERCEEDES:
                    /LA30 CONTROL TEST MAINDEC DHLAA-A
                    /
                    /
                    /LA30 EQUALITIES

          6117      MTON=6117                       /CAUTION! "MTON" DOES NOT CLA
          6125      MINS=6125
          6115      MINT=6115
          4577      UTSF=JMS I      CXTSF
          4576      UTCF=JMS I      CXTCF
          4575      UTLS=JMS I      CXTLS
          4574      UKSF=JMS I      CXKSF
          4573      UKCC=JMS I      CXKCC
          4572      UKRS=JMS I      CXKRS
          4571      UKRB=JMS I      CXKRB
          4570      USPF=JMS I      CXSPF
          4567      USPI=JMS I      CXSPI
          4566      SETLOC=JMS I    CSETTOX
          4565      SWITCH=JMS I    CCHKSWS
          5564      START1=JMP I    CTST1
          5563      START2=JMP I    CTST2
          5562      START3=JMP I    CTST3
          5561      START4=JMP I    CTST4
          5560      START=JMP I     CKSTART
          4557      PRINT=JMS I     CXPRINT
          4556      ERPRIN=JMS I    CEPRINT
          4555      CRLF=JMS I      CXCRLF
          4554      TYPE=JMS I      CXTYPE
          4553      PRTST=JMS I     CPRTTST
          4552      DELAY=JMS I     CXDELAY
          4551      OCTALP=JMS I    CXOCTAL
          4550      REPEAT=JMS I    CXREPET
          4547      COMPARE=JMS I   CCOMPXY
          4546      UCR=JMS I       CXCR
          4545      COCTAL=JMS I    COCTDEC
          4544      EXIT=JMS I      CXEXIT
          4543      WAIT=JMS I      CDEL250
          4542      DDIV=JMS I      CDUBDIV
          4541      MPY=JMS I       CMULTIP
          4540      A$K=JMS I       CQUESTN
          4537      LISTEN=JMS I    CKEYTYP
          4536      CHKRUB=JMS I    CC377
          4535      CHKCR=JMS I     CC215
          4534      CCNTC=JMS I     CC203
```



```
          0000      *0

    0000  0000             0
    0001  5001             JMP     1
    0002  0002             2
    0003  0003             3


          0020      *20

                    /CONSTANTS AND COMMONLY USED LOCATIONS

    0020  0001      K0001,  1
    0021  0002      K0002,  2
    0022  0007      K0007,  7
    0023  0010      K0010,  10
    0024  0012      K0012,  12              /10 DEC
    0025  0017      K0017,  17
    0026  0077      K0077,  77
    0027  0212      K0212,  212             /LF
    0030  0215      K0215,  215             /CR
    0031  0240      K0240,  240             /SPACE
    0032  0260      K0260,  260             /0
    0033  0330      K0330,  330             /X
    0034  0334      K0334,  334             /BACKSLASH
    0035  4000      K4000,  4000
    0036  4600      K4600,  4600
    0037  7700      K7700,  7700            /MASK
    0040  7774      M4,     -4
    0041  7730      M50,    -50
    0042  7660      M120,   -120
    0043  7634      M144,   -144            /-100
    0044  7014      M764,   -764            /-500
    0045  7743      MAGIC,  -35
    0046  0000      BUFFER, 0
    0047  0000      COUNT,  0
    0050  0000      LINE,   0
    0051  0000      TALLY,  0
    0052  0000      TEMP,   0
    0053  0256      DECIM,  256             /DECIMAL OR PERIOD
    0054  0000      WORK1,  0
    0055  0000      WORK2,  0
    0056  0000      WORK3,  0
    0057  0000      REGA,   0
    0060  0000      REGB,   0
    0061  0000      REGC,   0
    0062  0000      X,      0
    0063  0000      XX,     0
    0064  0000      Y,      0
    0065  0000      YY,     0

    0066  0000      DC02,   0
    0067  0000      NUMA,   0
    0070  0000      NUMB,   0
    0071  0000      ERRCNT, 0
```

```
                0072  0000    0
                0073  0000    TIME,   0
                0074  0000    THOU,   0
                0075  0000    HUND,   0
                0076  0000    TENS,   0
                0077  0000    UNIT,   0
                0100  0000    REMAIN, 0
                0101  0000    ANSWER, 0
                0102  0000    KCODE,  0
                0103  0000    PCODE,  0
                0104  0000    KLA30S, 0
                0105  0000    FILLCH, 0
                0106  2305    T8EIOT, IOT8E
                0107  3507    PDP8,   XPDP8
                0110  3535    PDP8S,  XPDP8S
                0111  3521    PDP8L,  XPDP8L
                0112  3527    PDP8E,  XPDP8E
                0113  0000    KKLA30S,        0
                0114  7701    M77,    -77
                0115  7653    M125,   -125
                0116  0000    CHKSTO, 0

                      0200    *200
                              /STARTING ADDRESS 200
                              /STARTING ADDRESS 201
                0200  7040    KSTART, CMA
                0201  3113            DCA KKLA30S             /LA30S SELECTED FOR 300 BAUD OPERAION
                0202  3066            DCA DC02                /CLEAR FOR POSSIBLE DC02 ENABLE
                0203  4540            ASK                     /MAKE DECISIONS ON CONSOLE, PT08 OR DC02
                0204  4777            JMS     ASKTYP
                0205  1113            TAD KKLA30S
                0206  7640            SZA CLA
                0207  5211            JMP .+2                 /LA30P OR LA30S (110 OR 150 BAUD)
                0210  1376            TAD (-11
                0211  3105            DCA FILLCH
                0212  1066            TAD     DC02
                0213  6117            MTON
                0214  4553            PRTST                   /TRY TO PRINT A DUMMY CHARACTER
                0215  4555            CRLF
                0216  4557    LOOP,   PRINT; MESTID           /TITLE MESSAGE TO CONSUL-TTY
                0217  5776
                0220  4555            CRLF
                0221  4566            SETLOC; MILL1; XMIL1, -333
                0222  1031
                0223  7445
                0224  3071            DCA     ERRCNT
                0225  7604            LAS; AND (17); TAD (-17); SZA CLA; JMP .+3; HLT; JMP .-6
                0226  0375
                0227  1374
                0230  7640
                0231  5234
                0232  7402
                0233  5225
                0234  7604    TST1,   LAS
                0235  0023            AND     K0010           /TEST 1 MASK
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                0236  7650            SNA CLA                 /SR08 = 1 ??
                0237  5762            JMP I   ST1TST          /NO
                0240  7604    TST2,   LAS
                0241  0277            AND     K0004           /TEST 2 MASK
                0242  7650            SNA CLA                 /SR09 = 1 ??
                0243  5763            JMP I   ST2TST          /NO
                0244  1104    TST3,   TAD KLA30S              /AC SWITCH 4 SENSOR
                0245  7640            SZA CLA
                0246  5253            JMP TST4
                0247  7604            LAS
                0250  0021            AND     K0002           /TEST 3 MASK
                0251  7650            SNA CLA                 /SR10 = 1 ??
                0252  5764            JMP I   ST3TST          /NO
                0253  7604    TST4,   LAS                     /YES, INHIBIT TIME TESTS
                0254  0020            AND     K0001
                0255  7650            SNA CLA                 /SR11 = 1 ??
                0256  5765            JMP I   ST4TST          /NO
                0257  4555    ENDTST, CRLF
                0260  4557            PRINT; MESD             /DONE MESSAGE TO CONSUL-TTY
                0261  5712
                0262  4555            CRLF
                0263  4555            CRLF
                0264  4555            CRLF
                0265  5216            JMP     LOOP

                              /SUB-ROUTINE TO INITIALIZE LOCATIONS
                0266  0000    SETTOX, 0
                0267  7200            CLA
                0270  1666            TAD I   SETTOX
                0271  3301            DCA     SETSTO
                0272  2266            ISZ     SETTOX
                0273  1666            TAD I   SETTOX
                0274  3701            DCA I   SETSTO
                0275  2266            ISZ     SETTOX
                0276  5666            JMP I   SETTOX
                0277  0004    K0004,  4
                0300  0400    K0400,  400
                0301  0000    SETSTO, 0
                0302  0000    XREPET, 0
                0303  7604            LAS
                0304  0300            AND     K0400
                0305  7640            SZA CLA                 /IS AC BIT 3=1 ?
                0306  5702            JMP I   XREPET          /YES, LOOP ON THIS TEST SECTION
                0307  2302            ISZ     XREPET          /NO, SET EXIT TO GO TO NEXT TEST SECTION
                0310  5702            JMP I   XREPET

                              /ROUTINE TO CHECK THE SWITCHES AND DETERMINE WHAT COURSE OF
                0311  0000    CHKSWS, 0
                0312  7300            CLA CLL
                0313  1071            TAD     ERRCNT
                0314  7650            SNA CLA                 /ANY ERRORS?
                0315  5326            JMP     CHKSW2          /NO
                0316  3071            DCA     ERRCNT
                0317  7604            LAS
```

```
 218  0320  7700  CHKSW0, SMA CLA
 219  0321  5333        JMP     ERRHLT          /AC 00=0
 220  0322  7604  CHKSW1, LAS
 221  0323  7004        RAL
 222  0324  7700        SMA CLA                 /PRINT ERROR MESSAGE?
 223  0325  4336        JMS     EPRINT          /YES, AC 01=0
 224  0326  7604  CHKSW2, LAS
 225  0327  7006        RTL
 226  0330  7700        SMA CLA                 /LOOP ON TEST?
 227  0331  2311        ISZ     CHKSWS          /AC 01=0 DON'T LOOP
 228  0332  5711        JMP I   CHKSWS
 229
 230  0333  4347  ERRHLT, JMS     STRTST          /THIS ROUTINE WILL GET THE BEGGINING ADDRESS
 231  0334  7402        HLT                     /OF THE TEST IN "ERROR"
 232  0335  5322        JMP     CHKSW1
 233
 234  0336  0000  EPRINT, 0
 235  0337  4555        CRLF
 236  0340  4557        PRINT
 237  0341  5754  ERRTYP, DUMMY
 238  0342  4555        CRLF
 239  0343  4566        SETLOC) ERRTYP) DUMMY
 240  0344  0341
 241  0345  5754
 242  0346  5736        JMP I   EPRINT
 243  0347  0000  STRTST, 0
 244  0350  1311        TAD     CHKSWS
 245  0351  0360        AND     K7600
 246  0352  3357        DCA     STRSAV
 247  0353  1711        TAD I   CHKSWS
 248  0354  0361        AND     K0177
 249  0355  1357        TAD     STRSAV
 250  0356  5747        JMP I   STRTST
 251  0357  0000  STRSAV, 0
 252  0360  7600  K7600,  7600
 253  0361  0177  K0177,  177
 254  0362  1241  ST1TST, BIOTST
 255  0363  1522  ST2TST, PRITST
 256  0364  3200  ST3TST, TIMTST
 257  0365  3662  ST4TST, OPSTST
 258  0374  7761
 259  0375  0017
 260  0376  7767
 261  0377  0400
             0400  PAGE
 262
```



```
 263                 /ASK THE USER WHICH FAMILY OF 8 MACHINES IS RUNNING THE TEST.
 264  0400  0000  ASKTYP, 0
 265  0401  7402        HLT
 266  0402  7604        LAS
 267  0403  0377        AND     (200
 268  0404  3104        DCA     KLA30S          /=200 FOR LA30S AT 110, 150, OR 300 BAUD RATE
 269  0405  7604        LAS
 270  0406  0376        AND     (140            /MASK FOR PDP-8, 8/I
 271  0407  7106        CLL RTL
 272  0410  7006        RTL
 273  0411  7006        RTL
 274  0412  7430        SZL
 275  0413  5217        JMP .+4
 276  0414  7700        SMA CLA
 277  0415  5507        JMP I PDP8              /00
 278  0416  5511        JMP I PDP8L             /01
 279  0417  7700        SMA CLA
 280  0420  5512        JMP I PDP8E             /10
 281  0421  5510        JMP I PDP8S             /11
 282
```

```
                        /  334
                        /  257  /
                        /
                        /LINE FEED QUALITY TEST (PART 2)
                        /
                        /THERE WILL BE NO FILL CHARACTERS IF THE LA30 IS 300 BAUD AND SERIAL
                        /
                        /
0422  0020      MAX,    20              /INITIAL PROGRAM DELAY 16MS
0423  0000      VMAX,   0
0424  0000      II,     0               /ITERATION
0425  0000      OE,     0               /
0426  4555      CAL,    CRLF; PRINT; MPART2; CRLF
0427  4557
0430  0541
0431  4555
0432  3105              DCA FILLCH
0433  1375      CALX,   TAD (-46)       / 38(10) ITERATIONS
0434  3224              DCA II
0435  3225              DCA OE
0436  1222              TAD MAX
0437  3223              DCA VMAX
0440  4555      XCAL,   CRLF
0441  1223              TAD VMAX
0442  7041              CIA             /NEGATE FOR DELAY
0443  3245              DCA .+2; DELAY; 0
0444  4552
0445  0000
0446  4276              JMS xMULTIPLY; -163     /115 (10)
0447  7615
0450  4320              JMS XDIVIDE; -144       /100 (FOR PERCENT %)
0451  7634
0452  7201              CLA IAC
0453  0225              AND OE
0454  2225              ISZ OE
0455  7000              NOP             /IF OE OVERFLOWS
0456  7650              SNA CLA
0457  1374              TAD (55)        /CODE 334   (OE) EVEN
0460  1373              TAD (257)       /CODE 257   (OE) ODD
0461  4554              TYPE
0462  4544              EXIT
0463  5267              JMP .+4
0464  2224              ISZ II          /INCREMENT ITERATION
0465  5240              JMP XCAL
0466  4555              CRLF
0467  4565              SWITCH
0470  5226              JMP CAL         /ONCE MORE FROM THE TOP
0471  1113              TAD KKLA305
0472  7650              SNA CLA
0473  1372              TAD (-11)       /RESET (FILLCH)
0474  3105              DCA FILLCH
0475  5771'             JMP PRTST4      /CONTINUE WITH OTHER PRINTER TESTS
```



```
                        /MULTIPLIER IS SINGLE PRECISION
                        /MULTIPLICAND IS SP (VMAX)
                        /RESULT IS DOUBLE PRECISOION (LSB) (MSB)
                        /
0476  0476      xMULTIPLY,      .
0477  1676              TAD I xMULTIPLY
0500  2276              ISZ xMULTIPLY
0501  3320              DCA XDIVIDE
0502  3316              DCA LSB
0503  3317              DCA MSB
0504  7100      MULT,   CLL
0505  1316              TAD LSB
0506  1223              TAD VMAX
0507  3316              DCA LSB
0510  7004              RAL
0511  1317              TAD MSB
0512  3317              DCA MSB
0513  2320              ISZ XDIVIDE
0514  5304              JMP MULT
0515  5676              JMP I xMULTIPLY
0516  0000      LSB,    0
0517  0000      MSB,    0
0520  0520      XDIVIDE,        .
0521  3223              DCA VMAX
0522  7100      DIV,    CLL
0523  1720              TAD I XDIVIDE
0524  1316              TAD LSB
0525  3316              DCA LSB
0526  7004              RAL
0527  1370              TAD (-1)
0530  1317              TAD MSB
0531  7510              SPA
0532  5336              JMP .+4
0533  3317              DCA MSB
0534  2223              ISZ VMAX
0535  5322              JMP DIV
0536  2320              ISZ XDIVIDE
0537  7300              CLL CLA
0540  5720              JMP I XDIVIDE
0541  5020      MPART2, TEXT "(PART 2)"
0542  0122
0543  2440
0544  6251
0545  0000
0570  7777
0571  1757
0572  7767
0573  0257
0574  0055
0575  7732
0576  0140
0577  0200
      0600      PAGE
```

```
                        /ROUTINE TO CONVERT AN OCTAL NUMBER TO A DECIMAL NUMBER
                        /ENTERED WITH NUMBER TO BE CONVERTED IN THE ACCUMULATOR
                        
0600  0000  OCTDEC, 0
0601  3210          DCA     NUM             /SAVE NUMBER
0602  1256          TAD     K1750
0603  3215          DCA     DEVIS
0604  1377          TAD     (THOU-1
0605  3016          DCA     16
0606  1215          TAD     DEVIS
0607  4227          JMS     DEVIDE
0610  0000  NUM,    0
0611  1032          TAD     K0260
0612  3416          DCA I   16
0613  1024          TAD     K0012
0614  4227          JMS     DEVIDE
0615  1750  DEVIS,  1750
0616  7420          SNL
0617  5225          JMP     .+6
0620  7200          CLA
0621  1210          TAD     NUM
0622  1032          TAD     K0260
0623  3077          DCA     UNIT
0624  5600          JMP I   OCTDEC
0625  3215          DCA     DEVIS
0626  5206          JMP     NUM-2
                        
0627  0000  DEVIDE, 0
0630  7041          CIA
0631  3254          DCA     DEV1
0632  3255          DCA     DEV2
0633  1627          TAD I   DEVIDE
0634  7100  DEVA,   CLL
0635  1254          TAD     DEV1
0636  7420          SNL
0637  5242          JMP     .+3
0640  2255          ISZ     DEV2
0641  5234          JMP     DEVA
0642  7041          CIA
0643  1254          TAD     DEV1
0644  7041          CIA
0645  3627          DCA I   DEVIDE
0646  1255          TAD     DEV2
0647  1257          TAD     M2
0650  7100          CLL
0651  1021          TAD     K0002
0652  2227          ISZ     DEVIDE
0653  5627          JMP I   DEVIDE
                        
0654  0000  DEV1,   0
0655  0000  DEV2,   0
0656  1750  K1750,  1750
0657  7776  M2,     -2
```



```
0660  0000  DECOCT, 0
0661  4200          JMS     OCTDEC
0662  4557          PRINT; MESR             /"LA30 PRINT TIME BETWEEN CHARACTERS="
0663  5340
0664  4271          JMS     TYPNUM
0665  4557          PRINT; MESMSE                   /"  MILLI-SECONDS"
0666  5445
0667  4555          CRLF
0670  5660          JMP I   DECOCT
                        
                        /TYPE THE DECODED NUMBER
                        
0671  0000  TYPNUM, 0
0672  4305          JMS     TYPTHT
0673  1053          TAD     DECIM
0674  4554          TYPE
0675  1077          TAD     UNIT
0676  4554          TYPE
0677  5671          JMP I   TYPNUM
                        
0700  0000  SCRTYP, 0
0701  7200          CLA
0702  1030          TAD     K0215           /CR
0703  4554          TYPE
0704  5700          JMP I   SCRTYP
0705  0000  TYPTHT, 0
0706  1074          TAD     THOU
0707  4554          TYPE
0710  1075          TAD     HUND
0711  4554          TYPE
0712  1076          TAD     TENS
0713  4554          TYPE
0714  5705          JMP I   TYPTHT
                        
                        /ROUTINE TO PRINT AN OCTAL NUMBER
0715  0000  XOCTAL, 0000
0716  7006          RTL
0717  7006          RTL
0720  3060          DCA REGB        /SAVE NUMBER
0721  1040          TAD M4
0722  3061          DCA REGC        /SET UP COUNTER
0723  1060          TAD REGB        /GET NUMBER
0724  0022          AND K0007
0725  1032          TAD K0260
0726  4554          TYPE
0727  1060          TAD REGB        /GET NUMBER
0730  7006          RTL
0731  7004          RAL
0732  3060          DCA REGB        /SAVE THE REST
0733  2061          ISZ REGC
0734  5323          JMP .-11
0735  5715          JMP I XOCTAL
                        /
                        /ROUTINE TO TYPE LISTING
                        /ENTER WITH JMS +1 EQUAL TO START OF LIST
```

```
                        /
0736  0000  XPRINT, 0000
0737  7300          CLA CLL
0740  1736          TAD I XPRINT
0741  2336          ISZ XPRINT      /SET FOR RETURN +1
0742  3374          DCA STOPRT      /SAVE THE POINTER
0743  1774          TAD I STOPRT    /GET THE CHARACTER
0744  0037          AND K7700       /MASK BITS 0-5
0745  7450          SNA             /END OF MESSAGE
0746  5736          JMP I XPRINT    /YES, EXIT
0747  7500          SMA             /IS AC MINUS
0750  7020          CML             /NO, SET THE LINK
0751  7001          IAC
0752  7012          RTR
0753  7012          RTR
0754  7012          RTR
0755  4554          TYPE            /PRINT THE CHARACTER
0756  1774          TAD I STOPRT    /GET THE WORD
0757  0026          AND K0077       /MASK BITS 6-11
0760  7450          SNA             /END OF MESSAGE
0761  5736          JMP I XPRINT    /YES EXIT
0762  1372          TAD K3740       /NO, ADD A CONSTANT
0763  7500          SMA
0764  1373          TAD K4100
0765  1031          TAD K0240
0766  4554          TYPE            /TYPE THE CHARACTER
0767  7100          CLL
0770  2374          ISZ STOPRT      /UPDATE WORD LIST
0771  5343          JMP XPRINT+5
0772  3740  K3740,  3740
0773  4100  K4100,  4100
0774  0000  STOPRT, 0
0777  0073
      1000  PAGE

                    /USERS ROUTINE TO TYPE A CHARACTER

1000  0000  XTYPE,  0
1001  4575          UTLS
1002  4577          UTSF
1003  5202          JMP     .-1
1004  7200          CLA
1005  5600          JMP I   XTYPE

1006  0000  XCRLF,  0
1007  7410          SKP
1010  1214          XCR
1011  4610          JMS I .-1
1012  1027          TAD     K0212           /LF
1013  4554          TYPE
1014  5606          JMP I   XCRLF
                    /DELAY LOOP IN MILLI-SECONDS

1015  0000  XDELAY, 0
1016  7300          CLA CLL
```



```
1017  1615          TAD I   XDELAY
1020  2215          ISZ     XDELAY
1021  3232          DCA     MSCTR
1022  1231          TAD     MILL1
1023  3233          DCA     MILCTR
1024  2233          ISZ     MILCTR
1025  5224          JMP     .-1
1026  2232          ISZ     MSCTR
1027  5222          JMP     .-5
1030  5615          JMP I   XDELAY

1031  0000  MILL1,  0
1032  0000  MSCTR,  0
1033  0000  MILCTR, 0

                    /DELAY LOOP - 250 U-SEC.
1034  0000  DEL250, 0
1035  7300          CLA CLL
1036  1243          TAD     D250
1037  3233          DCA     MILCTR
1040  2233          ISZ     MILCTR
1041  5240          JMP     .-1
1042  5634          JMP I   DEL250
1043  7712  D250,   -66

1044  0000  ERNUM,  0
1045  1076          TAD     TENS
1046  4554          TYPE
1047  1077          TAD     UNIT
1050  4554          TYPE
1051  5644          JMP I   ERNUM

                    /ROUTINE TO COMPARE TWO NUMBERS

                    /       COMPAR
                    /       X       COMPARE THE CONTENTS OF "X"
                    /       Y       WITH THE QUANITY "Y"
                    /       A       HERE IF X>Y
                    /       B       HERE IF X<Y
                    /       C       HERE IF X=Y

1052  0000  COMPXY, 0
1053  7200          CLA
1054  1652          TAD I   COMPXY          /GET DATA
1055  3057          DCA     REGA            /STORE IT
1056  2252          ISZ     COMPXY
1057  1652          TAD I   COMPXY          /DATA IS COMPARED WITH THIS NUM.
1060  7041          CIA                     /NEGATE IT
1061  1457          TAD I   REGA
1062  7500          SMA
1063  5274          JMP     MORTST
1064  3057          DCA     REGA
1065  1021          TAD     K0002
1066  1252          TAD     COMPXY          /SET UP EXIT FOR
1067  3252          DCA     COMPXY          /"LESS-THAN" EXIT
```

```
                1070  1057          TAD     REGA
                1071  7041          CIA
                1072  3100          DCA     REMAIN
                1073  5652          JMP I   COMPXY
                1074  7450  MORTST, SNA
                1075  5301          JMP     COMPEQ
                1076  3100          DCA     REMAIN          /SET FOR DATA
                1077  2252          ISZ     COMPXY
                1100  5652          JMP I   COMPXY          /"MORE-THAN" EXIT

                1101  1377  COMPEQ, TAD     (3
                1102  1252          TAD     COMPXY
                1103  3252          DCA     COMPXY
                1104  5652          JMP I   COMPXY          /"EQUAL TO" EXIT


                                    /LA38 IOT SUB-ROUTINES

                1105  0000  XSPF,   0
                1106  0000          0
                1107  5705          JMP I   XSPF
                1110  7402          HLT

                1111  0000  XTSF,   0
                1112  0000          0
                1113  5711          JMP I   XTSF            /NO SKIP
                1114  2311          ISZ     XTSF            /SKIP
                1115  5711          JMP I   XTSF

                1116  0000  XTCF,   0
                1117  0000          0
                1120  5716          JMP I   XTCF
                1121  7402          HLT

                1122  0000  XTPC,   0
                1123  0000          0
                1124  5722          JMP I   XTPC
                1125  7402          HLT

                1126  0000  XSPI,   0
                1127  0000          0
                1130  5726          JMP I   XSPI
                1131  2326          ISZ     XSPI
                1132  5726          JMP I   XSPI

                1133  0000  XTLS,   0
                1134  0000          0
                1135  5733          JMP I   XTLS
                1136  7402          HLT

                1137  0000  XKSF,   0
                1140  0000          0
                1141  5737          JMP I   XKSF            /NO SKIP
                1142  2337          ISZ     XKSF            /SKIP
```



```
                1143  5737          JMP I   XKSF

                1144  0000  XKCC,   0
                1145  0000          0
                1146  5744          JMP I   XKCC
                1147  7402          HLT

                1150  0000  XKRS,   0
                1151  0000          0
                1152  5750          JMP I   XKRS
                1153  7402          HLT

                1154  0000  XKCF,   0
                1155  0000          0
                1156  5754          JMP I   XKCF
                1157  7402          HLT

                1160  0000  XKIE,   0
                1161  0000          0
                1162  5760          JMP I   XKIE
                1163  7402          HLT

                                    /IOT TABLE FOR THE DECWRITER

                1164  6000  IOTTAB, 6000
                1165  6001          6001
                1166  6002          6002
                1167  6004          6004
                1170  6005          6005
                1171  6006          6006
                1177  0003
                      1200          PAGE

                                    /LISTEN FOR THE KEYBOARD AND ECHO THE CHARACTER TYPED.
                1200  0000  KEYTYP, 0
                1201  4573          UKCC
                1202  4574          UKSF
                1203  5202          JMP     .-1
                1204  4571          UKRB
                1205  3116          DCA CHKSTO
                1206  1116          TAD CHKSTO
                1207  4575          UTLS
                1210  4577          UTSF
                1211  5210          JMP     .-1
                1212  7300          CLL CLA
                1213  5600          JMP I   KEYTYP
                                    /ISSUE A CARRIAGE RETURN
                1214  0000  XCR,    0
                1215  7200          CLA
                1216  1030          TAD     K0215
                1217  4554          TYPE
                1220  7200          CLA
                1221  1104          TAD KLA30S
                1222  7650          SNA CLA
                1223  5614          JMP I XCR
```

```
 708    1224  1105          TAD FILLCH
 709    1225  3227          DCA .+2
 710    1226  7610          SKP CLA
 711    1227  7000          NOP
 712    1230  1227          TAD .-1
 713    1231  7650          SNA CLA
 714    1232  5614          JMP ! XCR
 715    1233  1240          TAD K0377
 716    1234  4554          TYPE
 717    1235  2227          ISZ .-6
 718    1236  5226          JMP .-10
 719    1237  5614          JMP I   XCR
 720    1240  0377  K0377,  377
 721
 722                        /TEST 1 = BASIC INPUT IOT'S
 723
 724                        /ISSUE KCC WITH AC=7777.  AC SHOULD GO TO 0
 725                        /IF AC NOT 0,...KCC FAILURE IN USERS TTY
 726                        /TEST IS DONE 100 TIMES
 727    1241  4555  BIOTST, CRLF
 728    1242  4557          PRINT; MESB1I                    /"BASIC INPUT IOT TESTS"
 729    1243  5162
 730    1244  4555          CRLF
 731    1245  1043  T1PG1,  TAD     M144            /-100 (DECIMAL)
 732    1246  3047          DCA     COUNT
 733    1247  7240          CLA CMA                 /AC=7777
 734    1250  4573          UKCC                    /CLEAR AC AND FLAG
 735    1251  7440          SZA                     /AC=0?
 736    1252  5260          JMP     ET10            /ERROR
 737    1253  2047          ISZ     COUNT           /DONE
 738    1254  5247          JMP     .-5
 739    1255  4565          SWITCH
 740    1256  5245          JMP     T1PG1
 741    1257  5271          JMP     T1PG2
 742    1260  2071  ET10,    ISZ     ERRCNT          /KCC FAILURE AC NOT 0
 743    1261  7240          CLA CMA
 744    1262  4573          UKCC
 745    1263  7450          SNA                     /FAILURE ?
 746    1264  5245          JMP     T1PG1           /NO ERROR NOW
 747    1265  4566          SETLOC; ERRTYP; MESKCC                  /"KCC FAILURE--AC NOT 0"
 748    1266  0341
 749    1267  5111
 750    1270  5255          JMP     ET10+3
 751
 752
 753                        /SET THE AC = 7777 AND ISSUE A KCC.  WAIT FOR 150 MSEC
 754                        /FOR THE AC TO CLEAR (BY THE KCC), THEN CHECK THE FLAG--KSF
 755                        /SHOULD NOT SKIP.  A SKIP INDICATES A KSF FAILURE OR THAT THE
 756                        /FLAG WON'T CLEAR.
 757
 758    1271  7300  T1PG2,  CLA CLL
 759    1272  1043          TAD     M144            /-100 (DEC)
 760    1273  3047          DCA     COUNT
 761    1274  7040  T1PA2,  CMA
 762    1275  4573          UKCC
```



```
 763    1276  4552          DELAY
 764    1277  7552          =226                    /150 MSEC DELAY
 765    1300  4574          UKSF                    /SKIP ON FLG.
 766    1301  7410          SKP
 767    1302  5312          JMP     KSF1
 768    1303  7440          SZA
 769    1304  5317          JMP     KCC2
 770    1305  2047          ISZ     COUNT           /DONE YET?
 771    1306  5274          JMP     T1PA2           /NO, DO AGAIN
 772    1307  4565          SWITCH                  /YES, CHECK SWITCHES
 773    1310  5271          JMP     T1PG2
 774    1311  5324          JMP     T1PG3
 775    1312  2071  KSF1,    ISZ     ERRCNT
 776    1313  4566          SETLOC; ERRTYP; MESKSF                  /"KSF FAILURE OR FLAG WON'T CLEAR"
 777    1314  0341
 778    1315  5124
 779    1316  5307          JMP KSF1+3
 780    1317  2071  KCC2,    ISZ     ERRCNT
 781    1320  4566          SETLOC; ERRTYP; MESKCC
 782    1321  0341
 783    1322  5111
 784    1323  5307          JMP KSF1+3
 785
 786                        /BASIC IOT OUTPUT TESTS
 787
 788                        /ISSUE TLS AND WAIT 150 MSEC FOR FLAG TO SET,  SKIP ON FLG=1 (TSF)
 789                        /TSF SHOULD SKIP, OR ERROR OCCURS.  FLG NOT SET OR TSF FAILURE.
 790                        /WITH FLAG=1, SKIP ON FLAG 500 TIMES.  FAILURE TO SKIP CAUSES
 791                        /AN ERROR HALT.
 792
 793    1324  4555  T1PG3,  CRLF
 794    1325  4557          PRINT; MESB1O                    /"BASIC OUTPUT IOT TESTS"
 795    1326  5175
 796    1327  4555          CRLF
 797    1330  1044          TAD     M764
 798    1331  3047          DCA     COUNT
 799    1332  7240  T1PA3,  CLA CMA
 800    1333  4575          UTLS                    /USERS TLS = START PRINTER
 801    1334  4552          DELAY                   /DELAY 150 MSEC.
 802    1335  7552          =226
 803    1336  4577          UTSF                    /FLAG=1?
 804    1337  5345          JMP     TSF1            /NO, ERROR
 805    1340  2047          ISZ     COUNT           /DONE?
 806    1341  5336          JMP     .-3             /NO, REPEAT
 807    1342  4565          SWITCH
 808    1343  5324          JMP     T1PG3
 809    1344  5352          JMP     T1PG5
 810    1345  2071  TSF1,    ISZ     ERRCNT
 811    1346  4566          SETLOC; ERRTYP; MESTSF                  /"TSF FAILURE OR FLAG NOT SET"
 812    1347  0341
 813    1350  5000
 814    1351  5342          JMP TSF1+3
 815
 816                        /ISSUE TCF TO CLEAR FLAG.  SKIP ON FLAG 500 TIMES TO VERIFY THAT NO
 817                        /SKIP OCCURS WITH FLG=0.
```

```
                                                
1352  1044  T1PG5,  TAD     M764            /-500 TO COUNT
1353  3047           DCA     COUNT
1354  4576           UTCF                    /CLEAR FLAG
1355  4577  T1PA5,  UTSF
1356  7410           SKP
1357  5365           JMP     TCF1
1360  2047           ISZ     COUNT           /DONE?
1361  5355           JMP     T1PA5
1362  4565           SWITCH
1363  5352           JMP     T1PG5
1364  5772           JMP I   IOT$T6
1365  2071  TCF1,    ISZ     ERRCNT
1366  4566           SETLOC; ERRTYP; MESTCF                  /"TCF FAILURE OR FLAG WON'T CLEAR"
1367  0341
1370  5016
1371  5362           JMP TCF1-3
1372  1414  IOTST6,  T1PG6
      1400           PAGE

                     /TEST THE ABILITY TO COMMUNICATE WITH THE LA30.  SEND A "TLS" AND
                     /CHECK FOR A FLAG BACK IN 150 MSEC.  NO FLAG GIVES AN ERROR HALT.
1400  0000  PRTTST, 0
1401  7240           CLA CMA
1402  4575           UTLS
1403  4577           UTSF
1404  7410           SKP
1405  5600           JMP I   PRTTST
1406  4552           DELAY
1407  7552           =226            /WAIT FOR 150 MSEC FOR FLAG
1410  4577           UTSF            /FLAG BETTER BE BACK BY NOW
1411  7402           HLT             /NO FLAG--UNABLE TO COMMUNICATE WITH PRINTER
1412  7200           CLA
1413  5600           JMP I   PRTTST
                     /ISSUE TLS AND WAIT FOR FLAG.  CLEAR FLAG (TCF) SKIP ON FLAG=1
                     /NO SKIP SHOULD OCCUR.  IF SKIP OCCURED, TCF FAILED

1414  1043  T1PG6,  TAD     M144            /-100 TO COUNTER
1415  3047           DCA     COUNT
1416  7200  T1PA6,  CLA
1417  4575           UTLS
1420  4577           UTSF
1421  5220           JMP     .-1
1422  4576           UTCF
1423  4577           UTSF
1424  7410           SKP
1425  5233           JMP     TCF2
1426  2047           ISZ     COUNT
1427  5216           JMP     T1PA6
1430  4565           SWITCH
1431  5214           JMP     T1PG6
1432  5240           JMP     T1PG7
1433  2071  TCF2,    ISZ     ERRCNT
1434  4566           SETLOC; ERRTYP; MESTCF
1435  0341
```



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1436  5016
1437  5230           JMP TCF2-3

                     /CHECK PRINTER FLAG FOR ABILITY TO CAUSE INTERRUPTS

1440  4566  T1PG7,  SETLOC; 1; JMP I 2
1441  0001
1442  5402
1443  1044           TAD     M764
1444  3047           DCA     COUNT
1445  1377  T1PA7,  TAD     (T1PC7
1446  3002           DCA     2
1447  4573           UKCC                    /CLEAR READER FLAG
1450  4575           UTLS
1451  4577           UTSF
1452  5251           JMP     .-1
1453  4576           UTCF                    /CLEAR PRINTER FLAG
1454  6001           ION                     /ENABLE INTERRUPTS
1455  4552           DELAY
1456  7737           =41                     /WAIT FOR AN ILEGAL INTERRUPT
1457  6002           IOF                     /DISABLE INTERRUPTS
1460  1376           TAD     (T1PB7
1461  3002           DCA     2
1462  7001           IAC
1463  6115           MINT
1464  4575           UTLS
1465  4577           UTSF
1466  5265           JMP     .-1
1467  6001           ION
1470  4575           UTLS                    /CAUSE THE LA30 TO REQUEST AN INTERRUPT
1471  4552           DELAY
1472  7552           =226                    /WAIT FOR 150 MSEC FOR AN INTERRUPT
1473  6002           IOF
1474  2071           ISZ     ERRCNT
1475  4566           SETLOC; ERRTYP; NOINT
1476  0341
1477  5144
1500  5303           JMP     T1PB7+2
1501  2047  T1PB7,  ISZ     COUNT           /DONE?
1502  5245           JMP     T1PA7           /NO, REPEAT
1503  4565           SWITCH
1504  5240           JMP     T1PG7
1505  4550           REPEAT
1506  5564           START1
1507  5506           JMP I   T8EIOT
1510  4574  T1PC7,  UKSF
1511  7410           SKP
1512  4577           UTSF
1513  7410           SKP
1514  5301           JMP     T1PB7
1515  2071           ISZ     ERRCNT
1516  4566           SETLOC; ERRTYP; MESUI2                  /"UNEXPECTED INTERRUPT OCCURED"
1517  0341
1520  5426
1521  5303           JMP     T1PB7+2
```

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                        /TEST 2 PRINTER TESTS
                        /CARRIAGE RETURN TEST,  CHECK THE ABILITY OF THE CARRIAGE TO RETURN TO THE
                        /LEFT MARGIN FROM ANY POINT ON THE LINE
1522  4555  PRITST, CRLF
                        PRINTJ MESCR                    /"CARRIAGE RETURN TEST" TO MASTER TTY
                        CRLF
1523  4557      TAD     (-47
1524  5453      DCA     TALLY
1525  4555      DCA     LINE
1526  1375      TAD     K0240
1527  3051      TYPE
1530  3050  PRTST1, TAD  LINE
1531  1031      CMA
1532  4554      DCA     COUNT
1533  1050      TAD     K0330           /0330 CODE "X"
1534  7040      TYPE                    /PRINT CHARACTER
1535  3047      EXIT
1536  1033      JMP     PRINT2-3
1537  4554      ISZ     COUNT           /LINE PRINTING DONE?
1540  4544      JMP     .-5             /NO, CONTINUE PRINTING X CODE
1541  5357      IAC CLL
1542  2047      RAL
1543  5336      TAD     LINE
1544  7101      DCA     LINE            /ADD 2 TO LINE COUNTER
1545  7004      UCR
1546  1050      TAD     K0315           /0315 CODE, "M"
1547  3050      TYPE                    /PRINT IT
1550  4546      TAD     K0212           /"LF" CODE
1551  1363      TYPE                    /PRINT IT
1552  4554      ISZ     TALLY           /IS TEST DONE?
1553  1027      JMP     PRTST1          /NO, PRINT ANOTHER LINE
1554  4554      SWITCH
1555  2051      JMP     PRITST
1556  5333      JMP I   PRINT2
1557  4565  PRINT2, PRTST2
1560  5322  K0315,  315
1561  5762
1562  1626
1563  0315
                        /CHECK FOR A RUBOUT
1564  0000  C377,   0
1565  1116      TAD     CHKSTO
1566  1374      TAD     (-377
1567  7640      SZA CLA
1570  2364      ISZ     C377
1571  5764      JMP I   C377
1572  7401
1573  7731
1574  1501
1575  1510
1576  1600  PAGE
1577        /CHECK FOR A "CR"
1600  0000  C215,   0
1601  1116      TAD     CHKSTO
1602  1377      TAD     (-215
```



```
1603  7640      SZA CLA
1604  2200      ISZ     C215
1605  5600      JMP I   C215
                /CHECK FOR A CNTRL C
1606  0000  C203,   0
1607  1116      TAD     CHKSTO
1610  1376      TAD     (-203
1611  7640      SZA CLA
1612  2206      ISZ     C203
1613  5606      JMP I   C203
                /CHECK FOR AN "EXIT"
1614  0000  XEXIT,  0
1615  4574      UKSF
1616  5223      JMP     .+3
1617  4571      UKRB
1620  3116      DCA     CHKSTO
1621  4536      CHKRUB
1622  7410      SKP
1623  2214      ISZ     XEXIT
1624  4573      UKCC
1625  5614      JMP I   XEXIT

                /COLUMN TEST,  CHECK FOR 80 COLUMNS IN A LINE OF TYPE,  VERIFY
                /IT IS MORE THAN 79 AND LESS THAN 81

1626  4555  PRTST2, CRLF
1627  4557      PRINTJ MESCLM                   /"80 COLUMN TEST" TO MASTER TTY
1630  5466
1631  4555      CRLF                    /CRLF TO SLAVE
1632  1115      TAD     M125
1633  3051      DCA     TALLY
1634  3047      DCA     COUNT
1635  1104  POVER,  TAD KLA30S
1636  7640      SZA CLA
1637  5312      JMP T2LA30S
1640  1033      TAD     K0330           /GET "X" CODE
1641  4575      UTLS
1642  2000      ISZ     0
1643  5242      JMP     .-1
1644  4577      UTSF
1645  7610      SKP CLA
1646  5256      JMP     COLEND
1647  2047      ISZ     COUNT
1650  4577      UTSF
1651  5250      JMP     .-1
1652  4544      EXIT
1653  5267      JMP     COLOUT
1654  2051      ISZ     TALLY
1655  5235      JMP     POVER
1656  4547  COLEND, COMPAR
1657  0047      COUNT
1660  0120      120
1661  5303      JMP     COLERB          /COLUMNS > 80
1662  5272      JMP     COLERA          /COLUMNS < 80
1663  5264      JMP     .+1             /COLUMNS = 80
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1036  1664  4555  COLOK,  CRLF
1037  1665  4557          PRINT; MESGCO                   /"MAXIMUN COLUMNS = 80"
1038  1666  5211
1039  1667  4565  COLOUT, SWITCH
1040  1670  5226          JMP     PRTST2
1041  1671  5335          JMP     PRTST3
1042
1043                /OUTPUT AN ERROR MESSAGE
1044  1672  4710  COLERA, JMS I   XEHLT1
1045  1673  4555          CRLF
1046  1674  4557          PRINT; MESCEA                   /"LESS THAN 80 COLUMNS--BY"
1047  1675  5500
1048  1676  4711          JMS I   XENUM
1049  1677  4557          PRINT; MESCOL                   /" COLUMNS"
1050  1700  5534
1051  1701  4555          CRLF
1052  1702  5267          JMP     COLOUT
1053  1703  4710  COLERB, JMS I   XEHLT1
1054  1704  4555          CRLF
1055  1705  4557          PRINT; MESCEB                   /"MORE THAN 80 COLUMNS--BY"
1056  1706  5516
1057  1707  5276          JMP     COLERA+4
1058  1710  3652  XEHLT1, ERRLFR
1059  1711  1044  XENUM,  ERNUM
1060  1712  1033  T2LA30S,        TAD K0330
1061  1713  4554          TYPE
1062  1714  4544          EXIT; JMP COLOUT
1063  1715  5267
1064  1716  2047          ISZ COUNT
1065  1717  1047          TAD COUNT
1066  1720  1375          TAD (-106
1067  1721  7640          SZA CLA
1068  1722  5312          JMP T2LA30S
1069  1723  1374          TAD (260
1070  1724  3047          DCA COUNT
1071  1725  1047  T2LAX0, TAD COUNT
1072  1726  4554          TYPE
1073  1727  1047          TAD COUNT
1074  1730  1373          TAD (-271
1075  1731  7650          SNA CLA
1076  1732  5264          JMP COLOK
1077  1733  2047          ISZ COUNT
1078  1734  5325          JMP T2LAX0
1079
1080                /LINE FEED QUALITY TEST.
1081
1082  1735  4555  PRTST3, CRLF
1083  1736  4557          PRINT; MESLFQ                   /"LINE FEED QUALITY TEST" TO MASTER TTY
1084  1737  5541
1085  1740  4555          CRLF
1086  1741  1042          TAD     M120            /-80 FOR COLUMN COUNT
1087  1742  3047          DCA     COUNT
1088  1743  1034          TAD     K0334
1089  1744  4554          TYPE
1090  1745  1027          TAD     K0212
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1091  1746  4554          TYPE
1092  1747  4544          EXIT
1093  1750  5354          JMP     .+4
1094  1751  2047          ISZ     COUNT           /DONE WITH TEST?
1095  1752  5343          JMP     .-7
1096  1753  4555          CRLF
1097  1754  4565          SWITCH
1098  1755  5335          JMP     PRTST3
1099  1756  5772          JMP CAL         /PART 2
1100
1101                /CHARACTER PRINT TEST,  PRINT ONE LINE OF EVERY PRINTABLE CHARACTER
1102
1103  1757  4555  PRTST4, CRLF
1104  1760  4557          PRINT; MESCPT                   /"CHARACTER PRINT TEST" TO MASTER TTY
1105  1761  5561
1106  1762  4555          CRLF
1107  1763  1114          TAD     M77             /63 PRINTABLE CHARACTERS
1108  1764  3047          DCA     COUNT
1109  1765  1031          TAD     K0240           /STARTING CHAR, -1
1110  1766  3050          DCA     LINE
1111  1767  5770          JMP I .+1
1112  1770  2000          PRT5A
1113  1771  0426
1114  1772  7507
1115  1773  7507
1116  1774  0260
1117  1775  7672
1118  1776  7575
1119  1777  7563
1120  2000  2000          PAGE
1121  2000  1042  PRT5A,  TAD     M120            /80 COLUMNS PER LINE OF TYPE
1122  2001  3051          DCA     TALLY
1123  2002  2050          ISZ     LINE
1124  2003  1050          TAD     LINE
1125  2004  4554          TYPE            /PRINT A CHARACTER
1126  2005  4544          EXIT
1127  2006  5214          JMP     .+6
1128  2007  2051          ISZ     TALLY           /DONE WITH LINE?
1129  2010  5203          JMP     .-5             /NO, REPEAT
1130  2011  4555          CRLF                    /YES
1131  2012  2047          ISZ     COUNT           /DONE WITH TEST
1132  2013  5200          JMP     PRT5A           /NO, TYPE A LINE OF NEW CHARACTERS
1133  2014  4565          SWITCH
1134  2015  5777          JMP     PRTST4
1135  2016  5617          JMP I   PRINT5
1136  2017  2020  PRINT5, PRTST5
1137
1138                /CHARACTER SWIRL TEST,  TYPE A LINE OF ALL CHARACTERS,  SHIFT PATTERN
1139
1140  2020  4555  PRTST5, CRLF
1141  2021  4555          CRLF
1142  2022  4557          PRINT; MESWIR                   /"CHARACTER SWIRL TEST" TO MASTER TTY
1143  2023  5651
1144  2024  4555          CRLF
1145  2025  5254          JMP     FILBUF          /FILL PRINT BUFFER
1146  2026  2055  NEXLIN, ISZ     WORK2
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1145  2027  1055  PRTS5A, TAD     WORK2
1146  2030  3046          DCA     BUFFER          /RESET BUFFER POINTER
1147  2031  1376          TAD     (-121           /80 COL. +1
1148  2032  3047          DCA     COUNT
1149  2033  2047  PRTS5C, ISZ     COUNT           /FINISHED TYPING A LINE?
1150  2034  7410          SKP                     /NO
1151  2035  5275          JMP     NEX80           /YES, RESET BUFFER POINTER FOR SHIFT
1152  2036  1446  PRTS5B, TAD I   BUFFER         /GET A CHARACTER
1153  2037  1306          TAD     M337            /LAST PRINTING CHARACTER+1
1154  2040  7650          SNA CLA                 /LAST CHAR.?
1155  2041  5251          JMP     BUFSET          /YES, RESET BUFFER POINTER
1156  2042  1446          TAD I   BUFFER          /NO, GET CHARACTER
1157  2043  4554          TYPE                    /PRINT IT
1158  2044  4307          JMS     SWRAN
1159  2045  4544          EXIT
1160  2046  5302          JMP     PRINT6+3
1161  2047  2046          ISZ     BUFFER          /MOVE POINTER TO NEXT CHARACTER
1162  2050  5233          JMP     PRTS5C
1163  2051  1036  BUFSET, TAD     K4600           /RESET BUFFER POINTER TO FIRST
1164  2052  3046          DCA     BUFFER          /CHARACTER IN BUFFER
1165  2053  5236          JMP     PRTS5B
1166  2054  1036  FILBUF, TAD     K4600
1167  2055  3046          DCA     BUFFER          /SET BUFFER POINTER
1168  2056  1036          TAD     K4600
1169  2057  3055          DCA     WORK2
1170  2060  1037          TAD     K7700           /64 CHARACTERS FOR PRINTING
1171  2061  3047          DCA     COUNT           /"0340" CODE TERMINATES BUFFER
1172  2062  1031          TAD     K0240           /FIRST CHARACTER
1173  2063  3054          DCA     WORK1
1174  2064  1054          TAD     WORK1           /GET A CHARACTER
1175  2065  3446          DCA I   BUFFER          /STORE IT IN THE BUFFER
1176  2066  2054          ISZ     WORK1           /NEXT CHAR.
1177  2067  2046          ISZ     BUFFER
1178  2070  2047          ISZ     COUNT           /IS BUFFER FULL?
1179  2071  5264          JMP     .+5             /NO, PACK NEXT CHARACTER
1180  2072  1037          TAD     K7700           /-64 DEC DOES SWIRL TEST FOR 64 LINES
1181  2073  3051          DCA     TALLY
1182  2074  5227          JMP     PRTS5A
1183
1184  2075  2051  NEX80,  ISZ     TALLY           /DONE WITH TEST?
1185  2076  7410          SKP                     /NO, DO AGAIN
1186  2077  5302          JMP     .+3             /YES
1187  2100  4555          CRLF
1188  2101  5226          JMP     NEXLIN
1189  2102  4565          SWITCH
1190  2103  5220          JMP     PRTST5
1191  2104  5705          JMP I   PRINT6
1192  2105  2123  PRINT6, PRTST6
1193  2106  7441  M337,   -337
1194  2107  0000  SWRAN,  0                       /RANDOM NUMBER GENERATER FOR
1195  2110  1410          TAD I   10              /A RANDOM STALL PRINT ON SWIRL TEST
1196  2111  7440          SZA
1197  2112  7004          RAL
1198  2113  7001          IAC
1199  2114  1010          TAD     10
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1200  2115  0026          AND     K0277
1201  2116  7040          CMA
1202  2117  3321          DCA     .+2
1203  2120  4552          DELAY
1204  2121  0000          0
1205  2122  5707          JMP I   SWRAN
1206
1207                /HEAD "STEP-OVER" TEST
1208                /
1209                /NO FILL CHARACTERS WILL BE ISSUED EVEN IF THE LA30 IS SERIAL AND 300 BAUD
1210                /
1211  2123  4555  PRTST6, CRLF
1212  2124  4555          CRLF
1213  2125  4557          PRINT; MESPSO           /"PRINTER HEAD "STEP-OVER TEST""
1214  2126  5632
1215  2127  4555          CRLF
1216  2130  3105          DCA FILLCH
1217  2131  1375          TAD     (-116           /PRINT 78 COLUMNS OF "X" CODE
1218  2132  3047          DCA     COUNT
1219  2133  1033  XPRT6,  TAD     K0330
1220  2134  4554          TYPE
1221  2135  4544          EXIT
1222  2136  5343          JMP XXPRT6
1223  2137  4552          DELAY
1224  2140  4060          -3720           / (2) SECOND DELAY FOR PRINT HEAD TO MOVE AWAY
1225  2141  2047          ISZ     COUNT
1226  2142  5333          JMP XPRT6
1227  2143  4565  XXPRT6, SWITCH
1228  2144  5323          JMP     PRTST6
1229  2145  1113          TAD KKLA30S
1230  2146  7650          SNA CLA
1231  2147  1374          TAD (-11)
1232  2150  3105          DCA FILLCH
1233  2151  5773          JMP     PRTST7
1234  2173  2200
1235  2174  7767
1236  2175  7662
1237  2176  7657
1238  2177  1757
              2200          PAGE
1239                /OVER PRINT TEST
1240  2200  4555  PRTST7, CRLF
1241  2201  4555          CRLF
1242  2202  4557          PRINT; MESOPR           /"OVER-PRINT" TEST
1243  2203  5374
1244  2204  4555          CRLF
1245  2205  1042          TAD     M120            /TRY TO PRINT 80 CHARACTERS
1246  2206  3047          DCA     COUNT
1247  2207  1033  PRT7A,  TAD     K0330
1248  2210  4575          UTLS                    /PRINT
1249  2211  4575          UTLS                    /PRINT AGAIN-NOT WAITING FOR A FLAG
1250  2212  4577          UTSF
1251  2213  5212          JMP     .-1
1252  2214  4544          EXIT
1253  2215  5220          JMP     .+3
```

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1254    2216  2047          ISZ     COUNT
1255    2217  5287          JMP     PRT7A
1256    2220  4565          SWITCH
1257    2221  5200          JMP     PRTST7
1258    2222  5623          JMP I   PRINT8
1259    2223  2224    PRINT8, PRTST8
1260                  /SPACE TEST,  PRINT A LINE OF ALTERNATING SPACES AND O'S FOLLOWED
1261                  /BY FILLING IN THE SPACES WITH "X" CODE.
1262
1263    2224  4555    PRTST8, CRLF; CRLF
1264    2225  4555
1265    2226  4557          PRINT; MESPAC           /"SPACE TEST" TO MASTER TTY
1266    2227  5666
1267    2230  4555          CRLF
1268    2231  1041          TAD     M50             /40 DEC,
1269    2232  3047          DCA     COUNT
1270    2233  3051          DCA     TALLY
1271    2234  4544    XPRT8,  EXIT; JMP PRINT9+3
1272    2235  5257
1273    2236  1031          TAD     K0240           /SPACE
1274    2237  4554          TYPE
1275    2240  1263          TAD     K0317           /"O" CODE
1276    2241  4554          TYPE                    /TYPE IT ON SLAVE TTY
1277    2242  2047          ISZ     COUNT           /DONE WITH PRELIMINARY?
1278    2243  5234          JMP XPRT8               /NO, REPEAT
1279    2244  4546          UCR
1280    2245  4552          DELAY
1281    2246  7470          +310
1282    2247  1033          TAD     K0330
1283    2250  4554          TYPE
1284    2251  1041          TAD     M50             /40 DEC = NUMBER OF LOOPS
1285    2252  3047          DCA     COUNT
1286    2253  4264          JMS     SPACE
1287    2254  2047          ISZ     COUNT           /DONE?
1288    2255  5253          JMP     .+2             /NO, REPEAT
1289    2256  4555          CRLF
1290    2257  4565          SWITCH
1291    2260  5224          JMP     PRTST8
1292    2261  5662          JMP I   PRINT9
1293    2262  2400    PRINT9, PRTST9
1294    2263  0317    K0317,  317
1295    2264  0000    SPACE,  0
1296    2265  4546          UCR
1297    2266  1021          TAD     K0002
1298    2267  1051          TAD     TALLY
1299    2270  3051          DCA     TALLY
1300    2271  1051          TAD     TALLY
1301    2272  7041          CIA
1302    2273  3052          DCA     TEMP
1303    2274  1031          TAD     K0240
1304    2275  4554          TYPE
1305    2276  4544          EXIT
1306    2277  5257          JMP     PRINT9+3
1307    2300  2052          ISZ     TEMP
1308    2301  5274          JMP     .+5
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1309    2302  1033          TAD     K0330
1310    2303  4554          TYPE
1311    2304  5664          JMP I   SPACE
1312
1313                  /PATCH RELATED TO THE IOT TESTS FOR THE 8E
1314    2305  7604    IOT8E,  LAS
1315    2306  0377          AND     (140)
1316    2307  1376          TAD     (-100)
1317    2310  7640          SZA CLA
1318    2311  5563          START2
1319
1320                  /ISSUE A SPF (8E) AND CHECK FOR PRINT FLAG TO SET
1321    2312  1044    IOT8E1, TAD     M764
1322    2313  3047          DCA     COUNT
1323    2314  7200          CLA
1324    2315  4570          USPF
1325    2316  7000          NOP
1326    2317  4577          UTSF
1327    2320  5326          JMP     SPF1
1328    2321  2047          ISZ     COUNT
1329    2322  5314          JMP     .-6
1330    2323  4565    S8E1,   SWITCH
1331    2324  5312          JMP     IOT8E1
1332    2325  5332          JMP     IOT8E2
1333    2326  4566    SPF1,   SETLOC; ERRTYP; MESSPF
1334    2327  0341
1335    2330  5036
1336    2331  5323          JMP     S8E1
1337
1338                  /CHECK THE IOT "SPI" (SKIP ON AN INTERRUPT FROM THE PRINTER OR
1339                  /KEY BOARD,
1340    2332  4566    IOT8E2, SETLOC; 2; IOTSPI
        2333  0002
1341    2334  2342
1342    2335  1044          TAD     M764
1343    2336  3047          DCA     COUNT
1344    2337  4575          UTLS
1345    2340  6001          ION
1346    2341  5341          JMP     .
1347    2342  4567    IOTSPI, USPI
1348    2343  5353          JMP     SPI1
1349    2344  2047          ISZ     COUNT
1350    2345  5337          JMP     IOTSPI+3
1351    2346  4565    S8E2,   SWITCH
1352    2347  5332          JMP     IOT8E2
1353    2350  4550          REPEAT
1354    2351  5564          START1
1355    2352  5563          START2
1356    2353  4566    SPI1,   SETLOC; ERRTYP; MESSPI
1357    2354  0341
1358    2355  5056
1359    2356  5346          JMP     S8E2
1360    2376  7700
1361    2377  0140
              2400    PAGE
```

```
                                /NON-PRINTING CHARACTERS TEST.

2400  4555  PRTST9, CRLF                        /CRLF TO MASTER TTY
2401  4557         PRINT; MESNPR                      /"NON-PRINTING CHARACTER TEST" TO MASTER TTY
2402  5674
2403  4555         CRLF
2404  4566         SETLOC; TALLY; -36                 /NUMBER OF NON-PRINTING CHARACTERS
2405  0051
2406  7742
2407  4566         SETLOC; TEMP; TABLE                /TABLE OF NON-PRINTING CHARACTERS
2410  0052
2411  2433
2412  4566  NPRTST, SETLOC; COUNT; -20               / 16 ITERATIONS FOR EACH NON PRINTING CHARACTER
2413  0047
2414  7760
2415  1452         TAD I   TEMP               /GET A CHARACTER
2416  4554         TYPE                       /PRINT IT ON LA30
2417  4544         EXIT
2420  5226         JMP     TABLE-5
2421  2047         ISZ     COUNT              /DONE WITH LINE
2422  5215         JMP     .+5                /NO, REPEAT
2423  2052         ISZ     TEMP
2424  2051         ISZ     TALLY              /DONE WITH TEST
2425  5212         JMP     NPRTST             /NO, DO IT AGAIN FOR NEXT CHARACTER
2426  4565         SWITCH                     /LOOP THIS SECTION OF TEST?
2427  5200         JMP     PRTST9             /YES
2430  4550         REPEAT                     /LOOP THIS TEST
2431  5563         START2                     /YES
2432  5562         START3

2433  0200  TABLE,  200;201;202;203;204
2434  0201
2435  0202
2436  0203
2437  0204
2440  0205         205;206;207;210;211
2441  0206
2442  0207
2443  0210
2444  0211
2445  0213         213;214;216;217;220
2446  0214
2447  0216
2450  0217
2451  0220
2452  0221         221;222;223;224;225
2453  0222
2454  0223
2455  0224
2456  0225
2457  0226         226;227;230;231;232
2460  0227
2461  0230
2462  0231
```



```
2463  0232
2464  0233         233;234;235;236;237
2465  0234
2466  0235
2467  0236
2470  0237

                                /THIS ROUTINE IS A DOUBLE PRES, DEVIDE MATH ROUTINE
                                /USED WITH THE TIMING TESTS

2471  0000  DUBDIV, 0
2472  7300         CLA CLL
2473  1671         TAD I   DUBDIV
2474  2271         ISZ     DUBDIV
2475  3067         DCA     NUMA
2476  1671         TAD I   DUBDIV
2477  2271         ISZ     DUBDIV
2500  3070         DCA     NUMB
2501  1467         TAD I   NUMA
2502  3062         DCA     X
2503  2067         ISZ     NUMA
2504  1467         TAD I   NUMA
2505  3063         DCA     XX
2506  1470         TAD I   NUMB
2507  3064         DCA     Y
2510  2070         ISZ     NUMB
2511  1470         TAD I   NUMB
2512  3065         DCA     YY
2513  3101         DCA     ANSWER
2514  1064         TAD     Y                  /Y=-Y
2515  7040         CMA
2516  3064         DCA     Y
2517  7300         CLA CLL
2520  1065         TAD     YY
2521  7041         CIA
2522  3065         DCA     YY
2523  7430         SZL
2524  2064         ISZ     Y
2525  7300  OVER,  CLA CLL
2526  1063         TAD     XX                 /X-Y LSH
2527  1065         TAD     YY
2530  3063         DCA     XX
2531  1062         TAD     X                  /X-Y MSH
2532  7430         SZL
2533  7001         IAC
2534  7100         CLL
2535  1064         TAD     Y
2536  3062         DCA     X
2537  7420         SNL
2540  5343         JMP     .+3
2541  2101         ISZ     ANSWER
2542  5325         JMP     OVER
2543  7200         CLA
2544  1101         TAD     ANSWER
2545  5671         JMP I   DUBDIV
```

```
                2600    PAGE

                        /ROUTINE TO COMPUTE PRINT RATE OF THE LA30
                        /ANSWER EQUALS AVERAGE RATE FOR 100 CHARACTERS IN MILLI-SECONDS

2680  0000      CRATE,  0
2681  4573              UKCC
2682  4576              UTCF
2683  4566              SETLOC) 1) JMP I 2
2684  0001
2685  5402
2686  1377              TAD     (CRATEA
2687  3002              DCA 2
2688  3262              DCA     CRATEX
2689  3261              DCA     CRATEY
2690  1033              TAD     K0330
2691  4575      CRATEC, UTLS
2692  4577              UTSF
2693  5214              JMP     .-1
2694  4575              UTLS
2695  6001              ION
2696  4543              WAIT
2697  2262              ISZ     CRATEX
2698  5220              JMP     .-2
2699  2261              ISZ     CRATEY
2700  5220              JMP     .-4
2701  6002              IOF
2702  4555              CRLF
2703  4557              PRINT
2704  5144              NOINT
2705  4555              CRLF
2706  5633              JMP I   .+1
2707  1241              BIOTST
2708  4577      CRATEA, UTSF
2709  5255              JMP     CRATED
2710  4541              MPY
2711  0656              K1750
2712  2662              CRATEX
2713  4542              DDIV
2714  3031              MMSB
2715  0072              TIME-1
2716  5600              JMP I   CRATE
2717  2071      CRATEB, ISZ     ERRCNT
2718  4565              SWITCH
2719  7000              NOP
2720  4555              CRLF
2721  4557              PRINT) MESUI
2722  5373
2723  4555              CRLF
2724  5213              JMP     CRATEC
2725  4574      CRATED, UKSF
2726  5245              JMP     CRATEB
2727  2262              ISZ     CRATEX
2730  5217              JMP     CRATEC+4
2731  0000      CRATEY, 0
```



```
2732  0000      CRATEX, 0

2733  0000      RATE,   0
2734  7300              CLA CLL
2735  7001              IAC
2736  6115              MINT
2737  7200              CLA
2740  1036              TAD     K4600
2741  3046              DCA     BUFFER          /SET UP FOR STORAGE ADDRESS
2742  4321              JMS     RATEA
2743  4555              CRLF
2744  1036              TAD     K4600           /YES, RESET TO START OF BUFFER
2745  3046              DCA     BUFFER
2746  1043              TAD     M144            /RESET TALLY COUNTER
2747  3051              DCA     TALLY
2750  3054              DCA     WORK1
2751  7100              CLL                     /ADD 100 NUMBERS FROM BUFFER
2752  1446              TAD I   BUFFER          /GET A NUMBER
2753  2046              ISZ     BUFFER
2754  7430              SZL                     /OVERFLOW?
2755  2054              ISZ     WORK1           /YES, INCREMENT WORK3
2756  2051              ISZ     TALLY           /DONE ADDING 100 NUMBERS?
2757  5301              JMP     .-6             /NO, CONTINUE ADDING
2760  3055              DCA     WORK2           /YES, SAVE ANSWER
2761  3057              DCA     REGA
2762  1341              TAD     K0144
2763  3060              DCA     REGB
2764  4542              DDIV
2765  0054              WORK1
2766  0057              REGA
2767  4742              JMS I   CONVRT          /CONVERT OCTAL TO DECIMAL AND PRINT
2770  5663              JMP I   RATE
2771  0000      RATEA,  0
2772  4566              SETLOC) COUNT) -5
2773  0047
2774  7773
2775  4566              SETLOC) TALLY) -24
2776  0051
2777  7754
3000  4200              JMS     CRATE           /FIND LA30 PRINT RATE
3001  3446              DCA I   BUFFER          /STORE IT
3002  2046              ISZ     BUFFER
3003  2051              ISZ     TALLY           /DONE YET?
3004  5330              JMP     .-4             /NO, FIND THE PRINT RATE AGAIN
3005  4555              CRLF
3006  2047              ISZ     COUNT
3007  5325              JMP     RATEA+4
3010  5721              JMP I   RATEA           /YES
3011  0144      K0144,  144
3012  0660      CONVRT, DECOCT

3013  0000      HTOU,   0
3014  1075              TAD     HUND
3015  4554              TYPE
3016  1076              TAD     TENS
```

```
 1553    2747  4554            TYPE
 1554    2750  1053            TAD     DECIM
 1555    2751  4554            TYPE
 1556    2752  1077            TAD     UNIT
 1557    2753  4554            TYPE
 1558    2754  5743            JMP I   HTDU
 1559    2777  2634
               3000    PAGE
 1560
 1561
 1562                    /MULTIPLY ROUTINE FOR TIMING TESTS
 1563    3000  0000    MULTIP, 0
 1564    3001  7300            CLA CLL
 1565    3002  1600            TAD I   MULTIP
 1566    3003  3067            DCA     NUMA
 1567    3004  2200            ISZ     MULTIP
 1568    3005  1600            TAD I   MULTIP
 1569    3006  2200            ISZ     MULTIP
 1570    3007  3070            DCA     NUMB
 1571    3010  1467            TAD I   NUMA
 1572    3011  3234            DCA     MX
 1573    3012  1470            TAD I   NUMB
 1574    3013  3235            DCA     MY
 1575    3014  3231            DCA     MMSB
 1576    3015  3232            DCA     MLSB
 1577    3016  1234            TAD     MX
 1578    3017  7041            CIA
 1579    3020  3233            DCA     CMPYR
 1580    3021  7100            CLL
 1581    3022  1235            TAD     MY
 1582    3023  7430            SZL
 1583    3024  2231            ISZ     MMSB
 1584    3025  2233            ISZ     CMPYR
 1585    3026  5221            JMP     .-5
 1586    3027  3232            DCA     MLSB
 1587    3030  5600            JMP I   MULTIP
 1588    3031  0000    MMSB,   0
 1589    3032  0000    MLSB,   0
 1590    3033  0000    CMPYR,  0
 1591    3034  0000    MX,     0
 1592    3035  0000    MY,     0
 1593
 1594                    /SETUP THE IOTS FOR THE DECWRITER
 1595    3036  0000    SETUP,  0
 1596    3037  4566            SETLOC) COUNT) -6
 1597    3040  0047
               3041  7772
 1598    3042  4566            SETLOC) 10) IOTTAB-1
               3043  0010
 1599    3044  1163
 1600    3045  1377            TAD     (KEYTAB
 1601    3046  3054            DCA     WORK1
 1602    3047  1454            TAD I   WORK1
 1603    3050  3055            DCA     WORK2
 1604    3051  1102            TAD     KCODE
```



```
 1605    3052  1410            TAD I   10
 1606    3053  3455            DCA I   WORK2
 1607    3054  2054            ISZ     WORK1
 1608    3055  2047            ISZ     COUNT
 1609    3056  5247            JMP     .-7
 1610    3057  4566            SETLOC) 10) IOTTAB-1
               3060  0010
 1611    3061  1163
 1612    3062  4566            SETLOC) COUNT) -6
 1613    3063  0047
               3064  7772
 1614    3065  1376            TAD     (PRTTAB
 1615    3066  3054            DCA     WORK1
 1616    3067  1454            TAD I   WORK1
 1617    3070  3055            DCA     WORK2
 1618    3071  1103            TAD     PCODE
 1619    3072  1410            TAD I   10
 1620    3073  3455            DCA I   WORK2
 1621    3074  2054            ISZ     WORK1
 1622    3075  2047            ISZ     COUNT
 1623    3076  5267            JMP     .-7
 1624    3077  5636            JMP I   SETUP
 1625    3100  1135    KEYTAB, XKCF+1
 1626    3101  1140            XKSF+1
 1627    3102  1145            XKCC+1
 1628    3103  1151            XKRS+1
 1629    3104  1161            XKIE+1
 1630    3105  3355            XXKRB
 1631    3106  1106    PRTTAB, XSPF+1
 1632    3107  1112            XTSF+1
 1633    3110  1117            XTCF+1
 1634    3111  1123            XTPC+1
 1635    3112  1127            XSPI+1
 1636    3113  1134            XTLS+1
 1637
 1638                    /PUT THE DEVICE CODE IN THE SWITCHES AND STORE THEM FOR SETTING
 1639                    /UP THE IOT SUB-ROUTINES.
 1640
 1641    3114  0000    QUESTN, 0
 1642    3115  7240            CLA CMA
 1643    3116  7402            HLT
 1644    3117  7604            LAS
 1645    3120  0375            AND     (304
 1646    3121  7041            CIA
 1647    3122  1375            TAD     (304
 1648    3123  7650            SNA CLA
 1649    3124  5350            JMP     OPT08+2
 1650    3125  7604            LAS
 1651    3126  0025            AND     K0017
 1652    3127  7450            SNA
 1653    3130  5346            JMP     OPT08
 1654    3131  7604            LAS
 1655    3132  3066            DCA     DC02
 1656    3133  4566            SETLOC) PCODE) 120
 1657    3134  0103
```

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                3135  0120
1658            3136  4566          SETLOC; KCODE; 110
1659            3137  0102
                3140  0110
1660            3141  4236          JMS     SETUP
1661            3142  1066          TAD     DC02
1662            3143  6117          MTON
1663            3144  7200          CLA
1664            3145  5714          JMP I   QUESTN
1665            3146  7200  QPT08,  CLA
1666            3147  7402          HLT
1667            3150  7604          LAS
1668            3151  3052          DCA     TEMP
1669            3152  1052          TAD     TEMP
1670            3153  7012          RTR
1671            3154  7010          RAR
1672            3155  0366          AND     K0770
1673            3156  3102          DCA     KCODE
1674            3157  1052          TAD     TEMP
1675            3160  7006          RTL
1676            3161  7004          RAL
1677            3162  0366          AND     K0770
1678            3163  3103          DCA     PCODE
1679            3164  4236          JMS     SETUP
1680            3165  5714          JMP I   QUESTN
1681            3166  0770  K0770,  770
1682            3175  0304
1683            3176  3106
1684            3177  3100
                3200  PAGE
1685                                /TEST 3 = TIMING TESTS FOR CARRIAGE RETURNS, LINE FEEDS, AND PRINT RATE
1686
1687
1688            3200  4555  TIMTST, CRLF
1689            3201  4557          PRINT; MESLTT                   /"LA30 TIMING TESTS"
1690            3202  5252
1691            3203  4555          CRLF
1692            3204  4566          SETLOC; ERRTYP; DUMMY
1693            3205  0341
1694            3206  5754
1695
1696
1697                                /CHARACTER PRINT RATE TEST
1698
1699            3207  4555  TIMRAT, CRLF
1700            3210  4557          PRINT; MESRAT                   /"CHARACTER PRINT RATE TEST"
1701            3211  5234
1702            3212  4555          CRLF
1703
1704                                /COMPUTE PRINT TIME,
1705                                /STORE THE DATA OF 100 (DEC,) LOOPS OF LA30 CYCLE TIME,
1706                                /FIND THE PRINT RATE BY ADDING THE STORED RESULTS FROM THE 100 LOOPS
1707                                /OF LA30 DATA TIMES AND DIVIDING THE TOTAL BY THE COMPUTED CYCLE TIME OF
1708                                /THE COMPUTER,  PRINT THE RESULTS AND EXIT,
1709
```



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1710            3213  4620          JMS I   RATEX
1711            3214  5215          JMP     OKPRT
1712            3215  4565  OKPRT,  SWITCH
1713            3216  5207          JMP     TIMRAT
1714            3217  5221          JMP     TIMCAR
1715            3220  2663  RATEX,  RATE
1716
1717                                /CARRIAGE RETURN TIME TEST
1718
1719            3221  4555  TIMCAR, CRLF
1720            3222  4557          PRINT; MESTCR                   /"CARRIAGE RETURN TIME TEST" TO MASTER TTY
1721            3223  5715
1722            3224  4555          CRLF
1723            3225  4566          SETLOC; BUFFER; 4600                    /START OF STORAGE BUFFER
1724            3226  0046
                3227  4600
1725            3230  4566          SETLOC; COUNT; -11                      /BUFFER WILL CONTAIN 10 NUMBERS
1726            3231  0047
                3232  7767
1727            3233  3050          DCA     LINE            /NUMBER OF SPACES TO DO
1728            3234  3062          DCA     X
1729            3235  4305          JMS     CSPAC1
1730            3236  4312          JMS     CSPAC2
1731            3237  4555          CRLF
1732            3240  4566          SETLOC; BUFFER; 4577                    /RESET BUFFER STORAGE
1733            3241  0046
                3242  4577
1734            3243  4566          SETLOC; COUNT; -12                      /RESET LOOP COUNTER FOR ADDITION
1735            3244  0047
                3245  7766
1736            3246  2046          ISZ     BUFFER
1737            3247  1446          TAD I   BUFFER
1738            3250  2047          ISZ     COUNT
1739            3251  5246          JMP     .-3
1740            3252  3255          DCA     .+3             /STORE ADDITION OF 10 (DEC) CR DATA TIMES
1741            3253  1024          TAD     K0012
1742            3254  4702          JMS I   XDDIV
1743            3255  0000          0
1744            3256  1255          TAD     .-1
1745            3257  3052          DCA     TEMP
1746            3260  4555          CRLF
1747            3261  4557          PRINT; MESACR                   /"AVERAGE CR TIME"
1748            3262  5733
1749            3263  4703          JMS I   XTAVE
1750            3264  4566          SETLOC; BUFFER; 4577
1751            3265  0046
                3266  4577
1752            3267  4566          SETLOC; COUNT; -12
1753            3270  0047
                3271  7766
1754            3272  2046          ISZ     BUFFER
1755            3273  5725          JMP I   TIMB            /DETERMINE MAX, CARR, RETURN
1756
1757            3274  4565  STIMCR, SWITCH
1758            3275  5221          JMP     TIMCAR
```

```
 1759   3276  5704          JMP I   XLRATE
 1760   3277  3424  CRSPAC, XCSPAC
 1761   3300  3402  XTIMA,  TIMCRA
 1762   3301  3414  XCDON,  CRDONE
 1763   3302  0627  XDDIV,  DEVIDE
 1764   3303  3543  XTAVE,  TYPAVE
 1765   3304  3600  XLRATE, TIMLFR
 1766   3305  0000  CSPAC1, 0
 1767   3306  4677          JMS I   CRSPAC
 1768   3307  4700          JMS I   XTIMA
 1769   3310  4701          JMS I   XCDON
 1770   3311  5705          JMP I   CSPAC1
 1771   3312  0000  CSPAC2, 0
 1772   3313  1377          TAD     (-2
 1773   3314  1050          TAD     LINE
 1774   3315  3050          DCA     LINE
 1775   3316  4546          UCR
 1776   3317  4677          JMS I   CRSPAC
 1777   3320  4700          JMS I   XTIMA
 1778   3321  1045          TAD     MAGIC
 1779   3322  1052          TAD     TEMP
 1780   3323  3446          DCA I   BUFFER
 1781   3324  5712          JMP I   CSPAC2
 1782   3325  3441  TIMB,   TIMCRB
 1783   3326  3326  XKRB,   .
 1784   3327  1066          TAD DC02; SNA CLA; JMP XXKRB
 1785   3330  7650
 1786   3331  5355
 1787   3332  1376          TAD (-11); DCA STATIONS; DCA XDC02
 1788   3333  3364
 1789   3334  3365
 1790   3335  7120          STL; SKP
 1791   3336  7410
 1792   3337  7100  KRBL,   CLL; TAD XDC02; RAR; DCA XDC02
 1793   3340  1365
 1794   3341  7010
 1795   3342  3365
 1796   3343  2364          ISZ STATIONS; SKP; HLT
 1797   3344  7410
 1798   3345  7402
 1799   3346  1375          TAD (17); AND DC02; TAD XDC02; MTON; CLA
 1800   3347  0066
 1801   3350  1365
 1802   3351  6117
 1803   3352  7200
 1804   3353  4574          UKSF; JMP KRBL
 1805   3354  5337
 1806   3355  0000  XXKRB,  0; DCA CHKSTO
 1807   3356  3116
 1808   3357  1066          TAD DC02; MTON; CLA
 1809   3360  6117
 1810   3361  7200
 1811   3362  1116          TAD CHKSTO; JMP I XKRB
 1812   3363  5726
 1813   3364  0000  STATIONS,      0
```



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 1814   3365  0000  XDC02,  0
 1815   3375  0017
 1816   3376  7767
 1817   3377  7776
               3400  PAGE
 1818
 1819   3400  2052  TIMCRC, ISZ     TEMP
 1820   3401  5207          JMP     TIMDEL
 1821   3402  0000  TIMCRA, 0
 1822   3403  3052          DCA     TEMP
 1823   3404  4546          UCR
 1824   3405  1033          TAD     K0330
 1825   3406  4575          UTLS
 1826   3407  4552  TIMDEL, DELAY                   /1 MSEC DELAY
 1827   3410  7777          -1
 1828   3411  4577          UTSF                    /FLG=1?
 1829   3412  5200          JMP     TIMCRC          /NO, COUNT DELAY LOOP
 1830   3413  5602          JMP I   TIMCRA
 1831   3414  0000  CRDONE, 0
 1832   3415  1052          TAD     TEMP            /GET CR TIME DATA
 1833   3416  1045          TAD     MAGIC
 1834   3417  3446          DCA I   BUFFER          /STORE IT
 1835   3420  2046          ISZ     BUFFER          /SET BUFFER FOR MORE DATA
 1836   3421  2047          ISZ     COUNT           /DONE WITH PRELIMINARIES?
 1837   3422  5777          JMP     CSPAC1+1                /NO, GET MORE DATA ON CR TIME
 1838   3423  5614          JMP I   CRDONE
 1839   3424  0000  XCSPAC, 0
 1840   3425  7300          CLA CLL
 1841   3426  1050          TAD     LINE
 1842   3427  1023          TAD     K0010           /8 SPACES
 1843   3430  3050          DCA     LINE
 1844   3431  1050          TAD     LINE
 1845   3432  7041          CIA
 1846
 1847   3433  3051          DCA     TALLY
 1848   3434  1031          TAD     K0240
 1849   3435  4554          TYPE
 1850   3436  2051          ISZ     TALLY           /DONE SPACING?
 1851   3437  5234          JMP     .+3             /NO
 1852   3440  5624          JMP I   XCSPAC
 1853   3441  1446  TIMCRB, TAD I   BUFFER         /GET THE TIME MEASUREMENT
 1854   3442  7041          CIA
 1855   3443  3061          DCA     REGC            /STORE IT
 1856   3444  2047          ISZ     COUNT
 1857   3445  7410          SKP
 1858   3446  5256          JMP     .+10
 1859   3447  2046          ISZ     BUFFER
 1860   3450  1446          TAD I   BUFFER
 1861   3451  1061          TAD     REGC
 1862   3452  7750          SNA SPA CLA             /IS NEXT NUM > LAST ?
 1863   3453  5244          JMP     .-7             /NO, TRY NEXT ONE
 1864   3454  1446          TAD I   BUFFER
 1865   3455  5242          JMP     .-13
 1866   3456  1061          TAD     REGC            /GET THE HIGHEST MEAS.-NEG.
 1867   3457  7041          CIA                     /MAKE IT POS.
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 1868    3460  3052          DCA     TEMP
 1869    3461  4557          PRINTI MESMAX                   /"MAXIMUM CARRIAGE RETURN TIME IS "
 1870    3462  5755
 1871    3463  4343          JMS     TYPAVE                  /PRINT THE MAX. MEAS.
 1872    3464  4555          CRLF
 1873    3465  4557          PRINTI MESALL                   /THE 10 MEASURED CARRIAGE TIMES ARE!
 1874    3466  6205
 1875    3467  4555          CRLF
 1876    3470  1036          TAD     K4000
 1877    3471  3046          DCA     BUFFER
 1878    3472  4566          SETLOCI COUNT! -12
 1879    3473  0047
         3474  7766
 1880    3475  1446          TAD I   BUFFER
 1881    3476  2046          ISZ     BUFFER
 1882    3477  3052          DCA     TEMP
 1883    3500  4343          JMS     TYPAVE
 1884    3501  2047          ISZ     COUNT
 1885    3502  5275          JMP     .-5
 1886    3503  5704          JMP I   XSTIM
 1887    3504  3274  XSTIM,  STIMCR
 1888    3505  1044  TYPTU,  ERNUM
 1889    3506  3652  XEHLT2, ERRLFR
 1890
 1891    3507  1376  XPDP8,  TAD     (606
 1892    3510  3073          DCA     TIME
 1893    3511  4566          SETLOCI XMIL1! -337
 1894    3512  0223
         3513  7441
 1895    3514  1720          TAD I   ASKOUT
 1896    3515  3317          DCA     .+2
 1897    3516  5717          JMP I   .+1
 1898    3517  0000          0
 1899    3520  0400  ASKOUT, ASKTYP
 1900    3521  1375  XPDP8L, TAD     (522
 1901    3522  3073          DCA     TIME
 1902    3523  4566          SETLOCI XMIL1! -305
 1903    3524  0223
         3525  7473
 1904    3526  5314          JMP     XPDP8+5
 1905    3527  4566  XPDP8E, SETLOCI XMIL1! -407
 1906    3530  0223
         3531  7371
 1907    3532  1374          TAD     (705
 1908    3533  3073          DCA     TIME
 1909    3534  5314          JMP     XPDP8+5
 1910    3535  4566  XPDP8S, SETLOCI XMIL1! -13
 1911    3536  0223
         3537  7765
 1912    3540  1373          TAD     (120
 1913    3541  3073          DCA     TIME
 1914    3542  5314          JMP     XPDP8+5
 1915    3543  0000  TYPAVE, 0
 1916    3544  1052          TAD     TEMP
 1917    3545  4545          COCTAL
```



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 1918    3546  4755          JMS I   XTYTHT
 1919    3547  1077          TAD     UNIT
 1920    3550  4554          TYPE
 1921    3551  4557          PRINTI MESMSE
 1922    3552  5445
 1923    3553  4555          CRLF
 1924    3554  5743          JMP I   TYPAVE
 1925    3555  0705  XTYTHT, TYPTHT
 1926    3573  0100
 1927    3574  0705
 1928    3575  0522
 1929    3576  0606
 1930    3577  3306
               3600  PAGE
 1931
 1932                /LINE FEED RATE TEST
 1933
 1934    3600  4555  TIMLFR, CRLF
 1935    3601  4557          PRINTI MESLFR                   /"LINE FEED RATE TEST"
 1936    3602  5302
 1937    3603  4555          CRLF
 1938    3604  4566          SETLOCI COUNT! -1750
 1939    3605  0047
         3606  6030
 1940    3607  3051          DCA     TALLY
 1941    3610  4573          UKCC
 1942    3611  4576          UTCF
 1943    3612  1027  TIMLFA, TAD     K0212
 1944    3613  4575          UTLS
 1945    3614  5217          JMP     TIMCHK
 1946    3615  2051          ISZ     TALLY
 1947    3616  5212          JMP     TIMLFA                  /DO IT AGAIN
 1948
 1949    3617  4552  TIMCHK, DELAY
 1950    3620  7777          -1
 1951    3621  4577          UTSF
 1952    3622  7410          SKP
 1953    3623  5215          JMP     TIMLFA+3
 1954    3624  2047          ISZ     COUNT                   /IS ONE SECOND UP ?
 1955    3625  5217          JMP     TIMCHK                  /NO, GO BACK
 1956    3626  5244          JMP     OKLFR                   /ONE SECOND IS UP
 1957
 1958    3627  0000  OKTYP,  0
 1959    3630  4555          CRLF
 1960    3631  4557          PRINTI MESGLF                   /"LINE FEED RATE = "
 1961    3632  5327
 1962    3633  1051          TAD     TALLY
 1963    3634  4545          COCTAL
 1964    3635  1076          TAD     TENS
 1965    3636  4554          TYPE
 1966    3637  1077          TAD     UNIT
 1967    3640  4554          TYPE
 1968    3641  4557          PRINTI MESCHA
 1969    3642  5315
 1970    3643  5627          JMP I   OKTYP
```

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1971
1972    3644  4227  OKLFR,  JMS     OKTYP
1973    3645  4565          SWITCH
1974    3646  5200          JMP     TIMLFR
1975    3647  4550          REPEAT
1976    3650  5562          START3
1977    3651  5561          START4
1978    3652  0000  ERRLFR, 0
1979    3653  2071          ISZ     ERRCNT
1980    3654  7300          CLA CLL
1981    3655  1100          TAD     REMAIN
1982    3656  4545          COCTAL
1983    3657  4565          SWITCH
1984    3660  7000          NOP
1985    3661  5652          JMP I   ERRLFR
1986
1987                  /TEST 4--OPERATORS TESTS,  ECHO TEST AND ROLL-OVER TEST.
1988
1989    3662  4555  OPSTST, CRLF
1990    3663  4555          CRLF
1991    3664  4557          PRINT; MESOPT                   /"OPERATORS' TESTS--PRESS A KEY ON"
1992    3665  6022
1993    3666  4555          CRLF
1994
1995
1996                  /ECHO TEST.  OPERATOR TYPES A CHARACTER, THE CHARACTER IS TYPED
1997                  /BACK AND THE OCTAL EQUIVALENT OF THE CHARACTER IS TYPED BESIDE
1998                  /THE ECHOED CHARACTER,  A RUBOUT WILL RETURN CONTROL TO THE PGM.
1999
2000    3667  4555  ECHO1,  CRLF
2001    3670  4557          PRINT; MESECH           /"ECHO TEST--OPERATORS"
2002    3671  6033
2003    3672  4555          CRLF
2004    3673  4537  ECHO1A, LISTEN
2005    3674  4536          CHKRUB                  /CHECK FOR A RUBOUT--EXIT CHARACTER
2006    3675  5312          JMP     SET1            /EXIT THE TEST
2007    3676  1031          TAD     K0240
2008    3677  4554          TYPE                    /TYPE A SPACE
2009    3700  1310          TAD     K0275
2010    3701  4554          TYPE                    /TYPE AN = SIGN
2011    3702  1031          TAD     K0240
2012    3703  4554          TYPE
2013    3704  1116          TAD     CHKSTO          /GET THE TYPED CHARACTER
2014    3705  4551          OCTALP                  /CONVERT THE NUMBER TO PRINT CODE-PRINT
2015    3706  4555          CRLF
2016    3707  5273          JMP     ECHO1A
2017    3710  0275  K0275,  275
2018    3711  4000  EXET1,  ECHO2
2019    3712  4565  SET1,   SWITCH
2020    3713  5267          JMP     ECHO1
2021    3714  5711          JMP I   EXET1
2022          4000  PAGE
2023
2024
2025                  /LINE ECHO TEST,  ECHO UP TO 80 (DEC) CHARACTERS IN A LINE
                      /WHEN A "CR" IS TYPED,  TYPE A "CNTRL C" TO CHANGE THE LINE.
```



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2026                  /TYPE A RUBOUT TO EXIT THE TEST.
2027
2028    4000  4555  ECHO2,  CRLF
2029    4001  4557          PRINT; MESE2            /"LINE ECHO TEST"
2030    4002  5605
2031    4003  4555          CRLF
2032    4004  1042          TAD     M120
2033    4005  3047          DCA     COUNT           /BUFFER COUNT
2034    4006  3051          DCA     TALLY           /CLEAR CHARACTER COUNTER
2035    4007  1036          TAD     K4600
2036    4010  3046          DCA     BUFFER          /ADDRESS OF THE BUFFER
2037    4011  4537  ECHKEY, LISTEN                  /WAIT FOR A KEY TO BE PRESSED
2038    4012  4535          CHKCR                   /CHECK FOR A "CR" KEY
2039    4013  5224          JMP     ECHO2A          /HERE IF A "CR"
2040    4014  4536          CHKRUB                  /WAS IT A RUBOUT KEY??
2041    4015  5262          JMP     SET2            /YES, EXIT THE TEST
2042    4016  1116          TAD     CHKSTO          /NO
2043    4017  3446          DCA I   BUFFER          /STORE THE CHARACTER TYPED IN A BUFFER
2044    4020  2046          ISZ     BUFFER
2045    4021  2051          ISZ     TALLY           /COUNT THE CHARACTER
2046    4022  2047          ISZ     COUNT           /BUFFER FULL??
2047    4023  5211          JMP     ECHKEY          /NO, GO BACK FOR ANOTHER
2048    4024  1051  ECHO2A, TAD     TALLY           /GET THE COUNT
2049    4025  7041          CIA                     /NEGATE
2050    4026  3047          DCA     COUNT           /RESET THE BUFFER COUNTER
2051    4027  1036          TAD     K4600
2052    4030  3046          DCA     BUFFER          /RESET THE BUFFER ADDRESS
2053    4031  4555          CRLF
2054    4032  1446  ECHO2B, TAD I   BUFFER          /GET A CHARACTER FROM THE BUFFER
2055    4033  2046          ISZ     BUFFER          /UPDATE THE POINTER
2056    4034  4554          TYPE                    /TYPE IT
2057    4035  4574          UKSF                    /IS SOMEONE TYPING??
2058    4036  5245          JMP     ECONT           /NO
2059    4037  4571          UKRB                    /YES, LISTEN TO HIM
2060    4040  3116          DCA     CHKSTO
2061    4041  4534          CCNTC                   /CHECK FOR A "CONTROL C" CODE
2062    4042  5203          JMP     ECHO2+3         /HERE IF A LINE CHANGE IS WANTED
2063    4043  4536          CHKRUB                  /CHECK FOR A EXIT COMMAND
2064    4044  5262          JMP     SET2            /EXIT THE TEST
2065    4045  2047  ECONT,  ISZ     COUNT           /DONE TYPING THE BUFFER??
2066    4046  5232          JMP     ECHO2B          /NO
2067    4047  4555          CRLF
2068    4050  4537          LISTEN                  /WAIT FOR A COMMAND
2069    4051  4534          CCNTC                   /CHANGE THE LINE??
2070    4052  5203          JMP     ECHO2+3         /YES
2071    4053  4535          CHKCR                   /REPEAT THE LINE??
2072    4054  5224          JMP     ECHO2A          /YES
2073    4055  4536          CHKRUB                  /EXIT??
2074    4056  5262          JMP     SET2            /YES
2075    4057  1265          TAD     K0277           /NO--WRONG KEY USED, TRY AGAIN
2076    4060  4554          TYPE                    /TYPE A "?"
2077    4061  5247          JMP     ECONT+2         /GO BACK TO THE LISTEN ROUTINE
2078
2079    4062  4565  SET2,   SWITCH
2080    4063  5200          JMP     ECHO2
```

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2081  4064  5266          JMP     ROLTST
2082  4065  0277  K0277,  277
2083
2084                      /CHARACTER ROLL-OVER TEST,  "ROCK" BETWEEN TWO CHARACTER KEYS ON
2085                      /THE KEYBOARD.
2086
2087  4066  4555  ROLTST, CRLF
2088  4067  4557          PRINT; MESROL           /"CHARACTER ROLL-OVER TEST"
2089  4070  6053
2090  4071  4555          CRLF
2091  4072  3055          DCA     WORK2
2092  4073  4537          LISTEN
2093  4074  4536          CHKRUB
2094  4075  5331          JMP     SROLL
2095  4076  1116          TAD     CHKSTO
2096  4077  3054          DCA     WORK1
2097  4100  4537          LISTEN                  /WAIT FOR A CHARACTER
2098  4101  1116          TAD     CHKSTO
2099  4102  3303          DCA     .+3
2100  4103  4547          COMPAR
2101  4104  0054          WORK1
2102  4105  0000          0
2103  4106  7000          NOP
2104  4107  5312          JMP     .+3             /IT WAS A DIFFERENT CHARACTER
2105  4110  4555          CRLF                    /= SAME CHARACTER
2106  4111  5300          JMP     .+11
2107  4112  1305          TAD     .-5
2108  4113  3055          DCA     WORK2
2109  4114  1054          TAD     WORK1
2110  4115  3056          DCA     WORK3
2111  4116  4555          CRLF
2112  4117  4557          PRINT; MESURO           /"ROLL AND HOLD..." MESSAGE
2113  4120  6156
2114  4121  1054          TAD     WORK1
2115  4122  4554          TYPE
2116  4123  4557          PRINT; MESAND
2117  4124  6126
2118  4125  1055          TAD     WORK2
2119  4126  4554          TYPE
2120  4127  4555          CRLF
2121  4130  5336          JMP     ROLLA
2122  4131  4565  SROLL,  SWITCH
2123  4132  5266          JMP     ROLTST
2124  4133  4550          REPEAT
2125  4134  5561          START4
2126  4135  5777          JMP I   ENDALL
2127
2128  4136  4537  ROLLA,  LISTEN
2129  4137  4536          CHKRUB                  /EXIT??
2130  4140  5331          JMP     SROLL           /YES
2131  4141  1116          TAD     CHKSTO
2132  4142  7041          CIA
2133  4143  3054          DCA     WORK1           /STORE THE NEGATED CHARACTER
2134  4144  1056          TAD     WORK3           /GET THE FIRST CHARACTER
2135  4145  1054          TAD     WORK1           /GET THE TEST CHARACTER
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2136  4146  7650          SNA CLA                 /OK??
2137  4147  5336          JMP     ROLLA           /YES
2138  4150  1055          TAD     WORK2
2139  4151  1054          TAD     WORK1           /COMPARE THE SECOND WITH THE TEST CHARACTER
2140  4152  7650          SNA CLA                 /OK??
2141  4153  5336          JMP     ROLLA           /YES
2142  4154  4555          CRLF                    /NO, ERROR
2143  4155  4557          PRINT; MESERO           /"ERROR ON ROLL-OVER TEST"
2144  4156  6076
2145  4157  1056          TAD     WORK3           /GET THE FIRST CHARACTER
2146  4160  4554          TYPE                    /TYPE IT
2147  4161  4557          PRINT; MESAND
2148  4162  6126
2149  4163  1055          TAD     WORK2           /GET THE SECOND CHARACTER
2150  4164  4554          TYPE
2151  4165  4555          CRLF
2152  4166  2071          ISZ ERRCNT
2153  4167  4557          PRINT; MESER2           /"-=-ERROR CHARACTER WAS"
2154  4170  6131
2155  4171  1054          TAD     WORK1           /GET THE ERROR CHARACTER
2156  4172  7041          CIA
2157  4173  4551          OCTALP                  /CONVERT IT AND PRINT
2158  4174  4555          CRLF
2159  4175  4555          CRLF
2160  4176  5331          JMP     SROLL
2161  4177  0257  ENDALL, ENDTST
2162        4200  PAGE
2163
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                        /SPECIAL OPERATOR TEST
                        /
                        /ONLY ENTRY IS BY L/S 4200
                        /
                        /...SYSTEM MUST HAVE BEEN PREVIOUSLY INITIALIZED BY L/S 200
                        /
                        /FILL CHARACTERS ARE VARIABLE VIA THE AC SWITCHES 0-1-2-3 AT RUNTIME
                        /
                        /LINE LENGTH IS VARIABLE VIA THE AC SWITCHES 5 THRU 11 AT RUNTIME
                        /
                        /IF AT ANY TIME THE CONTENTS OF AC SWITCHES 5 THRU 11 = 0
                        /
                        /THE PROGRAM WILL HALT, TO CONTINUE PRESS "CONT" WITH A VALUE OTHER THAN
                        /
                        /ZERO IN AC SWITCHES 5 THRU 11.
                        /
4200  1377      LA30S,  TAD (-11
4201  3105              DCA FILLCH
4202  1066              TAD DC02
4203  6117              MTON
4204  4555              CRLF
4205  4557              PRINT
4206  4262              MLA30S          /"LA30S CARRIAGE RETURN TEST"
4207  4555              CRLF
4210  7402      LA30STOP,       HLT
4211  7604      LA30S1, LAS
4212  0376              AND (177
4213  3050              DCA LINE
4214  1050              TAD LINE
4215  7650              SNA CLA
4216  5210              JMP LA30STOP
4217  1375              TAD (120
4220  7040              CMA
4221  1050              TAD LINE
4222  7710              SPA CLA
4223  5226              JMP .+3
4224  1375              TAD (120
4225  3050              DCA LINE
4226  1050              TAD LINE
4227  7041              CIA
4230  3047              DCA COUNT
4231  1033              TAD K0330
4232  4554              TYPE
4233  2047              ISZ COUNT
4234  5231              JMP .-3
4235  7200              CLA
4236  1374              TAD (212
4237  4554              TYPE
4240  7604              LAS
4241  0373              AND (7400
4242  7450              SNA
4243  5256              JMP LA30S2
4244  7104              CLL RAL
4245  7006              RTL
4246  7006              RTL
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4247  7041              CIA
4250  3105              DCA FILLCH
4251  7200              CLA
4252  1372              TAD (377
4253  4554              TYPE
4254  2105              ISZ FILLCH
4255  5251              JMP .-4
4256  7200      LA30S2, CLA
4257  1371              TAD (215
4260  4554              TYPE
4261  5211              JMP LA30S1
4262  1401      MLA30S, TEXT    ?LA30 SERIAL LINE CARRIAGE RETURN EXERCISE?
4263  6360
4264  4023
4265  0522
4266  1101
4267  1440
4270  1411
4271  1605
4272  4003
4273  0122
4274  2211
4275  0107
4276  0540
4277  2205
4300  2425
4301  2216
4302  4005
4303  3005
4304  2203
4305  1123
4306  0500
4371  0215
4372  0377
4373  7400
4374  0212
4375  0120
4376  0177
4377  7767
      5000      *5000
                        /MESSAGES TO CONSUL TELETYPE
5000  2423      MESTSF, TEXT    ?TSF FAILURE OR FLAG NOT = 1?
5001  0640
5002  0601
5003  1114
5004  2522
5005  0540
5006  1722
5007  4006
5010  1401
5011  0740
5012  1617
5013  2440
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                5014  7540
                5015  6100
 2242           5016  2403    MESTCF, TEXT    ?TCF FAILURE OR FLAG WON'T CLEAR?
                5017  0640
                5020  0601
                5021  1114
                5022  2522
                5023  0540
                5024  1722
                5025  4006
                5026  1401
                5027  0740
                5030  2717
                5031  1647
                5032  2440
                5033  0314
                5034  0501
                5035  2200
 2243           5036  2022    MESSPF, TEXT    ?PRINT FLAG WON'T SET WITH "SPF"?
                5037  1116
                5040  2440
                5041  0614
                5042  0107
                5043  4027
                5044  1716
                5045  4724
                5046  4023
                5047  0524
                5050  4027
                5051  1124
                5052  1040
                5053  4223
                5054  2006
                5055  4200
 2244           5056  2320    MESSPI, TEXT    ?SPI FAILURE (SKIP ON A PRINTER OR KEYBOARD INTERRUPT)?
                5057  1140
                5060  0601
                5061  1114
                5062  2522
                5063  0540
                5064  5023
                5065  1311
                5066  2040
                5067  1716
                5070  4001
                5071  4020
                5072  2211
                5073  1624
                5074  0522
                5075  4017
                5076  2240
                5077  1305
                5100  3102
                5101  1701
                5102  2204
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                5103  4011
                5104  1624
                5105  0522
                5106  2225
                5107  2024
                5110  5100
 2245           5111  1303    MESKCC, TEXT    ?KCC FAILURE--AC NOT 0?
                5112  0340
                5113  0601
                5114  1114
                5115  2522
                5116  0555
                5117  5501
                5120  0340
                5121  1617
                5122  2440
                5123  6000
 2246           5124  1323    MESKSF, TEXT    ?KSF FAILURE OR FLAG WON'T CLEAR?
                5125  0640
                5126  0601
                5127  1114
                5130  2522
                5131  0540
                5132  1722
                5133  4006
                5134  1401
                5135  0740
                5136  2717
                5137  1647
                5140  2440
                5141  0314
                5142  0501
                5143  2200
 2247           5144  1617    NOINT,  TEXT    ?NO INTERRUPT OCCURED--ERROR?
                5145  4011
                5146  1624
                5147  0522
                5150  2225
                5151  2024
                5152  4017
                5153  0303
                5154  2522
                5155  0504
                5156  5555
                5157  0522
                5160  2217
                5161  2200
 2248           5162  0201    MESBII, TEXT    ?BASIC INPUT IOT TESTS?
                5163  2311
                5164  0340
                5165  1116
                5166  2025
                5167  2440
                5170  1117
                5171  2440
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                5172  2405
                5173  2324
                5174  2300
 2249           5175  0201    MESBIO, TEXT    ?BASIC OUTPUT IOT TESTS?
                5176  2311
                5177  0340
                5200  1725
                5201  2420
                5202  2524
                5203  4011
                5204  1724
                5205  4024
                5206  0523
                5207  2423
                5210  0000
 2250           5211  1501    MESGCO, TEXT    ?MAXIMUM COLUMNS PRINTED IN LINE = 80?
                5212  3011
                5213  1525
                5214  1540
                5215  0317
                5216  1425
                5217  1516
                5220  2340
                5221  2022
                5222  1116
                5223  2405
                5224  0440
                5225  1116
                5226  4014
                5227  1116
                5230  0540
                5231  7540
                5232  7060
                5233  0000
 2251           5234  0310    MESRAT, TEXT    ?CHARACTER PRINT RATE TEST ?
                5235  0122
                5236  0103
                5237  2405
                5240  2240
                5241  2022
                5242  1116
                5243  2440
                5244  2201
                5245  2405
                5246  4024
                5247  0523
                5250  2440
                5251  0000
 2252           5252  1401    MESLTT, TEXT    ?LA30 TIMING TESTS--PRINT RATE, CARR.RET., & LF?
                5253  6360
                5254  4024
                5255  1115
                5256  1116
                5257  0740
                5260  2405
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                5261  2324
                5262  2355
                5263  5520
                5264  2211
                5265  1624
                5266  4022
                5267  0124
                5270  0554
                5271  4003
                5272  0122
                5273  2256
                5274  2205
                5275  2456
                5276  5440
                5277  4640
                5300  1406
                5301  0000
 2253           5302  1411    MESLFR, TEXT    ?LINE FEED RATE TEST ?
                5303  1605
                5304  4006
                5305  0505
                5306  0440
                5307  2201
                5310  2405
                5311  4024
                5312  0523
                5313  2440
                5314  0000
 2254           5315  4014    MESCHA, TEXT    ? LINE FEEDS/SECOND?
                5316  1116
                5317  0540
                5320  0605
                5321  0504
                5322  2357
                5323  2305
                5324  0317
                5325  1604
                5326  0000
 2255           5327  1411    MESGLF, TEXT    ?LINE FEED RATE = ?
                5330  1605
                5331  4006
                5332  0505
                5333  0440
                5334  2201
                5335  2405
                5336  4075
                5337  4000
 2256           5340  1401    MESR,   TEXT    ?LA30 PRINT RATE---TIME BETWEEN CHAR. IN MILLI-SEC. = ?
                5341  6360
                5342  4020
                5343  2211
                5344  1624
                5345  4022
                5346  0124
                5347  0555
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                5350  5555
                5351  2411
                5352  1505
                5353  4002
                5354  0524
                5355  2705
                5356  0516
                5357  4003
                5360  1001
                5361  2256
                5362  4011
                5363  1640
                5364  1511
                5365  1414
                5366  1155
                5367  2305
                5370  0356
                5371  4075
                5372  4000
 2257           5373  0116    MESUI,  TEXT    ?AN UNEXPECTED INTERRUPT OCCURED--OTHER THAN THE LA30?
                5374  4025
                5375  1605
                5376  3020
                5377  0503
                5400  2405
                5401  0440
                5402  1116
                5403  2405
                5404  2222
                5405  2520
                5406  2440
                5407  1703
                5410  0325
                5411  2205
                5412  0455
                5413  5517
                5414  2410
                5415  0522
                5416  4024
                5417  1001
                5420  1640
                5421  2410
                5422  0540
                5423  1401
                5424  6360
                5425  0000
 2258           5426  0116    MESUI2, TEXT    ?AN UNWANTED INTERRUPT OCCURED?
                5427  4025
                5430  1627
                5431  0116
                5432  2405
                5433  0440
                5434  1116
                5435  2405
                5436  2222
```



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                5437  2520
                5440  2440
                5441  1703
                5442  0325
                5443  2205
                5444  0400
 2259           5445  4015    MESMSE, TEXT    ? MILLI-SEC,?
                5446  1114
                5447  1411
                5450  5523
                5451  0503
                5452  5600
 2260           5453  0301    MESCR,  TEXT    ?CARRIAGE RETURN TEST?
                5454  2222
                5455  1101
                5456  0705
                5457  4022
                5460  0524
                5461  2522
                5462  1640
                5463  2405
                5464  2324
                5465  0000
 2261           5466  7060    MESCLM, TEXT    ?80 COLUMN LINE TEST?
                5467  4003
                5470  1714
                5471  2515
                5472  1640
                5473  1411
                5474  1605
                5475  4024
                5476  0523
                5477  2400
 2262           5500  1405    MESCEA, TEXT    ?LESS THAN 80 COLUMNS--BY  ?
                5501  2323
                5502  4024
                5503  1001
                5504  1640
                5505  7060
                5506  4003
                5507  1714
                5510  2515
                5511  1623
                5512  5555
                5513  0231
                5514  4040
                5515  0000
 2263           5516  1517    MESCEB, TEXT    ?MORE THAN 80 COLUMNS--BY  ?
                5517  2205
                5520  4024
                5521  1001
                5522  1640
                5523  7060
                5524  4003
                5525  1714
```

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                5526  2515
                5527  1623
                5530  5555
                5531  0231
                5532  4040
                5533  0000
2264            5534  4003    MESCOL, TEXT    ? COLUMNS?
                5535  1714
                5536  2515
                5537  1623
                5540  0000
2265            5541  1411    MESLFQ, TEXT    ?LINE FEED QUALITY TEST (PART 1)?
                5542  1605
                5543  4006
                5544  0505
                5545  0440
                5546  2125
                5547  0114
                5550  1124
                5551  3140
                5552  2405
                5553  2324
                5554  4050
                5555  2001
                5556  2224
                5557  4061
                5560  5100
2266            5561  0310    MESCPT, TEXT    ?CHARACTER PRINT TEST?
                5562  0122
                5563  0103
                5564  2405
                5565  2240
                5566  2022
                5567  1116
                5570  2440
                5571  2405
                5572  2324
                5573  0000
2267            5574  4217    MESOPR, TEXT    ?"OVER-PRINT" TEST?
                5575  2605
                5576  2255
                5577  2022
                5600  1116
                5601  2442
                5602  4024
                5603  0523
                5604  2400
2268            5605  1411    MESE2,  TEXT    ?LINE ECHO TEST (TYPE UP TO 80 CHARACTERS)?
                5606  1605
                5607  4005
                5610  0310
                5611  1740
                5612  2405
                5613  2324
                5614  4050
```



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                5615  2431
                5616  2005
                5617  4025
                5620  2040
                5621  2417
                5622  4070
                5623  6040
                5624  0310
                5625  0122
                5626  0103
                5627  2405
                5630  2223
                5631  5100
2269            5632  2022    MESPSO, TEXT    ?PRINTER HEAD "STEP-OVER" TEST?
                5633  1116
                5634  2405
                5635  2240
                5636  1005
                5637  0104
                5640  4042
                5641  2324
                5642  0520
                5643  5517
                5644  2605
                5645  2242
                5646  4024
                5647  0523
                5650  2400
2270            5651  2327    MESWIR, TEXT    ?SWIRL PRINT PATTERN TEST?
                5652  1122
                5653  1440
                5654  2022
                5655  1116
                5656  2440
                5657  2001
                5660  2424
                5661  0522
                5662  1640
                5663  2405
                5664  2324
                5665  0000
2271            5666  2320    MESPAC, TEXT    ?SPACE TEST?
                5667  0103
                5670  0540
                5671  2405
                5672  2324
                5673  0000
2272            5674  1617    MESNPR, TEXT    ?NON-PRINTING CHARACTER TEST?
                5675  1655
                5676  2022
                5677  1116
                5700  2411
                5701  1607
                5702  4003
                5703  1001
```

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                5704  2201
                5705  0324
                5706  0522
                5707  4024
                5710  0523
                5711  2400
 2273           5712  0417    MESD,   TEXT    ?DONE?
                5713  1605
                5714  0000
 2274           5715  0301    MESTCR, TEXT    ?CARRIAGE RETURN TIME TEST ?
                5716  2222
                5717  1101
                5720  0705
                5721  4022
                5722  0524
                5723  2522
                5724  1640
                5725  2411
                5726  1505
                5727  4024
                5730  0523
                5731  2440
                5732  0000
 2275           5733  0126    MESACR, TEXT    ?AVERAGE CARRIAGE RETURN TIME IS ?
                5734  0522
                5735  0107
                5736  0540
                5737  0301
                5740  2222
                5741  1101
                5742  0705
                5743  4022
                5744  0524
                5745  2522
                5746  1640
                5747  2411
                5750  1505
                5751  4011
                5752  2340
                5753  0000
 2276           5754  4000    DUMMY,  TEXT    ? ?
 2277           5755  1501    MESMAX, TEXT    ?MAXIMUM CARRIAGE RETURN TIME IS ?
                5756  3011
                5757  1525
                5760  1540
                5761  0301
                5762  2222
                5763  1101
                5764  0705
                5765  4022
                5766  0524
                5767  2522
                5770  1640
                5771  2411
                5772  1505
```



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                5773  4011
                5774  2340
                5775  0000
 2278           5776  1401    MESTID, TEXT    ?LA30 (DECWRITER) CONTROL/EXERCISER TEST?
                5777  6360
                6000  4050
                6001  0405
                6002  0327
                6003  2211
                6004  2405
                6005  2251
                6006  4003
                6007  1716
                6010  2422
                6011  1714
                6012  5705
                6013  3005
                6014  2203
                6015  1123
                6016  0522
                6017  4024
                6020  0523
                6021  2400
 2279           6022  1720    MESOPT, TEXT    ?OPERATORS' TESTS?
                6023  0522
                6024  0124
                6025  1722
                6026  2347
                6027  4024
                6030  0523
                6031  2423
                6032  0000
 2280           6033  0310    MESECH, TEXT    ?CHARACTER ECHO TEST--OPERATORS'?
                6034  0122
                6035  0103
                6036  2405
                6037  2240
                6040  0503
                6041  1017
                6042  4024
                6043  0523
                6044  2455
                6045  5517
                6046  2005
                6047  2201
                6050  2417
                6051  2223
                6052  4700
 2281           6053  0310    MESROL, TEXT    ?CHARACTER ROLL-OVER TEST--OPERATORS'?
                6054  0122
                6055  0103
                6056  2405
                6057  2240
                6060  2217
                6061  1414
```

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                6062  5517
                6063  2605
                6064  2240
                6065  2405
                6066  2324
                6067  5555
                6070  1720
                6071  0522
                6072  0124
                6073  1722
                6074  2347
                6075  0000
 2282           6076  0522    MESERO, TEXT    ?ERROR ON ROLL-OVER TEST, GOOD CHARACTERS ARE  ?
                6077  2217
                6100  2240
                6101  1716
                6102  4022
                6103  1714
                6104  1455
                6105  1726
                6106  0522
                6107  4024
                6110  0523
                6111  2454
                6112  4007
                6113  1717
                6114  0440
                6115  0310
                6116  0122
                6117  0103
                6120  2405
                6121  2223
                6122  4001
                6123  2205
                6124  4040
                6125  0000
 2283           6126  4001    MESAND, TEXT    ? AND ?
                6127  1604
                6130  4000
 2284           6131  5555    MESER2, TEXT    ?--THE ERROR CHARACTER IS OCTAL NUMBER-- ?
                6132  2410
                6133  0540
                6134  0522
                6135  2217
                6136  2240
                6137  0310
                6140  0122
                6141  0103
                6142  2405
                6143  2240
                6144  1123
                6145  4017
                6146  0324
                6147  0114
                6150  4016
```



```
                6151  2515
                6152  0205
                6153  2255
                6154  5540
                6155  0000
 2285           6156  2217    MESURO, TEXT    ?ROLL AND HOLD BETWEEN THE TWO CHARACTERS -- ?
                6157  1414
                6160  4001
                6161  1604
                6162  4010
                6163  1714
                6164  0440
                6165  0205
                6166  2427
                6167  0505
                6170  1640
                6171  2410
                6172  0540
                6173  2427
                6174  1740
                6175  0310
                6176  0122
                6177  0103
                6200  2405
                6201  2223
                6202  4055
                6203  5540
                6204  0000
 2286           6205  2410    MESALL, TEXT    ?THE TEN MEASURED CARRIAGE RET. TIMES ARE:?
                6206  0540
                6207  2405
                6210  1640
                6211  1505
                6212  0123
                6213  2522
                6214  0504
                6215  4003
                6216  0122
                6217  2211
                6220  0107
                6221  0540
                6222  2205
                6223  2456
                6224  4024
                6225  1115
                6226  0523
                6227  4001
                6230  2205
                6231  7200
 2287                 0120          *120
 2288                       $
 2289           0134  1606
 2290           0135  1600
 2291           0136  1564
 2292           0137  1200
```

```
2293    0140  3114
2294    0141  3000
2295    0142  2471
2296    0143  1034
2297    0144  1614
2298    0145  0600
2299    0146  1214
2300    0147  1052
2301    0150  0302
2302    0151  0715
2303    0152  1015
2304    0153  1400
2305    0154  1000
2306    0155  1006
2307    0156  0336
2308    0157  0736
2309    0160  0200
2310    0161  0253
2311    0162  0244
2312    0163  0240
2313    0164  0234
2314    0165  0311
2315    0166  0266
2316    0167  1126
2317    0170  1105
2318    0171  3326
2319    0172  1150
2320    0173  1144
2321    0174  1137
2322    0175  1133
2323    0176  1116
2324    0177  1111
```



```
0000  11110000  00000000  11111111  11111111  11111111  11111111  11111111  11111111
0100  11111111  11111110  00000000  00001111  11111111  11111111  11111111  11111111

0200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0300  11111111  11111111  11111111  11111111  11111111  11111111  11111100  00001111

0400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0500  11111111  11111111  11111111  11111111  11111100  00000000  00000000  11111111

0600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0700  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111001


1000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1100  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11000001

1200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1300  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11100000

1400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1500  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11001111

1600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1700  11111111  11111111  11111111  11111111  11111111  11111111  11111111  10111111


2000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
2100  11111111  11111111  11111111  11111111  11111111  11000000  00000000  00011111

2200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
2300  11111111  11111111  11111111  11111111  11111111  11111110  00000000  00000011

2400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
2500  11111111  11111111  11111111  11111111  11111100  00000000  00000000  00000000

2600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
2700  11111111  11111111  11111111  11111111  11111111  11111000  00000000  00000001


3000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
3100  11111111  11111111  11111111  11111111  11111111  11111111  11111110  00000111

3200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
3300  11111111  11111111  11111111  11111111  11111111  11111111  11111100  00000111

3400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
3500  11111111  11111111  11111111  11111111  11111111  11111100  00000000  00011111

3600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
3700  11111111  11111000  00000000  00000000  00000000  00000000  00000000  00000000
```

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

4200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
4300  11111110  00000000  00000000  00000000  00000000  00002000  00000000  01111111

4400
4500

4600
4700


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  11111111  11111111

5600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
5700  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111


6000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
6100  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

6200  11111111  11111111  11111111  11000000  00000000  00000000  00000000  00000000
6300  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000

6400
6500

6600
6700


7000
7100

7200
7300

7400
7500

7600
7700
```



```
ANSWER  0101        DEV2    0655        K0277   4065        MESCOL  5534
ASK     4540        DEVA    0634        K0315   1563        MESCPT  5561
ASKOUT  3520        DEVIDE  0627        K0317   2263        MESCR   5453
ASKTYP  0400        DEVIS   0615        K0330   0033        MESD    5712
BIOTST  1241        DIV     0522        K0334   0034        MESE2   5605
BUFFER  0046        DUBDIV  2471        K0377   1240        MESECH  6033
BUFSET  2051        DUMMY   5754        K0400   0300        MESER2  6131
  203   1606        ECHKEY  4011        K0770   3166        MESERO  6076
  215   1600        ECHO1   3667        K1750   0656        MESGCO  5211
C377    1564        ECHO1A  3673        K3740   0772        MESGLF  5327
CAL     0426        ECHO2   4000        K4000   0035        MESKCC  5111
CALX    0433        ECHO2A  4024        K4100   0773        MESKSF  5124
CCNTC   4534        ECHO2B  4032        K4600   0036        MESLFQ  5541
CHKCR   4535        ECONT   4045        K7600   0360        MESLFR  5302
CHKRUB  4536        ENDALL  4177        K7700   0037        MESLTT  5252
CHKSTO  0116        ENDTST  0257        KCC2    1317        MESMAX  5755
CHKSW0  0320        EPRINT  0336        KCODE   0102        MESMSE  5445
CHKSW1  0322        ERNUM   1044        KEYTAB  3100        MESNPR  5674
CHKSW2  0326        ERPRIN  4556        KEYTYP  1200        MESOPR  5574
CHKSWS  0311        ERRCNT  0071        KKLA30  0113        MESOPT  6022
CMPYR   3033        ERRHLT  0333        KLA30S  0104        MESPAC  5666
COCTAL  4545        ERRLFR  3652        KRBL    3337        MESPSO  5632
COLEND  1656        ERRTYP  0341        KSF1    1312        MESR    5340
COLERA  1672        ET10    1260        KSTART  0200        MESRAT  5234
COLERB  1703        EXET1   3711        LA30S   4200        MESROL  6053
COLOK   1664        EXIT    4544        LA30S1  4211        MESSPF  5036
COLOUT  1667        FILBUF  2054        LA30S2  4256        MESSPI  5056
COMPAR  4547        FILLCH  0105        LA30ST  4210        MESTCF  5016
COMPEQ  1101        HTOU    2743        LINE    0050        MESTCR  5715
COMPXY  1052        HUND    0075        LISTEN  4537        MESTID  5776
CONVRT  2742        II      0424        LOOP    0216        MESTSF  5000
COUNT   0047        IOT8E   2305        LSB     0516        MESUI   5373
CRATE   2600        IOT8E1  2312        M120    0042        MESUI2  5426
CRATEA  2634        IOT8E2  2332        M125    0115        MESURO  6156
CRATEB  2645        IOTSPI  2342        M144    0043        MESWIR  5651
CRATEC  2613        IOTST6  1372        M2      0657        MILCTR  1033
CRATED  2655        IOTTAB  1164        M337    2106        MILL1   1031
CRATEX  2662        K0001   0020        M4      0040        MINS    6125
CRATEY  2661        K0002   0021        M50     0041        MINT    6115
CRDONE  3414        K0004   0277        M764    0044        MLA30S  4262
CRLF    4555        K0007   0022        M77     0114        MLSB    3032
CRSPAC  3277        K0010   0023        MAGIC   0045        MMSB    3031
CSPAC1  3305        K0012   0024        MAX     0422        MORTST  1074
CSPAC2  3312        K0017   0025        MESACR  5733        MPART2  0541
D250    1043        K0077   0026        MESALL  6205        MPY     4541
DC02    0066        K0144   2741        MESAND  6126        MSB     0517
DDIV    4542        K0177   0361        MESBII  5162        MSCTR   1032
DECIM   0053        K0212   0027        MESBIO  5175        MTON    6117
DECOCT  0662        K0215   0030        MESCEA  5500        MULT    0504
DEL250  1034        K0240   0031        MESCEB  5516        MULTIP  3000
DELAY   4552        K0260   0032        MESCHA  5315        MX      3034
DEV1    0654        K0275   3710        MESCLM  5466        MY      3035
```

NEX88	2075	REGC	0061	TCF1	1365	XDIVID	0520
NEXLIN	2026	REMAIN	0100	TCF2	1433	XEHLT1	1710
NOINT	5144	REPEAT	4550	TEMP	0052	XEHLT2	3506
NPRTST	2412	ROLLA	4136	TENS	0076	XENUM	1711
NUM	0610	ROLTST	4066	THOU	0074	XEXIT	1614
NUMA	0067	S8E1	2323	TIMB	3325	XKCC	1144
NUMB	0070	S8E2	2346	TIMCAR	3221	XKCF	1154
OCTALP	4551	SCRTYP	0700	TIMCWK	3617	XKIE	1160
OCTDEC	0600	SET1	3712	TIMCRA	3402	XKRB	3326
OE	0425	SET2	4062	TIMCRB	3441	XKRS	1150
OKLFR	3644	SETLOC	4566	TIMCRC	3400	XKSF	1137
OKPRT	3215	SETSTO	0301	TIMDEL	3407	XLRATE	3304
OKTYP	3627	SETTOX	0266	TIME	0073	XMIL1	0223
OPSTST	3662	SETUP	3036	TIMLFA	3612	XMULTI	0476
OVER	2525	SPACE	2264	TIMLFR	3600	XOCTAL	0715
PCODE	0103	SPF1	2326	TIMRAT	3207	XPDP8	3507
PDP8	0107	SPI1	2353	TIMTST	3200	XPDP8E	3527
PDP8E	0112	SROLL	4131	TSF1	1345	XPDP8L	3521
PDP8L	0111	ST1TST	0362	TST1	0234	XPDP8S	3535
PDP8S	0110	ST2TST	0363	TST2	0240	XPRINT	0736
POVER	1635	ST3TST	0364	TST3	0244	XPRT6	2133
PRINT	4557	ST4TST	0365	TST4	0253	XPRT8	2234
PRINT2	1562	START	5560	TYPAVE	3543	XREPET	0302
PRINT5	2017	START1	5564	TYPE	4554	XSPF	1105
PRINT6	2105	START2	5563	TYPNUM	0671	XSPI	1126
PRINT8	2223	START3	5562	TYPTHT	0705	XSTIM	3504
PRINT9	2262	START4	5561	TYPTU	3505	XTAVE	3303
PRITST	1522	STATIO	3364	UCR	4546	XTCF	1116
PRT5A	2000	STIMCR	3274	UKCC	4573	XTIMA	3300
PRT7A	2207	STOPRT	0774	UKRB	4571	XTLS	1133
PRTS5A	2027	STRSAV	0357	UKRS	4572	XTPC	1122
PRTS5B	2036	STRTST	0347	UKSF	4574	XTSF	1111
PRTS5C	2033	SWITCH	4565	UNIT	0077	XTYPE	1000
PRTST	4553	SWRAN	2107	USPF	4570	XTYTHT	3555
PRTST1	1533	T1PA2	1274	USPI	4567	XX	0063
PRTST2	1626	T1PA3	1332	UTCF	4576	XXKRB	3355
PRTST3	1735	T1PA5	1355	UTLS	4575	XXPRT6	2143
PRTST4	1757	T1PA6	1416	UTSF	4577	Y	0064
PRTST5	2020	T1PA7	1445	VMAX	0423	YY	0065
PRTST6	2123	T1PB7	1501	WAIT	4543		
PRTST7	2200	T1PC7	1510	WORK1	0054		
PRTST8	2224	T1PG1	1245	WORK2	0055		
PRTST9	2400	T1PG2	1271	WORK3	0056		
PRTTAB	3106	T1PG3	1324	X	0062		
PRTTST	1400	T1PG5	1352	XCAL	0440		
QPT08	3146	T1PG6	1414	XCDON	3301		
QUESTN	3114	T1PG7	1440	XCR	1214		
RATE	2663	T2LA30	1712	XCRLF	1006		
RATEA	2721	T2LAX0	1725	XCSPAC	3424		
RATEX	3220	T8EIOT	0106	XDC02	3365		
REGA	0057	TABLE	2433	XDDIV	3302		
REGB	0060	TALLY	0051	XDELAY	1015		

ERRORS DETECTED: 0

LINKS GENERATED: 6

RUN-TIME: 12 SECONDS

3K CORE USED

```
XTSF          16     623#    625     626     627     1632
XTYPE         35     526#    531
XTYTHT      1918    1925#
XX           100#   1413    1430    1432
XXKRB       1630    1786    1806#
XXPRT6      1222    1227#
Y            101#   1415    1420    1422    1428    1437
YY           102#   1418    1424    1426    1431
.L0134        51    2289#
.L0135        50    2290#
.L0136        49    2291#
.L0137        48    2292#
.L0140        47    2293#
.L0141        46    2294#
.L0142        45    2295#
.L0143        44    2296#
.L0144        43    2297#
.L0145        42    2298#
.L0146        41    2299#
.L0147        40    2300#
.L0150        39    2301#
.L0151        38    2302#
.L0152        37    2303#
.L0153        36    2304#
.L0154        35    2305#
.L0155        34    2306#
.L0156        33    2307#
.L0157        32    2308#
.L0160        31    2309#
.L0161        30    2310#
.L0162        29    2311#
.L0163        28    2312#
.L0164        27    2313#
.L0165        26    2314#
.L0166        25    2315#
.L0167        24    2316#
.L0170        23    2317#
.L0171        22    2318#
.L0172        21    2319#
.L0173        20    2320#
.L0174        19    2321#
.L0175        18    2322#
.L0176        17    2323#
.L0177        16    2324#
.L0374       156     258#
.L0375       155     259#
.L0376       141     260#
.L0377       137     261#
.L0570       361     372#
.L0571       331     373#
.L0572       329     374#
.L0573       318     375#
.L0574       317     376#
```

```
.L0575       300     377#
.L0576       270     378#
.L0577       267     379#
.L0777       387     522#
.L1177       609     684#
.L1574       969     973#
.L1575       935     974#
.L1576       893     975#
.L1577       882     976#
.L1772      1099    1113#
.L1773      1074    1114#
.L1774      1069    1115#
.L1775      1066    1116#
.L1776       987    1117#
.L1777       980    1118#
.L2173      1233    1234#
.L2174      1231    1235#
.L2175      1217    1236#
.L2176      1147    1237#
.L2177      1132    1238#
.L2376      1316    1360#
.L2377      1315    1361#
.L2777      1456    1359#
.L3175      1645    1647    1682#
.L3176      1614    1683#
.L3177      1600    1684#
.L3375      1799    1815#
.L3376      1787    1816#
.L3377      1772    1817#
.L3573      1912    1926#
.L3574      1907    1927#
.L3575      1900    1928#
.L3576      1891    1929#
.L3577      1837    1930#
.L4371      2227    2231#
.L4372      2222    2232#
.L4373      2213    2233#
.L4374      2210    2234#
.L4375      2195    2200    2235#
.L4376      2190    2236#
.L4377      2180    2237#
.V0003       609     684#
.V0017       155     259#   1799    1815#
.V0055       317     376#
.V0073       387     522#
.V0100      1912    1926#
.V0120      2195    2200    2235#
.V0140       270     378#   1315    1361#
.V0177      2190    2236#
.V0200        31     267     379#   2309#
.V0212      2210    2234#
.V0215      2227    2231#
.V0234        27    2313#
```

```
,V0240      28    2312#
,V0244      29    2311#
,V0253      30    2310#
,V0257     318     375#
,V0260    1069    1115#
,V0266      25    2315#
,V0302      39    2301#
,V0304    1645    1647    1682#
,V0311      26    2314#
,V0336      33    2307#
,V0377    2222    2232#
,V0400     137     261#
,V0426    1099    1113#
,V0522    1900    1928#
,V0600      42    2298#
,V0606    1891    1929#
,V0705    1907    1927#
,V0715      38    2302#
,V0736      32    2308#
,V1000      35    2305#
,V1006      34    2306#
,V1015      37    2303#
,V1034      44    2296#
,V1052      40    2300#
,V1105      23    2317#
,V1111      16    2324#
,V1116      17    2323#
,V1126      24    2316#
,V1133      18    2322#
,V1137      19    2321#
,V1144      20    2320#
,V1150      21    2319#
,V1200      48    2292#
,V1214      41    2299#
,V1400      36    2304#
,V1501     893     975#
,V1510     882     976#
,V1564      49    2291#
,V1600      50    2290#
,V1606      51    2289#
,V1614      43    2297#
,V1757     331     373#   1132    1238#
,V2200    1233    1234#
,V2471      45    2295#
,V2634    1456    1559#
,V3000      46    2294#
,V3100    1600    1684#
,V3106    1614    1683#
,V3114      47    2293#
,V3306    1837    1930#
,V3326      22    2318#
,V7400    2213    2233#
,V7401     969     973#
```

```
,V7507    1074    1114#
,V7563     980    1118#
,V7575     987    1117#
,V7657    1147    1237#
,V7662    1217    1236#
,V7672    1066    1116#
,V7700    1316    1360#
,V7731     935     974#
,V7732     300     377#
,V7761     156     258#
,V7767     141     260#    329     374#   1231    1235#   1787    1816#   2180    2237#
,V7776    1772    1817#
,V7777     361     372#
```