[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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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      [XTSF
          4576      UTCF=JMS I      [XTCF
          4575      UTLS=JMS I      [XTLS
          4574      UKSF=JMS I      [XKSF
          4573      UKCC=JMS I      [XKCC
          4572      UKRS=JMS I      [XKRS
          4571      UKRB=JMS I      [XKRB
          4570      USPF=JMS I      [XSPF
          4567      USPI=JMS I      [XSPI
          4566      SETLOC=JMS I    [SETTOX
          4565      SWITCH=JMS I    [CHKSWS
          5564      START1=JMP I    [TST1
          5563      START2=JMP I    [TST2
          5562      START3=JMP I    [TST3
          5561      START4=JMP I    [TST4
          5560      START=JMP I     [KSTART
          4557      PRINT=JMS I     [XPRINT
          4556      ERPRIN=JMS I    [EPRINT
          4555      CRLF=JMS I      [XCRLF
          4554      TYPE=JMS I      [XTYPE
          4553      PRTST=JMS I     [PRTTST
          4552      DELAY=JMS I     [XDELAY
          4551      OCTALP=JMS I    [XOCTAL
          4550      REPEAT=JMS I    [XREPET
          4547      COMPARE=JMS I   [COMPXY
          4546      UCR=JMS I       [XCR
          4545      COCTAL=JMS I    [OCTDEC
          4544      EXIT=JMS I      [XEXIT
          4543      WAIT=JMS I      [DEL250
          4542      DDIV=JMS I      [DUBDIV
          4541      MPY=JMS I       [MULTIP
          4540      ASK=JMS I       [QUESTN
          4537      LISTEN=JMS I    [KEYTYP
          4536      CHKRUB=JMS I    [C377
          4535      CHKCR=JMS I     [C215
          4534      CCNTC=JMS I     [C203
```



```
          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
```

```
  108   0072  0000   0
  109   0073  0000   TIME,   0
  110   0074  0000   THOU,   0
  111   0075  0000   HUND,   0
  112   0076  0000   TENS,   0
  113   0077  0000   UNIT,   0
  114   0100  0000   REMAIN, 0
  115   0101  0000   ANSWER, 0
  116   0102  0000   KCODE,  0
  117   0103  0000   PCODE,  0
  118   0104  0000   KLA30S, 0
  119   0105  0000   FILLCH, 0
  120   0106  2305   T8EIOT, IOT8E
  121   0107  3507   PDP8,   XPDP8
  122   0110  3535   PDP8S,  XPDP8S
  123   0111  3521   PDP8L,  XPDP8L
  124   0112  3527   PDP8E,  XPDP8E
  125   0113  0000   KKLA30S,        0
  126   0114  7701   M77,    -77
  127   0115  7653   M125,   -125
  128   0116  0000   CHKSTO, 0
  129
  130         0200   *200
  131                /STARTING ADDRESS 200
  132                /STARTING ADDRESS 201
  133   0200  7040   KSTART, CMA
  134   0201  3113           DCA KKLA30S             /LA30S SELECTED FOR 300 BAUD OPERAION
  135   0202  3066           DCA DC02                /CLEAR FOR POSSIBLE DC02 ENABLE
  136   0203  4540           ASK                     /MAKE DECISIONS ON CONSOLE, PT08 OR DC02
  137   0204  4777           JMS     ASKTYP
  138   0205  1113           TAD KKLA30S
  139   0206  7640           SZA CLA
  140   0207  5211           JMP .+2                 /LA30P OR LA30S (110 OR 150 BAUD)
  141   0210  1376           TAD (-11
  142   0211  3105           DCA FILLCH
  143   0212  1066           TAD     DC02
  144   0213  6117           MTON
  145   0214  4553           PRTST                   /TRY TO PRINT A DUMMY CHARACTER
  146   0215  4555           CRLF
  147   0216  4557   LOOP,   PRINT; MESTID           /TITLE MESSAGE TO CONSUL-TTY
  148   0217  5776
  149   0220  4555           CRLF
  150   0221  4566           SETLOC; MILL1; XMIL1, -333
  151   0222  1031
  152   0223  7445
  153   0224  3071           DCA     ERRCNT
  154   0225  7604           LAS; AND (17); TAD (-17); SZA CLA; JMP .+3; HLT; JMP .-6
  155   0226  0375
  156   0227  1374
  157   0230  7640
  158   0231  5234
  159   0232  7402
  160   0233  5225
  161   0234  7604   TST1,   LAS
  162   0235  0023           AND     K0010           /TEST 1 MASK
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  163   0236  7650           SNA CLA                 /SR08 = 1 ??
  164   0237  5762           JMP I   ST1TST          /NO
  165   0240  7604   TST2,   LAS
  166   0241  0277           AND     K0004           /TEST 2 MASK
  167   0242  7650           SNA CLA                 /SR09 = 1 ??
  168   0243  5763           JMP I   ST2TST          /NO
  169   0244  1104   TST3,   TAD KLA30S              /AC SWITCH 4 SENSOR
  170   0245  7640           SZA CLA
  171   0246  5253           JMP TST4
  172   0247  7604           LAS
  173   0250  0021           AND     K0002           /TEST 3 MASK
  174   0251  7650           SNA CLA                 /SR10 = 1 ??
  175   0252  5764           JMP I   ST3TST          /NO
  176   0253  7604   TST4,   LAS                     /YES, INHIBIT TIME TESTS
  177   0254  0020           AND     K0001
  178   0255  7650           SNA CLA                 /SR11 = 1 ??
  179   0256  5765           JMP I   ST4TST          /NO
  180   0257  4555   ENDTST, CRLF
  181   0260  4557           PRINT; MESD             /DONE MESSAGE TO CONSUL-TTY
  182   0261  5712
  183   0262  4555           CRLF
  184   0263  4555           CRLF
  185   0264  4555           CRLF
  186   0265  5216           JMP     LOOP
  187
  188                /SUB-ROUTINE TO INITIALIZE LOCATIONS
  189   0266  0000   SETTOX, 0
  190   0267  7200           CLA
  191   0270  1666           TAD I   SETTOX
  192   0271  3301           DCA     SETSTO
  193   0272  2266           ISZ     SETTOX
  194   0273  1666           TAD I   SETTOX
  195   0274  3701           DCA I   SETSTO
  196   0275  2266           ISZ     SETTOX
  197   0276  5666           JMP I   SETTOX
  198   0277  0004   K0004,  4
  199   0300  0400   K0400,  400
  200   0301  0000   SETSTO, 0
  201   0302  0000   XREPET, 0
  202   0303  7604           LAS
  203   0304  0300           AND     K0400
  204   0305  7640           SZA CLA                 /IS AC BIT 3=1 ?
  205   0306  5702           JMP I   XREPET          /YES, LOOP ON THIS TEST SECTION
  206   0307  2302           ISZ     XREPET          /NO, SET EXIT TO GO TO NEXT TEST SECTION
  207   0310  5702           JMP I   XREPET
  208
  209                /ROUTINE TO CHECK THE SWITCHES AND DETERMINE WHAT COURSE OF
  210
  211   0311  0000   CHKSWS, 0
  212   0312  7300           CLA CLL
  213   0313  1071           TAD     ERRCNT
  214   0314  7650           SNA CLA                 /ANY ERRORS?
  215   0315  5326           JMP     CHKSW2          /NO
  216   0316  3071           DCA     ERRCNT
  217   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  7300          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
```

```
                                TAD     REGA
                                CIA
                                DCA     REMAIN
                                JMP I   COMPXY
                        MORTST, SNA
                                JMP     COMPEQ
                                DCA     REMAIN          /SET FOR DATA
                                ISZ     COMPXY
                                JMP I   COMPXY          /"MORE-THAN" EXIT

                        COMPEQ, TAD     (3
                                TAD     COMPXY
                                DCA     COMPXY
                                JMP I   COMPXY          /"EQUAL TO" EXIT


                        /LA30 IOT SUB-ROUTINES

                        XSPF,   0
                                0
                                JMP I   XSPF
                                HLT

                        XTSF,   0
                                0
                                JMP I   XTSF            /NO SKIP
                                ISZ     XTSF            /SKIP
                                JMP I   XTSF

                        XTCF,   0
                                0
                                JMP I   XTCF
                                HLT

                        XTPC,   0
                                0
                                JMP I   XTPC
                                HLT

                        XSPI,   0
                                0
                                JMP I   XSPI
                                ISZ     XSPI
                                JMP I   XSPI

                        XTLS,   0
                                0
                                JMP I   XTLS
                                HLT

                        XKSF,   0
                                0
                                JMP I   XKSF            /NO SKIP
                                ISZ     XKSF            /SKIP
```



```
                                JMP I   XKSF

                        XKCC,   0
                                0
                                JMP I   XKCC
                                HLT

                        XKRS,   0
                                0
                                JMP I   XKRS
                                HLT

                        XKCF,   0
                                0
                                JMP I   XKCF
                                HLT

                        XKIE,   0
                                0
                                JMP I   XKIE
                                HLT

                        /IOT TABLE FOR THE DECWRITER

                        IOTTAB, 6000
                                6001
                                6002
                                6004
                                6005
                                6006
                                PAGE

                        /LISTEN FOR THE KEYBOARD AND ECHO THE CHARACTER TYPED.
                        KEYTYP, 0
                                UKCC
                                UKSF
                                JMP     .-1
                                UKRB
                                DCA CHKSTO
                                TAD CHKSTO
                                UTLS
                                UTSF
                                JMP     .-1
                                CLL CLA
                                JMP I   KEYTYP
                        /ISSUE A CARRIAGE RETURN
                        XCR,    0
                                CLA
                                TAD     K0215
                                TYPE
                                CLA
                                TAD KLA30S
                                SNA CLA
                                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
```



```
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
```

```
                                /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
1523  4557          PRINTJ MESCR                    /"CARRIAGE RETURN TEST" TO MASTER TTY
1524  5453
1525  4555          CRLF
1526  1375          TAD     (-47
1527  3051          DCA     TALLY
1530  3050          DCA     LINE
1531  1031          TAD     K0240
1532  4554          TYPE
1533  1050  PRTST1, TAD     LINE
1534  7040          CMA
1535  3047          DCA     COUNT
1536  1033          TAD     K0330           /0330 CODE "X"
1537  4554          TYPE                    /PRINT CHARACTER
1540  4544          EXIT
1541  5357          JMP     PRINT2-3
1542  2047          ISZ     COUNT           /LINE PRINTING DONE?
1543  5336          JMP     .-5             /NO, CONTINUE PRINTING X CODE
1544  7101          IAC CLL
1545  7004          RAL
1546  1050          TAD     LINE
1547  3050          DCA     LINE            /ADD 2 TO LINE COUNTER
1550  4546          UCR
1551  1363          TAD     K0315           /0315 CODE, "M"
1552  4554          TYPE                    /PRINT IT
1553  1027          TAD     K0212           /"LF" CODE
1554  4554          TYPE                    /PRINT IT
1555  2051          ISZ     TALLY           /IS TEST DONE?
1556  5333          JMP     PRTST1          /NO, PRINT ANOTHER LINE
1557  4565          SWITCH
1560  5322          JMP     PRITST
1561  5762          JMP I   PRINT2
1562  1626  PRINT2, PRTST2
1563  0315  K0315,  315
                                /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
      1600  PAGE
                                /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     .+5
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  5300
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, ERRLPR
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  1772  0426
1114  1773  7507
1115  1774  0260
1116  1775  7672
1117  1776  7575
1118  1777  7563
              2000        PAGE
1119  2000  1042  PRT5A,  TAD     M120            /80 COLUMNS PER LINE OF TYPE
1120  2001  3051          DCA     TALLY
1121  2002  2050          ISZ     LINE
1122  2003  1050          TAD     LINE
1123  2004  4554          TYPE            /PRINT A CHARACTER
1124  2005  4544          EXIT
1125  2006  5214          JMP     .+6
1126  2007  2051          ISZ     TALLY           /DONE WITH LINE?
1127  2010  5203          JMP     .-5             /NO, REPEAT
1128  2011  4555          CRLF                    /YES
1129  2012  2047          ISZ     COUNT           /DONE WITH TEST
1130  2013  5200          JMP     PRT5A           /NO, TYPE A LINE OF NEW CHARACTERS
1131  2014  4565          SWITCH
1132  2015  5777          JMP     PRTST4
1133  2016  5617          JMP I   PRINT5
1134  2017  2020  PRINT5, PRTST5
1135
1136                      /CHARACTER SWIRL TEST,  TYPE A LINE OF ALL CHARACTERS,  SHIFT PATTERN
1137
1138  2020  4555  PRTST5, CRLF
1139  2021  4555          CRLF
1140  2022  4557          PRINT; MESWIR                   /"CHARACTER SWIRL TEST" TO MASTER TTY
1141  2023  5651
1142  2024  4555          CRLF
1143  2025  5254          JMP     FILBUF          /FILL PRINT BUFFER
1144  2026  2055  NEXLIN, ISZ     WORK2
```

```
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   K0077
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  5574
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  5207          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
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                                /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
```

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                    2600    PAGE

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

2600  0000  CRATE,  0
2601  4573          UKCC
2602  4576          UTCF
2603  4566          SETLOC) 1; JMP I 2
2604  0001
2605  5402
2606  1377          TAD     (CRATEA
2607  3002          DCA 2
2610  3262          DCA     CRATEX
2611  3261          DCA     CRATEY
2612  1033          TAD     K0330
2613  4575  CRATEC, UTLS
2614  4577          UTSF
2615  5214          JMP     .-1
2616  4575          UTLS
2617  6001          ION
2620  4543          WAIT
2621  2262          ISZ     CRATEX
2622  5220          JMP     .-2
2623  2261          ISZ     CRATEY
2624  5220          JMP     .-4
2625  6002          IOF
2626  4555          CRLF
2627  4557          PRINT
2630  5144          NOINT
2631  4555          CRLF
2632  5633          JMP I .+1
2633  1241          BIOTST
2634  4577  CRATEA, UTSF
2635  5255          JMP     CRATED
2636  4541          MPY
2637  0656          K1750
2640  2662          CRATEX
2641  4542          DDIV
2642  3031          MMSB
2643  0072          TIME-1
2644  5600          JMP I   CRATE
2645  2071  CRATEB, ISZ     ERRCNT
2646  4565          SWITCH
2647  7000          NOP
2650  4555          CRLF
2651  4557          PRINT; MESUI
2652  5373
2653  4555          CRLF
2654  5213          JMP     CRATEC
2655  4574  CRATED, UKSF
2656  5245          JMP     CRATEB
2657  2262          ISZ     CRATEX
2660  5217          JMP     CRATEC+4
2661  0000  CRATEY, 0
```



```
2662  0000  CRATEX, 0

2663  0000  RATE,   0
2664  7300          CLA CLL
2665  7001          IAC
2666  6115          MINT
2667  7200          CLA
2670  1036          TAD     K4600
2671  3046          DCA     BUFFER          /SET UP FOR STORAGE ADDRESS
2672  4321          JMS     RATEA
2673  4555          CRLF
2674  1036          TAD     K4600           /YES, RESET TO START OF BUFFER
2675  3046          DCA     BUFFER
2676  1043          TAD     M144            /RESET TALLY COUNTER
2677  3051          DCA     TALLY
2700  3054          DCA     WORK1
2701  7100          CLL                     /ADD 100 NUMBERS FROM BUFFER
2702  1446          TAD I   BUFFER          /GET A NUMBER
2703  2046          ISZ     BUFFER
2704  7430          SZL                     /OVERFLOW?
2705  2054          ISZ     WORK1           /YES, INCREMENT WORK3
2706  2051          ISZ     TALLY           /DONE ADDING 100 NUMBERS?
2707  5301          JMP     .-6             /NO, CONTINUE ADDING
2710  3055          DCA     WORK2           /YES, SAVE ANSWER
2711  3057          DCA     REGA
2712  1341          TAD     K0144
2713  3060          DCA     REGB
2714  4542          DDIV
2715  0054          WORK1
2716  0057          REGA
2717  4742          JMS I   CONVRT          /CONVERT OCTAL TO DECIMAL AND PRINT
2720  5663          JMP I   RATE
2721  0000  RATEA,  0
2722  4566          SETLOC) COUNT) -5
2723  0047
2724  7773
2725  4566          SETLOC) TALLY) -24
2726  0051
2727  7754
2730  4200          JMS     CRATE           /FIND LA30 PRINT RATE
2731  3446          DCA I   BUFFER          /STORE IT
2732  2046          ISZ     BUFFER
2733  2051          ISZ     TALLY           /DONE YET?
2734  5330          JMP     .-4             /NO, FIND THE PRINT RATE AGAIN
2735  4555          CRLF
2736  2047          ISZ     COUNT
2737  5325          JMP     RATEA+4
2740  5721          JMP I   RATEA           /YES
2741  0144  K0144,  144
2742  0660  CONVRT, DECOCT

2743  0000  HTDU,   0
2744  1075          TAD     HUND
2745  4554          TYPE
2746  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
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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
 1686                         /TEST 3 - TIMING TESTS FOR CARRIAGE RETURNS, LINE FEEDS, AND PRINT RATE
 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
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 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          PRINT; 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          PRINT; 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          SETLOC; 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     .-3
 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          SETLOC; 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          SETLOC; XMIL1; -305
 1903    3524  0223
         3525  7473
 1904    3526  5314          JMP     XPDP8+5
 1905    3527  4566  XPDP8E, SETLOC; 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, SETLOC; XMIL1; -13
 1911    3536  0223
         3537  7765
 1912    3540  1373          TAD     (100
 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
```



```
 1918    3546  4755          JMS I   XTYTHT
 1919    3547  1077          TAD     UNIT
 1920    3550  4554          TYPE
 1921    3551  4557          PRINT; 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          PRINT; MESLFR                 /"LINE FEED RATE TEST"
 1936    3602  5302
 1937    3603  4555          CRLF
 1938    3604  4566          SETLOC; 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          PRINT; 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          PRINT; MESCHA
 1969    3642  5315
 1970    3643  5627          JMP I   OKTYP
```

```
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.
```



```
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  3305            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  2305
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  1517
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
```



```
                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
```

```
                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
```



```
                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
```

```
                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
```



```
                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
```

```
                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  00000000  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
ASK     4540
ASKOUT  3520
ASKTYP  0400
BIOTST  1241
BUFFER  0046
BUFSET  2051
 203    1606
 215    1600
C377    1564
CAL     0426
CALX    0433
CCNTC   4534
CHKCR   4535
CHKRUB  4536
CHKSTO  0116
CHKSW0  0320
CHKSW1  0322
CHKSW2  0326
CHKSWS  0311
CMPYR   3033
COCTAL  4545
COLEND  1656
COLERA  1672
COLERB  1703
COLOK   1664
COLOUT  1667
COMPAR  4547
COMPEQ  1101
COMPXY  1052
CONVRT  2742
COUNT   0047
CRATE   2600
CRATEA  2634
CRATEB  2645
CRATEC  2613
CRATED  2655
CRATEX  2662
CRATEY  2661
CRDONE  3414
CRLF    4555
CRSPAC  3277
CSPAC1  3305
CSPAC2  3312
D250    1043
DC02    0066
DDIV    4542
DECIM   0053
DECOCT  0660
DEL250  1034
DELAY   4552
DEV1    0654
DEV2    0655
DEVA    0634
DEVIDE  0627
DEVIS   0615
DIV     0522
DUBDIV  2471
DUMMY   5754
ECHKEY  4011
ECHO1   3667
ECHO1A  3673
ECHO2   4000
ECHO2A  4024
ECHO2B  4032
ECONT   4045
ENDALL  4177
ENDTST  0257
EPRINT  0336
ERNUM   1044
ERPRIN  4556
ERRCNT  0071
ERRHLT  0333
ERRLFR  3652
ERRTYP  0341
ET10    1260
EXET1   3711
EXIT    4544
FILBUF  2054
FILLCH  0105
HTDU    2743
HUND    0075
II      0424
IOT8E   2305
IOT8E1  2312
IOT8E2  2332
IOTSPI  2342
IOTST6  1372
IOTTAB  1164
K0001   0020
K0002   0021
K0004   0277
K0007   0022
K0010   0023
K0012   0024
K0017   0025
K0077   0026
K0144   2741
K0177   0361
K0212   0027
K0215   0030
K0240   0031
K0260   0032
K0275   3710
K0277   4065
K0315   1563
K0317   2263
K0330   0033
K0334   0034
K0377   1240
K0400   0300
K0770   3166
K1750   0656
K3740   0772
K4000   0035
K4100   0773
K4600   0036
K7600   0360
K7700   0037
KCC2    1317
KCODE   0102
KEYTAB  3100
KEYTYP  1200
KKLA30  0113
KLA30S  0104
KRBL    3337
KSF1    1312
KSTART  0200
LA30S   4200
LA30S1  4211
LA30S2  4256
LA30ST  4210
LINE    0050
LISTEN  4537
LOOP    0216
LSB     0516
M120    0042
M125    0115
M144    0043
M2      0657
M337    2106
M4      0040
M50     0041
M764    0044
M77     0114
MAGIC   0045
MAX     0422
MESACR  5733
MESALL  6205
MESAND  6126
MESBII  5162
MESBIO  5175
MESCEA  5500
MESCEB  5516
MESCHA  5315
MESCLM  5466
MESCOL  5534
MESCPT  5561
MESCR   5453
MESD    5712
MESE2   5605
MESECH  6033
MESER2  6131
MESERO  6076
MESGCO  5211
MESGLF  5327
MESKCC  5111
MESKSF  5124
MESLFQ  5541
MESLFR  5302
MESLTT  5252
MESMAX  5755
MESMSE  5445
MESNPR  5674
MESOPR  5574
MESOPT  6022
MESPAC  5666
MESPSO  5632
MESR    5340
MESRAT  5234
MESROL  6053
MESSPF  5036
MESSPI  5056
MESTCF  5016
MESTCR  5715
MESTID  5776
MESTSF  5000
MESUI   5373
MESUI2  5426
MESURO  6156
MESWIR  5651
MILCTR  1033
MILL1   1031
MINS    6125
MINT    6115
MLA30S  4262
MLSB    3032
MMSB    3031
MORTST  1074
MPART2  0541
MPY     4541
MSB     0517
MSCTR   1032
MTON    6117
MULT    0504
MULTIP  3000
MX      3034
MY      3035
```

```
NEX80   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        TIMCHK  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        TYPTWT  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
OPT08   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#
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.L1577       882     976#
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.L1777       980    1118#
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.L2174      1231    1235#
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,V0304    1645    1647    1682#
,V0311      26    2314#
,V0336      33    2307#
,V0377    2222    2232#
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