

IDENTIFICATION

Product Code: MAINDEC-08-D2Q D-D

Product Name: Family of 8 ASR33/35
Teletype Tests, Part 2

Date Created: June 4, 1968

Maintainer: Diagnostics Group

(1)

(1)

(1)

1. ABSTRACT

The Family-of-8 ASR33/35 Teletype Tests, Part 2 is the second part of a 2 part package used to test the ASR33 or ASR35 Teletype when attached to a Family-of-8 system.

Part 2 contains nine selectable programs numbered from 0 to 10 (octal). The programs are selected by means of Switch Register (SR).

The available programs are:

PRG0	Printer Test
PRG1	Punch Test
PRG2	Keyboard Test
PRG3	Combined Reader, Printer, Punch Test
PRG4	Printer Exerciser. Prints lines of characters stored in LOC 0021 and 0022. No stalls.
PRG5	Same as PRG4, but stalls between characters.
PRG6	Punch Exerciser. Punches and read checks data blocks of data stored in LOC 0021 and 0022. No stalls.
PRG7	Same as PRG6, but random stalls between characters punched.
PRG10	Punch Exerciser. Punches and read checks blocks of Binary Count pattern. Random stalls between characters punched.

2. REQUIREMENTS

2.1 Equipment

- a. Standard PDP-8/S, PDP-8, or PDP-8/I with
- b. ASR33 or ASR35 Teletype.

2.2 Storage

Locations 0000 through 5173 are used.

2.3 Preliminary Programs

Family-of-8 ASR33/35 Teletype Tests, Part 1. PRG0, PRG1, and PRG2 must have been run successfully.

3. LOADING PROCEDURES

3.1 Method

The Binary Loader is used to load the program.

4. STARTING PROCEDURES (PRG0)

4.1 Control Switch Settings (PRG0)

SR0	Halt at end of routine. Routine number in AC.
SR1	Select routine whose number is set in SR6 through SR11.
SR2	Loop program.
SR6 through SR11	Routine number to be selected.

4.2 Starting Addresses (PRG0)

This program starts at LOC 0200.

4.3 Program and/or Operator Action (PRG0)

- a. Insure Teletype is on-line.
- b. Turn off Teletype reader and punch.
- c. Load address 0200.
- d. Set SR to 0000.
- e. Press START.
- f. Program halts at LOC 0232 to permit setting of options.
- g. Select desired options, if any, in SR. For normal run SR should be 0000. Press

CONTINUE.

- h. Program is executed and halts at program end halt at LOC 0274, unless prevented from ending, by SR options.

NOTE

The resulting printouts during execution of PRG0 must be verified visually by user to determine correct teleprinter operation. Refer to Section 9. Program description.

4.A STARTING PROCEDURES (PRG1)

4.1A Control Switch Settings (PRG1)

SR0	Halt at end of routine. Routine number in AC.
SR1	Select routine whose number is set in SR6 through SR11.
SR2	Loop Program.
SR5=1	Halt on error. Bad character in AC.
SR5=0	Halt at end of data block. Error count in AC.
SR6 through SR11	Routine number to be selected.

4.2A Starting Addresses (PRG1)

This program starts at LOC 0200.

4.3A Program and/or Operator Action (PRG1)

- a. Turn on Teletype punch.
- b. With Teletype off-line, punch a section of blank leader about 6 in. long. Return Teletype to on-line position.
- c. Load leader on reader, leaving very little slack between punch and reader.
- d. Turn on reader.
- e. Load address 0200.
- f. Set SR to 0001.
- g. Press START.
- h. Program halts at LOC 0232 to permit setting of options.
- i. Set desired options, if any, in SR. For normal run, set SR to 0000. Press CONTINUE.
- j. Program is executed and halts at program end halt at LOC 0274, unless prevented from ending by SR options, or if errors occur.

4.B STARTING PROCEDURES (PRG2)

4.1B Control Switch Settings (PRG2)

SR0	Halt at end of routine. Routine number in AC.
SR1	Select routine whose number is set in SR6 through SR11.
SR2	Loop Program.
SR6 through SR11	Routine number to be selected.

4.2B Starting Addresses (PRG2)

This program starts at LOC 0200.

4.3B Program and/or Operator Action (PRG2)

- a. Insure Teletype is on-line.
- b. Turn off Teletype reader and punch.
- c. Load address 0200.
- d. Set SR to 0002.
- e. Press START.
- f. Program title is printed and program halts at LOC 0232 to permit setting of options.
- g. Set desired options, if any, in SR. For normal run, set SR to 0000. Press CONTINUE.
- h. Follow program instructions.
- i. When last routine is completed, and provided that no SR options prevent it, the program stops at program end halt at LOC 0274.

NOTE

Correct operation of the keyboard is determined by user, by checking that the printed characters match with the characters keyed.

4.C STARTING PROCEDURES (PRG3)

4.1C Control Switch Settings (PRG3)

SR0	Halt at end of routine. Routine number in AC.
SR1	Select routine whose number is set in SR6 through SR11.
SR2	Loop program.
SR5=1	Halt on error. Bad character in AC.
SR5=0	Halt at end of data block if errors occurred. Error count in AC.
SR6 through SR11	Routine number to be selected.

4.2C Starting Addresses (PRG3)

This program starts at LOC 0200.

4.3C Program and/or Operator Action (PRG3)

- a. Turn on Teletype punch.
- b. With Teletype off-line, punch a section of blank leader about 6 in. long. Return Teletype to on-line position.
- c. Load leader on reader, leaving very little slack between punch and reader.
- d. Turn on reader.
- e. Load address 0200.
- f. Set SR to 0003.
- g. Press START.
- h. Program halts at LOC 0232 to permit setting of options.
- i. Set desired options, if any, in SR. For normal run, set SR to 0000. Press CONTINUE.
- j. Program is executed and halts at program end halt at LOC 0274, unless prevented from ending, by SR options, or if errors occur.

4.D STARTING PROCEDURES (PRG4 and PRG5)

4.1D Control Switch Settings (PRG4 and PRG5)

None

4.2D Starting Addresses (PRG4 and PRG5)

Both programs are started at LOC 0200.

4.3D Program and/or Operator Action (PRG4 and PRG5)

- a. Insure Teletype is on-line.
- b. Turn off Teletype reader and punch.
- c. Deposit in LOC 0021 and 0022 the 8-bit codes for characters to be printed.
- d. For PRG5, deposit in LOC 0023, the desired stall count in 2's complement form. A count of -1 gives a 1 ms stall, etc.
- e. Load address 0200.
- f. Set SR to 0004, or 0005.
- g. Press START.
- h. The program runs continuously, printing lines with characters stored in LOC 0021 and 0021.

4.E STARTING PROCEDURES (PRG6, PRG7, and PRG10)

4.1E Control Switch Settings (PRG6, PRG7, and PRG10)

SR5=1 Halt on error. Bad character in AC.

SR5=0 Halt at end of data block if errors occurred. Error count in AC.

4.2E Starting Addresses (PRG6, PRG7, and PRG10)

These programs start at LOC 0200.

4.3E Program and/or Operator Action (PRG6, PRG7, and PRG10)

- a. Turn on Teletype punch.
- b. With Teletype off-line, punch a section of blank leader about 6 in. long. Return Teletype to on-line position.
- c. Load leader on reader, leaving very little slack between punch and reader.
- d. Turn on reader.
- e. For PRG6 and PRG7, deposit in LOC 0021 and 0022 the 8-bit codes for characters to be punched.
- f. Load address 0200.
- g. Set SR to 0006, 0007, or 0010.
- h. Press START.
- i. The program runs continuously, unless errors occur.

5. OPERATING PROCEDURE

5.1 Program and/or Operator Action

5.1.1 Normal Halts

- LOC 0232 SR SET halt. Occurs to permit setting of desired options. Press CONTINUE. (PRG0, PRG1, PRG2, PRG3).
- LOC 0274 Program end halt. Occurs if no "loop program" option is set. Set desired options and press CONTINUE. If no options are set, this halt reoccurs. (PRG0, PRG1, PRG2, PRG3).
- LOC 0320 Routine end halt. Occurs at end of routine if SR0 = 1. To proceed, press CONTINUE. (PRG0, PRG1, PRG2, PRG3).

6. ERRORS

6.1 Error Halts and Description

- LOC 0177 Incorrect program number selected. Set SR to correct program number and press CONTINUE. (All programs).
- LOC 0255 Nonexistent routine selected. Set correct routine number in SR6 through SR11 and press CONTINUE. (PRG0, PRG1, PRG2, PRG3).
- LOC 1137 Sync error halt. Sync reader subroutine has not found sync character within 145 characters. Position tape in reader so that sync character (rubout) is within 145 characters from read station, and press CONTINUE. (PRG1, PRG3, PRG6, PRG7 and PRG10).
- LOC 1160 Unexpected Interrupt. A non-Teletype device has caused interrupt. Turn off device, and press CONTINUE. (PRG1, PRG3, PRG6, PRG7, and PRG10).
- LOC 1343 Read Check error A. Bad character in AC. Press CONTINUE. (SR5 must be on).
- LOC 1346 Read check error B. Follow up halt. Correct character in AC. To proceed, press CONTINUE. (PRG1, PRG3, PRG6, PRG7, PRG10).
- LOC 1356 Block errors halt. Number of errors in AC. To proceed press CONTINUE. (SR5 must be off). (PRG1, PRG3, PRG6, PRG7, PRG10).

7. RESTRICTIONS

7.1 Starting Restrictions

All programs must be started at LOC 0200.

7.2 Operating Restrictions

PRG0 and PRG1 must precede execution of PRG3. PRG0 must precede execution of PRG2.

8. MISCELLANEOUS

8.1 Execution Time

PRG0 execution time: 15 minutes

PRG1 execution time: 19 minutes

PRG2 execution time: User dependent

PRG3 execution time: 37 minutes

PRG4 through PRG10 are continuous running programs.

9. PROGRAM DESCRIPTIONS

The Family-of-8 ASR33/35 Teletype Tests Part 2, consists of 9 programs numbered from 0 to 10 (octal).

9.1 PRG0 - Printer Test

This program contains 31 routines numbered from 0 to 36 (octal).

RTN0 Carriage return test. Checks ability of carriage return to print position 1 from all other print positions. No printing should occur in any print position other than position 1.

RTN1 Right margin test. This test shows when the right margin is not correctly adjusted. The test prints 14 groups of ---- I followed by characters - I -. A correctly adjusted margin will give the following printout:

----I----I----I----I----I----I----I----I----I----I----I--I

The I's are printed to facilitate counting print positions.

RTN2 Space Test. The test prints / in alternate positions of the line. After a double carriage return it scapes to the blank positions and prints a left slant slash. A double carriage return is issued after printing each left slant slash.

RTN3 Line Feed Test. The test prints a left slant slash followed by a line feed, followed by a 250 ms delay until 72 slashes have been printed. The result should appear to be a left slanted line from position 1 to 72. Vertical spacing variations should be apparent if adjustment is required.

RTN4 Types line of characters ABC.

RTN5 Types line of characters DEF.

RTN6	Types line of characters	GHI.
RTN7	Types line of characters	JKL.
RTN10	Types line of characters	MNO.
RTN11	Types line of characters	PQR.
RTN12	Types line of characters	STU.
RTN13	Types line of characters	VWX.
RTN14	Types line of characters	YZO.
RTN15	Types line of characters	123
RTN16	Types line of characters	456
RTN17	Types line of characters	789
RTN20	Types line of characters	!"#
RTN21	Types line of characters	\$%&
RTN22	Types line of characters	'()
RTN23	Types line of characters	*+,
RTN24	Types line of characters	-./
RTN25	Types line of characters	: ; <
RTN26	Types line of characters	= > ?
RTN27	Types line of characters	@ [\
RTN30	Types line of characters	[↑ +
RTN31	Types line of all characters	.
RTN32	Types line of all characters. Fixed delay between characters in a line. Delay is determined at random.	
RTN33	Types six lines of ASR33 WORST CASE PATTERN.	
RTN34	Types six lines of ASR33 WORST CASE PATTERN. Fixed delay between characters in a line. Delay is determined at random.	
	The ASR33 WORST CASE PATTERN consists of characters ^ ← W/W←	
RTN35	Types six lines of ASR35 WORST CASE PATTERN.	
RTN36	Types six lines of ASR35 WORST CASE PATTERN. Fixed delay between character in a line. Delay is determined at random.	
	The ASR35 WORST CASE PATTERN consists of characters ^ [? C ? [

9.2 PRG1 - Punch Test

This program contains 15 routines numbered from 0 to 16 (octal). The test sequence used by the routines is:

- a. Set up data block
- b. Punch leader
- c. Punch sync character (Rubout)
- d. Punch data block
- e. Sync the reader
- f. Read data block
- g. Punch trailer
- h. Wait for reader to complete reading of data block before going to next routine.

RTN0	Punch and read check block of all 0s.
RTN1	Punch and read check block of channel 1.
RTN2	Punch and read check block of channel 2.
RTN3	Punch and read check block of channel 3.
RTN4	Punch and read check block of channel 4.
RTN5	Punch and read check block of channel 5.
RTN6	Punch and read check block of channel 6.
RTN7	Punch and read check block of channel 7.
RTN10	Punch and read check block of channel 8.
RTN11	Punch and read check block of sliding 1 pattern.
RTN12	Punch and read check block of sliding 0 pattern.
RTN13	Punch and read check block of 1s and 0s pattern.
RTN14	Same as RTN13, but random delay between characters punched.
RTN15	Punch and read check block of binary count pattern.
RTN16	Same as RTN15, but random delay between characters punched.

9.3 PRG2 - Keyboard Test

This program contains 3 routines numbered from 0 to 2.

RTN0	Checks that KSF command skips when flag = 1. Test is done 1000 times.
RTN1	Echo Test. Any characters read from keyboard are typed. Correct operation verification is done visually by user. Reading a rubout character ends the test.
RTN2	Octal equivalence test. The octal equivalent of any characters keyed is typed. Reading a rubout ends the test.

9.4 PRG3 - Combined Reader, Printer, Punch Test

This program contains 27 routines numbered from 0 to 32 (octal). All routines use the following test sequence:

- a. Fill core block with data to be punched/printed.
- b. Punch leader.
- c. Punch sync character.
- d. Punch data block (no delay between characters).
- e. Sync the reader.
- f. Read/Check data block (Random delay between characters).
- g. Punch data block (Random delay between characters).
- h. Read data block (no delay between characters).
- i. Punch trailer.
- j. Wait for reader to complete reading data block.
- k. End of test sequence.

RTN0	Punch/Print and read check block of ABC
RTN1	Punch/Print and read check block of DEF
RTN2	Punch/Print and read check block of GHI
RTN3	Punch/Print and read check block of JKL
RTN4	Punch/Print and read check block of MNO
RTN5	Punch/Print and read check block of PQR
RTN6	Punch/Print and read check block of STU
RTN7	Punch/Print and read check block of VWX
RTN10	Punch/Print and read check block of YZ0
RTN11	Punch/Print and read check block of 123
RTN12	Punch/Print and read check block of 456
RTN13	Punch/Print and read check block of 789
RTN14	Punch/Print and read check block of ! " #
RTN15	Punch/Print and read check block of \$ % &
RTN16	Punch/Print and read check block of ' () .
RTN17	Punch/Print and read check block of * + ,
RTN20	Punch/Print and read check block of - . /
RTN21	Punch/Print and read check block of : ; <
RTN22	Punch/Print and read check block of = > ?
RTN23	Punch/Print and read check block of @ [\

RTN24	Punch/Print and read check block of] ↑ ←
RTN25	Punch/Print and read check block of all printable characters.
RTN26	Punch/Print and read check block of ASR33 Printer worst case pattern (␣ ← W/)
RTN27	Punch/Print and read check block of ASR33 Printer worst case pattern with interspersed blanks.
RTN30	Punch/Print and read check block of ASR35 Printer worst case pattern. (▼ [?C)
RTN31	Punch/Print and read check block of ASR35 Printer worst case pattern with interspersed blanks.
RTN32	Punch/Print and read check blocks of space, rubout (1s and 0s).

9.5 PRG4 – Printer Exerciser

Prints lines with data stored in LOC 0021 and 0022, no stalls.

9.6 PRG5 – Printer Exerciser

Prints lines with data stored in LOC 0021 and 0022. Fixed delay between characters.

Delay is determined at random.

9.7 PRG6, PRG7, and PRG10 Punch Exerciser

PRG6 punches and read checks data blocks with data stored in LOC 0021 and 0022. No stalls.

PRG7 is the same as PRG6, but random stalls between characters punched.

PRG10 punches and read checks blocks of Binary Count pattern. Random stalls between characters.

The three exercisers use the following sequence:

- a. Set up data block
- b. Punch leader
- c. Punch sync character (rubout)
- d. Punch data block
- e. Sync the reader
- f. Read data block
- g. Punch data block
- h. Back to step f.

/FAMILY-CP-0 ASR33/35 TELETYPE TESTS = PART 2

/PRG0-PRINTER TEST

/PRG1-PUNCH TEST

/PRG2-KEYBOARD TEST

/PRG3-COMBINED READER, PRINTER, PUNCH TEST.

/PRG4-PRINTER EXERCISER, PRINTS LINES OF CHARACTERS STORED IN LOC 0021 AND 0022.

/ NO STALLS.

/PRG5-PRINTER EXERCISER, PRINTS LINES OF CHARACTERS STORED IN LOC 0021 AND 0022. STALLS
/ BETWEEN CHARACTERS.

/PRG6-PUNCH EXERCISER, PUNCHES AND READ CHECKS DATA BLOCKS OF DATA STORED IN LOC 0021

/ AND 0022, NO STALLS

/PRG7- SAME AS PRG6, BUT RANDOM STALLS BETWEEN CHARACTERS PUNCHED.

/PRG10-PUNCH EXERCISER, PUNCHES AND READ CHECKS BLOCKS OF BINARY COUNT PATTERN,

/ RANDOM STALLS

/

/STARTING ADDRESS:0200

/

/SR OPTIONS

/

/SR0-HALT AT END OF ROUTINE, ROUTINE NUMBER IN AC.

/SR1-SELECT ROUTINE WHERE NUMBER IS SET IN SR6 TO 11.

/SR2-LOOP PROGRAM

/SR3-HALT ON ERROR, BAD CHARACTER IN AC,

/SR4-HALT AT END OF DATA BLOCK, ERROR COUNT IN AC

/SR6 TO SR11 = ROUTINE NUMBER TO BE SELECTED,

/ASR33/32 TELETYPE TESTS - PART 2

```

0000 0000
0001 5001
0002 0002
0003 0003
0004 0004
0005 5402
0006 0000
0007 0020
0008 0000
0009 0000
0010 0000
0011 0000
0012 0000
0013 0000
0014 0000
0015 0000
0016 0000
0017 0017
0018 7770
0019 0161
0020 0000
0021 7444
0022 7764
0023 0000
0024 0000
0025 0000
0026 0017
0027 7770
0028 0161
0029 0000
0030 7444
0031 7764
0032 0000
0033 0000
0034 0000
0035 0000
0036 0000
0037 0077
0038 0000
0039 0000
0040 0000
0041 0000
0042 0000
0043 0330
0044 0257
0045 0313
0046 0322
0047 0400
0048 0444
0049 1246
0050 0350
0051 0360
0052 0520
0053 0542
0054 1530
0055 0621
0056 1516
0057 0637
0058 0661
0059 0677
0060 0684
0061 0694
0062 0704
0063 0714
0064 0724
0065 0734
0066 0744
0067 0754
0068 0764
0069 0774
0070 0784
0071 0794
0072 0804
0073 0814
0074 0824
0075 0834
0076 0844
0077 0854
0078 0864
0079 0874
0080 0884
0081 0894
0082 0904
0083 0914
0084 0924
0085 0934
0086 0944
0087 0954
0088 0964
0089 0974
0090 0984
0091 0994
0092 1004
0093 1014
0094 1024
0095 1034
0096 1044
0097 1054
0098 1064
0099 1074
0100 1084
0101 1094
0102 1104
0103 1114
0104 1124
0105 1134
0106 1144
0107 1154
0108 1164
0109 1174
0110 1184
0111 1194
0112 1204
0113 1214
0114 1224
0115 1234
0116 1244
0117 1254
0118 1264
0119 1274
0120 1284
0121 1294
0122 1304
0123 1314
0124 1324
0125 1334
0126 1344
0127 1354
0128 1364
0129 1374
0130 1384
0131 1394
0132 1404
0133 1414
0134 1424
0135 1434
0136 1444
0137 1454
0138 1464
0139 1474
0140 1484
0141 1494
0142 1504
0143 1514
0144 1524
0145 1534
0146 1544
0147 1554
0148 1564
0149 1574
0150 1584
0151 1594
0152 1604
0153 1614
0154 1624
0155 1634
0156 1644
0157 1654
0158 1664
0159 1674
0160 1684
0161 1694
0162 1704
0163 1714
0164 1724
0165 1734
0166 1744
0167 1754
0168 1764
0169 1774
0170 1784
0171 1794
0172 1804
0173 1814
0174 1824
0175 1834
0176 1844
0177 1854
0178 1864
0179 1874
0180 1884
0181 1894
0182 1904
0183 1914
0184 1924
0185 1934
0186 1944
0187 1954
0188 1964
0189 1974
0190 1984
0191 1994
0192 2004
0193 2014
0194 2024
0195 2034
0196 2044
0197 2054
0198 2064
0199 2074
0200 2084
0201 2094
0202 2104
0203 2114
0204 2124
0205 2134
0206 2144
0207 2154
0208 2164
0209 2174
0210 2184
0211 2194
0212 2204
0213 2214
0214 2224
0215 2234
0216 2244
0217 2254
0218 2264
0219 2274
0220 2284
0221 2294
0222 2304
0223 2314
0224 2324
0225 2334
0226 2344
0227 2354
0228 2364
0229 2374
0230 2384
0231 2394
0232 2404
0233 2414
0234 2424
0235 2434
0236 2444
0237 2454
0238 2464
0239 2474
0240 2484
0241 2494
0242 2504
0243 2514
0244 2524
0245 2534
0246 2544
0247 2554
0248 2564
0249 2574
0250 2584
0251 2594
0252 2604
0253 2614
0254 2624
0255 2634
0256 2644
0257 2654
0258 2664
0259 2674
0260 2684
0261 2694
0262 2704
0263 2714
0264 2724
0265 2734
0266 2744
0267 2754
0268 2764
0269 2774
0270 2784
0271 2794
0272 2804
0273 2814
0274 2824
0275 2834
0276 2844
0277 2854
0278 2864
0279 2874
0280 2884
0281 2894
0282 2904
0283 2914
0284 2924
0285 2934
0286 2944
0287 2954
0288 2964
0289 2974
0290 2984
0291 2994
0292 3004
0293 3014
0294 3024
0295 3034
0296 3044
0297 3054
0298 3064
0299 3074
0300 3084
0301 3094
0302 3104
0303 3114
0304 3124
0305 3134
0306 3144
0307 3154
0308 3164
0309 3174
0310 3184
0311 3194
0312 3204
0313 3214
0314 3224
0315 3234
0316 3244
0317 3254
0318 3264
0319 3274
0320 3284
0321 3294
0322 3304
0323 3314
0324 3324
0325 3334
0326 3344
0327 3354
0328 3364
0329 3374
0330 3384
0331 3394
0332 3404
0333 3414
0334 3424
0335 3434
0336 3444
0337 3454
0338 3464
0339 3474
0340 3484
0341 3494
0342 3504
0343 3514
0344 3524
0345 3534
0346 3544
0347 3554
0348 3564
0349 3574
0350 3584
0351 3594
0352 3604
0353 3614
0354 3624
0355 3634
0356 3644
0357 3654
0358 3664
0359 3674
0360 3684
0361 3694
0362 3704
0363 3714
0364 3724
0365 3734
0366 3744
0367 3754
0368 3764
0369 3774
0370 3784
0371 3794
0372 3804
0373 3814
0374 3824
0375 3834
0376 3844
0377 3854
0378 3864
0379 3874
0380 3884
0381 3894
0382 3904
0383 3914
0384 3924
0385 3934
0386 3944
0387 3954
0388 3964
0389 3974
0390 3984
0391 3994
0392 4004
0393 4014
0394 4024
0395 4034
0396 4044
0397 4054
0398 4064
0399 4074
0400 4084
0401 4094
0402 4104
0403 4114
0404 4124
0405 4134
0406 4144
0407 4154
0408 4164
0409 4174
0410 4184
0411 4194
0412 4204
0413 4214
0414 4224
0415 4234
0416 4244
0417 4254
0418 4264
0419 4274
0420 4284
0421 4294
0422 4304
0423 4314
0424 4324
0425 4334
0426 4344
0427 4354
0428 4364
0429 4374
0430 4384
0431 4394
0432 4404
0433 4414
0434 4424
0435 4434
0436 4444
0437 4454
0438 4464
0439 4474
0440 4484
0441 4494
0442 4504
0443 4514
0444 4524
0445 4534
0446 4544
0447 4554
0448 4564
0449 4574
0450 4584
0451 4594
0452 4604
0453 4614
0454 4624
0455 4634
0456 4644
0457 4654
0458 4664
0459 4674
0460 4684
0461 4694
0462 4704
0463 4714
0464 4724
0465 4734
0466 4744
0467 4754
0468 4764
0469 4774
0470 4784
0471 4794
0472 4804
0473 4814
0474 4824
0475 4834
0476 4844
0477 4854
0478 4864
0479 4874
0480 4884
0481 4894
0482 4904
0483 4914
0484 4924
0485 4934
0486 4944
0487 4954
0488 4964
0489 4974
0490 4984
0491 4994
0492 5004
0493 5014
0494 5024
0495 5034
0496 5044
0497 5054
0498 5064
0499 5074
0500 5084
0501 5094
0502 5104
0503 5114
0504 5124
0505 5134
0506 5144
0507 5154
0508 5164
0509 5174
0510 5184
0511 5194
0512 5204
0513 5214
0514 5224
0515 5234
0516 5244
0517 5254
0518 5264
0519 5274
0520 5284
0521 5294
0522 5304
0523 5314
0524 5324
0525 5334
0526 5344
0527 5354
0528 5364
0529 5374
0530 5384
0531 5394
0532 5404
0533 5414
0534 5424
0535 5434
0536 5444
0537 5454
0538 5464
0539 5474
0540 5484
0541 5494
0542 5504
0543 5514
0544 5524
0545 5534
0546 5544
0547 5554
0548 5564
0549 5574
0550 5584
0551 5594
0552 5604
0553 5614
0554 5624
0555 5634
0556 5644
0557 5654
0558 5664
0559 5674
0560 5684
0561 5694
0562 5704
0563 5714
0564 5724
0565 5734
0566 5744
0567 5754
0568 5764
0569 5774
0570 5784
0571 5794
0572 5804
0573 5814
0574 5824
0575 5834
0576 5844
0577 5854
0578 5864
0579 5874
0580 5884
0581 5894
0582 5904
0583 5914
0584 5924
0585 5934
0586 5944
0587 5954
0588 5964
0589 5974
0590 5984
0591 5994
0592 6004
0593 6014
0594 6024
0595 6034
0596 6044
0597 6054
0598 6064
0599 6074
0600 6084
0601 6094
0602 6104
0603 6114
0604 6124
0605 6134
0606 6144
0607 6154
0608 6164
0609 6174
0610 6184
0611 6194
0612 6204
0613 6214
0614 6224
0615 6234
0616 6244
0617 6254
0618 6264
0619 6274
0620 6284
0621 6294
0622 6304
0623 6314
0624 6324
0625 6334
0626 6344
0627 6354
0628 6364
0629 6374
0630 6384
0631 6394
0632 6404
0633 6414
0634 6424
0635 6434
0636 6444
0637 6454
0638 6464
0639 6474
0640 6484
0641 6494
0642 6504
0643 6514
0644 6524
0645 6534
0646 6544
0647 6554
0648 6564
0649 6574
0650 6584
0651 6594
0652 6604
0653 6614
0654 6624
0655 6634
0656 6644
0657 6654
0658 6664
0659 6674
0660 6684
0661 6694
0662 6704
0663 6714
0664 6724
0665 6734
0666 6744
0667 6754
0668 6764
0669 6774
0670 6784
0671 6794
0672 6804
0673 6814
0674 6824
0675 6834
0676 6844
0677 6854
0678 6864
0679 6874
0680 6884
0681 6894
0682 6904
0683 6914
0684 6924
0685 6934
0686 6944
0687 6954
0688 6964
0689 6974
0690 6984
0691 6994
0692 7004
0693 7014
0694 7024
0695 7034
0696 7044
0697 7054
0698 7064
0699 7074
0700 7084
0701 7094
0702 7104
0703 7114
0704 7124
0705 7134
0706 7144
0707 7154
0708 7164
0709 7174
0710 7184
0711 7194
0712 7204
0713 7214
0714 7224
0715 7234
0716 7244
0717 7254
0718 7264
0719 7274
0720 7284
0721 7294
0722 7304
0723 7314
0724 7324
0725 7334
0726 7344
0727 7354
0728 7364
0729 7374
0730 7384
0731 7394
0732 7404
0733 7414
0734 7424
0735 7434
0736 7444
0737 7454
0738 7464
0739 7474
0740 7484
0741 7494
0742 7504
0743 7514
0744 7524
0745 7534
0746 7544
0747 7554
0748 7564
0749 7574
0750 7584
0751 7594
0752 7604
0753 7614
0754 7624
0755 7634
0756 7644
0757 7654
0758 7664
0759 7674
0760 7684
0761 7694
0762 7704
0763 7714
0764 7724
0765 7734
0766 7744
0767 7754
0768 7764
0769 7774
0770 7784
0771 7794
0772 7804
0773 7814
0774 7824
0775 7834
0776 7844
0777 7854
0778 7864
0779 7874
0780 7884
0781 7894
0782 7904
0783 7914
0784 7924
0785 7934
0786 7944
0787 7954
0788 7964
0789 7974
0790 7984
0791 7994
0792 8004
0793 8014
0794 8024
0795 8034
0796 8044
0797 8054
0798 8064
0799 8074
0800 8084
0801 8094
0802 8104
0803 8114
0804 8124
0805 8134
0806 8144
0807 8154
0808 8164
0809 8174
0810 8184
0811 8194
0812 8204
0813 8214
0814 8224
0815 8234
0816 8244
0817 8254
0818 8264
0819 8274
0820 8284
0821 8294
0822 8304
0823 8314
0824 8324
0825 8334
0826 8344
0827 8354
0828 8364
0829 8374
0830 8384
0831 8394
0832 8404
0833 8414
0834 8424
0835 8434
0836 8444
0837 8454
0838 8464
0839 8474
0840 8484
0841 8494
0842 8504
0843 8514
0844 8524
0845 8534
0846 8544
0847 8554
0848 8564
0849 8574
0850 8584
0851 8594
0852 8604
0853 8614
0854 8624
0855 8634
0856 8644
0857 8654
0858 8664
0859 8674
0860 8684
0861 8694
0862 8704
0863 8714
0864 8724
0865 8734
0866 8744
0867 8754
0868 8764
0869 8774
0870 8784
0871 8794
0872 8804
0873 8814
0874 8824
0875 8834
0876 8844
0877 8854
0878 8864
0879 8874
0880 8884
0881 8894
0882 8904
0883 8914
0884 8924
0885 8934
0886 8944
0887 8954
0888 8964
0889 8974
0890 8984
0891 8994
0892 9004
0893 9014
0894 9024
0895 9034
0896 9044
0897 9054
0898 9064
0899 9074
0900 9084
0901 9094
0902 9104
0903 9114
0904 9124
0905 9134
0906 9144
0907 9154
0908 9164
0909 9174
0910 9184
0911 9194
0912 9204
0913 9214
0914 9224
0915 9234
0916 9244
0917 9254
0918 9264
0919 9274
0920 9284
0921 9294
0922 9304
0923 9314
0924 9324
0925 9334
0926 9344
0927 9354
0928 9364
0929 9374
0930 9384
0931 9394
0932 9404
0933 9414
0934 9424
0935 9434
0936 9444
0937 9454
0938 9464
0939 9474
0940 9484
0941 9494
0942 9504
0943 9514
0944 9524
0945 9534
0946 9544
0947 9554
0948 9564
0949 9574
0950 9584
0951 9594
0952 9604
0953 9614
0954 9624
0955 9634
0956 9644
0957 9654
0958 9664
0959 9674
0960 9684
0961 9694
0962 9704
0963 9714
0964 9724
0965 9734
0966 9744
0967 9754
0968 9764
0969 9774
0970 9784
0971 9794
0972 9804
0973 9814
0974 9824
0975 9834
0976 9844
0977 9854
0978 9864
0979 9874
0980 9884
0981 9894
0982 9904
0983 9914
0984 9924
0985 9934
0986 9944
0987 9954
0988 9964
0989 9974
0990 9984
0991 9994
0992 10004
0993 10014
0994 10024
0995 10034
0996 10044
0997 10054
0998 10064
0999 10074
1000 10084
1001 10094
1002 10104
1003 10114
1004 10124
1005 10134
1006 10144
1007 10154
1008 10164
1009 10174
1010 10184
1011 10194
1012 10204
1013 10214
1014 10224
1015 10234
1016 10244
1017 10254
1018 10264
1019 10274
1020 10284
1021 10294
1022 10304
1023 10314
1024 10324
1025 10334
1026 10344
1027 10354
1028 10364
1029 10374
1030 10384
1031 10394
1032 10404
1033 10414
1034 10424
1035 10434
1036 10444
1037 10454
1038 10464
1039 10474
1040 10484
1041 10494
1042 10504
1043 10514
1044 10524
1045 10534
1046 10544
1047 10554
1048 10564
1049 10574
1050 10584
1051 10594
1052 10604
1053 10614
1054 10624
1055 10634
1056 10644
1057 10654
1058 10664
1059 10674
1060 10684
1061 10694
1062 10704
1063 10714
1064 10724
1065 10734
1066 10744
1067 10754
1068 10764
1069 10774
1070 10784
1071 10794
1072 10804
1073 10814
1074 10824
1075 10834
1076 10844
1077 10854
1078 10864
1079 10874
1080 10884
1081 10894
1082 10904
1083 10914
1084 10924
1085 10934
1086 10944
1087 10954
1088 10964
1089 10974
1090 10984
1091 10994
1092 11004
1093 11014
1094 11024
1095 11034
1096 11044
1097 11054
1098 11064
1099 11074
1100 11084
1101 11094
1102 11104
1103 11114
1104 11124
1105 11134
1106 11144
1107 11154
1108 11164
1109 11174
1110 11184
1111 11194
1112 11204
1113 11214
1114 11224
1115 11234
1116 11244
1117 11254
1118 11264
1119 11274
1120 11284
1121 11294
1122 11304
1123 11314
1124 11324
1125 11334
1126 11344
1127 11354
1128 11364
1129 11374
1130 11384
1131 11394
1132 11404
1133 11414
1134 11424
1135 11434
1136 11444
1137 11454
1138 11464
1139 11474
1140 11484
1141 11494
1142 11504
1143 11514
1144 11524
1145 11534
1146 11544
1147 11554
1148 11564
1149 11574
1150 11584
1151 11594
1152 11604
1153 11614
1154 11624
1155 11634
1156 11644
1157 11654
1158 11664
1159 11674
1160 11684
1161 11694
1162 11704
1163 11714
1164 11724
1165 11734
1166 11744
1167 11754
1168 11764
1169 11774
1170 11784
1171 11794
1172 11804
1173 11814
1174 11824
1175 11834
1176 11844
1177 11854
1178 11864
1179 11874
1180 11884
1181 11894
1182 11904
1183 11914
1184 11924
1185 11934
1186 11944
1187 11954
1188 11964
1189 11974
1190 11984
1191 11994
1192 12004
1193 12014
1194 12024
1195 12034
1196 12044
1197 12054
1198 12064
1199 12074
1200 12084
1201 12094
1202 12104
1203 12114
1204 12
```

0065	0735	UFW336, FW336
0066	0751	UFW335, FW335
0067	1000	UFW354, FW354
0070	1010	UFW356, FW356
0071	1034	UFW355, FW355
0072	1067	UPLTLR, PLTLR
0073	1102	UPSYNC, PSYNC
0074	1106	URSYNC, RSYNC
0075	1400	UULMSK, ULMSK
0076	1417	UUCNTP, ULUNTP
0077	1161	UOUT, UUT
0100	1217	UPBLK, PBLK
0101	1225	UPBLKR, PBLKR
0102	1270	URBLK, RBLK
0103	1277	URBLKR, RBLKR
0104	1443	UNTST, NTST
0105	1500	UCNTST, UNTST
0106	1600	UASUCN, ASUCN
0107	1461	USTST, STST
0110	1052	CHECK, CHCK
0111	0600	INPATI, INITPT
0112	0607	GETPT, GETPTT
0113	0000	TEMP, 0
0114	0020	TEMP1, 0
0115	0000	TEMPU, 0
0116	0000	UTEMP, 0
0117	0000	UTEMP1, 0
0120	0000	UTEMP2, 0
0121	0000	CTRA, 0
0122	0000	CTRB, 0
0123	0100	SRMSK, 100
0124	0000	ERRCR, 0
0125	0000	ERRCTH, 0
0126	0277	ULYMSK, 277
0127	0000	PFLAG, 0
0130	0000	BLACNT, 0
0131	0215	GR, 215
0132	0212	LF, 212
0133	7401	MREOUT, -377
0134	0000	RBUSY, 0
0135	0000	LINK, 0
0136	0000	AC, 0
0137	0240	SPACE, 240
0140	0257	C257, 257
0141	0334	C334, 334

0142	7771	M1,	-1
0143	7776	M2,	-2
0144	7762	M16,	-16
0145	7734	M44,	-44
0146	7670	M110,	-110
0147	7661	M111,	-111
0150	0000	TEM0,	0
0151	0000	TEM1,	0
0152	0000	FLAG,	0
0153	0071	K77,	//
0154	7740	M40,	-40
0155	0100	C100,	100
0156	0240	C240,	240
0157	7500	SKIPMA, SMA	
0160	7510	SKIPPA, SPA	
0161	2400	PRGTAB, PRG0	
0162	3060	PRG1	
0163	3440	PRG2	
0164	3531	PRG3	
0165	4076	PRG4	
0166	4104	PRG5	
0167	4111	PRG6	
0170	4131	PRG7	
0171	4151	PRG10	
	4446	SETLOC=JMS 1 SETCTR	
	4450	MOVE=JMS 1 UMOVE	
	4445	DELAY=JMS 1 ULYIMS	

```

0177 7402 /INCORRECT PROGRAM NUMBER HALT.
0200 7604 /HEAD SR
0201 0026
0202 1027
0203 7540
0204 5177
0205 7604
0206 0026
0207 3025
0210 1025
0211 1030
0212 3115
0213 1515
0214 3231
0215 7350
0216 7710
0217 5222
0220 1032
0221 7410
0222 1035
0223 3042
0224 4455
0225 0005
0226 0001
0227 7776
0230 5631
0231 0000
0232 7602
0233 7200
0234 1020
0235 3036
0236 4276
0237 7604
0240 7004
0241 7500
0242 5435
0243 7604
0244 0037
0245 7041
0246 1034
0247 7650
0250 5435
0251 1036
0252 7001
0253 7640
0254 5236
0255 7402
0256 5235

*177
START,
HLT
LAS
AND PRGMSK
TAU PRGLIM
SMA SZA /VALID PROGRAM NUMBER?
JMP 177
LAS
AND PRGMSK
UCA PRGNUM
TAU PRGNUM
TAU PSW
UCA TEMP
TAU I TEMP
UCA PRGAUR
CLA CLL CMA RAR /DETERMINE CPU ID.
SPA CLA /IS IT PDP8/81?
JMP .+3 /NO, IT IS A PDP8/S.
TAU KP8 /YES, IT IS PDP8/81
SKP KP8
TAU KP8S
UCA MILL
JMS I UMOVE
P
1
-2
JMP I ,+1
PRGADR, 0
SRSET, HLT CLA
GETRNDY, CLA
TAU KSTART
UCA NXTST
JMS FORWD
LAS
KAL
SMA
JMP I CURTST
LAS
AND TSTMSK
CLA
TAU RTNNO
SMA CLA
JMP I CURTST
TAU NXTST
LAU CLA
SZA CLA
JMP GETRNDY+3
INCRTN, HLT
JMP GETRNDY

/INCORRECT PROGRAM NUMBER HALT.
/HEAD SR
/NO, GO TO LOC 177
/READ SR
/SAVE PROGRAM NUMBER
/DEVELOP PROGRAM
/START ADDRESS AND
/DETERMINE CPU ID.
/IS IT PDP8/81?
/NO, IT IS A PDP8/S.
/YES, IT IS PDP8/81
/SET DELAY CONSTANT
/GO TO SELECTED PROGRAM.
/STORE AT NXTST
/GET ADDRESS OF 1ST ROUTINE
/HEAD SR
/ROUTINE SELECT?
/NO, START WITH CURRENT ROUTINE.
/YES, READ SR
/GET ROUTINE NUMBER,
/2'S COMPLEMENT IT,
/ADD CURRENT ROUTINE NUMBER.
/IS IT THIS ROUTINE?
/YES, GO DO IT,
/NO, IS THIS THE LAST ROUTINE?
/NO,
/YES, INCORRECT ROUTINE NUMBER

```

0257	4515	CHAINN, JMS SHALT	/HALT? (SR0) GO CHECK,
0260	7604	LAS	/HEAD SR
0261	7006	HTL	
0262	7630	SZL CLA	/ROUTINE SELECT?(SR1)
0263	5235	JMP GETRUY	/YES,
0264	1036	IAU NXTST	
0265	7001	IAU	
0266	7640	SZL CLA	/LAST ROUTINE?
0267	5236	JMP GETRUY+3	/NO, SET UP TO DO NEXT ROUTINE
0270	7604	LAS	
0271	7006	HTL	
0272	7710	SPA CLA	/LOOP PROGRAM? (SR2)
0273	5235	JMP GETRUY	/YES, GO REPEAT PROGRAM,
0274	7402	HLT	/PROGRAM END HALT
0275	5257	JMP CHAINN	/GO CHECK FOR OPTIONS AGAIN.
0276	0000	0	
0277	7300	CLA CLL	
0300	1436	IAU I NXTST	/GET AND STORE NEXT ROUTINE
0301	3034	UCA RTNNO	/NUMBER,
0302	2036	ISZ NXTST	
0303	1036	IAU NXTST	/SET CURRENT
0304	3115	UCA TEMP	/ROUTINE NUMBER
0305	2036	ISZ NXTST	
0306	1036	IAU NXTST	/SET CURRENT
0307	3035	UCA CURTST	/ROUTINE ADDRESS,
0310	1515	IAU I TEMP	/SET NEXT
0311	3036	UCA NXTST	/ROUTINE ADDRESS,
0312	5676	JMP I FORWD	/EXIT,
0313	0000	0	
0314	7604	LAS	/HEAD SR,
0315	7700	SMA CLA	/HALT? (SR0)
0316	5715	JMP I SHALT	/NO, EXIT
0317	1034	IAU RTNNO	/GET CURRENT RTN NUMBER
0320	7402	HLT	/UNCONDITIONAL HALT,
0321	5715	JMP I SHALT	/EXIT,

```

0322 0000 STCTR, 0
0323 7200 CLA
0324 1724 TAU 1 STCTR /GET CTR ADDRESS
0325 3115 UCA TEMP /STORE AT TEMP.
0326 2322 152 STCTR
0327 1722 TAU 1 STCTR /GET COUNT AND STORE
0330 3515 UCA 1 TEMP /PER C(TEMP)
0331 2322 152 STCTR
0332 5722 JMP 1 STCTR /EXIT,
0333 0000
0334 7300 ULYMS, 0
0335 1025 CLA CLL
0336 3040 TAU DELAY /GET MILLISECOND COUNT
0337 5740 UCA MSCTR /STORE AT MSCTR
0340 0341 JMP 1, +1
0341 1042 TAU MILL /GET 1MS CONSTANT
0342 3041 UCA MILCTR /STORE IN MILCTR
0343 2041 152 MILCTR /DELAYED 1 MILLISECOND?
0344 5345 JMP, -1 /NO.
0345 2040 152 MSCTR /YES, DONE DELAYING?
0346 5337 JMP, -7 /NO. GO DELAY ANOTHER MILSEC.
0347 5735 JMP 1 DLYMS /EXIT,
0350 0000
0351 4447 JMS 1 RANDNO /GENERATE RANDOM NUMBER
0352 0120 AND DLYMSK /MASK OUT UNDESIRED BITS
0353 7450 SNA /RESULT ZERO?
0354 5351 JMP DLYCNT+1 /YES, GET ANOTHER NUMBER
0355 7041 UCA IAC /NO, 2'S COMPLEMENT IT
0356 3025 UCA DELAYM /STORE AT DELAYM
0357 5750 JMP 1 DLYCNT /EXIT
0360 0000
0361 7200 CRLF, 0
0362 1760 CLA 1 CRLF
0363 3375 UCA CRCTR
0364 2360 152 CRLF
0365 4450 JMS 1 XTYPST
0366 0372, +4
0367 2375 152 CRCTR
0370 5365 JMP, -5
0371 5760 JMP 1 CRLF
0372 0015
0373 0012
0374 0001
0375 0000 CRCTR, 0

```

```

0400      * 17/*1
0401      /RANDOM NUMBER GENERATOR SUBROUTINE
0402      RANGEN, 0
0403      CLA
0404      TAU RANTND
0405      TAU RANDEX
0406      SEA CLA
0407      JMP RANTAD
0408      TAU RANTBL
0409      UCA RANDEX
0410      TAU RANCON
0411      CLL HAL
0412      SEL
0413      TAC
0414      UCA RANCON
0415      TAU RANCON
0416      TAU I RANDEX
0417      UCA I RANDEX
0418      TAU RANSAY
0419      KAR
0420      TAU I RANDEX
0421      ISE RANDEX
0422      UCA HANSAY
0423      TAU RANSAY
0424      JMP I RANGEN
0425      RANDEX, RANTND
0426      RANCON, 6543
0427      RANTBL, 1*1
0428      6543
0429      3210
0430      0765
0431      5432
0432      2107
0433      7654
0434      4321
0435      1076
0436      -
0437      RANTND, -
0438      RANSAY, 0
0400      0400
0401      6000
0402      1242
0403      1227
0404      7640
0405      5215
0406      1231
0407      3227
0408      1230
0409      7104
0410      7430
0411      7001
0412      3230
0413      1230
0414      1627
0415      3627
0416      1243
0417      7010
0418      1627
0419      2227
0420      3243
0421      1243
0422      5600
0423      0442
0424      6543
0425      0432
0426      6543
0427      3210
0428      0765
0429      5432
0430      2107
0431      7654
0432      4321
0433      1076
0434      7536
0435      0000

```



```

0444 0000 /TYPE CHARACTER STRING SUBROUTINE
0445 7200 TYPSTG, 0
0446 1644 CLA
0447 3150 TAU I TYPSTG
0450 3152 UCA TEMQ /GET AND STORE
0451 2244 UCA FLAG /INITIAL ADDRESS
0452 1550 ISZ TYPSTG /CLEAR FLAG.
0453 7012 TAU I TEMQ /SET UP EXIT
0454 7012 HTR /PICK UP DATA
0455 7012 HTR
0456 4263 JMS TSC2
0457 1550 TAU I TEMQ
0460 4263 JMS TSC2
0461 2150 ISZ TEMQ
0462 5252 JMP TSC1
0463 0000
0464 0153 ANU K77
0465 3151 UCA TEMR /MASK OFF 6 BITS
0466 1152 TAU FLAG /SAVE CHARACTER
0467 7640 SZA CLA /TEST "SPECIAL" FLAG,
0470 5300 JMP TYPSP /SET TYPE SPECIAL
0471 1151 TAU TEMR /NO, REGULAR CHARACTER
0472 7450 SNA /ZEMO?
0473 5276 JMP ,+3 /YES, SET FLAG.
0474 4317 JMS PRINT /NO, PRINT IT.
0475 5663 JMP I TSC2 /RETURN.
0476 2152 ISZ FLAG /SET "SPECIAL" FLAG,
0477 5663 JMP I TSC2 /EXIT
0500 3152 UCA FLAG /CLEAR FLAG,
0501 1151 TAU TEMR /TEST FOR 0,
0502 7041 CLA
0503 7450 SNA
0504 5274 JMP TYPAT /0:TYPE "0"
0505 7001 IAC /TEST FOR 01
0506 7650 SNA CLA
0507 5644 JMP I TYPSTG /YES, EXIT CODE.
0510 1157 TAU SKIPMA /ALTER INSTRUCTION
0511 3321 UCA SWITCH /TO BE "SMA"
0512 1151 TAU TEMR /TYPE CHAR
0513 4317 JMS PRINT
0514 1160 TAU SKIPPA /ALTER INSTRUCTION
0515 3321 UCA SWITCH /TO BE "SPA"
0516 5663 JMP I TSC2 /RETURN
0517 0000
0520 1154 PRINT, 0 /COMPARE WITH 40
0521 7510 TAU M40 /OR SMA FOR SPECIAL CODES,
0522 1152 SPA
0523 1150 TAU C100
0524 4454 JMS I UPUNCH
0525 5717 JMP I PRINT. /GO PRINT CHARACTER
/RETURN

```

0526	0200	PUNCH,	0	ISZ PFLAG	/SET PFLAG
0527	2127		ISZ	PFLAG	/PUNCH/PRINT
0530	6246		TL3		
0531	7200		CLA		
0532	1127		TAU PFLAG		/GET C(PFLAG)
0533	7650		SNA CLA		/FLAG RESET?
0534	5337		JMP ,+3		/YES
0535	6041		TSF		/NO, FLAG UP?
0536	5332		JMP ,+4		/NO,
0537	6042		TCF		/YES, CLEAR PRINTER FLAG.
0540	3127		UCA PFLAG		/CLEAR PFLAG
0541	5726		JMP I PUNCH		/EXIT,
0542	0000	MOVVE,	0		
0543	7200		CLA		
0544	1742		TAU I MOVVE		/GET AND STORE
0545	3364		UCA FADUR		/"FROM" ADDRESS
0546	2342		ISZ MOVVE		
0547	1742		TAU I MOVVE		/GET AND STORE
0550	3365		UCA TADUR		/"TO" ADDRESS
0551	2342		ISZ MOVVE		
0552	1742		TAU I MOVVE		/GET AND STORE
0553	3366		UCA MCTR		/"MOVE" COUNT,
0554	2342		ISZ MOVVE		/SET UP EXIT,
0555	1764	MOVEA,	TAU I FADUR		/GET "FROM" WORD
0556	3765		UCA I TADUR		/STORE AT "TO" LOCATION
0557	2364		ISZ FADUR		/+1 TO FADUR
0560	2365		ISZ TADUR		/+1 TO TADUR
0561	2366		ISZ MCTR		/DONE MOVING?
0562	5355		JMP MOVEA		/NO, REPEAT
0563	5742		JMP I MOVVE		/YES, EXIT.
0564	0000	FADUR,	0		
0565	0000	TADUR,	0		
0566	0000	MCTR,	0		

```

0600      * 17/+1
0600      /INITIALIZE BINARY PATTERN SUBROUTINE
0601      INITPT, 0
0602      CLA
0603      UCA PT0
0604      JMP I INITPT
0605      PT0, 0
0606      PT1, 0
0607      PTMSK, 377
0608      /SUBROUTINE TO SET AC TO NEXT BINARY PATTERN CHARACTER
0609      GETPTT, 0
0610      CLA
0611      IAU PT0
0612      UCA PT1
0613      IAU PT1
0614      IAC
0615      AND PTMSK
0616      UCA PT0
0617      IAU PT1
0618      JMP I GETPTT
0619      /GET PT0
0620      /STORE AT PT1
0621      /GET PT1
0622      /+1 TO AC
0623      /LIMIT TO 8 BITS
0624      /STORE AT PT0
0625      /GET PT1
0626      /EXIT

0627      /SET BUFFER AREA SUBROUTINE
0628      STBF, 0
0629      JMS I UMOVE
0630      CR
0631      BLOCKA
0632      -2
0633      JMS I UMOVE
0634      CR
0635      BLOCKB
0636      -2
0637      JMS I UMOVE
0638      CR
0639      BLOCKC
0640      -2
0641      JMP I STBF
0642      /EXIT,

```

```

0637 0000
0640 7200
0641 1637
0642 3245
0643 2237
0644 4455
0645 0000
0646 4177
0647 7775
0650 4455
0651 4177
0652 4202
0653 7673
0654 4455
0655 4177
0656 4311
0657 7670
0660 5637
0661 0000
0662 4455
0663 1710
0664 4177
0665 7701
0666 4455
0667 1710
0670 4276
0671 7767
0672 4455
0673 4177
0674 4311
0675 7670
0676 5661

0677 0000
0700 4455
0701 0021
0702 4177
0703 7776
0704 4455
0705 4177
0706 4201
0707 7672
0710 4455
0711 4177
0712 4311
0713 7670
0714 5677

FBF3,
0
CLA
LAD I FBF3
UCA ,+3
ISE FBF3
JMS I UMOVE
0
BLOCK1
-3
JMS I UMOVE
BLOCK1
BLOCK1+3
-105
JMS I UMOVE
BLOCK1
BLOCK2
-110
JMP I FBF3
/EXIT
0
JMS I UMOVE
A
BLOCK1
-77
JMS I UMOVE
A
BLOCK1+77
-11
JMS I UMOVE
BLOCK1
BLOCK2
-110
JMP I FBALL
/EXIT

FBALL,
0
JMS I UMOVE
PTEMP
BLOCK1
-2
JMS I UMOVE
BLOCK1
BLOCK1+2
-106
JMS I UMOVE
BLOCK1
BLOCK2
-110
JMP I FBTEMP
/EXIT,

FBTEMP,
0
JMS I UMOVE
PTEMP
BLOCK1
-2
JMS I UMOVE
BLOCK1
BLOCK1+2
-106
JMS I UMOVE
BLOCK1
BLOCK2
-110
JMP I FBTEMP
/EXIT,

/FILL 144 CHARACTER BUFFER
/WITH 3 CHARACTERS WHOSE
/ADDRESS IS SPECIFIED
/AT CALL+1

/FILL 144 CHARACTER BUFFER
/WITH ALL PRINTABLE ASCII
/CHARACTERS,

/FILL 144 CHARACTER BUFFER
/WITH DATA IN PTEMP
/AND PTEMP1,

```


Address	Hex	Assembly	Comment
1000	0000		
1000	0000		
1001	4455	JMS I UMOVE	/MOVE 4 CHARACTER ASR35 PRINTER
1001	A3DWP4		/WORST CASE PATTERN TO BLOCK1.
1002	1666		
1003	4177	BLOCK1	
1004	7774	-4	
1005	4455	JMS I UMOVE	/FILL BLOCK1 WITH PATTERN
1006	4177	BLOCK1	
1007	4203	BLOCK1+4	
1010	7674	-104	
1011	4455	JMS I UMOVE	/FILL BLOCK2 WITH PATTERN
1012	4177	BLOCK1	
1013	4311	BLOCK2	
1014	7670	-110	
1015	5600	JMP I FW354	/EXIT
1016	0000		
1017	4455	JMS I UMOVE	/MOVE 6 CHARACTER ASR35 PRINTER
1020	1672	A3DWP6	/WORST CASE PATTERN TO BLOCK1
1021	4177	BLOCK1	
1022	7772	-6	
1023	4455	JMS I UMOVE	/FILL BLOCK1 WITH PATTERN
1024	4177	BLOCK1	
1025	4205	BLOCK1+6	
1026	7676	-102	
1027	4455	JMS I UMOVE	/FILL BLOCK2 WITH PATTERN
1030	4177	BLOCK1	
1031	4311	BLOCK2	
1032	7670	-110	
1033	5616	JMP I FW356	/EXIT
1034	0000		
1035	4455	JMS I UMOVE	/MOVE 8 CHARACTER ASR35 PRINTER
1036	1700	A3DWP8	/WORST CASE PATTERN TO BLOCK1
1037	4177	BLOCK1	
1040	7770	-10	
1041	4455	JMS I UMOVE	/FILL BLOCK1 WITH PATTERN
1042	4177	BLOCK1	
1043	4207	BLOCK1+10	
1044	7700	-100	
1045	4455	JMS I UMOVE	/FILL BLOCK2 WITH PATTERN
1046	4177	BLOCK1	
1047	4311	BLOCK2	
1050	7670	-110	
1051	5634	JMP I FW355	/EXIT

```

1052 0000 /SUBROUTINE TO COMPARE C(AC) TO C(CALL+1)
1053 3266 CHCK, 0
1054 1652 DCA WCHK /STORE AC AT WCHK
1055 7041 TAU I CHCK /SET COMPARE DATA
1056 1266 CIA /2'S COMPLEMENT IT
1057 2252 TAU WCHK /ADD C(WCHK)
1060 7640 ISZ CHCK /SET UP FOR UNEQUAL EXIT
1061 5264 SEA CLA /EQUAL?
1062 2252 JMP ,+3 /NO,
1063 5652 ISZ CHCK /YES, SET UP FOR EQUAL EXIT,
1064 1266 JMP I CHCK /EQUAL EXIT
1065 5652 TAU WCHK /RESTORE AC
1066 0000 JMP I CHCK /UNEQUAL EXIT,
WCHK, 0

1067 0000 /PUNCH 70 (CODE 376) CHARACTERS SUBROUTINE
1070 4446 PLTLR, 0
1071 1100 JMS I SETCTR /SET P70CTR TO -70
1072 7672 P70CTR
1073 1301 -106
1074 4454 TAU LOCUE /GET 376 CODE
1075 2300 JMS I UPUNCH /GO PUNCH IT
1076 5273 ISZ P70CTR /ALL CHARACTERS PUNCHED?
1077 5667 JMP ,+3 /NO, REPEAT,
1100 0000 JMP I PLTLR /YES, EXIT,
1101 0376 P70CTR, 0
LOCUE, 376
1102 0000 /PUNCH SYNC CHARACTER SUBROUTINE (HUBOUT)
1103 7240 PSYNC, 0
1104 4454 CLA CMA /SET AC TO 7777
1105 5702 JMS I UPUNCH /PUNCH A RUBOUT
JMP I PSYNC /EXIT.

1106 0000 /SYNC READER SUBROUTINE
1107 4446 RSYNC, 0
1110 1122 JMS I SETCTR /SET RSCTR TO -145
1111 7557 RSCTR
1112 4451 -241
1113 7240 JMS I URRODY /WAIT FOR READER NOT BUSY
1114 3134 CLA CMA /READER NOT BUSY,
1115 4446 DCA RBUZY /SET READER BUSY INDICATOR
1116 1157 JMS I SETCTR /SET READER INTERRUPT
1117 1123 VCTR /SERVICE RETURN ADDRESS,
RSSERV
1120 6001 LUN /ENABLE INTERRUPT
1121 5706 JMP I RSYNC /EXIT
1122 0000 RSCTR, 0

```

1123	6036	RSSERV, KRB	TAU MRBOUT	/READ
1124	1133	SEA CLA	/ADD MINUS RUBOUT	
1125	7640	JMP .+7 /NO.	/IS IT A RUBOUT?	
1126	5335	DCA RBUSY	/YES, CLEAR READER BUSY,	
1127	3134	CLA CLL		
1130	7300	TAU LINK		
1131	1135	KAL	/RESTORE LINK	
1132	7004	TAU AC	/RESTORE AC	
1133	1136	JMP I 0	/RETURN	
1134	5400	ISZ RSCTR	/145 CHARACTER READ?	
1135	2322	JMP I UOUT	/NO.	
1136	5477	HLT CLA	/YES, NO SYNC,	
1137	7602	JMS I SETCTR	/SET RSCTR TO -145	
1140	4446	RSCTR		
1141	1122	-221		
1142	7557	JMP I UOUT	/RETURN	
1143	5477			
1144	3136	INTSVC, DCA AC	/SAVE AC	
1145	7010	KAK	/SAVE LINK	
1146	3135	DCA LINK	/PUNCH/PRINTER?	
1147	6041	TSF	/NO.	
1150	5354	JMP .+4	/YES, CLEAR FLAG,	
1151	6042	TCF	/CLEAR PFLAG	
1152	3127	DCA PFLAG	/RETURN	
1153	5361	JMP OUT	/HEADER/KYBD?	
1154	6031	KSP	/NO ERROR,	
1155	5360	JMP .+3	/GO SERVICE READER	
1156	5757	JMP I .+1		
1157	0000	0	/UNEXPECTED INTERRUPT	
1160	7402	OUT,		
1161	7300	HLT		
1162	1135	CLA CLL	/RESTORE LINK	
1163	7004	TAU LINK	/RESTORE AC,	
1164	1136	KAL	/ENABLE INTERRUPT	
1165	6001	TUN	/RETURN	
1166	5400	JMP I 0		


```

1200      *. 17/+1
1200      PSTUP, 0
1201      SETLOC
1202      PAUR
1203      BLCKA
1204      MOVE
1205      BLKCN
1206      PCTR
1207      -1
1210      JMP I PSTUP
1211      /
1212      POCR, 0
1213      CLA
1214      TAU I PAUR
1215      ISZ PAUR
1216      JMS I UPUNCH
1217      JMP I POCR
1218      /
1219      PBLK, 0
1220      JMS PSTUP
1221      JMS POCR
1222      ISZ PCTR
1223      JMP I=2
1224      JMP I PBLK
1225      /
1226      PBLKR, 0
1227      JMS PSTUP
1228      JMS I UDCNTP
1229      SETLOC
1230      UAP
1231      UBLK
1232      TAU I DAP
1233      UGA DELAYM
1234      ISZ DAP
1235      DELAY
1236      JMS PUCH
1237      ISZ PCTR
1238      JMP I=6
1239      JMP I PBLKR
1240      /
1241      UAP, 0
1242      PCTR, 0
1243      PAUR, 0
1244      0000
1245      0000

1200      /PUNCH SETUP
1201      /SET DATA ADDR
1202
1203      /SET BLOCK LENGTH
1204
1205      /EXIT
1206
1207      /PUNCH DATA CHAR SUB,
1208
1209      /GET DATA
1210      /UPDATE PAUR,
1211      /GO PUNCH/PRINT DATA
1212      /EXIT
1213
1214      /PUNCH DATA BLOCK FULL SPEED
1215
1216      /GO PUNCH CHARACTER
1217      /ALL CHARS PUNCHED?
1218      /NO, REPEAT
1219      /YES, EXIT
1220
1221      /PUNCH DATA BLOCK RANDOM STALLS,
1222      /GO DO SET UP
1223      /FILL DELAY BLOCK
1224      /UBLK ADDRESS TO DAP
1225
1226      /GET DELAY WORD
1227      /TO DELAYM
1228      /UPDATE DAP,
1229      /DELAY,
1230      /GO PUNCH CHARACTER
1231      /ALL CHARS PUNCHED?
1232      /NO, REPEAT
1233      /YES, EXIT,

```



```

1331 3124
1332 2125
1333 5336
1334 7240
1335 3125
1336 7604
1337 0125
1340 7650
1341 5347
1342 1124
1343 7402
1344 7200
1345 1326
1346 7402
1347 2315
1350 5477
1351 7200
1352 1125
1353 7650
1354 5357
1355 1125
1356 7402
1357 7600
1360 3134
1361 1135
1362 7004
1363 1136
1364 5400

ERROR,   UCA ERROR
         ISE ERRCTR
         JMP 1+5
         CLA CMA
         UCA ERRCTR
         LAR SR5MSK
         AND SR5MSK
         SNA CLA
         JMP RU DONE
         TAU ERRCTR
         HLT
         CLA
         TAU SB
         HLT
         ISE RBCTR
         JMP I UOUT
         CLA
         TAU ERRCTR
         SNA CLA
         JMP 1+5
         TAU ERRCTR
         HLT
         CLA
         UCA RBUSY
         TAU LINK
         KAL
         TAU AC
         JMP I 0

RU DONE,
         /STORE BAD CHARACTER
         /INCREMENT ERROR COUNTER
         /OFLOW, 7777 TO AC
         /RESTORE TO 7777,
         /READ SR
         /HALT ON ERROR?(SR5)
         /NO,
         /YES, GET BAD CHARACTER
         /ERROR HALT, BAD CHAR IN AC
         /GOOD CHAR IN AC
         /ALL DONE?
         /NO, TO MAINLINE
         /YES,
         /GET C(ERRCTR)
         /ANY ERRORS?
         /NO,
         /YES,
         /NUMBER OF ERRORS IN AC,
         /CLEAR RBUSY INDICATOR
         /RESTORE LINK
         /TO MAINLINE

```

```

1400      *, 17/+1
1401      DLMSR, 0
1402      CLA CLL
1403      TAU DELAYS
1404      UCA RCTRA
1405      JMP I, +1
1406      .+1
1407      TAU MILL
1408      UCA RCTRB
1409      152 RCTRB
1410      JMP, =1
1411      152 RCTRA
1412      JMP, =7
1413      JMP I DLMSR
1414      RCTRA, 0
1415      RCTRB, 0
1416

1417      DLNTP, 0
1418      MOVE
1419      BLKCNT
1420      UCTR
1421      -1
1422      SETLOC
1423      UADDR
1424      UBLK
1425      JMS I RANDNO
1426      AND DLYMSK
1427      SNA
1428      JMP GNRND
1429      CIA
1430      UCA I UADDR
1431      152 UADDR
1432      152 DCTR
1433      JMP GNRND
1434      JMP I DLNTP
1435      DADDR, 0
1436      UCTR, 0
1437

1400      /GET AND STORE MSEC
1401      /DELAY COUNT
1402
1403      /GET AND STORE
1404      /IMS CONSTANT
1405      /DELAYED 1 MS?
1406      /NO,
1407      /YES, DONE DELAYING?
1408      /NO,
1409      /YES, EXIT
1410
1411      /SUB TO FILL DELAY BLOCK
1412      /SET DELAY BLOCK LENGTH
1413
1414      /UBLK ADDR TO UADDR
1415
1416      /GET RANDOM NUMBER,
1417      /REMOVE EXCESS BITS
1418      /ZERO?
1419      /YES, GET ANOTHER NUMBER
1420      /NO, 2'S COMPLEMENT IT
1421      /STORE IT IN DELAY BLOCK
1422      /UPDATA DELAY BLOCK ADDR,
1423      /BLOCK FULL?
1424      /NO, REPEAT,
1425      /YES, EXIT,

```

```

1443 0000 /PUNCH TEST NORMAL TEST SEQUENCE ROUTINE
1444 4446 NTST,
1445 0134 SETLOC /CLEAR RBUSY
1446 0000 RBUSY
1447 1643
1450 3253 TAU I NTST /SELECT PUNCH MODE
1451 4472 DCA NTSTA
1452 4473 JMS I UPLTLR /PUNCH LEADER
1453 0000 JMS I UPSYNC /PUNCH SYNC CHARACTER
1454 4474 JMS I URSYNC /SYNC READER
1455 4502 JMS I URDBLK /READ DATA BLOCK
1456 4472 JMS I UPLTLR /PUNCH TRAILER
1457 4451 JMS I URDRY /WAIT FOR RDR NOT BUSY
1460 5444 JMP I CHAIN /CHAIN
1461 0000 /PUNCH TESTS SPECIAL TEST SEQUENCE ROUTINE.
1462 4446 STST,
1463 0134 SETLOC /CLEAR RBUSY
1464 0000 RBUSY
1465 1661 TAU I STST /SELECT PUNCH MODE
1466 3273 DCA STSTA
1467 1273 TAU STSTA
1470 3276 DCA STSTC
1471 4472 JMS I UPLTLR /PUNCH LEADER
1472 4473 JMS I UPSYNC /PUNCH SYNC CHARACTER
1473 0000 JMS I URSYNC /PUNCH DATA BLOCK
1474 4474 JMS I URDBLK /SYNC READER
1475 4502 JMS I URDRY /READ DATA BLOCK
1476 0000 JMS I URDBLK /PUNCH DATA BLOCK
1477 5275 JMP STSTB /GO READ AGAIN
1500 0000 /COMBINED TEST NORMAL TEST SEQUENCE
1501 4446 CNTST,
1502 0134 SETLOC /CLEAR RBUSY
1503 0000 RBUSY
1504 4472 JMS I UPLTLR /PUNCH LEADER
1505 4473 JMS I UPSYNC /PUNCH SYNC CHARACTER
1506 4500 JMS I UPLBLK /PUNCH DATA BLOCK (NO STALLS)
1507 4474 JMS I URSYNC /SYNC READER
1510 4503 JMS I URBLKR /READ DATA BLOCK (STALLS)
1511 4501 JMS I UPLBLK /PUNCH DATA BLOCK (STALLS)
1512 4502 JMS I URDBLK /READ DATA BLOCK (NO STALLS)
1513 4472 JMS I UPLTLR /PUNCH TRAILER
1514 4451 JMS I URDRY /WAIT FOR READER NOT BUSY
1515 5444 JMP I CHAIN /CHAIN

```

```

1516 0000
1517 7200
1520 3023
1521 1710
1522 3323
1523 2310
1524 4461
1525 0000
1526 4450
1527 5710

1530 0000
1531 4440
1532 1951
1533 7664
1534 4440
1535 1950
1536 4170
1537 1029
1540 7640
1541 4443
1542 1750
1543 4454
1544 2350
1545 2351
1546 5337
1547 5730
1550 0000
1551 0000

/TYPE LINE OF 3 CHARACTERS (NO DELAY)
TYPLN3, 0
CLA
UCA DELAYM /CLEAR DELAYM
TAU I TYPLN3 /SET AND STORE
UCA :+3 /ADDRESS OF DATA
ISZ TYPLN3
JMS I UPRF3 /GO FILL BUFFER WITH 3 CHARACTERS
0
JMS I UTYPE /GO TYPE LINE
JMP I TYPLN3 /EXIT
/TYPE LINE OF ASCII PRINTABLE CHARACTERS
TYPE, 0
JMS I SETCTR /SET TCTR TO =76
TCTR
-114
JMS I SETCTR /SET FETCH TO ADDRESS
FETCH /OF BLOCKA,
BLOCKA
TAU DELAYM /GET C(DELAYM)
SZA CLA /0?
JMS I ULYIMS /NO, SO DELAY.
TAU I FETCH /YES, SET CHARACTER
JMS I UPUNCH /GO PRINT CHARACTER
ISZ FETCH /SET UP FOR NEXT CHARACTER
ISZ TCTR /DONE?
JMP TYPEA /NO, REPEAT
JMP I TYPE /YES, EXIT,

FETCH, 0
TCTR, 0

```

6/26/68 14:46,37

*. 17/+1
ASCCN, 0
TAU I ASCCN
UCA WASC
ISZ ASCCN
TAU I ASCCN
UCA SASC
ISZ ASCCN
TAU K7700
ANU I WASC
RTH CLL
RTH
RTH
JMS CNV
ISZ SASC
TAU K7700
UMA
ANU I WASC
JMS CNV
JMP I ASCCN
0
UCA ASCT
TAU ASCT
RTL
KAL
ANU K0707
TAU ASCT
ANU K0707
TAU K6060
UCA I SASC
JMP I CNV
WASC,
SASC,
ASCT,
K7700,
K0707,
K6060,
0000

1600
0000
1601
1600
1602 3236
1603 2200
1604 1600
1605 3237
1606 2200
1607 1241
1610 0636
1611 7112
1612 7012
1613 7012
1614 4223
1615 2237
1616 1241
1617 7040
1620 0636
1621 4223
1622 5600
1623 0000
1624 3240
1625 1240
1626 7006
1627 7004
1630 0242
1631 1240
1632 0242
1633 1243
1634 3637
1635 5623
1636 0000
1637 0000
1640 0000
1641 7700
1642 0707
1643 6060

1644	0247	A3SWP4,	0247	/"
1645	0337		0337	/LEFT ARROW
1646	0327		0327	/"
1647	0257		0257	/"
1650	0247	A3SWP6,	0247	/"
1651	0337		0337	/LEFT ARROW
1652	0327		0327	/"
1653	0257		0257	/"
1654	0327		0327	/"
1655	0337		0337	/LEFT ARROW
1656	0247	A3SWP5,	0247	/"
1657	0240		0240	/SPACE
1660	0337		0337	/LEFT ARROW
1661	0240		0240	/SPACE
1662	0327		0327	/"
1663	0240		0240	/SPACE
1664	0257		0257	/"
1665	0240		0240	/SPACE
1666	0247	A3SWP4,	0247	/
1667	0335		0335	/"
1670	0277		0277	/"
1671	0305		0305	/"
1672	0247	A3SWP6,	0247	/"
1673	0335		0335	/"
1674	0277		0277	/"
1675	0305		0305	/"
1676	0277		0277	/"
1677	0335		0335	/"
1700	0247	A3SWP5,	0247	/"
1701	0240		0240	/SPACE
1702	0335		0335	/"
1703	0240		0240	/SPACE
1704	0277		0277	/"
1705	0240		0240	/SPACE
1706	0305		0305	/"
1707	0240		0240	/SPACE
1710	0301	A,	0301	
1711	0302		0302	
1712	0303		0303	
1713	0304	U,	0304	
1714	0305		0305	
1715	0306		0306	
1716	0307	G,	0307	
1717	0310		0310	
1720	0311		0311	
1721	0312	J,	0312	
1722	0313		0313	
1723	0314		0314	
1724	0315	M,	0315	
1725	0316		0316	
1726	0317		0317	

1727	0320	P,	320
1730	0321		321
1731	0322		322
1732	0323	S,	323
1733	0324		324
1734	0325		325
1735	0326	V,	326
1736	0327		327
1737	0330		330
1740	0331	Y,	331
1741	0332		332
1742	0260		260
1743	0261	ONE,	261
1744	0262		262
1745	0263		263
1746	0264	FOUR,	264
1747	0265		265
1750	0266		266
1751	0267	SEVEN,	267
1752	0270		270
1753	0271		271
1754	0241	C241,	241
1755	0242		242
1756	0243		243
1757	0244	C244,	244
1760	0245		245
1761	0246		246
1762	0247	C247,	247
1763	0250		250
1764	0251		251
1765	0252	C252,	252
1766	0253		253
1767	0254		254
1770	0255	C255,	255
1771	0256		256
1772	0257		257
1773	0272	C272,	272
1774	0273		273
1775	0274		274
1776	0275	C275,	275
1777	0276		276
2000	0277		277
2001	0300	C300,	300
2002	0333		333
2003	0334		334
2004	0335	C335,	335
2005	0336		336
2006	0337		337

/SLIDING 1 PATTERN

SLID1,

2007 0001
2010 0002
2011 0004
2012 0010
2013 0020
2014 0040
2015 0100
2016 0200
2017 0100
2020 0040
2021 0020
2022 0010
2023 0004
2024 0002
2025 0376
2026 0375
2027 0375
2030 0367
2031 0357
2032 0337
2033 0277
2034 0177
2035 0277
2036 0337
2037 0357
2040 0367
2041 0375
2042 0375

0001
0002
0004
0010
0020
0040
0100
0200
0100
0040
0010
0004
0002
0376
0375
0375
0367
0357
0337
0277
0177
0277
0337
0357
0367
0375
0375

/SLIDING 0 PATTERN

SLID0,

2043 4005
2044 2240
2045 2405
2046 2324
2047 0001
2050 4022
2051 1107
2052 1024
2053 4015
2054 0122
2055 0711
2056 1640
2057 2405
2060 2324
2061 0001

4005
2240
2405
2324
0001
4022
1107
1024
4015
0122
0711
1640
2405
2324
0001

/SPC,C
/R,SPC
/T,E
/S,T
/END CODE
/SPC,R
/I,G
/H,T
/SPC,M
/A,R
/G,I
/N,SPC
/T,E
/S,T
/END CODE

CRTST,

RMTST,

2062	4023	SPTST,	4023	/SPC,S
2063	2001		2001	/P,A
2064	0305		0305	/C,E
2065	4024		4024	/SPC,T
2066	0523		0523	/E,S
2067	2400		2400	/T
2070	0100		0100	/END CODE
2071	4014	LFTST,	4014	/SPC,L
2072	0640		0640	/F,SPC
2073	2405		2405	/T,E
2074	2324		2324	/S,T
2075	0001		0001	/END CODE
2076	4003	CHRTST,	4003	/SPC,C
2077	1001		1001	/H,A
2100	2201		2201	/H,A
2101	0324		0324	/C,T
2102	0522		0522	/E,R
2103	4024		4024	/SPC,T
2104	0523		0523	/E,S
2105	2423		2423	/T,S
2106	0001		0001	/END CODE
2107	4027	WCPTST,	4027	/SPC,W
2110	1722		1722	/O,R
2111	2324		2324	/O,R
2112	4003		4003	/SPC,C
2113	0123		0123	/A,S
2114	0540		0540	/E,SPC
2115	2001		2001	/P,A
2116	2424		2424	/T,T
2117	0522		0522	/E,R
2120	1640		1640	/N,SPC
2121	2405		2405	/T,E
2122	2324		2324	/S,T
2123	0015		0015	/CR
2124	0012		0012	/LF
2125	0001		0001	/END CODE

2126 0012
2127 0012
2130 4001
2131 2322
2132 6363
2133 5763
2134 6540
2135 1331
2136 0204
2137 4024
2140 0523
2141 2400
2142 1500
2143 1200
2144 0100

KMSG1,

0012
0012
4001
2322
6363
5763
6540
1331
0204
4024
0523
2400
1500
1200
0100

/CR
/LF

/SP,A
/S,R
/S,J
/I,J
/S,SP
/K,Y
/B,O
/SP,T
/E,S
/T
/CH
/LF
/END CODE

/KMSG2, TYPE: PRESS A KEY

KMSG2,

0012
0012
4020
2202
2323
4001
4013
0531
2600
1500
1200
0100

2145 0012
2146 0012
2147 4020
2150 2202
2151 2323
2152 4001
2153 4013
2154 0531
2155 5600
2156 1500
2157 1200
2160 0100

/CR
/LF
/SP,P
/R,E
/S,S
/SP,A
/SP,K
/E,Y
/CH
/LF
/END CODE

2161 0015
2162 0012
2163 4005
2164 0510
2165 1740
2166 2405
2167 2524
2170 0015
2171 0012
2172 4005
2173 1001
2174 2201
2175 0524
2176 0522
2177 2340
2200 1505
2201 3105
2202 0440
2203 2711
2204 1414
2205 4002
2206 0540
2207 2431
2210 2005
2211 0456
2212 0015
2213 0012
2214 4022
2215 2502
2216 1725
2217 2440
2220 0510
2221 0425
2222 4022
2223 1725
2224 2411
2225 1605
2226 5600
2227 1500
2230 1200
2231 1500
2232 1200
2233 0100

KMSG3, 0015
0012
4005
0510
1740
2405
2524
0015
0012
4005
1001
2201
0524
0522
2340
1505
3105
0440
2711
1414
4002
0540
2431
2005
0456
0015
0012
4022
2502
1725
2440
0510
0425
4022
1725
2411
1605
5600
1500
1200
1500
1200
0100

/CH
/LF
/SP,E
/C,H
/O,SP
/T,E
/S,T
/CH
/LF
/SP,C
/H,A
/R,A
/C,T
/E,H
/S,P
/K,E
/Y,E
/O,SP
/W,I
/L,L
/SP,B
/E,SP
/T,Y
/P,E
/O,
/CH
/LF
/SP,R
/O,B
/O,U
/T,SP
/E,N
/O,S
/SP,R
/O,U
/T,I
/N,E
/.
/CH
/LF
/CH
/LF
/END CODE

2234 0012
 2235 0012
 2236 0012
 2237 0012
 2240 4017
 2241 0324
 2242 0114
 2243 4005
 2244 2125
 2245 1126
 2246 0114
 2247 0516
 2250 2440
 2251 2405
 2252 2324
 2253 0012
 2254 0001
 2255 0012
 2256 0012
 2257 4040
 2260 4040
 2261 0001

KMSG4, 0012
 0012
 0012
 0012
 4017
 0324
 0114
 4005
 2125
 1126
 0114
 0516
 2440
 2405
 2324
 0012
 0001
 KMSG5, 0012
 0012
 OCTEOV, 4040
 4040
 0001

/CR
 /LF
 /CR
 /LF
 /SP,0
 /C,T
 /A,L
 /SP,E
 /Q,U
 /I,V
 /A,L
 /E,N
 /T,SR
 /T,E
 /S,T
 /CR
 /END CODE
 /CR
 /LF
 /END CODE

```

2400      *, 17/+1
2401      PRG0,
2402      JMS I USTBF
2403      JMS I SETCTR
2404      KSTART
2405      POTS0
2406      JMP I ,+1
2407      SRSET
2408      /CARRIAGE RETURN TEST
2409      POTS0, 0
2410      POTS1
2411      JMS I UCRLF
2412      -2
2413      JMS I XTYPST
2414      CRTST
2415      JMS I UCRLF
2416      -2
2417      TAU C334
2418      JMS I UPUNCH
2419      TAU M111
2420      UCA UTEMP
2421      ISZ UTEMP
2422      CRTSTA,
2423      SKP
2424      JMP I CHAIN
2425      TAU UTEMP
2426      UCA UTEMP1
2427      TAU SPACE
2428      JMS I UPUNCH
2429      ISZ UTEMP1
2430      JMP ,=3
2431      TAU CR
2432      JMS I UPUNCH
2433      JMS I UPUNCH
2434      TAU C257
2435      JMS I UPUNCH
2436      JMP CRTSTA
2437
2400      /SET UP BUFFER AREA
2401      /SET KSTART TO INITIAL
2402      /ROUTINE ADDRESS
2403      /GO START PROGRAM
2404
2405      /CRLF TWICE
2406      /PRINT TEST TITLE
2407      /CRLF TWICE
2408      /GET "\n" CODE
2409      /PRINT IT
2410      /~75 TO UTEMP
2411      /ALL DONE?
2412      /NO
2413      /YES, CHAIN
2414      /UTEMP TO UTEMP1
2415      /SET "SPACE" CODE
2416      /PRINT IT
2417      /SPACED NO, OF TIMES IN UTEMP1?
2418      /NO, SO SPACE AGAIN
2419      /YES, SET "CR" CODE,
2420      /PRINT IT,
2421      /DUMMY CYCLE,
2422      /SET "/" CODE
2423      /PRINT IT
2424      /GO TO CRTSTA

```

```

2441 0001 /RIGHT MARGIN TEST
2442 2473 POTS1, 1
2443 4453 POTS2
2444 7776 JMS I UCRLF /CRLF TWICE
2445 4450 -2
2446 2050 JMS I XTYPST /PRINT TEST TITLE
2447 4453 RMTST
2448 7776 JMS I UCRLF /CRLF TWICE
2449 1144 -2
2450 1144 TAD M16
2451 3116 DCA UTEMP /-14 TO UTEMP
2452 4450 JMS I XTYPST /PRINT --- I
2453 2456 ,+2
2454 5262 JMP ,+5
2455 5555
2456 5555
2457 5555
2458 1100
2459 0100
2460 2116
2461 5253
2462 4450 JMS I XTYPST /DONE 14 TIMES?
2463 2467 ,+2 /NO, SO DO IT AGAIN
2464 5272 JMP ,+4 /YES, PRINT =I-
2465 5511
2466 5500
2467 0100
2470 5444 JMP I CHAIN /CHAIN
2471 5444
2472 5444

```



```

2473 0002 /SPACE TEST
2474 2541 P0TS2, 2
2475 4453 P0TS3
2476 7776 JMS I UCRLF /CRLF TWICE
2477 4450 -2 JMS I XTYPST /PRINT TEST TITLE
2500 2062 SPTST
2501 4453 JMS I UCRLF /CRLF TWICE
2502 7776 -2
2503 1145 TAU M44
2504 3116 UCA UTEMP
2505 4450 JMS I XTYPST /-36 TO UTEMP
2506 2510 .+2 /PRINT \, SPACE
2507 5312 JMP .+3
2510 3440
2511 0001 /"\, SPC
2512 2116 /END CODE
2513 5305 ISE UTEMP /DONE 36 TIMES?
2514 1145 JMP SPTSTA /NO, SO DO IT AGAIN.
2515 3116 TAU M44
2516 1142 UCA UTEMP /-36 TO UTEMP
2517 3117 UCA UTEMP1 /GET =1
2520 1117 TAU UTEMP1 /AC TO UTEMP1
2521 3120 UCA UTEMP2 /UTEMP1
2522 1131 TAU CR /TO UTEMP2
2523 4454 JMS I UPUNCH /GET "CR" CODE
2524 4454 JMS I UPUNCH /PRINT IT
2525 1137 TAU SPACE /DUMMY CYCLE
2526 4454 JMS I UPUNCH /GET "SPACE" CODE
2527 2120 ISE UTEMP /PRINT IT
2530 5325 JMP .+3 /DONE SPACING?
2531 1140 TAU C257 /NO,
2532 4454 JMS I UPUNCH /GET "/" CODE
2533 2116 ISE UTEMP /PRINT IT
2534 7410 SKP /DONE 36 TIMES?
2535 5444 JMP I CHAIN /NO,
2536 1143 TAU M2 /YES, CHAIN
2537 1117 TAU UTEMP1 /-2 TO AC
2540 5517 JMP SPTSTB /ADU C(UTEMP1)
        /GO TO SPTSTB
SPTSTA,
SPTSTB,

```

/LINE FEED TEST

2541 0003
 2542 2600
 2543 4453
 2544 7776
 2545 4450
 2546 2071
 2547 4453
 2550 7776
 2551 1146
 2552 3116
 2553 1141
 2554 4454
 2555 1132
 2556 4454
 2557 2116
 2560 7410
 2561 5444
 2562 4452
 2563 4443
 2564 5353

POTS3, 3
 POTS4
 JMS I UCRLF /CRLF TWICE
 -2
 JMS I XTYPST /PRINT TEST TITLE
 LFTST
 JMS I UCRLF /CRLF TWICE
 -2
 TAU M110
 DCA UTEMP /=72 TO UTEMP
 LFTSTA, TAU C334 /GET "\n" CODE
 JMS I UPUNCH /PRINT IT
 TAU LF UPUNCH /GET "LF" CODE
 JMS I UTEMP /PRINT IT
 ISE UTEMP /DONE?
 SKP /NO,
 JMP I CHAIN /YES, CHAIN
 JMS I DLYCNT /GENERATE RANDOM DELAY COUNT
 JMS I DLY1MS /GO DELAY,
 JMP LFTSTA /GO TO LFTSTA

```

2600 2600 2601 2602 2603 2604 2605 2606 2607 2610 2611 2612 2613 2614
2600 2604 2613 4453 7776 4450 2076 4453 7776 4460 1710 5444 0000 2620
* 177+1
POTS4, 4
/TYPE LINE OF CHARACTERS ABC
JMS I UCRLF /CRLF TWICE
-2
JMS I XTYPST /PRINT TITLE
CHRTST
JMS I UCRLF /CRLF TWICE
-2
JMS I UTPLN3 /PRINT LINE
A
JMP I CHAIN
POTS5, 2
POTS6
/TYPE LINE OF CHARACTERS DEF
JMS I UTPLN3
U
JMP I CHAIN
POTS6, 6
POTS7
/TYPE LINE OF CHARACTERS GHI
JMS I UTPLN3
G
JMP I CHAIN
POTS7, 7
POTS10
/TYPE LINE OF CHARACTERS JKL
JMS I UTPLN3
J
JMP I CHAIN
POTS10, 10
POTS11
/TYPE LINE OF CHARACTERS MNO
JMS I UTPLN3
M
JMP I CHAIN
POTS11, 11
POTS12
/TYPE LINE OF CHARACTERS POR
JMS I UTPLN3
P
JMP I CHAIN
POTS12, 12
POTS13
/TYPE LINE OF CHARACTERS STU
JMS I UTPLN3
S
JMP I CHAIN

```

2651	0013	POTS13, 13
2652	2650	POTS14
		/TYPE LINE OF CHARACTERS VMX
2653	4460	JMS I UTPLN3
2654	1735	V
2655	5444	JMP I CHAIN
2656	0014	POTS14, 14
2657	2663	POTS15
		/TYPE LINE OF CHARACTERS YZ0
2660	4460	JMS I UTPLN3
2661	1740	Y
2662	5444	JMP I CHAIN
2663	0015	POTS15, 15
2664	2670	POTS16
		/TYPE LINE OF CHARACTERS 123
2665	4460	JMS I UTPLN3
2666	1745	ONE
2667	5444	JMP I CHAIN
2670	0016	POTS16, 16
2671	2675	POTS17
		/TYPE LINE OF CHARACTERS 456
2672	4460	JMS I UTPLN3
2673	1746	FOUR
2674	5444	JMP I CHAIN
2675	0017	POTS17, 17
2676	2702	POTS20
		/TYPE LINE OF CHARACTERS 789
2677	4460	JMS I UTPLN3
2700	1751	SEVEN
2701	5444	JMP I CHAIN
2702	0020	POTS20, 20
2703	2707	POTS21
		/TYPE LINE OF CHARACTERS !"#
2704	4460	JMS I UTPLN3
2705	1754	G241
2706	5444	JMP I CHAIN
2707	0021	POTS21, 21
2710	2714	POTS22
		/TYPE LINE OF CHARACTERS \$%&
2711	4460	JMS I UTPLN3
2712	1757	G244
2713	5444	JMP I CHAIN
2714	0022	POTS22, 22
2715	2721	POTS23
		/TYPE LINE OF CHARACTERS '()
2716	4460	JMS I UTPLN3
2717	1762	G247
2720	5444	JMP I CHAIN

```

2721 0023 POTS23, 23
2722 2726 POTS24
      /TYPE LINE OF CHARACTERS **,
      JMS I UTPLN3
      C222
      JMP I CHAIN
      POTS24, 24
2723 4460 POTS25
2724 1765
2725 5444
2726 0024
2727 2735
      /TYPE LINE OF CHARACTERS -, (
      JMS I UTPLN3
      C235
      JMP I CHAIN
      POTS25, 25
2730 4460 POTS26
2731 1770
2732 5444
2733 0025
2734 2740
      /TYPE LINE OF CHARACTERS !:K
      JMS I UTPLN3
      C2/2
      JMP I CHAIN
      POTS26, 26
2735 4460 POTS27
2736 1775
2737 5444
2740 0026
2741 2745
      /TYPE LINE OF CHARACTERS =>?
      JMS I UTPLN3
      C2/5
      JMP I CHAIN
      POTS27, 27
2742 4460 POTS30
2743 1776
2744 5444
2745 0027
2746 2752
      /TYPE LINE OF CHARACTERS @ L\
      JMS I UTPLN3
      C300
      JMP I CHAIN
      POTS30, 30
2747 4460 POTS31
2750 2001
2751 5444
2752 0030
2753 2757
      /TYPE LINE OF CHARACTERS J* AND LEFT ARROW
      JMS I UTPLN3
      C335
      JMP I CHAIN
      POTS31, 31
2754 4460 POTS32
2755 2004
2756 5444
2757 0031
2760 2765
      /TYPE LINE OF ALL CHARACTERS
      JMS I UFBALL /FILL BUFFER WITH ALL CHARS,
      UCA DELAYM /0 TO DELAYM,
      JMS I UTTYPE /TYPE LINE
      JMP I CHAIN /CHAIN
      POTS32, 32
2761 4462
2762 3023
2763 4456
2764 5444
2765 0032
2766 3000 POTS33
      /TYPE LINE OF ALL CHARACTERS, FIXED DELAY BETWEEN CHARACTERS
      JMS I UFBALL /FILL BUFFER WITH ALL CHARS
      JMS I DLYCNT /GENERATE DELAY COUNT
      JMS I UTTYPE /TYPE LINE
      JMP I CHAIN /CHAIN
2767 4462
2770 4452
2771 4456
2772 5444

```

```

3000 3000 4453
3003 3003 7776
3001 3017 3004 4450
3005 2107
3006 4465
3007 3023
3010 4446
3011 0121
3012 7772
3013 4456
3014 2121
3015 5213
3016 5444
3017 0034
3020 3032

3021 4465
3022 4446
3023 0121
3024 7772
3025 4452
3026 4456
3027 2121
3030 5222
3031 5444
3032 0032
3033 3042

3034 4470
3035 3023
3036 4446
3037 0121
3040 7772
3041 4456
3042 2121
3043 5241
3044 5444
3045 0036
3046 7771

3047 4470
3050 4446
3051 0121
3052 7772
3053 4452
3054 4456
3055 2121
3056 5253
3057 5444

* 17/+1
POTS33, 33
POTS34
/TYPE 6 LINES OF ASR33 WORST CASE PATTERN, NO DELAY,
JMS I UCRLF /CRLF TWICE
-2
JMS I XTYPST /PRINT TITLE
WCPST
JMS I UFW336 /PATTERN TO BUFFER
UCA DELAYM /0 TO DELAYM
JMS I SETCTR /-6 TO CTRA
CTRA
-6
JMS I UTYPE /TYPE LINE
ISE CTRA /ALL LINES TYPED?
JMP ,-2 /NO, REPEAT
JMP I CHAIN /YES, CHAIN,
POTS34, 34
POTS35
/TYPE 6 LINES OF ASR33 WORST CASE PATTERN, FIXED DELAY BETWEEN CHARACTERS
JMS I UFW336 /PATTERN TO BUFFER
JMS I SETCTR /-6 TO CTRA
CTRA
-6
JMS I DLYCNT /GENERATE DELAY COUNT
JMS I UTYPE /TYPE LINE
ISE CTRA /ALL LINES TYPED?
JMP ,-3 /NO, REPEAT
JMP I CHAIN /YES, CHAIN
POTS35, 35
POTS36
/TYPE 6 LINES OF ASR35 WORST CASE PATTERN, NO DELAY
JMS I UFW356 /PATTERN TO BUFFER
UCA DELAYM /0 TO DELAYM
JMS I SETCTR /-6 TO CTRA
CTRA
-6
JMS I UTYPE /TYPE LINE
ISE CTRA /ALL LINES TYPED?
JMP ,-2 /NO, REPEAT
JMP I CHAIN /YES, CHAIN
POTS36, 36
/TYPE 6 LINES OF ASR35 WORST CASE PATTERN, FIXED DELAY BETWEEN CHARACTERS
JMS I UFW356 /PATTERN TO BUFFER
JMS I SETCTR /-6 TO CTRA
CTRA
-6
JMS I DLYCNT /GENERATE DELAY COUNT
JMS I UTYPE /TYPE LINE
ISE CTRA /ALL LINES TYPED?
JMP ,-3 /NO, REPEAT
JMP I CHAIN /YES, CHAIN

```

/PROGRAM 1: ASR33/35 PUNCH FUNCTION TEST

```

3060 4446
3061 0002
3062 1144
3063 4446
3064 0130
3065 7400
3066 4446
3067 0020
3070 3073
3071 5672
3072 0232

3073 0000
3074 3106
3075 4446
3076 4175
3077 0000
3100 4455
3101 4175
3102 4176
3103 7401
3104 4504
3105 4500

3106 0001
3107 3121
3110 4446
3111 4175
3112 0001
3113 4455
3114 4175
3115 4176
3116 7401
3117 4504
3120 4500

3121 0002
3122 3200
3123 4446
3124 4175
3125 0002
3126 4455
3127 4175
3130 4176
3131 7401
3132 4504
3133 4500

/PGM: JMS I SETCTR /SET INTERRUPT SERVICE ADDRESS
2 /TO INTSVC
INTSVC
SETLOC /SET DATA BLOCK
BLKCNT /LENGTH TO
=400 /-256
JMS I SETCTR /SET KSTART TO INITIAL
KSTART /ROUTINE ADDRESS.
P1T0 /GO START PROGRAM
JMP I ,+1
SRSET

/ROUTINE 0,
/PUNCH AND READ CHECK BLOCK OF ALL 0'S
P1T0, 0
P1T1
SETLOC /0 TO BLOCK A
BLCKA /FILL BUFFER
0
MOVE
BLCKA
BLCKA+1
-3/7
JMS I UNTST /GO TO NORMAL TEST,
JMS I UPBLK /USE THIS CALL
/ROUTINE 1
/PUNCH AND READ CHECK BLOCK OF CHANNEL 1 PUNCHES.
P1T1, 1
P1T2
SETLOC /1 TO BLOCKA
BLCKA
1
MOVE /FILL BUFFER
BLCKA
BLCKA+1
-3/7
JMS I UNTST /GO TO NORMAL TEST
JMS I UPBLK /USE THIS CALL
/ROUTINE 2
/PUNCH AND READ CHECK BLOCK OF CHANNEL 2 PUNCHES
P1T2, 2
P1T3
SETLOC /2 TO BLOCKA
BLCKA
2
MOVE /FILL BUFFER
BLCKA
BLCKA+1
-3/7
JMS I UNTST /GO TO NORMAL TEST
JMS I UPBLK /USE THIS CALL

```

```

3200          *.17/+1
3201          /ROUTINE 3
3202          /PUNCH AND READ CHECK BLOCK OF CHANNEL 3 PUNCHES
3203          P1T3, 3
3204          P1T4
3205          SETLOC
3206          /4 TO BLOCK A
3207          BLOCKA
3208          4
3209          MOVE
3210          /FILL BUFFER
3211          BLOCKA
3212          BLOCKA+1
3213          -3//
3214          JMS I UNTST
3215          /GO TO NORMAL TEST
3216          JMS I UPBLK
3217          /USE THIS CALL
3218          /ROUTINE 4
3219          /PUNCH AND READ CHECK BLOCK OF CHANNEL 4 PUNCHES
3220          P1T4, 4
3221          P1T5
3222          SETLOC
3223          /10 TO BLOCKA
3224          BLOCKA
3225          10
3226          MOVE
3227          /FILL BUFFER
3228          BLOCKA
3229          BLOCKA+1
3230          -3//
3231          JMS I UNTST
3232          /60 TO NORMAL TEST
3233          JMS I UPBLK
3234          /USE THIS CALL
3235          /ROUTINE 5
3236          /PUNCH AND READ CHECK BLOCK OF CHANNEL 5 PUNCHES
3237          P1T5, 5
3238          P1T6
3239          SETLOC
3240          /10 TO BLOCKA
3241          BLOCKA
3242          20
3243          MOVE
3244          /FILL BUFFER
3245          BLOCKA
3246          BLOCKA+1
3247          -3//
3248          JMS I UNTST
3249          /GO TO NORMAL TEST
3250          JMS I UPBLK
3251          /USE THIS CALL

```



```

3241 0000 /ROUTINE 6
3242 3254 /PUNCH AND READ CHECK BLOCK OF CHANNEL 6 PUNCHES
3243 4446 P116, 6
3244 4175 P117
3245 0040 SETLOC
3246 4455 BLOCKA
3247 4175 40
3250 4176 MOVE
3251 7401 BLOCKA
3252 4504 BLOCKA+1
3253 4500 -3/7
      JMS I UNIST
      JMS I UPBLK
      /GO TO NORMAL TEST
      /USE THIS CALL

3254 0007 /ROUTINE 7
3255 3267 /PUNCH AND READ CHECK BLOCK OF CHANNEL 7 PUNCHES
3256 4446 P117, 7
3257 4175 P1110
3260 2100 SETLOC
3261 4455 BLOCKA
3262 4175 100
3263 4176 MOVE
3264 7401 BLOCKA
3265 4504 BLOCKA+1
3266 4500 -3/7
      JMS I UNIST
      JMS I UPBLK
      /GO TO NORMAL TEST
      /USE THIS CALL

3267 0010 /ROUTINE 10
3270 3502 /PUNCH AND READ CHECK BLOCK OF CHANNEL 8 PUNCHES
3271 4446 P1110, 10
3272 4175 P1111
3273 0200 SETLOC
3274 4455 BLOCKA
3275 4175 BLOCKA+1
3276 4176 200
3277 7401 MOVE
3300 4504 BLOCKA
3301 4500 -3/7
      JMS I UNIST
      JMS I UPBLK
      /GO TO NORMAL TEST
      /USE THIS CALL

3302 0011 /ROUTINE 11
3303 3316 /PUNCH AND READ CHECK BLOCK OF SLIDING 1 PATTERN
3304 4455 P1111, 11
3305 2007 P1112
3306 4175 MOVE
3307 7762 SLID1
3310 4455 BLOCKA
3311 4175 BLOCKA+16
3312 4215 -10
3313 7410 MOVE
3314 4504 BLOCKA
3315 4500 -302
      JMS I UNIST
      /GO TO NORMAL TEST
      /USE THIS CALL

```

/ROUTINE 12
/PUNCH AND READ CHECK BLOCK OF SLIDING 0 PATTERN.

3316 0012
3317 3332
3320 4452
3321 2022
3322 4172
3323 7762
3324 4452
3325 4172
3326 4212
3327 7416
3330 4504
3331 4500

PT12, 12
PT13
MOVE
SLID0
BLUCKA
-16
MOVE
BLUCKA
BLUCKA+16
-302

JMS I UNTST /GO TO NORMAL TEST
JMS I UPBLK /USE THIS CALL

/ROUTINE 13
/PUNCH AND READ CHECK BLOCK OF ONES AND ZEROES,

3332 0013
3333 3350
3334 4446
3335 4172
3336 0377
3337 4446
3340 4176
3341 0000
3342 4452
3343 4172
3344 4177
3345 7402
3346 4504
3347 4500

PT13, 13
PT14
SETLOC
BLUCKA
377
SETLOC
BLUCKA+1
0
MOVE
BLUCKA
BLUCKA+2
-376

JMS I UNTST /GO TO NORMAL TEST
JMS I UPBLK /USE THIS CALL

/ROUTINE 14
/PUNCH AND READ CHECK BLOCK OF ONES AND ZEROES, RANDOM
/STALLS BETWEEN CHARACTERS PUNCHED,

3350 0014
3351 3400
3352 4446
3353 4172
3354 0377
3355 4446
3356 4176
3357 0000
3360 4452
3361 4172
3362 4177
3363 7402
3364 4504
3365 4501

PT14, 14
PT15
SETLOC
BLUCKA
377
SETLOC
BLUCKA+1
0
MOVE
BLUCKA
BLUCKA+2
-376

JMS I UNTST /GO TO NORMAL TEST
JMS I UPBLKR /USE THIS CALL

```
* 17/+1  
/ROUTINE 12  
/PUNCH AND READ CHECK BLOCK OF BINARY COUNT PATTERN  
PIT15, 12  
    PIT16  
    SETLOC  
    TEMPU  
    BLOCKA  
    SETLOC  
    CTRA  
-400  
JMS I INPAT  
PIT15A, JMS I GETPT  
        DCA I TEMPU  
        ISZ TEMPU  
        ISZ CTRA  
        JMP PIT15A  
        JMS I UNIST  
        JMS I UPBLK  
/ROUTINE 10  
/PUNCH AND READ CHECK BLOCK OF BINARY COUNT PATTERN  
/RANDOM STALLS BETWEEN CHARACTERS PUNCHED.  
PIT16, 16  
    /777  
    SETLOC  
    TEMPU  
    BLOCKA  
    SETLOC  
    CTRA  
-400  
JMS I INPAT  
PIT16A, JMS I GETPT  
        DCA I TEMPU  
        ISZ TEMPU  
        ISZ CTRA  
        JMP PIT16A  
        JMS I UNIST  
        JMS I UPBLKR  
/GO TO NORMAL TEST  
/USE THIS CALL
```

```

3440 4446 /PROGRAM 2, KEYBOARD TEST
3441 0020 PRG2, SETLOC /SET KSTART TO INITIAL
3442 3447 KSTART /ROUTINE ADDRESS
3443 4450 P2T0 /PRINT
3444 2126 JMS I XTYPST
3445 5646 KMSG1
3446 0232 JMP I, +1
SRSET

/ROUTINE 0
/CLEAR AC AND FLAG (KCC), WAIT FOR FLAG TO SET, WITH FLAG SET, SKIP
/ON FLAG 1000 TIMES, KSF SHOULD SKIP EVERY TIME,
P2T0, 0
P2T1 /-1000 TO CTRA
SETLOC
CTRA -1/P0
KCC /CLEAR AC AND FLAG
JMS I XTYPST
KMSG2
KSF /READY?
JMP, =1 /WAIT
KSF /READY, SKIP ON FLAG
JMP P2E0 /NO SKIP, ERROR
ISZ CTRA /ALL DONE?
JMP, =3 /NO, REPEAT
JMP I CHAIN /YES, CHAIN
HLT CLA /KSF FAILURE
KSF /SCOPE LOOP
JMP, =1 /SKIPS ON FLAG
JMP, =2 /CONTINUOUSLY

P2E0,
/ROUTINE 1,
/ECHO TEST CHARACTER RECEIVED FROM KEYBOARD IS TYPED, THE
/CHARACTER TYPED SHOULD MATCH CHARACTER KEYED, RUBOUT CHARACTER
/ENDS ROUTINE.
P2T1, 1
P2T2 /CLEAR AC AND FLAG
KCC
JMS I XTYPST
KMSG3
KSF /READY?
JMP, =1 /WAIT
KRB /READ CHARACTER
ILS /PRINT IT
ISF /PRINTER READY?
JMP, =1 /NO, WAIT
JAU MRBOUT
SEA /IS IT RUBOUT?
JMP P2T1A /NO
JMP I CHAIN /YES, CHAIN
3472 0001
3473 3511
3474 6032
3475 4450
3476 2161
3477 6031
3500 5277
3501 6036
3502 6046
3503 6041
3504 5303
3505 1133
3506 7440
3507 5277
3510 5444

```

ROUTINE 2,
 /OCTAL EQUIVALENT TEST, THE OCTAL EQUIVALENT OF ANY
 /CHARACTER KEYED IS PRINTED, RUBOUT ENDS ROUTINE.

3511 0202
 3512 7777
 3513 6032
 3514 4450
 3515 2234
 3516 4450
 3517 2170
 3520 6031
 3521 5320
 3522 6036
 3523 3336
 3524 4506
 3525 3536
 3526 2257
 3527 4450
 3530 2255
 3531 1336
 3532 1135
 3533 7640
 3534 5320
 3535 5444
 3536 0000

P2T2,
 2
 7777
 KCC
 JMS I XTYPST
 KMSG4
 JMS I XTYPST
 KMSG3A
 KSF
 JMP ,=1
 KRB
 UCA P2T2W
 JMS I UASCCN
 P2T2W
 OCTEQV
 JMS I XTYPST
 KMSG5
 TAU P2T2W
 TAU MRBOUT
 SEA CLA
 JMP P2T2A
 JMP I CHAIN
 P2T2W, 0

/CLEAR AC AND FLAG
 /PRINT TITLE AND
 /INSTRUCTION
 /FLAG 1?
 /NO. WAIT
 /YES. READ KEYBOARD
 /STORE CHARACTER
 /CONVERT CHARACTER
 /TO PRINTABLE OCTAL,
 /PRINT CHARACTER
 /WAS IT A RUBOUT?
 /NO.
 /YES. CHAIN

```

3537 4446 /PROGRAM 3, COMBINED READER, PRINTER, PUNCH TEST,
3540 0002 PRG3, SETLOC /SET INTERRUPT SERVICE
3541 1144 2 /ADDRESS TO INTSVC
3542 4446 INTSVC /SET DATA BLOCK LENGTH
3543 0130 SETLOC /TO =150
3544 7552 BLKCNT
3545 4457 JMS I, USTBF /SET UP BUFFER AREA
3546 4446 SETLOC /SET KSTART TO INITIAL
3547 0020 KSTART /ROUTINE ADDRESS
3550 3553 P3T0 JMS I, +1 /START PROGRAM
3551 5752 SRSET
3552 0232 0
3553 0000 P3T1 JMS I, UBRF3 /DATA: ABC
3554 3560 A
3555 4461 JMS I, UCNTST
3556 1710 1
3557 4505 P3T2 JMS I, UBRF3 /DATA: DEF
3560 0001 U
3561 3565 JMS I, UCNTST
3562 4461 2
3563 1715 P3T3 JMS I, UBRF3 /DATA: GHI
3564 4505 G
3565 0002 JMS I, UCNTST
3566 3572 3
3567 4461 P3T4 JMS I, UBRF3 /DATA: JKL
3570 1710 J
3571 4505 JMS I, UCNTST
3572 0003 4
3573 3577 P3T5 JMS I, UBRF3 /DATA: MNO
3574 4461 M
3575 1721 JMS I, UCNTST
3576 4505 5
3577 0004 P3T6 JMS I, UBRF3 /DATA: PQR
3600 3604 6
3601 4461 JMS I, UCNTST
3602 1724 7
3603 4505 P3T7 JMS I, UBRF3 /DATA: STU
3604 0005 8
3605 3611 JMS I, UCNTST
3606 4461 9
3607 1727 0
3610 4505 P3T8 JMS I, UBRF3 /DATA: STU
3611 0000 1
3612 3610 JMS I, UCNTST
3613 4461 2
3614 1734 3
3615 4505 4

```

6/26/68 14147,13

```
3616 0007
3617 3623
3620 4461
3621 1735
3622 4505
3623 0010
3624 3630
3625 4461
3626 1740
3627 4505
3630 0011
3631 3635
3632 4461
3633 1745
3634 4505
3635 0012
3636 3642
3637 4461
3640 1746
3641 4505
3642 0013
3643 3647
3644 4461
3645 1751
3646 4505
3647 0014
3650 3654
3651 4461
3652 1754
3653 4505
3654 0015
3655 3661
3656 4461
3657 1757
3660 4505
3661 0016
3662 3666
3663 4461
3664 1762
3665 4505
3666 0017
3667 4000
3670 4461
3671 1765
3672 4505

P3T7, / P3T10
JMS I UFBF3 /DATA: VMX
V
JMS I UCNTST
10
P3T11,
JMS I UFBF3 /DATA: YZ0
Y
JMS I UCNTST
11
P3T12,
JMS I UFBF3 /DATA: 123
ONE
JMS I UCNTST
12
P3T13,
JMS I UFBF3 /DATA: 456
FOUR
JMS I UCNTST
13
P3T14,
JMS I UFBF3 /DATA: 789
SEVEN
JMS I UCNTST
14
P3T15,
JMS I UFBF3 /DATA: !"#
G241
JMS I UCNTST
15
P3T16,
JMS I UFBF3 /DATA: $%&
G244
JMS I UCNTST
16
P3T17,
JMS I UFBF3 /DATA: '()
G247
JMS I UCNTST
17
P3T18,
JMS I UFBF3 /DATA: *+
G252
JMS I UCNTST
```

```

4000 4000 4000
4001 4001 4001
4002 4461 4461
4003 1770 1770
4004 4505 4505

4005 0021 0021
4006 4012 4012
4007 4461 4461
4010 1775 1775
4011 4505 4505
4012 0022 0022
4013 4017 4017
4014 4461 4461
4015 1776 1776
4016 4505 4505
4017 0023 0023
4020 4024 4024
4021 4461 4461
4022 2001 2001
4023 4505 4505
4024 0024 0024
4025 4031 4031
4026 4461 4461
4027 2004 2004
4030 4505 4505
4031 0025 0025
4032 4035 4035
4033 4462 4462
4034 4505 4505
4035 0026 0026
4036 4041 4041
4037 4464 4464
4040 4505 4505
4041 0027 0027
4042 4045 4045
4043 4466 4466
4044 4505 4505
4045 0030 0030
4046 4051 4051
4047 4467 4467
4050 4505 4505
4051 0031 0031
4052 4055 4055
4053 4471 4471
4054 4505 4505

* 17/+1
P3T20, 20
P3T21
JMS I UFBF3 /DATA: =,/
C222
JMS I UCNTST

P3T21, 21
P3T22
JMS I UFBF3 /DATA: !;<
C2/2
JMS I UCNTST

P3T22, 22
P3T23
JMS I UFBF3 /DATA: ==?
C2/3
JMS I UCNTST

P3T23, 23
P3T24
JMS I UFBF3 /DATA: @L\
C300
JMS I UCNTST

P3T24, 24
P3T25
JMS I UFBF3 /DATA: J* AND LEFT ARROW
C335
JMS I UCNTST

P3T25, 25
P3T26
JMS I UFBALL /DATA: ALL PRINTABLE ASCII
JMS I UCNTST

P3T26, 26
P3T27
JMS I UFW334 /DATA: ASR33 PRINTER WORST CASE
JMS I UCNTST /PATTERN

P3T27, 27
P3T30
JMS I UFW335 /DATA: ASR33 PRINTER WORST CASE
JMS I UCNTST /PATTERN WITH INTERPERSED BLANKS

P3T30, 30
P3T31
JMS I UFW354 /DATA: ASR35 PRINTER WORST CASE
JMS I UCNTST /PATTERN

P3T31, 31
P3T32
JMS I UFW355 /DATA: ASR33 PRINTER WORST CASE
JMS I UCNTST /PATTERN WITH INTERPERSED BLANKS

```



```

4055 0032
4056 7777
4057 4446
4060 4177
4061 0377
4062 4446
4063 4200
4064 0000
4065 4455
4066 4177
4067 4201
4070 7672
4071 4455
4072 4177
4073 4511
4074 7670
4075 4505

4076 7200
4077 3025
4100 4457
4101 4463
4102 4456
4103 5302

4104 4463
4105 4457
4106 4452
4107 4456
4110 5306

4111 4446
4112 0002
4113 1144
4114 4446
4115 0130
4116 7400
4117 4455
4120 0021
4121 4175
4122 7776
4123 4455
4124 4175
4125 4177
4126 7402
4127 4507
4130 4500

P3T32, 32
      ///
      SETLOC
      BLOCK1
      377
      SETLOC
      BLOCK1+1
      0
      MOVE
      BLOCK1
      BLOCK1+2
      -106
      MOVE
      BLOCK1
      BLOCK2
      -110
      JMS I UCNST

/PROGRAM 4; PRINT LINES WITH DATA IN PTEMP AND PTEMP1, NO DELAY,
PRG4,
      CLA DELAYM
      JMS I USTBF
      JMS I UFTMP
      JMS I UTYPE
      JMP -1
      /0 TO DELAYM
      /FILL BUFFER WITH DATA
      /TYPE LINE
      /REPEAT

/PROGRAM 5; PRINT LINES WITH DATA IN PTEMP AND PTEMP1, FIXED RANDOM DELAY
PRG5,
      JMS I UFTMP
      JMS I USTBF
      JMS I DLYCNT
      JMS I UTYPE
      JMP -2
      /FILL BUFFER WITH DATA,
      /GENERATE DELAY COUNT,
      /TYPE LINE
      /REPEAT
      /PUNCH AND READ CHECK DATA BLOCKS
      /WITH DATA IN PTEMP AND PTEMP1, NO DELAY
      /SET INTERRUPT SERVICE
      /ADDRESS TO INTSVC
      2
      SETLOC
      INTSVC
      SETLOC
      BLKCNT
      -400
      MOVE
      PTEMP
      BLOCKA
      -2
      MOVE
      BLOCKA
      BLOCKA+2
      -376
      JMS I USTST
      JMS I UPLK

/GO TO SPECIAL TEST SEQUENCE
/CLSE THIS CALL.

```

/PROGRAM 7, PUNCH AND READ CHECK DATA BLOCKS WITH DATA
/IN PTEMP AND PTEMP1, RANDOM STALLS BETWEEN CHARS PUNCHED
PRG7, SETLOC

4131 4446
4132 0002
4133 1144
4134 4446
4135 0130
4136 7400
4137 4455
4140 0021
4141 4175
4142 7776
4143 4455
4144 4175
4145 4177
4146 7402
4147 4507
4150 4501

2
INTSVC
SETLOC
BLKCNT
-400
MOVE
PTEMP
BLOCKA
-2
MOVE
BLOCKA
BLOCKA+2
-576
JMS I USTST
JMS I UPBLKR
/GO TO SPECIAL TEST SEQUENCE
/USE THIS CALL,
/ADDRESS TO INTSVC
/SET BLOCK LENGTH TO
/-256
/FILL BUFFER WITH DATA IN
/PTEMP AND PTEMP1

/PROGRAM 10, PUNCH AND READ CHECK BLOCKS OF BINARY
/COUNT PATTERN, RANDOM STALLS BETWEEN CHARACTERS PUNCHED
PRG10, SETLOC

4151 4446
4152 0002
4153 1144
4154 4446
4155 0130
4156 7400
4157 4446
4160 0115
4161 4175
4162 4446
4163 0121
4164 7400
4165 4511
4166 4512
4167 3515
4170 2115
4171 2121
4172 5366
4173 4507
4174 4501

2
INTSVC
SETLOC
BLKCNT
-400
SETLOC
TEMPU
BLOCKA
SETLOC
CTRA
-400
JMS I INPATT
JMS I GETPT
UCA I TEMP
ISE TEMP
ISE CTRA
JMP PRG10A
JMS I USTST
JMS I UPBLKR
/GO TO SPECIAL TEST SEQUENCE
/USE THIS CALL
/ADDRESS TO INTSVC
/SET BLOCK LENGTH TO
/-256
/FILL BUFFER WITH BINARY
/COUNT PATTERN
/GO TO SPECIAL TEST SEQUENCE
/USE THIS CALL

PRG10A,

6/26/68 1 47.20

4175 0212	/	BLOCKA, 212	/CR
4176 0212		212	/LF
4177 0000		BLOCK1, 0	
4307 0212		*BLOCK1+110	
4310 0212		BLOCKB, 212	/CR
4311 0000		212	/LF
4421 0212		BLOCK2, 0	
4422 0212		*BLOCK2+110	
4575 0000		BLOCKC, 212	/CR
5175		212	/LF
		*BLOCKA+400	
		DBLK, 0	
		*DBLK+400	

3

THERE ARE NO ERRORS

