

#### IDENTIFICATION

Product Code: Maindec-08-D2QD-D  
Product Name: Family of 8 ASR33/35  
Teletype Tests, Part 2  
Date Created: June 4, 1968  
Maintainer: Diagnostics Group

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.



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.

B. Keller

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/FAMILY-OF-8 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. STALL
/      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
/SR5=1-HALT ON ERROR, BAD CHARACTER IN AC.
/SR5=0- HALT AT END OF DATA BLOCK, ERROR COUNT IN AC
/SR6 TO SR11 = ROUTINE NUMBER TO BE SELECTED.
```

## /ASR33/33 TELETYPE TESTS - PART 2

0000	0000	*0	0000
0001	0001		0001
0002	0002		0
0003	0003		0
	0005	*5	0005
0005	0005		0005
0006	0006		0
	0020	*20	0020
0020	0020		KSTAR1, 0
0021	0021		PTEMP, 0
0022	0022		PTEMP1, 0
0023	0023		DELAYM, 0
0024	0024		DELAYS, 0
0025	0025		PRGNUM, 0
0026	0017		PRGMSK, 17
0027	7770		PRGLIM, -10
0030	0161		PSW, PKSTAB
0031	0000		CPID, 0
0032	7444		KPB, -004
0033	7764		KPBS, -14
0034	0000		RTVNO, 0
0035	0000		CURTST, 0
0036	0000		NXTST, 0
0037	0077		TSTMSK, 77
0040	0000		MSCTR, 0
0041	0000		MILCTR, 0
0042	0000		MIL1, 0
0043	0330		OLYIMS, OLYMS
0044	0257		CHAIN, CHAINN
0045	0310		SHLT, SHALT
0046	0322		SETCTR, STCTR
0047	0400		RANUNO, RANGEN
0050	0444		XTYPSI, TYPSTG
0051	1240		URNDY, RRNDY
0052	0350		OLYCNT, OLUNT
0053	0360		UCKLF, CKLFB
0054	0520		UPUNCH, PUNCH
0055	0542		UMOVE, MOVVE
0056	1030		UTYPE, TYPE
0057	0621		USTBF, STBF
0060	1010		UTPLNS, TYPLNS
0061	0637		UFBF3, FBF3
0062	0661		UFBALL, FBALL
0063	0077		UFBTMP, FBTMP
0064	0710		UFW334, FWS34



0065	0733	UFW330, FW330
0066	0751	UFW335, FW335
0067	1000	UFW334, FW334
0070	1010	UFW336, FW336
0071	1034	UFW335, FW335
0072	1067	UPLTLR, PLTLR
0073	1102	URSYNC, RSYNC
0074	1100	URSYNC, RSYNC
0075	1400	UOLMSK, OLMSK
0076	1417	UJCNTP, JCNTP
0077	1161	UOUT, OUT
0100	1217	UPBLK, PBLK
0101	1220	UPBLKR, PBLKR
0102	1270	URDBLK, RDBLK
0103	1277	URBLKR, RUBLKR
0104	1443	UNTST, NTST
0105	1500	UCNTST, CNTST
0106	1600	UASCCN, ASCCN
0107	1401	USTST, STST
0110	1052	CHECK, CHCK
0111	0000	INPATT, INITPT
0112	0007	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	SRDMSK, 100
0124	0000	ERRCR, 0
0125	0020	ERRCTR, 0
0126	0077	DLYMSK, 77
0127	0000	PFLAG, 0
0130	0000	BLKCNT, 0
0131	0210	CR, 210
0132	0210	LF, 210
0133	7401	MRBOUT, -37
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	7777	M1,	-1
0143	7770	M2,	-2
0144	7762	M10,	-10
0145	7734	M44,	-44
0146	7670	M110,	-110
0147	7667	M111,	-111
0150	0000	TEMP,	0
0151	0000	TEMP,	0
0152	0000	FLAG,	0
0153	0077	K77,	77
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	3537		PRG3
0165	4070		PRG4
0166	4104		PRG5
0167	4111		PRG0
0170	4131		PRG7
0171	4151		PRG10
	4440	SETLOC=JMS I SETCTR	
	4455	MOVE=JMS I UMOVE	
	4443	DELAY=JMS I OLYIMS	

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0177 0177 7482 *177 HLT /INCORRECT PROGRAM NUMBER HALT,
0200 7604 START, LAS /READ SR
0201 0020 AND PRGMSK
0202 1027 TAU PRGLIM
0203 7540 SMA SZA /VALID PROGRAM NUMBER?
0204 5177 JMP 177 /NO, GO TO LOC 177
0205 7604 LAS /READ SR
0206 0020 AND PRGMSK
0207 3020 UCA PRGNUM /SAVE PROGRAM NUMBER
0210 1020 TAU PRGNUM /DEVELOP PROGRAM
0211 1030 TAU PSW /START ADDRESS AND
0212 3110 UCA TEMP
0213 1510 TAU I TEMP
0214 3231 UCA PRGADR
0215 7350 ID, CLA CLL CMA RAR /DETERMINE CPU ID,
0216 7710 SPA CLA /IS IT PDP8/8I?
0217 5222 JMP .+3 /NO, IT IS A PDP8/S,
0220 1032 TAU KP8 /YES, IT IS PDP8/8I
0221 7410 SKP
0222 1030 TAU KP8S
0223 3042 UCA MIL1 /SET DELAY CONSTANT
0224 4450 JMS I UMOVE
0225 0000 >
0226 0001 1
0227 7770 -2
0230 5631 JMP I ,+1 /GO TO SELECTED PROGRAM,
0231 0000 PRGADR, 0
0232 7602 SRSET, HLT CLA
0233 7200 GETRDY, CLA
0234 1020 TAU KSTART /GET ADDRESS OF 1ST ROUTINE
0235 3030 UCA NXTST /STORE AT NXTST
0236 4270 JMS FORWD
0237 7604 LAS /READ SR
0240 7004 RAL
0241 7500 SMA /ROUTINE SELECT?
0242 5430 JMP I CURTST /NO, START WITH CURRENT ROUTINE,
0243 7604 LAS /YES, READ SR
0244 0037 AND TSTMSK /GET ROUTINE NUMBER,
0245 7041 CIA /2'S COMPLEMENT IT,
0246 1034 TAU RTNNO /ADD CURRENT ROUTINE NUMBER,
0247 7650 SNA CLA /IS IT THIS ROUTINE?
0250 5430 JMP I CURTST /YES, GO DO IT,
0251 1030 TAU NXTST /NO, IS THIS THE LAST ROUTINE?
0252 7001 IAU
0253 7640 SZA CLA
0254 5230 INCRTN, JMP GETRDY+3 /NO,
0255 7402 HLT /YES, INCORRECT ROUTINE NUMBER
0256 5230 JMP GETRDY

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0257	4313	CHAINN,	JMS SHALT	/HALT? (SR0) GO CHECK.
0260	7004		LAS	/READ SR
0261	7006		RTL	
0262	703L		SZL CLA	/ROUTINE SELECT?(SR1)
0263	0233		JMP GETRUY	/YES,
0264	1030		TAU NXTST	
0265	7001		TAU	
0266	704K		SZA CLA	/LAST ROUTINE?
0267	0230		JMP GETRUY+3	/NO, SET UP TO DO NEXT ROUTINE
0270	7004		LAS	
0271	7000		RTL	
0272	7710		SMA CLA	/LOOP PROGRAM? (SR2)
0273	0233		JMP GETRUY	/YES, GO REPEAT PROGRAM,
0274	7402	PRGEND,	HLT	/PROGRAM END HALT
0275	0257		JMP CHAINN	/GO CHECK FOR OPTIONS AGAIN.
0276	0000	FORWD,	0	
0277	7300		CLA CLL	
0300	1430		TAU I NXTST	/GET AND STORE NEXT ROUTINE
0301	3034		UCA RTNNO	/NUMBER,
0302	2030		ISE NXTST	
0303	1430		TAU NXTST	/SET CURRENT
0304	3113		UCA TEMP	/ROUTINE NUMBER
0305	2030		ISE NXTST	
0306	1030		TAU NXTST	/SET CURRENT
0307	3030		UCA CURTST	/ROUTINE ADDRESS,
0310	1513		TAU I TEMP	/SET NEXT
0311	3030		UCA NXTST	/ROUTINE ADDRESS,
0312	0670		JMP I FORWD	/EXIT,
0313	0000	SHALT,	0	
0314	7004		LAS	/READ SR,
0315	7700		SMA CLA	/HALT? (SR0)
0316	0713		JMP I SHALT	/NO, EXIT
0317	1034		TAU RTNNO	/GET CURRENT RTN NUMBER
0320	7402		HLT	/UNCONDITIONAL HALT,
0321	0713		JMP I SHALT	/EXIT,

0322	0000	STCTR,	0	
0323	7200		CLA	
0324	1720		IAD I STCTR	/GET CTR ADDRESS
0325	3110		UCA TEMP	/STORE AT TEMP.
0326	2320		ISE STCTR	
0327	1720		IAD I STCTR	/GET COUNT AND STORE
0330	3010		UCA I TEMP	/PER C(TEMP)
0331	2320		ISE STCTR	
0332	5720		JMP I STCTR	/EXIT.
0333	0000	OLYMS,	0	
0334	7300		CLA CLL	
0335	1020		IAD DELAYM	/GET MILLISECOND COUNT
0336	3040		UCA MSCTR	/STORE AT MSCTR
0337	5740		JMP I ,+1	
0340	0341		,+1	
0341	1042		IAD MILI	/GET 1MS CONSTANT
0342	3041		UCA MILCTR	/STORE IN MILCTR
0343	2041		ISE MILCTR	/DELAYED 1 MILLISECOND?
0344	5340		JMP , -1	/NO,
0345	2040		ISE MSCTR	/YES, DONE DELAYING?
0346	5330		JMP , -7	/NO, GO DELAY ANOTHER MILSEC.
0347	5730		JMP I OLYMS	/EXIT.
0350	0000	OLCNT,	0	
0351	4440		JMS I RANDNO	/GENERATE RANDOM NUMBER
0352	0120		ANJ OLYMSK	/MASK OUT UNDESIRED BITS
0353	7450		SNA	/RESULT ZERO?
0354	5351		JMP OLCNT+1	/YES, GET ANOTHER NUMBER
0355	7041		CMA IAC	/NO, 2'S COMPLEMENT IT
0356	3020		UCA DELAYM	/STORE AT DELAYM
0357	5750		JMP I OLCNT	/EXIT
0360	0000	CRLF,	0	
0361	7200		CLA	
0362	1760		IAD I CRLF	
0363	3370		UCA CRCTR	
0364	2360		ISE CRLF	
0365	4450		JMS I XTYPST	
0366	0372		,+4	
0367	2370		ISE CRCTR	
0370	5360		JMP , -3	
0371	5760		JMP I CRLF	
0372	0010		0010	
0373	0012		0012	
0374	0001		0001	
0375	0000	CRCTR,	0	

```

0400 0000
0401 7220
0402 1242
0403 1227
0404 7646
0405 0210
0406 1231
0407 3227
0410 1230
0411 7184
0412 7430
0413 7001
0414 3230
0415 1230
0416 1627
0417 3627
0420 1243
0421 7010
0422 1627
0423 2227
0424 3243
0425 1243
0426 5600
0427 0442
0430 6043
0431 0432
0432 6043
0433 3210
0434 0760
0435 5432
0436 2107
0437 7654
0440 4321
0441 1070
0442 7330
0443 0000

```

```

* 17/*1
/RANDOM NUMBER GENERATOR SUBROUTINE
RANGEN, 0
    CLR
    TAU RANTND
    TAU RANDEX
    SEA CLA
    JMP RANTAD
    TAU RANTBL
    UCA RANDEX
    TAU RANCON
    CLL RAL
    SEL
    TAU
    UCA RANCON
RANTAU, TAU RANCON
    TAU I RANDEX
    UCA I RANDEX
    TAU RANSAY
    KAR
    TAU I RANDEX
    ISZ RANDEX
    UCA RANSAY
    TAU RANSAY
    JMP I RANGEN
RANDEX, RANTND
RANCON, 0043
RANTBL, ,+1
    0043
    3210
    0760
    0432
    2107
    7654
    4321
    1070
RANTND, -
RANSAY, 0

```

```

/TYPE CHARACTER STRING SUBROUTINE
TYPSTG, 0
      CLA
      TAU I TYPSTG      /GET AND STORE
      DCA TEMQ          /INITIAL ADDRESS
      DCA FLAG          /CLEAR FLAG.
      ISZ TYPSTG        /SET UP EXIT
TSC1,  TAU I TEMQ      /PICK UP DATA
      RTR
      RTR
      RTR
      JMS TSC2          /GO TYPE 1ST CHARACTER
      TAU I TEMQ        /PICK UP DATE
      JMS TSC2          /GO TYPE 2ND CHARACTER
      ISZ TEMQ          /EVEN STRING ADDRESS
      JMP TSC1          /GO BACK FOR MORE
TSC2,  0
      AND K77          /MASK OFF 6 BITS
      DCA TEMR          /SAVE CHARACTER
      TAU FLAG          /TEST "SPECIAL" FLAG,
      SEA CLA
      JMP TYPSP        /SET TYPE SPECIAL
      TAU TEMR          /NO, REGULAR CHARACTER
      SNA
      JMP ,+3          /ZERO?
      JMP ,+3          /YES, SET FLAG,
TYPAT, JMS PRINT      /NO, PRINT IT.
      JMP I TSC2        /RETURN,
      ISZ FLAG          /SET "SPECIAL" FLAG,
      JMP I TSC2        /EXIT
TYPSP, DCA FLAG        /CLEAR FLAG,
      TAU TEMR          /TEST FOR 0,
      CLA
      SNA
      JMP TYPAT        /0:TYPE "@"
      IAC
      /TEST FOR 01
      SNA CLA
      JMP I TYPSTG     /YES, EXIT CODE,
      TAU SKIPMA       /ALTER INSTRUCTION
      DCA SWITCH       /TO BE "SMA"
      TAU TEMR         /TYPE CHAR
      JMS PRINT
      TAU SKIPPA       /ALTER INSTRUCTION
      DCA SWITCH       /TO BE "SPA"
      JMP I TSC2        /RETURN
PRINT, 0
      TAU M40          /COMPARE WITH 40
      SWITCH, SPA      /OR SMA FOR SPECIAL CODES,
      TAU C100
      TAU C240
      JMS I UPUNCH     /GO PRINT CHARACTER
      JMP I PRINT      /RETURN

```

```

2444 0020
2445 7220
2446 1047
2447 3150
2452 3152
2451 2244
2452 1950
2453 7012
2454 7012
2455 7012
2456 4200
2457 1950
2460 4200
2461 2150
2462 5252
2463 0020
2464 0150
2465 3151
2466 1152
2467 7040
2470 5300
2471 1151
2472 7450
2473 5270
2474 4317
2475 5060
2476 2152
2477 5060
2500 3152
2501 1151
2502 7041
2503 7450
2504 5274
2505 7001
2506 7050
2507 5044
2510 1157
2511 3321
2512 1151
2513 4317
2514 1160
2515 3321
2516 5060
2517 0020
2520 1154
2521 7010
2522 1150
2523 1150
2524 4454
2525 5717

```

0526	0000	PUNCH,	0		
0527	2127		ISZ PFLAG	/SET PFLAG	
0530	6040		ILS	/PUNCH/PRINT	
0531	7200		CLA		
0532	1127		IAU PFLAG	/GET C(PFLAG)	
0533	7650		SNA CLA	/FLAG RESET?	
0534	5337		JMP ,+3	/YES	
0535	6041		ISZ	/NO, FLAG UP?	
0536	5332		JMP ,+4	/NO,	
0537	6042		ICF	/YES, CLEAR PRINTER FLAG.	
0540	3127		JCA PFLAG	/CLEAR PFLAG	
0541	5720		JMP I PUNCH	/EXIT,	
0542	0000	MOVVE,	0		
0543	7200		CLA		
0544	1742		IAU I MOVVE	/GET AND STORE	
0545	3364		JCA FADDR	/"FROM" ADDRESS	
0546	2342		ISZ MOVVE		
0547	1742		IAU I MOVVE	/GET AND STORE	
0550	3360		JCA TADDR	/"TO" ADDRESS	
0551	2342		ISZ MOVVE		
0552	1742		IAU I MOVVE	/GET AND STORE	
0553	3360		JCA MCTR	/"MOVE" COUNT.	
0554	2342		ISZ MOVVE	/SET UP EXIT,	
0555	1764	MOVEA,	IAU I FADDR	/GET "FROM" WORD	
0556	3760		JCA I TADDR	/STORE AT "TO" LOCATION	
0557	2364		ISZ FADDR	/+1 TO FADDR	
0560	2360		ISZ TADDR	/+1 TO TADDR	
0561	2360		ISZ MCTR	/DONE MOVING?	
0562	5350		JMP MOVEA	/NO, REPEAT	
0563	5742		JMP I MOVVE	/YES, EXIT,	
0564	0000	FADDR,	0		
0565	0000	TADDR,	0		
0566	0000	MCTR,	0		



```

0600 0000
0601 7200
0602 3204
0603 5600
0604 0000
0605 0000
0606 2577

0607 0000
0610 7200
0611 1204
0612 3200
0613 1200
0614 7001
0615 0200
0616 3204
0617 1200
0620 0607

*. 17/+1
/INITIALIZE BINARY PATTERN SUBROUTINE
INITPT, 0
      CLA
      DCA PT0          /SET PT0=0
      JMP I INITPT    /EXIT,
PT0, 0
PT1, 0
PTMSK, 077
/SUBROUTINE TO SET AC TO NEXT BINARY PATTERN CHARACTER
GETPT1, 0
      CLA
      TAU PT0          /GET PT0
      DCA PT1          /STORE AT PT1
      TAU PT1          /GET PT1
      JAC              /+1 TO AC
      AND PTMSK        /LIMIT TO 8 BITS
      DCA PT0          /STORE AT PT0
      TAU PT1          /GET PT1
      JMP I GETPTT    /EXIT

/SET BUFFER AREA SUBROUTINE
STBF, 0
      JMS I UMOVE     /MOVE CRLF TO BLOCKA
      CR
      BLOCKA
      -2
      JMS I UMOVE     /MOVE CRLF TO BLOCKB
      CR
      BLOCKB
      -2
      JMS I UMOVE     /MOVE CRLF TO BLOCKC
      CR
      BLOCKC
      -2
      JMP I STBF      /EXIT,
0621 0000
0622 4450
0623 0131
0624 4170
0625 7770
0626 4450
0627 0131
0630 4307
0631 7770
0632 4450
0633 0131
0634 4421
0635 7770
0636 0621

```

0637	0200	FBF3,	0	
0640	7200		CL=	/FILL 144 CHARACTER BUFFER
0641	1037		TAB I FBF3	/WITH 3 CHARACTERS WHOSE
0642	0240		JCR I+3	/ADDRESS IS SPECIFIED
0643	2237		ISE FBF3	/AT CALL+1
0644	4450		JMS I UMOVE	
0645	0000		0	
0646	4177		BLUCK1	
0647	7770		-3	
0650	4450		JMS I UMOVE	
0651	4177		BLUCK1	
0652	4202		BLUCK1+3	
0653	7673		-100	
0654	4450		JMS I UMOVE	
0655	4177		BLUCK1	
0656	4311		BLUCK2	
0657	7670		-110	
0660	5637		JMP I FBF3	/EXIT
0661	0000	FBALL,	0	
0662	4450		JMS I UMOVE	/FILL 144 CHARACTER BUFFER
0663	1710		A	/WITH ALL PRINTABLE ASCII
0664	4177		BLUCK1	/CHARACTERS,
0665	7701		-77	
0666	4450		JMS I UMOVE	
0667	1710		A	
0670	4270		BLUCK1+77	
0671	7767		-11	
0672	4450		JMS I UMOVE	
0673	4177		BLUCK1	
0674	4311		BLUCK2	
0675	7670		-110	
0676	5661		JMP I FBALL	/EXIT
0677	0000	FBTMP,	0	
0700	4450		JMS I UMOVE	/FILL 144 CHARACTER BUFFER
0701	0021		PTEMP	/WITH DATA IN PTEMP
0702	4177		BLUCK1	/AND PTEMP1,
0703	7770		-2	
0704	4450		JMS I UMOVE	
0705	4177		BLUCK1	
0706	4201		BLUCK1+2	
0707	7672		-100	
0710	4450		JMS I UMOVE	
0711	4177		BLUCK1	
0712	4311		BLUCK2	
0713	7670		-110	
0714	5677		JMP I FBTMP	/EXIT,

0715	0000	FW334,	0	
0716	445D		JMS I UMOVE	/MOVE 4 CHARACTER ASR33 PRINTER
0717	1044		ASSWP4	/WORST CASE PATTERN TO
0720	4177		BLOCK1	/BLOCK1
0721	777-		-4	
0722	445D		JMS I UMOVE	/FILL BLOCK1 WITH PATTERN
0723	4177		BLOCK1	
0724	4200		BLOCK1+4	
0725	707-		-104	
0726	445D		JMS I UMOVE	/FILL BLOCK2 WITH PATTERN
0727	4177		BLOCK1	
0730	4311		BLOCK2	
0731	7070		-110	
0732	571D		JMP I FW334	/EXIT
0733	0000	FW336,	0	
0734	445D		JMS I UMOVE	/MOVE 6 CHARACTER ASR33 PRINTER
0735	1054		ASSWP6	/WORST CASE PATTERN TO
0736	4177		BLOCK1	/BLOCK1
0737	7772		-0	
0740	445D		JMS I UMOVE	/FILL BLOCKS WITH PATTERN
0741	4177		BLOCK1	
0742	420D		BLOCK1+0	
0743	7070		-102	
0744	445D		MOVE	/FILL BLOCK2 WITH PATTERN.
0745	4177		BLOCK1	
0746	4311		BLOCK2	
0747	7070		-110	
0750	5730		JMP I FW336	/EXIT
0751	0000	FW33S,	0	
0752	445D		JMS I UMOVE	/MOVE 8 CHARACTER ASR33 PRINTER
0753	1050		ASSWPS	/WORST CASE PATTERN WITH
0754	4177		BLOCK1	/INTERSPERSED BLANKS TO BLOCK1.
0755	7770		-10	
0756	445D		JMS I UMOVE	/FILL BLOCK1 WITH PATTERN
0757	4177		BLOCK1	
0760	4207		BLOCK1+10	
0761	7700		-100	
0762	445D		JMS I UMOVE	/FILL BLOCK2 WITH PATTERN
0763	4177		BLOCK1	
0764	4311		BLOCK2	
0765	7070		-110	
0766	5751		JMP I FW33S	/EXIT

```

      1000 1000
1000 0000
1001 4455
1002 1666
1003 4177
1004 7774
1005 4455
1006 4177
1007 4203
1010 7674
1011 4455
1012 4177
1013 4311
1014 7670
1015 5600
1016 0000
1017 4455
1020 1672
1021 4177
1022 7772
1023 4455
1024 4177
1025 4205
1026 7676
1027 4455
1030 4177
1031 4311
1032 7670
1033 5616
1034 0000
1035 4455
1036 1700
1037 4177
1040 7770
1041 4455
1042 4177
1043 4207
1044 7700
1045 4455
1046 4177
1047 4311
1050 7670
1051 5634

```

```

* 177+1
FW354, 2
      JMS I UMOVE /MOVE 4 CHARACTER ASR35 PRINTER
      ASDWP4 /WORST CASE PATTERN TO BLOCK1.
      BLOCK1
      -4
      JMS I UMOVE /FILL BLOCK1 WITH PATTERN
      BLOCK1
      BLOCK1+4
      -104
      JMS I UMOVE /FILL BLOCK2 WITH PATTERN
      BLOCK1
      BLOCK2
      -110
      JMP I FW354 /EXIT
FW356, 0
      JMS I UMOVE /MOVE 6 CHARACTER ASR35 PRINTER
      ASDWP6 /WORST CASE PATTERN TO BLOCK1
      BLOCK1
      -6
      JMS I UMOVE /FILL BLOCK1 WITH PATTERN
      BLOCK1
      BLOCK1+6
      -102
      JMS I UMOVE /FILL BLOCK2 WITH PATTERN
      BLOCK1
      BLOCK2
      -110
      JMP I FW356 /EXIT
FW358, 0
      JMS I UMOVE /MOVE 8 CHARACTER ASR35 PRINTER
      ASDWP8 /WORST CASE PATTERN TO BLOCK1
      BLOCK1
      -10
      JMS I UMOVE /FILL BLOCK1 WITH PATTERN
      BLOCK1
      BLOCK1+10
      -120
      JMS I UMOVE /FILL BLOCK2 WITH PATTERN
      BLOCK1
      BLOCK2
      -110
      JMP I FW358 /EXIT

```

```

/SUBROUTINE TO COMPARE C(AC) TO C(CALL+1)
CHK, 0
1052 0000      OCA WCHK      /STORE AC AT WCHK
1053 3260      TAU I CHK      /SET COMPARE DATA
1054 1652      OJA          /2'S COMPLEMENT IT
1055 7041      TAU WCHK      /ADD C(WCHK)
1056 1260      ISZ CHK      /SET UP FOR UNEQUAL EXIT
1057 2252      SZA CLA      /EQUAL?
1060 7640      JMP ,+3      /NO.
1061 2264      ISZ CHK      /YES, SET UP FOR EQUAL EXIT.
1062 2252      JMP I CHK      /EQUAL EXIT
1063 5652      TAU WCHK      /RESTORE AC
1064 1260      JMP I CHK      /UNEQUAL EXIT.
1065 5652
1066 0000      WCHK, 0

/PUNCH /0 (CODE 376) CHARACTER SUBROUTINE
PLTLR, 0
1067 0000      JMS I SETCTR    /SET P70CTR TO -70
1070 4440      P70CTR
1071 1100      -106
1072 7672      TAU LDCUE      /GET 376 CODE
1073 1301      JMS I UPUNCH    /GO PUNCH IT
1074 4454      ISZ P70CTR      /ALL CHARACTERS PUNCHED?
1075 2300      JMP , -3      /NO, REPEAT,
1076 5273      JMP I PLTLR     /YES, EXIT.
1077 5667
1100 0000      P70CTR, 0
1101 0376      LDCUE, 376

/PUNCH SYNC CHARACTER SUBROUTINE (RUBOUT)
PSYNC, 0
1102 0000      CLA CMA      /SET AC TO 777/
1103 7240      JMS I UPUNCH    /PUNCH A RUBOUT
1104 4454      JMP I PSYNC     /EXIT.
1105 5702

/SYNC READER SUBROUTINE
RSYNC, 0
1106 0000      JMS I SETCTR    /SET RSCTR TO -145
1107 4440      RSCTR
1110 1122      -221
1111 7557      JMS I UHRDY     /WAIT FOR READER NOT BUSY
1112 4451      CLA CMA      /READER NOT BUSY,
1113 7240      OCA RBUSY     /SET READER BUSY INDICATOR
1114 3134      JMS I SETCTR    /SET READER INTERRUPT
1115 4440      VCTR          /SERVICE RETURN ADDRESS,
1116 1157      RSSERV
1117 1123      ION          /ENABLE INTERRUPT
1120 6001      JMP I RSYNC     /EXIT
1121 5700
1122 0000      RSCTR, 0

```

1123	6030	RSSERV, RRB	/READ
1124	1130	TAU MRBOUT	/ADD MINUS RUBOUT
1125	7040	SEA CLA	/IS IT A RUBOUT?
1126	5330	JMP ,+1 /NO.	
1127	3134	DCA RBUSY	/YES, CLEAR READER BUSY.
1130	7300	CLA CLL	
1131	1130	TAU LINK	
1132	7004	RAL	/RESTORE LINK
1133	1130	TAU AC	/RESTORE AC
1134	5400	JMP I 0	/RETURN
1135	2322	ISE RSCTR	/14X CHARACTER READY?
1136	5471	JMP I 00UT	/NO.
1137	7602	HLT CLA	/YES, NO SYNC.
1140	4440	JMS I SETCTR	/SET RSCTR TO -140
1141	1122	RSCTR	
1142	7551	T221	
1143	5471	JMP I 00UT	/RETURN
1144	3130	INTSVC, DCA AC	/SAVE AC
1145	7010	RAR	
1146	3130	DCA LINK	/SAVE LINK
1147	6041	ISF	/PUNCH/PRINTER?
1150	5354	JMP ,+4	/NO.
1151	6042	ICF	/YES, CLEAR FLAG.
1152	3121	DCA PFLAG	/CLEAR PFLAG
1153	5361	JMP OUT	/RETURN
1154	6031	RSP	/READER/KYBD?
1155	5360	JMP ,+3	/NO ERROR.
1156	5751	JMP I ,+1	/GO SERVICE READER
1157	0000	VCTR, 0	
1160	7402	HLT	/UNEXPECTED INTERRUPT
1161	7300	OUT, CLA CLL	
1162	1130	TAU LINK	
1163	7004	RAL	/RESTORE LINK
1164	1130	TAU AC	/RESTORE AC.
1165	6001	IUN	/ENABLE INTERRUPT
1166	5400	JMP I 0	/RETURN

```

1200 1200
1201 0000
1202 4440
1203 1240
1204 4170
1205 4450
1206 0130
1207 1244
1208 7777
1209 0600

1211 0000
1212 7200
1213 1640
1214 2240
1215 4454
1216 0611

1217 0000
1220 4200
1221 4211
1222 2244
1223 5221
1224 0617

1225 0000
1226 4200
1227 4476
1230 4440
1231 1240
1232 4570
1233 1640
1234 3020
1235 2240
1236 4440
1237 4211
1240 2244
1241 5230
1242 0620
1243 0000
1244 0000
1245 0000

* , 17/+1
PSTUP, 0 /PUNCH SETUP
          SETLOC /SET DATA ADDR
          PADUR
          BLOCKA
          MOVE /SET BLOCK LENGTH
          BLAUNT
          PCTR
          -1
          JMP I PSTUP /EXIT

/
PCCR, 0 /PUNCH DATA CHAR SUB,
          CLA
          TAU I PADUR /GET DATA
          ISZ PADUR /UPDATE PADUR,
          JMS I UPUNCH /GO PUNCH/PRINT DATA
          JMP I PCCR /EXIT

/
PBLK, 0 /PUNCH DATA BLOCK FULL SPEED
          JMS PSTUP
          JMS PCCR /GO PUNCH CHARACTER
          ISZ PCTR /ALL CHARS PUNCHED?
          JMP ,=2 /NO, REPEAT
          JMP I PBLK /YES, EXIT

/
PBLKR, 0 /PUNCH DATA BLOCK RANDOM STALLS,
          JMS PSTUP /GO DO SET UP
          JMS I UDCNTP /FILL DELAY BLOCK
          SETLOC /DBLK ADDRESS TO DAP
          DAP
          UBLK
          TAU I DAP /GET DELAY WORD
          UCA DELAYM /TO DELAYM
          ISZ DAP /UPDATE DAP,
          DELAY /DELAY,
          JMS PCCR /GO PUNCH CHARACTER
          ISZ PCTR /ALL CHARS PUNCHED?
          JMP ,=6 /NO, REPEAT
          JMP I PBLKR /YES, EXIT.

DAP, 0
PCTR, 0
PADUR, 0

```

1246	2020	RRDY,	0	/WAIT FOR RDR NOT BUSY SUB.
1247	7220		CLA	
1250	1134		TAU RBUSY	/FETCH RBUSY.
1251	7040		SZA CLA	/READER BUSY?
1252	0200		JMP ,=2	/YES, TRY AGAIN
1253	0040		JMP I RRDY	/NO,EXIT
1254	0000	RSTUP,	0	
1255	4240		JMS RRDY	/WAIT FOR RDR NOT BUSY
1256	2134		ISE RBUSY	/SET RBUSY INDICATOR
1257	4440		SETLOC	/SET DATA ADDR
1260	1312		RADDR	
1261	4170		BLCKA	
1262	4450		MOVE	/SET DATA BLOCK LENGTH
1263	0130		BLKCNT	
1264	1310		RBCTR	
1265	7777		-1	
1266	3120		UCA ERRCTR	/CLEAR ERROR COUNTER
1267	5654		JMP I RSTUP	/EXIT,
1270	0000	RDBLK,	0	/READ DATA BLOCK, FULL SPEED
1271	4254		JMS RSTUP	/GO DO SETUP
1272	4440		SETLOC	/SET READER SERVICE
1273	1157		VCTR	/ADDRESS,
1274	1321		RDSRV	
1275	6001		ION	/ENABLE INT.
1276	5670		JMP I RDBLK	
1277	0000	RDBLKR,	0	/READ DATA BLOCK,RANDOM STALLS
1300	4254		JMS RSTUP	/GO DO SETUP,
1301	4440		SETLOC	/SET READER SERVICE
1302	1157		VCTR	/ADDRESS,
1303	1314		RDSRV	
1304	4440		SETLOC	/SET DELAY BLOCK ADDRESS,
1305	1311		JAR	
1306	4570		JBLK	
1307	6001		ION	/ENABLE INT.
1310	5677		JMP I RDBLKR	/EXIT
1311	0000	DAR,	0	
1312	0000	RADDR,	0	
1313	0000	RBCTR,	0	
1314	7220	/READER SERVICE ROUTINES		
1315	1711	RDRSRV,	CLA	
1316	3024		TAU I DAR	/MOVE DELAY WORD TO
1317	2311		UCA DELAYS	/DELAYS,
1320	4470		ISE DAR	/UPDATE DAR
1321	1714		JMS I UOLMSR	/STALL,
1322	3320	RDSRV,	TAU I RADDR	/GET EXPECTED CHARACTER
1323	2312		UCA SB	/STORE AT SB
1324	0030		ISE RADDR	/UPDATE RADDR
1325	4010		KRB	/READ CHARACTER
1326	0420		JMS I CHECK	/GO CHECK IT,
1327	0331	SB,	0	
1330	5347		JMP ERROR	/ERROR
			JMP RUJONE	/GOOD,



1331	3124	ERROR,	UCA ERROR	/STORE BAD CHARACTER
1332	2120		ISZ ERRCTR	/INCREMENT ERROR COUNTER
1333	5330		JMP I+3	
1334	7240		CLA CMA	/OFLOW, 7777 TO AC
1335	3120		UCA ERRCTR	/RESTORE TO 7777,
1336	7624		LAS	/READ SR
1337	2120		AND SR0MSK	
1340	7650		SNA CLA	/HALT ON ERROR?(SR5)
1341	5347		JMP RUDDNE	/NO.
1342	1124		TAU ERROR	/YES, GET BAD CHARACTER
1343	7422		HLT	/ERROR HALT. BAD CHAR IN AC
1344	7200		CLA	
1345	1320		TAU SB	
1346	7402		HLT	/GOOD CHAR IN AC
1347	2310	RUDDNE,	ISZ RBCTR	/ALL DONE?
1350	5477		JMP I UDUT	/NO, TO MAINLINE
1351	7200		CLA	/YES,
1352	1120		TAU ERRCTR	/GET C(ERRCTR)
1353	7650		SNA CLA	/ANY ERRORS?
1354	5357		JMP I+3	/NO,
1355	1120		TAU ERRCTR	/YES,
1356	7402		HLT	/NUMBER OF ERRORS IN AC,
1357	7320		CLA CLL	
1360	3134		UCA RBUSY	/CLEAR RBUSY INDICATOR
1361	1130		TAU LINK	
1362	7404		RAL	/RESTORE LINK
1363	1130		TAU AC	/TO MAINLINE
1364	5400		JMP I 0	

```

/
1400 1400 * 177+1
1401 2000 DLMSR, 0
1402 7500 CIA CLL
1403 1024 TAD DELAYS /GET AND STORE MSEC
1404 3210 DCA RCTRA /DELAY COUNT
1405 5600 JMP I ,+1
1406 1420 ,+1
1407 1042 TAD MILL /GET AND STORE
1408 3210 DCA RCTRB /1MS CONSTANT
1409 2210 ISZ RCTRB /DELAYED 1 MS?
1410 5210 JMP ,=1 /NO.
1411 2210 ISZ RCTRA /YES, DONE DELAYING?
1412 2204 JMP ,=/ /NO.
1413 5000 JMP I DLMSR /YES, EXIT
1414 0000 RCTRA, 0
1415 0000 RCTRB, 0

1417 2000 DLCNTP, 0 /SUB TO FILL DELAY BLOCK
1418 4450 MOVE /SET DELAY BLOCK LENGTH
1419 0100 BLKCNT
1420 1442 DCTR
1421 7777 -1
1422 4440 SETLOC /BLK ADDR TO DADDR
1423 1441 DADDR
1424 4570 UBLK
1425 4447 GNRND, JMS I RANDNO /GET RANDOM NUMBER,
1426 0120 AND JLYMSK /REMOVE EXCESS BITS
1427 7450 SNA /ZERO?
1428 5227 JMP GNRND /YES, GET ANOTHER NUMBER
1429 7041 CIA /NO, 2'S COMPLEMENT IT
1430 3641 JCA I DADDR /STORE IT IN DELAY BLOCK
1431 2241 ISZ DADDR /UPDATE DELAY BLOCK ADDR.
1432 2242 ISZ DCTR /BLOCK FULL?
1433 5227 JMP GNRND /NO, REPEAT,
1434 5617 JMP I DLCNTP /YES, EXIT.
1435 0000 DADDR, 0
1436 0000 DCTR, 0

```

```

1443 0020
1444 4420
1445 0134
1446 0020
1447 1040
1448 0020
1449 4472
1450 4472
1451 4472
1452 4472
1453 0020
1454 4474
1455 4272
1456 4472
1457 4421
1460 0444

/PUNCH TEST NORMAL TEST SEQUENCE ROUTINE.
NTST, 0
      SETLOC /CLEAR RBUSY
      RBUSY
      0
      TAD I NTST /SELECT PUNCH MODE
      OCA NTSTA
      JMS I UPLTLR /PUNCH LEADER
      JMS I UPSYNC /PUNCH SYNC CHARACTER
NTSTA, 0
      JMS I URSYNC /SYNC READER
      JMS I URDBLK /READ DATA BLOCK
      JMS I UPLTLR /PUNCH TRAILER
      JMS I URRDY /WAIT FOR RDR NOT BUSY
      JMP I CHAIN /CHAIN

/PUNCH TESTS SPECIAL TEST SEQUENCE ROUTINE.
STST, 0
      SETLOC /CLEAR RBUSY
      RBUSY
      0
      TAD I STST /SELECT PUNCH MODE
      OCA STSTA
      TAD STSTA
      OCA STSTC
      JMS I UPLTLR /PUNCH LEADER
      JMS I UPSYNC /PUNCH SYNC CHARACTER
      JMS I URDBLK /PUNCH DATA BLOCK
      JMS I URSYNC /SYNC READER
      JMS I URDBLK /READ DATA BLOCK
      STSTB, 0 /PUNCH DATA BLOCK
      STSTC, 0 /PUNCH DATA BLOCK
      JMP STSTB /GO READ AGAIN

/COMBINED TEST NORMAL TEST SEQUENCE
CNTST, 0
      SETLOC /CLEAR RBUSY
      RBUSY
      0
      JMS I UPLTLR /PUNCH LEADER
      JMS I UPSYNC /PUNCH SYNC CHARACTER
      JMS I UPBLK /PUNCH DATA BLOCK (NO STALLS)
      JMS I URSYNC /SYNC READER
      JMS I URBLKR /READ DATA BLOCK (STALLS)
      JMS I UPBLKR /PUNCH DATA BLOCK (STALLS)
      JMS I URDBLK /READ DATA BLOCK (NO STALLS)
      JMS I UPLTLR /PUNCH TRAILER
      JMS I URRDY /WAIT FOR READER NOT BUSY
      JMP I CHAIN /CHAIN

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/TYPE LINE OF 3 CHARACTERS (NO DELAY)
TYPLNS, 0
1016 0000      CLR
1017 7200      CLR DELAYM      /CLEAR DELAYM
1020 0000      TAU I TYPLNS      /SET AND STORE
1021 1710      JCA ,+3      /ADDRESS OF DATA
1022 0000      ISZ TYPLNS
1023 0010      JMS I JMBFS      /GO FILL BUFFER WITH 3 CHARACTERS
1024 4461      0
1025 0000      JMS I UTYPE      /GO TYPE LINE
1026 4450      JMP I TYPLNS      /EXIT
1027 0710

/TYPE LINE OF ASCII PRINTABLE CHARACTERS
TYPE, 0
1030 0000      JMS I SETCTR      /SET TCTR TO =76
1031 4440      TCTR
1032 1001      -114
1033 7604      JMS I SETCTR      /SET FETCH TO ADDRESS
1034 4440      FETCH      /OF BLOCKA.
1035 1000      BLOCKA
1036 4170      TYPEA, TAU DELAYM      /GET C(DELAYM)
1037 1000      SEA CLR      /0?
1040 7640      JMS I DLY1MS      /NO, SO DELAY.
1041 4440      TAU I FETCH      /YES, SET CHARACTER
1042 1750      JMS I UPUNCH      /GO PRINT CHARACTER
1043 4454      ISZ FETCH      /SET UP FOR NEXT CHARACTER
1044 2000      ISZ TCTR      /DONE?
1045 2001      JMP TYPEA      /NO, REPEAT
1046 5337      JMP I TYPE      /YES, EXIT.
1047 0700
1050 0000      FETCH, 0
1051 0000      TCTR, 0

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1600 1600  
 1601 0000  
 1602 3230  
 1603 2200  
 1604 1600  
 1605 3237  
 1606 2200  
 1607 1241  
 1610 0030  
 1611 7112  
 1612 7012  
 1613 7012  
 1614 4220  
 1615 2237  
 1616 1241  
 1617 7040  
 1620 0030  
 1621 4220  
 1622 5600  
 1623 0000  
 1624 3240  
 1625 1240  
 1626 7000  
 1627 7004  
 1630 0242  
 1631 1240  
 1632 0242  
 1633 1240  
 1634 3637  
 1635 5620  
 1636 0000  
 1637 0000  
 1640 0000  
 1641 7700  
 1642 0707  
 1643 6060

\*, 17/+1

ASCCN, 0  
 TAU I ASCCN  
 UCA WASC  
 ISZ ASCCN  
 TAU I ASCCN  
 UCA SASC  
 ISZ ASCCN  
 TAU K7700  
 AND I WASC  
 RTR CLL  
 RTR  
 RTR  
 JMS CNV  
 ISZ SASU  
 TAU K7700  
 CMA  
 AND I WASC  
 JMS CNV  
 JMP I ASCCN  
 CNV, 0  
 UCA ASCT  
 TAU ASCT  
 RTL  
 RAL  
 AND K0707  
 TAU ASCT  
 AND K0707  
 TAU K6060  
 UCA I SASC  
 JMP I CNV  
 WASC, 0  
 SASC, 0  
 ASCT, 0  
 K7700, 7700  
 K0707, 0707  
 K6060, 6060

1644	0247	A33WP4,	0247	/"I"
1645	0337		0337	/LEFT ARROW
1646	0327		0327	/"W"
1647	0257		0257	/"I"
1650	0247	A33WP0,	0247	/"I"
1651	0337		0337	/LEFT ARROW
1652	0327		0327	/"W"
1653	0257		0257	/"I"
1654	0327		0327	/"W"
1655	0337		0337	/LEFT ARROW
1656	0247	A33WP5,	0247	/"I"
1657	0240		0240	/SPACE
1660	0337		0337	/LEFT ARROW
1661	0240		0240	/SPACE
1662	0327		0327	/"W"
1663	0240		0240	/SPACE
1664	0257		0257	/"I"
1665	0240		0240	/SPACE
1666	0247	A33WP4,	0247	/'
1667	0333		0333	/"C"
1670	0277		0277	/"?"
1671	0303		0303	/"C"
1672	0247	A33WP6,	0247	/"I"
1673	0333		0333	/"C"
1674	0277		0277	/"?"
1675	0303		0303	/"C"
1676	0277		0277	/"?"
1677	0333		0333	/"C"
1700	0247	A33WP5,	0247	/"I"
1701	0240		0240	/SPACE
1702	0333		0333	/"C"
1703	0240		0240	/SPACE
1704	0277		0277	/"?"
1705	0240		0240	/SPACE
1706	0303		0303	/"C"
1707	0240		0240	/SPACE
1710	0301	A,	0301	
1711	0302		0302	
1712	0303		0303	
1713	0304	D,	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

2007	0001	SLID1,	0001	/SLIDING 1 PATTERN
2010	0002		0002	
2011	0004		0004	
2012	0010		0010	
2013	0020		0020	
2014	0040		0040	
2015	0100		0100	
2016	0200		0200	
2017	0100		0100	
2020	0040		0040	
2021	0020		0020	
2022	0010		0010	
2023	0004		0004	
2024	0002		0002	
2025	0370	SLID0,	0370	/SLIDING 0 PATTERN
2026	0370		0370	
2027	0370		0370	
2030	0367		0367	
2031	0357		0357	
2032	0337		0337	
2033	0277		0277	
2034	0177		0177	
2035	0277		0277	
2036	0337		0337	
2037	0357		0357	
2040	0367		0367	
2041	0370		0370	
2042	0370		0370	
2043	4003	CRTST,	4003	/SPC,C
2044	2240		2240	/R,SPC
2045	2400		2400	/T,E
2046	2324		2324	/S,T
2047	0001		0001	/END CODE
2050	4022	RMTST,	4022	/SPC,R
2051	1107		1107	/I,G
2052	1024		1024	/H,T
2053	4010		4010	/SPC,M
2054	0122		0122	/A,R
2055	0711		0711	/G,I
2056	1640		1640	/N,SPC
2057	2400		2400	/T,E
2060	2324		2324	/S,T
2061	0001		0001	/END CODE



2062	4023	SPTST,	4023	/SPC,S
2063	2001		2001	/P,A
2064	0303		0303	/C,E
2065	4024		4024	/SPC,T
2066	0323		0323	/E,S
2067	2400		2400	/T
2070	0100		0100	/END CODE
2071	4014	LFTST,	4014	/SPC,L
2072	0640		0640	/F,SPC
2073	2403		2403	/T,E
2074	2324		2324	/S,T
2075	0001		0001	/END CODE
2076	4003	CHRTSI,	4003	/SPC,C
2077	1001		1001	/H,A
2100	2201		2201	/R,A
2101	0324		0324	/C,T
2102	0322		0322	/E,R
2103	4024		4024	/SPC,T
2104	0323		0323	/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	0340		0340	/E,SPC
2115	2001		2001	/P,A
2116	2424		2424	/T,T
2117	0322		0322	/E,R
2120	1640		1640	/N,SPC
2121	2403		2403	/T,E
2122	2324		2324	/S,T
2123	0013		0013	/CR
2124	0012		0012	/LF
2125	0001		0001	/END CODE

2126	0010	KMSG1,	0010	/CR	
2127	0012		0012	/LF	
2130	4001		4001		/SP,A
2131	2322		2322		/S,R
2132	0303		0303		/S,S
2133	0703		0703		/1,S
2134	0040		0040		/S,SP
2135	1331		1331		/K,Y
2136	0204		0204		/B,U
2137	4024		4024		/SP,T
2140	0023		0023		/E,S
2141	2400		2400		/T
2142	1000		1000		/CR
2143	1200		1200		/LF
2144	0100		0100		/END CODE
		/			
		/KMSG2, TYPE: PRESS A KEY			
2145	0010	KMSG2,	0010	/CR	
2146	0012		0012	/LF	
2147	4020		4020		/SP,P
2150	2200		2200		/R,E
2151	2323		2323		/S,S
2152	4001		4001		/SP,A
2153	4013		4013		/SP,K
2154	0031		0031		/E,Y
2155	0600		0600		/,
2156	1000		1000		/CR
2157	1200		1200		/LF
2100	0100		0100		/END CODE

2161	0010	KMSG3,	0010	/CR
2162	0012		0012	/LF
2163	4000		4000	/SP,E
2164	0310		0310	/C,H
2165	1740		1740	/O,SP
2166	2400		2400	/T,E
2167	2324		2324	/S,T
2170	0010	KMSG3A,	0010	/CR
2171	0012		0012	/LF
2172	4000		4000	/SP,C
2173	1001		1001	/H,A
2174	2201		2201	/R,A
2175	0324		0324	/C,T
2176	0522		0522	/E,R
2177	2340		2340	/S,P
2200	1300		1300	/K,E
2201	3100		3100	/Y,E
2202	0440		0440	/D,SP
2203	2711		2711	/W,I
2204	1414		1414	/L,L
2205	4002		4002	/SP,B
2206	0540		0540	/E,SP
2207	2431		2431	/T,Y
2210	2000		2000	/P,E
2211	0450		0450	/D,
2212	0010		0010	/CR
2213	0012		0012	/LF
2214	4022		4022	/SP,R
2215	2502		2502	/U,B
2216	1720		1720	/O,U
2217	2440		2440	/T,SP
2220	0510		0510	/E,N
2221	0420		0420	/D,S
2222	4022		4022	/SP,R
2223	1720		1720	/O,U
2224	2411		2411	/T,I
2225	1600		1600	/N,E
2226	0600		0600	/,
2227	1500		1500	/CR
2230	1200		1200	/LF
2231	1500		1500	/CR
2232	1200		1200	/LF
2233	0100		0100	/END CODE

2234	0010	KMSG4,	0010	/CR
2235	0012		0012	/LF
2236	0010		0010	/CR
2237	0012		0012	/LF
2240	4017		4017	/SP,0
2241	0324		0324	/C,T
2242	0114		0114	/A,L
2243	4000		4000	/SP,E
2244	2120		2120	/Q,U
2245	1120		1120	/I,V
2246	0114		0114	/A,L
2247	0510		0510	/E,N
2250	2440		2440	/T,SR
2251	2400		2400	/T,E
2252	2324		2324	/S,T
2253	0010		0010	/CR
2254	0001		0001	/END CODE
2255	0010	KMSG5,	0010	/CR
2256	0012		0012	/LF
2257	4040	OCTEQV,	4040	
2260	4040		4040	
2261	0001		0001	/END CODE

	2400		*. 17/+1		
2400	4457	PRG0,	JMS I USTBF	/SET UP BUFFER AREA	
2401	4446		JMS I SETCTR	/SET KSTART TO INITIAL	
2402	0020		KSTART	/ROUTINE ADDRESS	
2403	2405		P0TS0		
2404	5605		JMP I ,+1	/GO START PROGRAM	
2405	0232		SRSET		
			/CARRIAGE RETURN TEST		
2406	0020	P0TS0,	0		
2407	2441		P0TS1		
2410	4453		JMS I UCRLF	/CRLF TWICE	
2411	7770		-2		
2412	4456		JMS I XTYPST	/PRINT TEST TITLE	
2413	2043		CRTST		
2414	4453		JMS I UCRLF	/CRLF TWICE	
2415	7770		-2		
2416	1141		TAU C334	/SET "/" CODE	
2417	4454		JMS I UPUNCH	/PRINT IT	
2420	1147		TAU M111		
2421	3110		DCA UTEMP	/-73 TO UTEMP	
2422	2110	CRTSTA,	ISE UTEMP	/ALL DONE?	
2423	7410		SKP	/NO	
2424	5444		JMP I CHAIN	/YES, CHAIN	
2425	1110	CRTSTB,	TAU UTEMP		
2426	3117		DCA UTEMP1	/UTEMP TO UTEMP1	
2427	1137		TAU SPACE	/SET "SPACE" CODE	
2430	4454		JMS I UPUNCH	/PRINT IT	
2431	2117		ISE UTEMP1	/SPACED NO. OF TIMES IN UTEMP1?	
2432	5227		JMP ,=3	/NO. SO SPACE AGAIN	
2433	1131		TAU CR	/YES, SET "CR" CODE,	
2434	4454		JMS I UPUNCH	/PRINT IT.	
2435	4454		JMS I UPUNCH	/DUMMY CYCLE,	
2436	1140		TAU C257	/SET "/" CODE	
2437	4454		JMS I UPUNCH	/PRINT IT	
2440	5222		JMP CRTSTA	/GO TO CRTSTA	

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/RIGHT MARGIN TEST
2441 0001      POTS1, 1
2442 2470      PATS2
2443 4450      JMS I UORLF      /ORLF TWICE
2444 7770      -2
2445 4450      JMS I XTYPST     /PRINT TEST TITLE
2446 2050      RMTST
2447 4450      JMS I UORLF      /ORLF TWICE
2452 7770      -2
2451 1144      TAU M16        /-14 TO UTEMP
2452 3110      UCA UTEMP
2453 4450      RMTSTA, JMS I XTYPST /PRINT =-=- I
2454 2450      +2
2455 5262      JMP ,+5
2456 5550      5550
2457 5550      5550
2460 1100      1100
2461 0100      0100
2462 2110      ISE UTEMP      /DONE 14 TIMES?
2463 5250      JMP RMTSTA     /NO, SO DO IT AGAIN
2464 4450      JMS I XTYPST     /YES, PRINT =I-
2465 2467      +2
2466 5272      JMP ,+4
2467 5511      5511
2470 5500      5500
2471 0100      0100
2472 5444      JMP I CHAIN      /CHAIN

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/SPACE TEST
P@TS2, 2
2473 2222
2474 2221
2475 4453
2476 7770
2477 4452
2500 2062
2501 4453
2502 7770
2503 1140
2504 3110
2505 4450
SPTSTA, JMS I XTYPST /PRINT \, SPACE
2506 2010
2507 3312
2510 3440
2511 0001
2512 2110
2513 3300
2514 1140
2515 3110
2516 1140
SPTSTB, JMS I XTYPST /PRINT \, SPACE
2517 3117
2520 1117
2521 3120
2522 1131
2523 4454
2524 4454
2525 1137
2526 4454
2527 2120
2530 3320
2531 1140
2532 4454
2533 2110
2534 7410
2535 5444
2536 1143
2537 1117
2540 3317

P@TSS
JMS I UCRLF /CRLF TWICE
-2
JMS I XTYPST /PRINT TEST TITLE
SPTST
JMS I UCRLF /CRLF TWICE
-2
IAU M44
UCA UTEMP /=-36 TO UTEMP
JMS I XTYPST /PRINT \, SPACE
,+2
JMP ,+3
3440 /"\", SPC
0001 /END CODE
ISZ UTEMP /DONE 36 TIMES?
JMP SPTSTA /NO, SO DO IT AGAIN.
IAU M44
UCA UTEMP /-36 TO UTEMP
IAU M1 /GET =1
UCA UTEMP1 /AC TO UTEMP1
IAU UTEMP1 /UTEMP1
UCA UTEMP2 /TO UTEMP2
IAU CR /GET "CR" CODE
JMS I UPUNCH /PRINT IT
JMS I UPUNCH /DUMMY CYCLE
IAU SPACE /GET "SPACE" CODE
JMS I UPUNCH /PRINT IT
ISZ UTEMP2 /DONE SPACING?
JMP , -3 /NO.
IAU C257 /GET "/" CODE
JMS I UPUNCH /PRINT IT
ISZ UTEMP /DONE 36 TIMES?
SKP /NO.
JMP I CHAIN /YES, CHAIN
IAU M2 /-2 TO AC
IAU UTEMP1 /ADU C(UTEMP1)
JMP SPTSTB /GO TO SPTSTB

```

```

/LINE FEED TEST
P&TSS, 3
2541 220A
2542 2520
2543 4420
2544 7770
2545 4420
2546 2271
2547 4420
2550 7770
2551 1140
2552 3110
2553 1141
2554 4454
2555 1132
2556 4454
2557 2110
2560 7410
2561 5444
2562 4422
2563 4443
2564 2350

```

```

P&TSS, 3
P&TSS
JMS I UURLF /URLF TWICE
TK
JMS I XTYPST /PRINT TEST TITLE
LFTST
JMS I UURLF /URLF TWICE
TK
IAU M11W
UCA UTEMP /=72 TO UTEMP
LFTSTA, IAU C334 /GET "\ " CODE
JMS I UPUNCH /PRINT IT
IAU LF /GET "LF" CODE
JMS I UPUNCH /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 0000
2602 4450
2603 7770
2604 4450
2605 2670
2606 4450
2607 7770
2612 4460
2611 1710
2612 5444
2613 0000
2614 2620

2615 4460
2616 1710
2617 5444
2620 0000
2621 2620

2622 4460
2623 1710
2624 5444
2625 0000
2626 2630

2627 4460
2630 1721
2631 5444
2632 0010
2633 2637

2634 4460
2635 1724
2636 5444
2637 0011
2640 2644

2641 4460
2642 1727
2643 5444
2644 0012
2645 2651

2646 4460
2647 1732
2650 5444

```

```

*. 177+1
P0TS4, 4
P0TS5
/TYPE LINE OF CHARACTERS ABC
JMS I JURLF /URLF TWICE
Z
JMS I XTYPST /PRINT TITLE
JMS I JURLF /URLF TWICE
Z
JMS I UTPLN3 /PRINT LINE
A
JMP I CHAIN
P0TS5, 5
P0TS6
/TYPE LINE OF CHARACTERS DEF
JMS I UTPLN3
J
JMP I CHAIN
P0TS6, 6
P0TS7
/TYPE LINE OF CHARACTERS GHI
JMS I UTPLN3
J
JMP I CHAIN
P0TS7, 7
P0TS10
/TYPE LINE OF CHARACTERS JKL
JMS I UTPLN3
J
JMP I CHAIN
P0TS10, 10
P0TS11
/TYPE LINE OF CHARACTERS MNO
JMS I UTPLN3
M
JMP I CHAIN
P0TS11, 11
P0TS12
/TYPE LINE OF CHARACTERS PQR
JMS I UTPLN3
P
JMP I CHAIN
P0TS12, 12
P0TS13
/TYPE LINE OF CHARACTERS STU
JMS I UTPLN3
S
JMP I CHAIN

```

2651	0013	P0TS13, 13
2652	2650	P0TS14
		/TYPE LINE OF CHARACTERS VWX
2653	4460	JMS I UTPLN3
2654	1730	V
2655	5444	JMP I CHAIN
2656	0014	P0TS14, 14
2657	2665	P0TS15
		/TYPE LINE OF CHARACTERS YZ0
2660	4460	JMS I UTPLN3
2661	1740	Y
2662	5444	JMP I CHAIN
2663	0015	P0TS15, 15
2664	2670	P0TS16
		/TYPE LINE OF CHARACTERS 123
2665	4460	JMS I UTPLN3
2666	1745	ONE
2667	5444	JMP I CHAIN
2670	0016	P0TS16, 16
2671	2675	P0TS17
		/TYPE LINE OF CHARACTERS 456
2672	4460	JMS I UTPLN3
2673	1746	FOUR
2674	5444	JMP I CHAIN
2675	0017	P0TS17, 17
2676	2702	P0TS20
		/TYPE LINE OF CHARACTERS 789
2677	4460	JMS I UTPLN3
2700	1751	SEVEN
2701	5444	JMP I CHAIN
2702	0020	P0TS20, 20
2703	2707	P0TS21
		/TYPE LINE OF CHARACTERS !"#
2704	4460	JMS I UTPLN3
2705	1754	0241
2706	5444	JMP I CHAIN
2707	0021	P0TS21, 21
2710	2714	P0TS22
		/TYPE LINE OF CHARACTERS \$%&
2711	4460	JMS I UTPLN3
2712	1757	0244
2713	5444	JMP I CHAIN
2714	0022	P0TS22, 22
2715	2721	P0TS23
		/TYPE LINE OF CHARACTERS '()
2716	4460	JMS I UTPLN3
2717	1762	0247
2720	5444	JMP I CHAIN

2721	0023	P0TS23, 23	
2722	2726	P0TS24	
		/TYPE LINE OF CHARACTERS **,	
		JMS I UTPLN3	
		C222	
		JMP I CHAIN	
2723	4460	P0TS24, 24	
2724	1765	P0TS25	
2725	5444	/TYPE LINE OF CHARACTERS =, (	
2726	0024	JMS I UTPLN3	
2727	2733	C222	
		JMP I CHAIN	
2730	4460	P0TS25, 25	
2731	1770	P0TS26	
2732	5444	/TYPE LINE OF CHARACTERS ;;K	
2733	0025	JMS I UTPLN3	
2734	2740	C212	
		JMP I CHAIN	
2735	4460	P0TS26, 26	
2736	1773	P0TS27	
2737	5444	/TYPE LINE OF CHARACTERS =>?	
2740	0026	JMS I UTPLN3	
2741	2745	C212	
		JMP I CHAIN	
2742	4460	P0TS27, 27	
2743	1776	P0TS30	
2744	5444	/TYPE LINE OF CHARACTERS @ LN	
2745	0027	JMS I UTPLN3	
2746	2752	C320	
		JMP I CHAIN	
2747	4460	P0TS30, 30	
2750	2001	P0TS31	
2751	5444	/TYPE LINE OF CHARACTERS ]* AND LEFT ARROW	
2752	0030	JMS I UTPLN3	
2753	2757	C332	
		JMP I CHAIN	
2754	4460	P0TS31, 31	
2755	2004	P0TS32	
2756	5444	/TYPE LINE OF ALL CHARACTERS	
2757	0031	JMS I UFBALL	/FILL BUFFER WITH ALL CHARS.
2760	2765	JCA DELAYM	/W TO DELAYM.
		JMS I UTYPE	/TYPE LINE
		JMP I CHAIN	/CHAIN
2761	4462	P0TS32, 32	
2762	3023	P0TS33	
2763	4450	/TYPE LINE OF ALL CHARACTERS, FIXED DELAY BETWEEN CHARACTERS	
2764	5444	JMS I UFBALL	/FILL BUFFER WITH ALL CHARS
2765	0032	JMS I DLYCNT	/GENERATE DELAY COUNT
2766	3000	JMS I UTYPE	/TYPE LINE
		JMP I CHAIN	/CHAIN
2767	4462		
2770	4452		
2771	4450		
2772	5444		

3000	0030		
3001	0017		
3002	4400		
3003	7770		
3004	4450		
3005	2127		
3006	4400		
3007	0020		
3010	4440		
3011	0121		
3012	7772		
3013	4450		
3014	2121		
3015	5215		
3016	5444		
3017	0034		
3020	0032		
3021	4400		
3022	4440		
3023	2121		
3024	7772		
3025	4452		
3026	4450		
3027	2121		
3030	5220		
3031	5444		
3032	0030		
3033	0040		
3034	4470		
3035	0020		
3036	4440		
3037	0121		
3040	7772		
3041	4450		
3042	2121		
3043	5241		
3044	5444		
3045	0030		
3046	7777		
3047	4470		
3050	4440		
3051	0121		
3052	7772		
3053	4452		
3054	4450		
3055	2121		
3056	5250		
3057	5444		

  

```

*, 177+1
P0TS33, 33
P0TS34
/TYPE 6 LINES OF ASR33 WORST CASE PATTERN, NO DELAY.
JMS I UCRLF /CRLF TWICE
-2
JMS I XTYPST /PRINT TITLE
WCPTST
JMS I UFW336 /PATTERN TO BUFFER
UCA DELAYM /0 TO DELAYM
JMS I SLCCTR /-6 TO CTRA
CTRA
-0
JMS I UTYPE /TYPE LINE
ISE CTRA /ALL LINES TYPED?
JMP ,-2 /NO, REPEAT
JMP I CHAIN /YES, CHAIN.
P0TS34, 34
P0TS35
/TYPE 6 LINES OF ASR33 WORST CASE PATTERN, FIXED DELAY BETWEEN CHARACTERS
JMS I UFW336 /PATTERN TO BUFFER
JMS I SLCCTR /-6 TO CTRA
CTRA
-0
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
P0TS35, 35
P0TS36
/TYPE 6 LINES OF ASR35 WORST CASE PATTERN, NO DELAY
JMS I UFW356 /PATTERN TO BUFFER
UCA DELAYM /0 TO DELAYM
JMS I SLCCTR /-6 TO CTRA
CTRA
-0
JMS I UTYPE /TYPE LINE
ISE CTRA /ALL LINES TYPED?
JMP ,-2 /NO, REPEAT,
JMP I CHAIN /YES, CHAIN
P0TS36, 36
/777
/TYPE 6 LINES OF ASR35 WORST CASE PATTERN, FIXED DELAY BETWEEN CHARACTERS
JMS I UFW356 /PATTERN TO BUFFER
JMS I SLCCTR /-6 TO CTRA
CTRA
-0
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

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```

/PROGRAM 1. ASR33/35 PUNCH FUNCTION TEST
/
3060 4440 PRG1, JMS I SETQTR /SET INTERRUPT SERVICE ADDRESS
3061 0022 < /TO INTSVC
3062 1144 INTSVC
3063 4440 SETLOC /SET DATA BLOCK
3064 0132 BLKCNT /LENGTH TO
3065 7400 -400 /#200
3066 4440 JMS I SETQTR /SET KSTART TO INITIAL
3067 0222 KSTART /ROUTINE ADDRESS.
3070 0270 PIT0
3071 0072 JMP I .+1 /GO START PROGRAM
3072 0232 SRSET

/ROUTINE 0,
/PUNCH AND READ CHECK BLOCK OF ALL 0'S
PIT0, 0
PIT1
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,
PIT1, 1
PIT2
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
PIT2, 2
PIT3
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

```

	3220		*. 17/+1
			/ROUTINE 3
			/PUNCH AND READ CHECK BLOCK OF CHANNEL 3 PUNCHES
			P1T3, 3
3200	2000		P1T4
3201	3210		SETLOC /4 TO BLOCK A
3202	4440		BLUCCA
3203	4170		4
3204	0024		MOVE /FILL BUFFER
3205	4450		BLUCCA
3206	4170		BLUCCA+1
3207	4170		-3//
3210	7401		JMS I UNTST /GO TO NORMAL TEST
3211	4004		JMS I UPBLK /USE THIS CALL
3212	4000		
			/ROUTINE 4
			/PUNCH AND READ CHECK BLOCK OF CHANNEL 4 PUNCHES
			P1T4, 4
3213	0024		P1T5
3214	3220		SETLOC /10 TO BLOCKA
3215	4440		BLUCCA
3216	4170		10
3217	0010		MOVE /FILL BUFFER
3220	4450		BLUCCA
3221	4170		BLUCCA+1
3222	4170		-3//
3223	7401		JMS I UNTST /GO TO NORMAL TEST
3224	4004		JMS I UPBLK /USE THIS CALL
3225	4000		
			/ROUTINE 5
			/PUNCH AND READ CHECK BLOCK OF CHANNEL 5 PUNCHES
			P1T5, 5
3226	0020		P1T6
3227	3241		SETLOC /10 TO BLOCKA
3230	4440		BLUCCA
3231	4170		20
3232	0020		MOVE /FILL BUFFER
3233	4450		BLUCCA
3234	4170		BLUCCA+1
3235	4170		-3//
3236	7401		JMS I UNTST /GO TO NORMAL TEST
3237	4004		JMS I UPBLK /USE THIS CALL
3240	4000		

```

/ROUTINE 6
/PUNCH AND READ CHECK BLOCK OF CHANNEL 6 PUNCHES
P1T6,  0
3241  0000      PLT/
3242  0204      SETLOC          /40 TO BLOCKA
3243  4440      BLOCKA
3244  4170      40
3245  0040      MOVE          /FILL BUFFER
3246  4450      BLOCKA
3247  4170      BLOCKA+1
3250  4170      -3//
3251  7401      JMS I UNTST    /GO TO NORMAL TEST
3252  4004      JMS I UPBLK    /USE THIS CALL
3253  4000

/ROUTINE 7
/PUNCH AND READ CHECK BLOCK OF CHANNEL 7 PUNCHES
P1T7,  /
3254  0001      P1T10
3255  3201      SETLOC          /100 TO BLOCK A
3256  4440      BLOCKA
3257  4170      100
3260  0100      MOVE          /FILL BUFFER
3261  4450      BLOCKA
3262  4170      BLOCKA+1
3263  4170      -3//
3264  7401      JMS I UNTST    /GO TO NORMAL TEST
3265  4004      JMS I UPBLK    /USE THIS CALL.
3266  4000

/ROUTINE 10
/PUNCH AND READ CHECK BLOCK OF CHANNEL 8 PUNCHES
P1T10,  10
3267  0010      P1T11
3270  3002      SETLOC          /200 TO BLOCK A
3271  4440      BLOCKA
3272  4170      200
3273  0200      MOVE          /FILL BUFFER
3274  4450      BLOCKA
3275  4170      BLOCKA+1
3276  4170      -3//
3277  7401      JMS I UNTST    /GO TO NORMAL TEST
3300  4004      JMS I UPBLK    /USE THIS CALL.
3301  4000

/ROUTINE 11
/PUNCH AND READ CHECK BLOCK OF SLIDING 1 PATTERN
P1T11,  11
3302  0011      P1T12
3303  3010      MOVE          /FILL BUFFER WITH
3304  4450      SLID1        /SLIDING 1 PATTERN
3305  2007      BLOCKA
3306  4170      -10
3307  7762      MOVE
3310  4450      BLOCKA
3311  4170      BLOCKA+10
3312  4210      -302
3313  7410      JMS I UNTST    /GO TO NORMAL TEST
3314  4004      JMS I UPBLK    /USE THIS CALL
3315  4000

```

```

/ROUTINE 12
/PUNCH AND READ CHECK BLOCK OF SLIDING Z PATTERN.
P1112, 12
3316 0012          P1115
3317 3332          MOVE          /FILL BUFFER WITH
3320 4455          SLIDZ          /SLIDING Z PATTERN
3321 2025          BLOCKA
3322 4175          -10
3323 7762          MOVE
3324 4455          BLOCKA
3325 4175          BLOCKA+10
3326 4215          -302
3327 7410          JMS I UNTST      /GO TO NORMAL TEST
3330 4504          JMS I UPBLK      /USE THIS CALL
3331 4500

/ROUTINE 13
/PUNCH AND READ CHECK BLOCK OF ONES AND ZEROES.
P1113, 13
3332 0013          P1114
3333 3350          SETLOC          /377 TO BLOCK A
3334 4446          BLOCKA
3335 4175          S//
3336 0377          SETLOC          /0 TO BLOCKA+1
3337 4446          BLOCKA+1
3340 4176          0
3341 0000          MOVE          /FILL BUFFER
3342 4455          BLOCKA
3343 4175          BLOCKA+2
3344 4177          -370
3345 7402          JMS I UNTST      /GO TO NORMAL TEST
3346 4504          JMS I UPBLK      /USE THIS CALL
3347 4500

/ROUTINE 14
/PUNCH AND READ CHECK BLOCK OF ONES AND ZEROES, RANDOM
/STALLS BETWEEN CHARACTERS PUNCHED.
P1114, 14
3350 0014          P1115
3351 3406          SETLOC          /377 TO BLOCKA
3352 4446          BLOCKA
3353 4175          S//
3354 0377          SETLOC          /0 TO BLOCKA+1
3355 4446          BLOCKA+1
3356 4176          0
3357 0000          MOVE          /FILL BUFFER
3360 4455          BLOCKA
3361 4175          BLOCKA+2
3362 4177          -370
3363 7402          JMS I UNTST      /GO TO NORMAL TEST
3364 4504          JMS I UPBLKR     /USE THIS CALL
3365 4501

```



```

3420
3421
3422
3423
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3430
3431
3432
3433
3434
3435
3436
3437

* 177+1
/Routine 10
/PUNCH AND READ CHECK BLOCK OF BINARY COUNT PATTERN
PIT15, 10
      PIT16
      SETLOC          /BLOCK A ADDR TO TEMPU
      TEMPU
      BLOCKA
      SETLOC          /-256 TO CTRA
      CTRA
      -400
      JMS I INPATT    /INITIALIZE B. PATTERN
PIT15A, JMS I GETPT   /FILL BUFFER WITH
      JCA I TEMPU     /BINARY COUNT PATTERN
      ISZ TEMPU
      ISZ CTRA
      JMP PIT15A
      JMS I UNTST     /GO TO NORMAL TEST
      JMS I UPBLK     /USE THIS CALL

/Routine 10
/PUNCH AND READ CHECK BLOCK OF BINARY COUNT PATTERN
/RANDOM STALLS BETWEEN CHARACTERS PUNCHED,
PIT16, 10
      /111
      SETLOC          /BLOCK A ADDR TO TEMPU
      TEMPU
      BLOCKA
      SETLOC          /-256 TO CTRA
      CTRA
      -400
      JMS I INPATT    /INITIALIZE B. PATTERN
PIT16A, JMS I GETPT   /FILL BUFFER WITH
      JCA I TEMPU     /BINARY COUNT PATTERN
      ISZ TEMPU
      ISZ CTRA
      JMP PIT16A
      JMS I UNTST     /GO TO NORMAL TEST
      JMS I UPBLKR    /USE THIS CALL

```

```

/PROGRAM 2, KEYBOARD TEST
3442 4440 PRG2, SETLOC /SET KSTART TO INITIAL
3441 0020 KSTART /ROUTINE ADDRESS
3442 3047 P210
3443 4450 JMS I XTYPST /PRINT
3444 2120 KMSG1
3445 5040 JMP I ,+1
3446 0232 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,
P210, 0
P211
SETLOC /-1000 TO CTRA
CTRA
-1/20
KCC /CLEAR AC AND FLAG
JMS I XTYPST
KMSG2
KSF /READY?
JMP ,=1 /WAIT
KSF /READY, SKIP ON FLAG
JMP P2E0 /NO SKIP, ERROR
ISE CTRA /ALL DONE?
JMP ,=3 /NO, REPEAT
JMP I CHAIN /YES, CHAIN
P2E0, HLT CLA /KSF FAILURE
KSF /SCOPE LOOP
JMP ,=1 /SKIPS ON FLAG
JMP ,=2 /CONTINUOUSLY

/ROUTINE 1,
/ECHO TEST CHARACTER RECEIVED FROM KEYBOARD IS TYPED, THE
/CHARACTER TYPED SHOULD MATCH CHARACTER KEYED, RUBOUT CHARACTER
/ENDS ROUTINE.
P211, 1
P212
KCC /CLEAR AC AND FLAG
JMS I XTYPST
KMSG3
P211A, KSF /READY?
JMP ,=1 /WAIT
KRB /READ CHARACTER
ILS /PRINT IT
ISF /PRINTER READY?
JMP ,=1 /NO, WAIT
IAU MRBUUT
SEA /IS IT RUBOUT?
JMP P211A /NO
JMP I CHAIN /YES, CHAIN

```

```

/ROUTINE 2.
/OCTAL EQUIVALENT TEST, THE OCTAL EQUIVALENT OF ANY
/CHARACTER KEYED IS PRINTED, RUBOUT ENDS ROUTINE.
P2T2, 2
      2
      7777
      KCC /CLEAR AC AND FLAG
      JMS I XTYPST /PRINT TITLE AND
      KMSG4 /INSTRUCTION
      JMS I XTYPST
      KMSG5A
P2T2A, KSF /FLAG 1?
      JMP .-1 /NO. WAIT
      KRB /YES, READ KEYBOARD
      UCA P2T2W /STORE CHARACTER
      JMS I UASCCN /CONVERT CHARACTER
      P2T2W /TO PRINTABLE OCTAL.
      UCTEQV
      JMS I XTYPST /PRINT CHARACTER
      KMSG2
      TAU P2T2W
      TAU MRBUUT
      SEA CLA /WAS IT A RUBOUT?
      JMP P2T2A /NO.
      JMP I CHAIN /YES, CHAIN
P2T2W, 0

```

```

3511 0002
3512 7777
3513 0032
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 1136
3533 7640
3534 5320
3535 5444
3536 0000

```

```

/PROGRAM 3, COMBINED READER, PRINTER, PUNCH TEST.
3537 4446
3540 0402
3541 1144
3542 4440
3543 0130
3544 7552
3545 4457
3546 4440
3547 0020
3550 3550
3551 5752
3552 0232
3553 0000
3554 3560
3555 4461
3556 1710
3557 4505
3560 0001
3561 3565
3562 4461
3563 1710
3564 4505
3565 0002
3566 3572
3567 4461
3570 1710
3571 4505
3572 0003
3573 3577
3574 4461
3575 1721
3576 4505
3577 0004
3600 3604
3601 4461
3602 1724
3603 4505
3604 0005
3605 3611
3606 4461
3607 1727
3610 4505
3611 0006
3612 3616
3613 4461
3614 1732
3615 4505

/SET INTERRUPT SERVICE
/ADDRESS TO INTSV0
INTSV0
SETLOC
/SET DATA BLOCK LENGTH
/TO #150
BKCONT
-220
JMS I UBTBF /SET UP BUFFER AREA
SETLOC /SET KSTART TO INITIAL
KSTART /ROUTINE ADDRESS
PST0
JMP I ,+1 /START PROGRAM
SKSET

PST0, 0
PST1
JMS I UF B F 3 /DATA: ABC
A
JMS I UCNTST
PST1, 1
PST2
JMS I UF B F 3 /DATA: DEF
J
JMS I UCNTST
PST2, 2
PST3
JMS I UF B F 3 /DATA: GHI
G
JMS I UCNTST
PST3, 3
PST4
JMS I UF B F 3 /DATA: JKL
J
JMS I UCNTST
PST4, 4
PST5
JMS I UF B F 3 /DATA: MNO
M
JMS I UCNTST
PST5, 5
PST6
JMS I UF B F 3 /DATA: PQR
P
JMS I UCNTST
PST6, 6
PST7
JMS I UF B F 3 /DATA: STU
S
JMS I UCNTST

```

3616 0027  
 3617 3623  
 3620 4461  
 3621 1730  
 3622 4020  
 3623 0010  
 3624 3630  
 3625 4461  
 3626 1740  
 3627 4020  
 3630 0011  
 3631 3630  
 3632 4461  
 3633 1740  
 3634 4020  
 3635 0012  
 3636 3642  
 3637 4461  
 3640 1740  
 3641 4020  
 3642 0013  
 3643 3647  
 3644 4461  
 3645 1751  
 3646 4020  
 3647 0014  
 3650 3654  
 3651 4461  
 3652 1754  
 3653 4020  
 3654 0015  
 3655 3661  
 3656 4461  
 3657 1757  
 3660 4020  
 3661 0010  
 3662 3660  
 3663 4461  
 3664 1762  
 3665 4020  
 3666 0017  
 3667 4000  
 3670 4461  
 3671 1760  
 3672 4020

PST7, /  
 PST10  
 JMS I UFBFS /DATA: VWX  
 V  
 JMS I UCNTST  
 PST10, 10  
 PST11  
 JMS I UFBFS /DATA: YX0  
 Y  
 JMS I UCNTST  
 PST11, 11  
 PST12  
 JMS I UFBFS /DATA: 123  
 ONE  
 JMS I UCNTST  
 PST12, 12  
 PST13  
 JMS I UFBFS /DATA: 456  
 FOUR  
 JMS I UCNTST  
 PST13, 13  
 PST14  
 JMS I UFBFS /DATA: 789  
 SEVEN  
 JMS I UCNTST  
 PST14, 14  
 PST15  
 JMS I UFBFS /DATA: !"#\$  
 U241  
 JMS I UCNTST  
 PST15, 15  
 PST16  
 JMS I UFBFS /DATA: \$%&  
 U244  
 JMS I UCNTST  
 PST16, 16  
 PST17  
 JMS I UFBFS /DATA: '()  
 U247  
 JMS I UCNTST  
 PST17, 17  
 PST20  
 JMS I UFBFS /DATA: \*+  
 U252  
 JMS I UCNTST

4000	4000	4. 177+1		
4001	0020	P3120,	20	
4002	4000		P3121	
4003	4461		JMS I UFBF3	/DATA: =./
4004	1772		U200	
4005	4000		JMS I UCNTST	
4006	0021	P3121,	21	
4007	4012		P3122	
4008	4461		JMS I UFBF3	/DATA: :;K
4009	1773		U272	
4010	4000		JMS I UCNTST	
4011	0022	P3122,	22	
4012	4017		P3123	
4013	4461		JMS I UFBF3	/DATA: =>?
4014	1770		U270	
4015	4000		JMS I UCNTST	
4016	0023	P3123,	23	
4017	4024		P3124	
4018	4461		JMS I UFBF3	/DATA: @L\
4019	2001		U300	
4020	4000		JMS I UCNTST	
4021	0024	P3124,	24	
4022	4031		P3125	
4023	4461		JMS I UFBF3	/DATA: J* AND LEFT ARROW
4024	2004		U300	
4025	4000		JMS I UCNTST	
4026	0025	P3125,	25	
4027	4030		P3126	
4028	4462		JMS I UFBALL	/DATA: ALL PRINTABLE ASCII
4029	4000		JMS I UCNTST	
4030	0020	P3126,	26	
4031	4041		P3127	
4032	4464		JMS I UFW334	/DATA: ASR33 PRINTER WORST CASE
4033	4000		JMS I UCNTST	/PATTERN
4034	0027	P3127,	27	
4035	4040		P3128	
4036	4466		JMS I UFW335	/DATA: ASR33 PRINTER WORST CASE
4037	4000		JMS I UCNTST	/PATTERN WITH INTERSPERSED BLANKS
4038	0027	P3128,	28	
4039	4040		P3129	
4040	4467		JMS I UFW354	/DATA: ASR35 PRINTER WORST CASE
4041	4000		JMS I UCNTST	/PATTERN
4042	0030	P3129,	29	
4043	4051		P3130	
4044	4467		JMS I UFW354	/DATA: ASR35 PRINTER WORST CASE
4045	4000		JMS I UCNTST	/PATTERN
4046	0031	P3130,	30	
4047	4050		P3131	
4048	4031		JMS I UFW355	/DATA: ASR35 PRINTER WORST CASE
4049	4050		JMS I UCNTST	/PATTERN WITH INTERSPERSED BLANKS
4050	4471	P3131,	31	
4051	4050		P3132	
4052	4050		JMS I UFW355	/DATA: ASR35 PRINTER WORST CASE
4053	4471		JMS I UCNTST	/PATTERN WITH INTERSPERSED BLANKS
4054	4050			

```

4055 0432          P3T32, 02
4056 7777          /1111
4057 4440          SETLOC          /DATA: ONE'S AND ZEROES
4058 4177          BLOCK1
4061 0377          377
4062 4440          SETLOC
4063 4200          BLOCK1+1
4064 0420          0
4065 4455          MOVE
4066 4177          BLOCK1
4067 4201          BLOCK1+2
4070 7672          -100
4071 4455          MOVE
4072 4177          BLOCK1
4073 4311          BLOCK2
4074 7670          -110
4075 4500          JMS I UCNTST

/
/PROGRAM 4, PRINT LINES WITH DATA IN PTEMP AND PTEMP1, NO DELAY,
PRG4, 04A
4076 7200          OCA DELAYM          /0 TO DELAYM
4077 5020          JMS I USTBF
4100 4457          JMS I UFBTMP          /FILL BUFFER WITH DATA
4101 4463          JMS I UTYPE          /TYPE LINE
4102 4450          JMP , -1          /REPEAT

/
/PROGRAM 5, PRINT LINES WITH DATA IN PTEMP AND PTEMP1, FIXED RANDOM DELAY
PRG5, 04A
4104 4463          JMS I UFBTMP          /FILL BUFFER WITH DATA,
4105 4457          JMS I USTBF
4106 4452          JMS I DLYCNT          /GENERATE DELAY COUNT,
4107 4456          JMS I UTYPE          /TYPE LINE
4110 5306          JMP , =2          /REPEAT

/PROGRAM 6, PUNCH AND READ CHECK DATA BLOCKS
/WITH DATA IN PTEMP AND PTEMP1, NO DELAY
PRG6, 04A
4111 4440          SETLOC
4112 0002          2          /SET INTERRUPT SERVICE
4113 1144          INTSVC          /ADDRESS TO INTSVC
4114 4440          SETLOC          /SET BLOCK LENGTH TO
4115 0130          BLKCNT          /-206
4116 7400          -400
4117 4455          MOVE          /FILL BUFFER WITH DATA
4120 0021          PTEMP          /IN PTEMP AND PTEMP1
4121 4170          BLOCKA
4122 7770          -2
4123 4455          MOVE
4124 4170          BLOCKA
4125 4177          BLOCKA+2
4126 7402          -370
4127 4507          JMS I USTST          /GO TO SPECIAL TEST SEQUENCE
4130 4500          JMS I UPBLK          /CLOSE THIS CALL,

```

```

/PROGRAM 7, PUNCH AND READ CHECK DATA BLOCKS WITH DATA
/IN PTEMP AND PTEMP1, RANDOM STALLS BETWEEN CHARS PUNCHED
4131 4446 PRG7, SETLOC /SET INTERRUPT SERVICE
4132 0002 2 /ADDRESS TO INTSVC
4133 1144 INTSVC
4134 4446 SETLOC /SET BLOCK LENGTH TO
4135 0130 BLKCNT /-256
4136 7400 -400
4137 4450 MOVE /FILL BUFFER WITH DATA IN
4140 0021 PTEMP /PTEMP AND PTEMP1
4141 4170 BLUCKA
4142 7770 -2
4143 4450 MOVE
4144 4170 BLUCKA
4145 4177 BLUCKA+2
4146 7402 -376
4147 4507 JMS I USTST /GO TO SPECIAL TEST SEQUENCE
4150 4501 JMS I UPBLKR /USE THIS CALL.

```

```

/PROGRAM 10, PUNCH AND READ CHECK BLOCKS OF BINARY
/COUNT PATTERN, RANDOM STALLS BETWEEN CHARACTERS PUNCHED
4151 4446 PRG10, SETLOC /SET INTERRUPT SERVICE
4152 0002 2 /ADDRESS TO INTSVC
4153 1144 INTSVC
4154 4446 SETLOC /SET BLOCK LENGTH TO
4155 0130 BLKCNT /-256
4156 7400 -400
4157 4446 SETLOC
4160 0110 TEMPU
4161 4170 BLUCKA
4162 4446 SETLOC
4163 0121 CTRA
4164 7400 -400
4165 4511 JMS I INPATT /FILL BUFFER WITH BINARY
4166 4512 PRG10A, JMS I GETPT /COUNT PATTERN
4167 5510 JCA I TEMPU
4170 2110 ISE TEMPU
4171 2121 ISE CTRA
4172 5360 JMP PRG10A
4173 4507 JMS I USTST /GO TO SPECIAL TEST SEQUENCE
4174 4501 JMS I UPBLKR /USE THIS CALL

```



```
4175 0210 /  
4176 0212 BLOCKA, 210 /CR  
212 /LF  
  
4177 0000 BLOCK1, 0  
  
4307 4307 *BLOCK1+110  
4310 0210 BLOCKB, 210 /CR  
0212 212 /LF  
  
4311 0000 BLOCK2, 0  
  
4421 4421 *BLOCK2+110  
4421 0210 BLOCKC, 210 /CR  
4422 0212 212 /LF  
  
4575 4575 *BLOCKA+400  
0000 DBLK, 0  
  
5175 *DBLK+400  
  
$
```

THERE ARE NO ERRORS