

IDENTIFICATION

PRODUCT CODE: MAINDEC-15-D2BB-D(D)
PRODUCT NAME: PDP-15 ABR 33/35
TELETYPE TEST, PART 2
DATE CREATED: JULY 16, 1970
MAINTAINER: DIAGNOSTICS GROUP
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1. ABSTRACT

THE PDP-15 ASR33/35 TELETYPE TESTS PART 2 IS THE SECOND PART OF A TWO-PART PACKAGE USED TO TEST THE ASR33, OR ASR35 TELETYPE WHEN ATTACHED TO A PDP-15 SYSTEM.

PART 2 CONTAINS SEVEN SELECTABLE PROGRAMS USED TO TEST THE TELEPRINTER, PUNCH, KEYBOARD, AND THE PRINTER, PUNCH AND READER IN COMBINATION. THE PROGRAMS ARE SELECTED AND CONTROLLED BY MEANS OF THE ACCUMULATOR SWITCHES (ACS).

THE PROGRAMS AVAILABLE 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 00021 AND 00022.
PRG5	PUNCH EXERCISER, PUNCHES AND READ CHECKS DATA BLOCKS OF DATA STORED IN LOC 00021 AND 00022.
PRG6	PUNCH EXERCISER, PUNCHES AND READ CHECKS BLOCKS OF BINARY COUNT PATTERN.

2. REQUIREMENTS

2.1 EQUIPMENT

- A. STANDARD PDP-15 AND
- B. ASR33 OR ASR35 TELETYPE.

2.2 STORAGE

LOCATIONS 00000 THROUGH 04406 ARE USED.

2.3 PRELIMINARY PROGRAMS

PDP-15 ASR33/35 TELETYPE TESTS PART 1 PROGRAMS PRG0, PRG1, AND PRG2 MUST HAVE BEEN RUN SUCCESSFULLY.

3. LOADING PROCEDURE

TO LOAD THE PROGRAM PROCEED AS FOLLOWS:

- A. LOAD OBJECT TAPE IN TELETYPE READER, OR IN HIGH SPEED READER IF THE SYSTEM HAS SAID READER.
- B. SET ADDRESS SWITCHES TO 17700.
- C. SET BANK SWITCH TO "ON" POSITION
- D. PRESS "RESET"
- E. PRESS "READ IN"
- F. THE PROGRAM WILL LOAD AND HALT WITH AC#777777 IF PROGRAM LOADED CORRECTLY, IF THE PROGRAM HALTS WITH AC#0 A CHECKSUM ERROR HAS OCCURRED, REPEAT THE LOADING PROCEDURE.

4. USE PROCEDURE
-----4.1 USE PROCEDURE FOR PRG0

- A. INSURE TELETYPE IS ON=LINE
- B. TURN OFF TELETYPE READER AND PUNCH.
- C. SET CONSOLE REGISTER DISPLAY TO AC.
- D. SET ADDRESS SWITCH TO 00200.
- E. SET AC SWITCHES TO 000000. (SELECTS PRG0)
- F. PRESS I/O RESET; PRESS START.
- G. PROGRAM HALTS AT LOC 00233 TO PERMIT SETTING OF AC SWITCH OPTIONS. NORMAL OPERATION IS WITH AC SWITCHES SET TO 000000.

THE AC SWITCH OPTIONS FOR THIS PROGRAM ARE:

- ACS0#1 HALTS PROGRAM AT LOC 00320. AT END OF CURRENT ROUTINE, NUMBER OF ROUTINE JUST COMPLETED IS DISPLAYED IN AC. TO PROCEED, PRESS CONTINUE.
- ACS1#1 SELECTS ROUTINE WHOSE NUMBER IS SET IN ACS12 THROUGH ACS17, ROUTINE IS SELECTED AT COMPLETION OF CURRENT ROUTINE.
- ACS2#1 LOOP PROGRAM. ENTIRE PROGRAM IS REPEATED.
- ACS12 NUMBER OF ROUTINE TO BE SELECTED.
THROUGH
ACS17 ACS1 MUST BE 1.
- H. PRESS CONTINUE.
- I. PROGRAM IS EXECUTED AND HALTS AT LOC 00275. PROGRAM END HALT, IF NO LOOP OPTIONS ARE SET.

NOTE

THE PRINTOUTS, RESULTING FROM THE EXECUTION OF PRG0, MUST BE VERIFIED BY USER TO DETERMINE CORRECT TELEPRINTER OPERATION. (SEE SECTION 9, FOR DESCRIPTION.)

4.2 USE PROCEDURE FOR PRG1

- A. TURN ON TELETYPE PUNCH.
- B. WITH TELETYPE OFF-LINE, PUNCH 6 IN, OF BLANK LEADER, RETURN TELETYPE TO ON-LINE POSITION.
- C. LOAD READER WITH BLANK LEADER, LEAVING VERY LITTLE SLACK BETWEEN PUNCH AND READER.
- D. TURN ON READER.
- E. SET CONSOLE REGISTER DISPLAY SWITCH TO AC.
- F. SET ADDRESS SWITCHES TO 00200.
- G. SET AC SWITCHES TO 000001, (SELECTS PRG1)
- H. PRESS I/O RESET; PRESS START.
- I. PROGRAM HALTS AT LOC 00233 TO PERMIT SETTING OF AC SWITCH OPTIONS. NORMAL OPERATION IS WITH AC SWITCHES SET TO 040000, TO CAUSE PROGRAM TO HALT-ON-ERROR.

THE AC SWITCH OPTIONS FOR THIS PROGRAM ARE

- | | |
|---------------------------|---|
| ACS0=1 | HALTS PROGRAM AT LOC 00320, AT END OF CURRENT ROUTINE. NUMBER OF ROUTINE JUST COMPLETED IS DISPLAYED IN AC. TO PROCEED, PRESS CONTINUE. |
| ACS1=1 | SELECT ROUTINE WHOSE NUMBER IS SET IN ACS12 THROUGH ACS17. ROUTINE IS SELECTED UPON ROUTINE'S COMPLETION. |
| ACS2=1 | LOOP PROGRAM. ENTIRE PROGRAM IS REPEATED. |
| ACS3=1 | HALT-ON-ERROR. BAD CHARACTER IS DISPLAYED IN AC. |
| ACS3=0 | HALT AT END OF DATA BLOCK IF ERRORS OCCURRED. ERROR COUNT IS DISPLAYED IN AC. |
| ACS12
THROUGH
ACS17 | NUMBER OF ROUTINE TO BE SELECTED, ACS1 MUST BE 1. |
- J. PRESS CONTINUE.
 - K. PROGRAM IS EXECUTED AND HALTS AT LOC 00275, PROGRAM END HALT, IF NO OPTIONS ARE SET, OR IF NO ERRORS OCCUR.
(SEE SECTION 3.1.1 OR 6.1 FOR HALTS)

4.3 USE PROCEDURE FOR PRC2

- A. INSURE TELETYPE IS ON-LINE
- B. TURN OFF TELETYPE READER AND PUNCH,
- C. SET CONSOLE REGISTER DISPLAY SWITCH TO AC.
- D. SET ADDRESS SWITCHES TO 00200,
- E. SET AC SWITCHES TO 000002,
- F. PRESS I/O RESET; PRESS START,
- G. PROGRAM TITLE IS PRINTED AND PROGRAM HALTS AT LOC 00233 TO PERMIT SETTING OF AC SWITCH OPTIONS; NORMAL OPERATION IS WITH AC SWITCHES SET TO 000000,

THE AC SWITCH OPTIONS FOR THIS PROGRAM ARE

ACS0=1 HALTS PROGRAM AT LOC 00320, AT END OF CURRENT ROUTINE, NUMBER OF COMPLETED ROUTINE IS DISPLAYED IN AC, TO PROCEED, PRESS CONTINUE,

ACS1=1 SELECT ROUTINE WHOSE NUMBER IS SET IN ACS12 THROUGH ACS17, ROUTINE IS SELECTED AT COMPLETION OF CURRENT ROUTINE,

ACS2=1 LOOP PROGRAM, ENTIRE PROGRAM IS REPEATED,

ACS12 NUMBER OF ROUTINE TO BE SELECTED,
THROUGH ACS1 MUST BE 1,
ACS17

- H. PRESS CONTINUE,
- I. FOLLOW TELEPRINTER INSTRUCTIONS,
- J. WHEN LAST ROUTINE IS COMPLETED, AND PROVIDED THAT NO OPTIONS PREVENTS IT, THE PROGRAM STOPS AT PROGRAM END HALT AT LOC 00279,

NOTE

CORRECT KEYBOARD OPERATION IS DETERMINED BY USER, BY CHECKING THAT PRINTED CHARACTERS COORESPOND WITH CHRACTERS KEYED,

(SEE SECTIONS 5.1.1 AND 6.1 FOR HALTS AND REMEDY.)

4.4 USE PROCEDURE FOR PRG3

- A. TURN ON TELETYPE PUNCH.
- B. WITH TELETYPE OFF-LINE, PUNCH 6 INCHES OF BLANK LEADER; RETURN TELETYPE TO ON-LINE POSITION.
- C. LOAD READER WITH BLANK LEADER, LEAVING LITTLE SLACK BETWEEN PUNCH AND READER.
- D. TURN ON READER.
- E. SET CONSOLE REGISTER DISPLAY SWITCHES TO AC.
- F. SET ADDRESS SWITCHES TO 00200.
- G. SET AC SWITCHES TO 00003, (SELECTS PRG3)
- H. PRESS I/O RESET; PRESS START.
- I. PROGRAM HALTS AT LOC 00233 TO PERMIT SETTING OF AC SWITCH OPTIONS, NORMAL OPERATION IS WITH AC SWITCHES SET TO 04000, TO CAUSE PROGRAM HALT-ON-ERROR,

THE AC SWITCH OPTIONS FOR THIS PROGRAM ARE

ACS0#1 HALTS PROGRAM AT LOC 00320, UPON ROUTINE'S COMPLETION, NUMBER OF COMPLETED ROUTINE IS DISPLAYED IN AC, TO PROCEED, PRESS CONTINUE.

ACS1#1 SELECT ROUTINE WHOSE NUMBER IS SET IN ACS12 THROUGH ACS17, ROUTINE IS SELECTED UPON ROUTINE'S COMPLETION.

ACS2#1 LOOP PROGRAM, ENTIRE PROGRAM IS REPEATED.

ACS3#1 HALT-ON-ERROR, BAD CHARACTER IS DISPLAYED IN AC.

ACS3#0 HALT AT END OF DATA BLOCK IF ERRORS OCCURRED, ERROR COUNT IS DISPLAYED IN AC.

ACS12 THROUGH ACS17 NUMBER OF ROUTINE TO BE SELECTED, ACS1 MUST BE 1.

- J. PRESS CONTINUE.
- K. PROGRAM IS EXECUTED AND HALTS AT LOC 00275, PROGRAM END HALT, IF NO OPTIONS ARE SET, OR IF NO ERRORS OCCUR,

(SEE SECTIONS 5.1.1 AND 6.1 FOR HALTS AND REMEDY.)

4.5 USE PROCEDURE FOR PRG4

-
- A. INSURE TELETYPE IS ON-LINE
 - B. TURN OFF TELETYPE READER AND PUNCH,
 - C. DEPOSIT IN LOC 00021 AND 00022 THE 8 BIT CODES FOR CHARACTERS TO BE PRINTED,
 - D. SET CONSOLE REGISTER DISPLAY SWITCH TO AC,
 - E. SET ADDRESS SWITCHES TO 00200,
 - F. SET AC SWITCHES TO 000004,
 - G. FOR FULL SPEED OPERATION LEAVE ACS0=0, FOR STALLING BETWEEN CHARACTERS SET ACS0=1,
 - H. PRESS I/O RESET; PRESS START,
 - I. THE PROGRAM RUNS CONTINUOUSLY, PRINTING LINES WITH CHARACTERS STORED IN LOC 00021 AND 00022 UNTIL STOPPED BY USER,

4.6 USE PROCEDURE FOR PRG5 AND PRG6

- A. TURN ON TELETYPE PUNCH.
- B. WITH TELETYPE OFF-LINE, PUNCH 6 IN. OF BLANK LEADER, RETURN TELETYPE TO ON-LINE POSITION.
- C. LOAD READER WITH BLANK LEADER, LEAVING LITTLE SLACK BETWEEN PUNCH AND READER.
- D. TURN ON READER.
- E. FOR PRG5, DEPOSIT IN LOC 00021 AND 00022 THE 8-BIT CODES FOR CHARACTERS TO BE PUNCHED.
- F. SET CONSOLE REGISTER DISPLAY SWITCH TO AC.
- G. SET ADDRESS SWITCHES TO 00200.
- H. SET AC SWITCHES TO 000005 OR 000006.
- I. FOR FULL SPEED OPERATION LEAVE ACS0=0. FOR STALLING BETWEEN CHARACTERS SET ACS0=1.
- J. PRESS I/O RESET; PRESS START.
- K. THE SELECTED PROGRAM RUNS CONTINUOUSLY UNTIL STOPPED BY USER, UNLESS ERRORS OCCUR. AC SWITCH OPTIONS MAY BE SET AT ANY TIME.

THE AC SWITCH OPTIONS FOR THIS PROGRAM ARE

ACS3=1	HALT-ON-ERROR, BAD CHARACTER IS DISPLAYED IN AC.
ACS3=0	HALT AT END OF DATA BLOCK IF ERRORS OCCURRED, ERROR COUNT IN AC.

(SEE SECTIONS 5.1.1 1 FOR HALTS AND REMEDY.)

5. OPERATING PROCEDURE

5.1 PROGRAM AND/OR OPERATOR ACTION

5.1.1 NORMAL HALTS

- LOC 00233 OPTION SET HALT, OCCURS DURING PRG0, PRG1, PRG2, AND PRG3 TO PERMIT SETTING OF OPTIONS, SET OPTIONS DESIRED AND PRESS CONTINUE.
- LOC 00275 PROGRAM END HALT, OCCURS AT END OF PRG0, PRG1, PRG2, AND PRG3, IF NO "LOOP PROGRAM" OPTIONS IS SET, SET DESIRED OPTIONS AND PRESS CONTINUE. IF NO OPTIONS ARE SET, THIS HALT REOCCURS.
- LOC 00320 ROUTINE END HALT, OCCURS AT END OF CURRENT ROUTINE DURING PRG0, PRG1, PRG2, AND PRG3, IF ACS0 IS ON, AC DISPLAYS ROUTINE NUMBER, TO PROCEED, PRESS CONTINUE.

6. ERRORS

6.1 ERROR HALTS AND DESCRIPTION

LOC 00177 INCORRECT PROGRAM NUMBER SELECTED. SET THE PROGRAM NUMBER IN ACS14 THROUGH ACS17 AND PRESS CONTINUE.

LOC 00256 NON-EXISTENT ROUTINE NUMBER SELECTED. SET THE CORRECT NUMBER IN ACS12 THROUGH ASC17 AND PRESS CONTINUE.

LOC 01044 SYNC ERROR. SYNC READER SUBROUTINE HAS NOT FOUND SYNC CHARACTER WITHIN 149 CHARACTERS. POSITION TAPE IN READER SO THAT SYNC CHARACTER (RUBOUT) IS WITHING 149 CHARACTERS FROM READ STATION, AND PRESS CONTINUE. (PRG1, PRG3, PRG6).

LOC 01065 UNEXPECTED INTERRUPT. A NON-TELETYPE DEVICE HAS CAUSED INTERRUPT. TURN OFF DEVICE AND PRESS CONTINUE. (PRG1, PRG3, PRG6).

LOC 01235 READ CHECK ERROR A. BAD CHARACTER IN AC. PRESS CONTINUE. (ACS3 MUST BE ON FOR THIS HALT TO OCCUR.) (PRG1, PRG3, PRG6).

LOC 01237 READ CHECK ERROR B. FOLLOW UP HALT. CORRECT CHARACTER IN AC. TO PROCEED. PRESS CONTINUE. (PRG1, PRG3, PRG6).

LOC 01245 BLOCK ERRORS HALT. NUMBER OF ERRORS IN AC. TO PROCEED. PRESS CONTINUE. (PRG1, PRG3, PRG6).

LOC 03036 PRG2, ROUTINE B ERROR HALT. KSF FAILED TO SKIP WITH KEYBOARD FLAG SET. PRESSING CONTINUE ENTERS SCOPE LOOP THAT SKIPS ON FLAG CONTINUOUSLY.

7. RESTRICTIONS

7.1 STARTING RESTRICTIONS

ALL PROGRAMS MUST BE STARTED AT LOC 00200.

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: 16 MIN (MAX)
PRG1: 20 MIN (MAX)
PRG2: USER DEPENDENT
PRG3: 40 MIN (MAX)
PRG4 THROUGH PRG10 ARE CONTINUOUSLY RUNNING PROGRAMS

9. PROGRAM DESCRIPTIONS

THE PDP-15 ASR33/35 TELETYPE TESTS PART 2, CONSIST OF 7 PROGRAMS NUMBERED FROM 0 TO 6,

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 SHOWS WHEN THE RIGHT MARGIN IS INCORRECTLY ADJUSTED, THE TEST PRINTS 14 GROUPS OF . . . ; FOLLOWED BY CHARACTERS -|. A CORRECTLY ADJUSTED MARGIN WILL GIVE THE FOLLOWING PRINTOUT!

---|---|---|---|---|---|---|---|---|---|---|---|---|---|

THE |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 SPACES 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 SLASH FOLLOWED BY A LINE FEED, FOLLOWED BY RANDOM STALLS UNTIL 72 SLASHES HAVE BEEN PRINTED, THE RESULT IS A LEFT SLANTED LINE FROM POSITION 1 TO 72, VERTICAL SPACING VARIATIONS WILL INDICATE IF ADJUSTMENT IS REQUIRED.

(9.1 CONT'D)

RTN4	TYPES LINE OF CHARACTERS	ABC,
RTN5	TYPES LINE OF CHARACTERS	DEF,
RTN6	TYPES LINE OF CHARACTERS	GH1,
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	VXZ,
RTN14	TYPES LINE OF CHARACTERS	YZ0
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	,

(9.1 CONT'D)

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 '0W/

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 'C7C

9.2

PRG10PUNCH 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 KEYS 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 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

(9,4 CONT'D)

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 1"0
RTN15 PUNCH/PRINT AND READ CHECK BLOCK OF 5%6
RTN16 PUNCH/PRINT AND READ CHECK BLOCK OF 1(),
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 3!+
RTN25 PUNCH/PRINT AND READ CHECK BLOCK OF ALL
PRINTABLE CHARACTER,
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)

(9.4 CONT'D)

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 (15 AND 09).

9.5 PRG4-PRINTER EXERCISER

PRINTS LINES WITH DATA STORED IN LOC 00021 AND 00022,
 ACS0 CONTROLS FULL SPEED, OR STALL OPERATION.

9.6 PRG5 AND PRG6 PUNCH EXERCISERS

PRG5 PUNCHES AND READ CHECKS DATA BLOCKS WITH DATA STORED
 IN LOC 00021 AND 00022. ACS0 CONTROLS FULL SPEED, OR STALL
 OPERATION.

PRG6 PUNCHES AND READ CHECKS BLOCKS OF BINARY COUNT PATTERN,
 RANDOM STALLS BETWEEN CHARACTERS.

THE TWO EXERCISERS USE THE FOLLOWING SEQUENCE:

- A. SET UP DATA BLOCK; DETERMINE WHETHER FULL SPEED, OR STALL
 OPERATION.
- 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.

/PDP-15-ASR33-35 TELETYPE TESTS-PART2
/COPYRIGHT 1969, DIGITAL EQUIPMENT CORP., MAYNARD, MASS.
/
/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.
/PRG5-PUNCH EXERCISER. PUNCHES AND READ CHECKS DATA BLOCKS OF DATA
/ STORED IN LOC 0021 AND 0022.
/PRG6-PUNCH EXERCISER. PUNCHES AND READ CHECKS BLOCKS OF BINARY COUNT
/ PATTERN.
/
/STARTING ADDRESS:00200
.EJECT

00020		.ABS	
00020	000000	.LOC 20	
00021	000000	KSTART	0
00022	000000	PTEMP	0
00023	000000	PTEMP1	0
00024	620002	DELAYM	0
00025	000000	JMP*	2
			0
00026	000000	DELAYS	0
00027	000000	PRGNUM	0
00030	000017	PRGMSK	17
00031	777770	PRGLIM	-10
00032	000111	PSW	PRGTAB
00033	000000	RTNNO	0
00034	000000	CURTST	0
00035	000000	NXTST	0
00036	000077	TSTMSK	77
00037	000000	MSCTR	0
00040	000000	MILCTR	0
00041	777142	MIL1	-636
00042	000000	TEMP	0
00043	000000	TEMP1	0
00044	000000	TEMPU	0
00045	000000	UTEMP	0
00046	000000	UTEMP1	0
00047	000000	UTEMP2	0
00050	000000	CTRA	0
00051	000000	CTRB	0
00052	040000	SR3MSK	040000
00053	000000	ERRCR	0
00054	000000	ERRCTR	0
00055	000277	DLYMSK	277
00056	000000	PFLAG	0
00057	000000	RLKCNT	0
00060	000215	CR	215
00061	000212	LF	212
00062	777401	MRBOUT	-377
		.EJECT	

00063	000000	RBUSY	0
00064	000020	LINK	0
00065	000000	AC	0
00066	000240	SPACE	240
00067	000257	C257	257
00070	000334	C334	334
00071	000001	K1	1
00072	777777	M1	-1
00073	777776	M2	-2
00074	777762	M16	-16
00075	777734	M44	-44
00076	777670	M110	-110
00077	777667	M111	-111
00100	000000	TEMQ	0
00101	000000	TEMR	0
00102	000000	FLAG	0
00103	000077	K77	77
00104	777740	M40	-40
00105	000100	C100	100
00106	000240	C240	240
00107	740100	SKIpMA	SMA
00110	741100	SKIPPA	SPA
00111	002071	PRGTAB	PRG0
00112	002527		PRG1
00113	003011		PRG2
00114	003107		PRG3
00115	003336		PRG4
00116	003346		PRG5
00117	003373		PRG6
	700322	KRA=700322	
		.EJECT	

00177		.LOC 177		
00177	740040	HLT		/INCORRECT PROGRAM NUMBER
00200	750004	START LAS		/READ SWITCHES
00201	500030	AND PRGMSK		/AND WITH PRGMSK
00202	340031	TAD PRGLIM		/ADD PROGRAM LIMIT
00203	740300	SMA: SZA		/VALID PROGRAM NUMBER?
00204	600177	JMP 177		/NO.
00205	750004	LAS		/YES, READ SWITCHES
00206	500030	AND PRGMSK		
00207	040027	DAC PRGNUM		/SAVE PROGRAM NUMBER
00210	340032	TAD PSW		/DEVELOP PROGRAM
00211	040042	DAC TEMP		/ADDRESS,
00212	220042	LAC* TEMP		
00213	040221	DAC PRGADR		/STORE ADDRESS
00214	100533	JMS MOVVE		/INITIALIZE INTERRUPT AREA
00215	000024	24		
00216	000001	1		
00217	777776	-2		
00220	620221	JMP* .+1		/GO TO SELECTED PROGRAM
00221	000000	PRGADR 0		
00233		.LOC 233		
00233	750040	SRSET HLT: CLA		/SELECT OPTIONS
00234	200020	GETRDY LAC KSTART		/GET ADDR OF 1ST RTN.
00235	040035	DAC NXTST		/STORE AT NXTST.
00236	100277	JMS FORWD		
00237	750004	LAS		/READ SWITCHES
00240	742010	RTL		
00241	740400	SNL		/SELECT ROUTINE?
00242	620034	JMP* CURTST		/NO, STAT WITH CURRENT ROUTINE.
00243	750004	LAS		/YES, READ SWITCHES.
00244	500036	AND TSTMSK		
00245	740001	CMA		
00246	340071	TAD K1		
00247	340033	TAD RTNNO		
00250	751200	SNA: CLA		/IS IT THIS ROUTINE?
00251	620034	JMP* CURTST		/YES, GO DO IT.
00252	200035	LAC NXTST		/NO.
00253	340071	TAD K1		
00254	750200	SZA: CLA		/LAST ROUTINE?
00255	600236	JMP GETRDY+2		/NO.
00256	750040	INCRTN HLT: CLA		/YES, INCORRECT ROUTINE NUMBER
00257	600234	JMP GETRDY		
		.EJECT		

00260	100313	CHAIN	JMS	SHALT	/HALT?(ACS0)
00261	750004		LAS		/READ SWITCHES
00262	742010		RTL		
00263	741400		SZL		/ROUTINE SELECT?(ACS1)
00264	600234		JMP	GETRDY	/YES.
00265	200035		LAC	NXTST	
00266	340071		TAD	K1	
00267	750200		SZA:CLA		/LAST RTN?
00270	600236		JMP	GETRDY+2	/NO.
00271	750004		LAS		/YES
00272	742010		RTL		
00273	751100		SPA:CLA		/LOOP PROGRAM? (ACS2)
00274	600234		JMP	GETRDY	/YES.
00275	750040	PRGEND	HLT:CLA		/NO. PROGRAM END HALT.
00276	600260		JMP	CHAIN	
00277	000000	FORWD	0		
00300	220035		LAC*	NXTST	/GET NEXT RTN NO.
00301	040033		DAC	RTNNO	/STORE AT RTNNO.
00302	440035		ISZ	NXTST	
00303	200035		LAC	NXTST	/GET CURRENT RTN NUMBER
00304	040042		DAC	TEMP	
00305	440035		ISZ	NXTST	
00306	200035		LAC	NXTST	/GET CURRENT RTN ADDRESS
00307	040034		DAC	CURTST	
00310	220042		LAC*	TEMP	/GET NEXT RTN ADDRESS
00311	040035		DAC	NXTST	
00312	620277		JMP*	FORWD	/EXIT.
00313	000000	SHALT	0		
00314	750004		LAS		/READ SWITCHES
00315	740100		SMA		/HALT? (ACS0)
00316	620313		JMP*	SHALT	/NO. EXIT.
00317	200033		LAC	RTNNO	/GET ROUTINE NUMBER
00320	740040		HLT		/ROUTINE AND HALT
00321	620313		JMP*	SHALT	/EXIT
00322	000000	STCTR	0		
00323	220322		LAC*	STCTR	/GET LOC ADDRESS
00324	040042		DAC	TEMP	/SAVE AT TEMP
00325	440322		ISZ	STCTR	
00326	220322		LAC*	STCTR	/GET COUNT AND STORE
00327	060042		DAC*	TEMP	/AT DESIRED LOCATION
00330	440322		ISZ	STCTR	
00331	754000		CLA:CLL		
00332	620322		JMP*	STCTR	/EXIT
100322		SETLOC=JMS STCTR			
			.EJECT		


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00333 000000 DLYMS 0
00334 200023 LAC DELAYM /SET MILLISECOND COUNT
00335 040037 DAC MSCTR /STORE IN MSCTR
00336 620337 JMP* .+1
00337 000340 .+1
00340 200041 LAC MIL1 /SET 1 MS CONSTANT
00341 040040 DAC MILCTR /STORE AT MILCTR
00342 440040 ISZ MILCTR /DELAY ONE
00343 600342 JMP .-1 /MILLISECOND
00344 440037 ISZ MSCTR /DELAYED NUMBER OF
00345 600336 JMP .-7 /MILLISECONDS REQUIRED?
00346 754000 CLA:CLL /YES.
00347 620333 JMP* DLYMS /EXIT.
100333 DELAY=JMS DLYMS
00350 000000 DLCNT 0
00351 100411 JMS RANGEN /GET RANDOM NUMBER
00352 500055 AND DLYMSK /MASK OUT UNDESIRED BITS
00353 741200 SNA /0?
00354 600351 JMP .-3 /YES. GET ANOTHER NUMBER
00355 740001 CMA
00356 340071 TAD K1
00357 040023 DAC DELAYM /STORE DELAY COUNT
00360 620350 JMP* DLCNT /EXIT
00361 000000 CRLF 0
00362 220361 LAC* CRLF /GET CRLF COUNT
00363 040375 DAC CRCTR /AND STORE IT
00364 440361 ISZ CRLF
00365 100451 JMS TYPSTG /CRLF ONCE
00366 000372 .+4
00367 440375 ISZ CRCTR /DONE?
00370 600365 JMP .-3 /NO. CRLF AGAIN
00371 620361 JMP* CRLF /YES. EXIT.
00372 000015 0015 /CR
00373 000012 0012 /LF
00374 000001 0001 /END CODE
00375 000000 CRCTR 0 /CRLF COUNTER
00376 000000 PUNCH 0
00377 440056 ISZ PFLAG
00400 700406 TLS /PUNCH/PRINT
00401 200056 LAC PFLAG /GET C(PFLAG)
00402 751200 SNA:CLA /FLAG RESET?
00403 600406 JMP .+3 /YES
00404 700401 ISF /NO. FLAG UP?
00405 600401 JMP .-4 /NO.
00406 700402 TCF /YES. CLEAR PRINTER FLAG
00407 140056 DZM PFLAG /CLEAR PFLAG
00410 620376 JMP* PUNCH /EXIT.
.EJECT

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		/RANDOM NUMBER GENERATOR	
00411	000000	RANGEN	?
00412	200437	LAC	RANDEX
00413	544421	SAD	(RANTBL+10)
00414	741000	SKP	
00415	600425	JMP	RANTAD-1
00416	204402	LAC	(RANTBL
00417	040437	DAC	RANDEX
00420	200436	LAC	RANCON
00421	745100	SPA:CLL	
00422	744002	STL	
00423	740010	RAL	
00424	040436	DAC	RANCON
00425	220437	LAC*	RANDEX
00426	340436	RANTAD	TAD RANCON
00427	060437	DAC*	RANDEX
00430	200450	LAC	RANSAV
00431	740020	RAR	
00432	360437	TAD*	RANDEX
00433	040450	DAC	RANSAV
00434	440437	ISZ	RANDEX
00435	620411	JMP*	RANGEN
00436	123456	RANCON	123456
00437	000450	RANDEX	RANTBL+10
00440	654321	RANTBL	654321
00441	361416		361416
00442	055363		055363
00443	546060		546060
00444	243035		243035
00445	762572		762572
00446	453237		453237
00447	150214		150214
00450	000000	RANSAV	0
			.EJECT

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/TYPE CHARACTER STRING SUBROUTINE
00451 000000 TYPSTG 0
00452 220451 LAC* TYPSTG /GET AND STORE STRING
00453 040100 DAC TEMQ /ADDRESS
00454 140102 DZM FLAG /CLEAR FLAG
00455 440451 ISZ TYPSTG /SET UP EXIT
00456 220100 TSC1 LAC* TEMQ /PICK UP DATA.
00457 742020 RTR
00460 742020 RTR
00461 742020 RTR
00462 100467 JMS TSC2 /GO TYPE 1ST CHARACTER
00463 220100 LAC* TEMQ /PICK UP DATA
00464 100467 JMS TSC2 /GO TYPE 2ND CHARACTER
00465 440100 ISZ TEMQ
00466 600456 JMP TSC1 /GO BACK FOR MORE.
00467 000000 TSC2 0
00470 500103 AND K77 /MASK OFF 6 BITS
00471 040101 DAC TEMR /SAVE CHARACTER
00472 200102 LAC FLAG /TEST "SPECIAL" FLAG.
00473 750200 SZA:CLA
00474 600504 JMP TYPSP /SPECIAL
00475 200101 LAC TEMR /REGULAR
00476 741200 SNA /0?
00477 600502 JMP .+3 /YES. SET FLAG TO SPECIAL
00480 100524 TYPAT JMS PRINT /NO. GO PRINT IT
00501 620467 JMP* TSC2 /RETURN
00502 440102 ISZ FLAG /SET FLAG TO "SPECIAL"
00503 620467 JMP* TSC2 /RETURN.
00504 140102 TYPSP DZM FLAG /CLEAR FLAG.
00505 200101 LAC TEMR /SET CHARACTER
00506 740001 CMA
00507 340071 TAD K1
00510 741200 SNA
00511 600504 JMP TYPAT /IT'S 0: PRINT "0"
00512 340071 TAD K1 /TEST FOR 01
00513 751200 SNA:CLA /01?
00514 620451 JMP* TYPSTG /YES. EXIT CODE. EXIT.
00515 200107 LAC SKIPMA /SET C(SWITCH) TO "SMA"
00516 040526 DAC SWITCH
00517 200101 LAC TEMR /GET CHARACTER
00520 100524 JMS PRINT /GO PRINT IT
00521 200110 LAC SKIPPA /SET C(SWITCH) TO "SPA".
00522 040526 DAC SWITCH
00523 620467 JMP* TSC2 /RETURN.
00524 000000 PRINT 0
00525 340104 TAD M40 /COMPARE WITH 40
00526 741100 SWITCH SPA /CHARGED TO SMA FOR SPECIAL CODES.
00527 340105 TAD C100
00530 340126 TAD C240
00531 100376 JMS PUNCH /PRINT CHARACTER
00532 620524 JMP* PRINT /RETURN
.EJECT

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00533 000000 MOVVE 0
00534 220533 LAC* MOVVE
00535 040554 DAC FADDR
00536 440533 ISZ MOVVE
00537 220533 LAC* MOVVE
00540 040555 DAC TADDR
00541 440533 ISZ MOVVE
00542 220533 LAC* MOVVE
00543 040556 DAC MCTR
00544 440533 ISZ MOVVE
00545 220554 MOVEA LAC* FADDR
00546 060555 DAC* TADDR
00547 440554 ISZ FADDR
00550 440555 ISZ TADDR
00551 440556 ISZ MCTR
00552 600545 JMP MOVEA
00553 620533 JMP* MOVVE
00554 000000 FADDR 0
00555 000000 TADDR 0
00556 000000 MCTR 0
00557 000000 /SUBROUTINE TO INITIALIZE BINARY PATTERN
00560 140562 INITPT 0
00561 620557 DZM PT0
00562 000000 JMP* INITPT /EXIT
00563 000000 PT0 0
00564 000377 PT1 0
00565 000000 PTMSK 377
00566 200562 /SET AC WITH NEXT BINARY CHARACTER SUBROUTINE
00567 040563 GETPTT 0
00570 340071 LAC PT0 /GET PT0
00571 500564 AND PT1 /STORE AT PT1
00572 040562 TAD K1 /INCREMENT NUMBER
00573 200563 AND PTMSK /LIMIT TO 8 BITS
00574 620565 DAC PT0 /STORE AT PT0
LAC PT1 /GET PT1
JMP* GETPTT /EXIT
/SUBROUTINE TO COMPARE C(AC) TO C(CALL+1).
00575 000000 CHCK 0
00576 040612 DAC WCHK /STORE AC AT CHK
00577 220575 LAC* CHCK /GET COMPARE DATA
00600 740001 CMA /2'S COMPLEMENT IT
00601 340071 TAD K1 /SET UP UNEQUAL EXIT
00602 440575 ISZ CHCK
00603 340612 TAD WCHK /ADD C(WCHK)
00604 750200 SZA:CLA /EQUAL?
00605 600610 JMP .+3 /NO.
00606 440575 ISZ CHCK /SET UP EQUAL EXIT. EQUAL
00607 620575 JMP* CHCK /EQUAL EXIT.
00610 200612 LAC WCHK /RESTORE AC
00611 620575 JMP* CHCK /UNEQUAL EXIT.
00612 000000 WCHK 0
MOVE=JMS MOVVE
.EJECT

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/SET BUFFER AREA SUBROUTINE
00613 000000 STBF 0
00614 100533 MOVE /CRLF TO BLOCK A
00615 000060 CR
00616 003401 BLOCKA
00617 777776 -2
00620 100533 MOVE /CRLF TO BLOCK B
00621 000060 CR
00622 003513 BLoCKB
00623 777776 -2
00624 100533 MOVE /CRLF TO BLOCK C
00625 000060 CR
00626 003625 BLoCKC
00627 777776 -2
00630 620613 JMP* STBF /EXIT
00631 000000 FBF3 0
00632 220631 LAC* FBF3 /FILL 144 CHARACTER BUFFER
00633 040636 DAC .+3 /WITH 3 CHARACTERS WHOSE
00634 440631 ISZ FBF3 /ADDRESS IS SPECIFIED AT
00635 100533 MOVE /CALL+1
00636 000000 0
00637 003403 BLOCK1
00640 777775 -3
00641 100533 MOVE
00642 003403 BLOCK1
00643 003406 RLoCK1+3
00644 777673 -105
00645 100533 MOVE
00646 003403 BLOCK1
00647 003515 RLoCK2
00650 777670 -110
00651 620631 JMP* FBF3
00652 000000 FBALL 0
00653 100533 MOVE /FILL 144 CHARACTER BUFFER
00654 001516 A /WITH ALL PRINTABLE ASCII
00655 003403 BLoCK1 /CHARACTERS.
00656 777701 -77
00657 100533 MOVE
00660 001516 A
00661 003502 BLoCK1+77
00662 777767 -11
00663 100533 MOVE
00664 003403 BLoCK1
00665 003515 BLoCK2
00666 777670 -110
00667 620652 JMP* FBALL
.EJECT

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00670	000000	FBTMP	0	
00671	100533		MOVE	/FILL 144 CHARACTER BUFFER
00672	000001		PTEMP	/WITH DATA IN PTEMP
00673	003403		BLOCK1	/AND PTEMP1.
00674	777776		-2	
00675	100533		MOVE	
00676	003403		BLOCK1	
00677	003405		BLOCK1+2	
00700	777672		-106	
00701	100533		MOVE	
00702	003403		BLOCK1	
00703	003515		BLOCK2	
00704	777670		-110	
00705	620670		JMP*	FBTMP
00706	000000	FW334	0	
00707	100533		MOVE	/FILL 144 CHARACTER BUFFER
00710	001466		A33WP4	/WITH 4 CHARACTER ASR33
00711	003403		BLOCK1	/WORST CASE PRINTER PATTERN
00712	777774		-4	
00713	100533		MOVE	
00714	003403		BLOCK1	
00715	003407		BLOCK1+4	
00716	777674		-104	
00717	100533		MOVE	
00720	003403		BLOCK1	
00721	003515		BLOCK2	
00722	777670		-110	
00723	620706		JMP*	FW334
00724	000000	FW33S	0	/EXIT
00725	100533		MOVE	/FILL 144 CHARACTER BUFFER
00726	001472		A33WPS	/WITH ASR33 WORST CASE
00727	003403		BLOCK1	/PATTERN WITH INTERSPERSED
00730	777770		-10	/BLANKS.
00731	100533		MOVE	
00732	003403		BLOCK1	
00733	003413		BLOCK1+10	
00734	777700		-100	
00735	100533		MOVE	
00736	003403		BLOCK1	
00737	003515		BLOCK2	
00740	777670		-110	
00741	620724		JMP*	FW33S
			.EJECT	/EXIT

00742	000000	FW354	0	
00743	100533		MOVE	/FILL BUFFER WITH ASR35
00744	001502		A35WP4	/WORST CASE PATTERN.
00745	003403		BLOCK1	
00746	777774		-4	
00747	100533		MOVE	
00750	003403		BLOCK1	
00751	003407		BLOCK1+4	
00752	777674		-104	
00753	100533		MOVE	
00754	003403		BLOCK1	
00755	003515		BLOCK2	
00756	777670		-110	
00757	620742		JMP*	FW354 /EXIT
00760	000000	FW35S	0	
00761	100533		MOVE	/FILL BUFFER WITH ASR35
00762	001506		A35WPS	/WORST CASE PATTERN WITH
00763	003403		BLOCK1	/INTERSPERSED BLANKS.
00764	777770		-10	
00765	100533		MOVE	
00766	003403		BLOCK1	
00767	003413		BLOCK1+10	
00770	777700		-100	
00771	100533		MOVE	
00772	003403		BLOCK1	
00773	003515		BLOCK2	
00774	777670		-110	
00775	620760		JMP*	FW35S /EXIT.
00776	000000	/PUNCH LEADER TRAILER SUBROUTINE	PLTLR	0
00777	100322		SETLOC	/-70 TO LTRCTR
01000	001007		LTRCTR	
01001	777672		-106	
01002	201010		LAC	LDCOE
01003	100376		JMS	PUNCH
01004	441007		ISZ	LTRCTR
01005	601002		JMP	.-3
01006	620776		JMP*	PLTLR /YES. EXIT
01007	000000	LTRCTR	0	
01010	000376	LDCOE	376	
01011	000000	RSYNC	0	/SYNC READER SUBROUTINE
01012	100322		SETLOC	/-145 TO RSCTR
01013	001026		RSCTR	
01014	777557		-221	
01015	101141		JMS	RRDY
01016	750001		CLA: CMA	/WAIT FOR READER NOT BUSY.
01017	040063		DAC	RBUSY
01020	100322		SETLOC	/SET READER BUSY INDICATOR
01021	001064		VCTR	/SET READER SERVICE
01022	001027		RSSERV	/ADDRESS.
01023	700322		KRA	/START READ
01024	700042		ION	/ENABLE INTERRUPT
01025	621011		JMP*	RSYNC
01026	000000	RSCTR	0	
			.EJECT	

01027	700312	RSSERV	*RR		/READ BUFFER, SELECT READER.
01030	700322		*RA		
01031	340062		TAD	*RABOUT	/ADD MINUS RUBOUT
01032	750200		SZA:CLA		/RUBOUT?
01033	601042		JMP	.*7	/NO.
01034	140063		DZM	RBUSY	/CLEAR READER BUSY.
01035	754000		CLA:CLL		
01036	200064		LAC	LINK	
01037	740010		RAL		/RESTORE LINK.
01040	200065		LAC	AC	/RESTORE AC.
01041	620000		JMP*	0	/TO MAINLINE.
01042	441026		ISZ	RSCTR	/145 CHARACTERS READ?
01043	601066		JMP	OUT	/NO.
01044	750040		HLT:CLA		/YES, NO SYNC
01045	100322		SETLOC		/-145 TO RSCTR
01046	001026		RSCTR		
01047	777557		-221		
01050	601066		JMP	OUT	/TO MAINLINE
01051	040065	INTSVC	DAC	AC	/SAVE AC
01052	740020		RAR		
01053	040064		DAC	LINK	/SAVE LINK
01054	700401		TSF		/PUNCH/PRINTER?
01055	601061		JMP	.*4	/NO.
01056	700402		TCF		/YES.CLEAR FLAG
01057	140056		DZM	PFLAG	/CLEAR PFLAG.
01060	601066		JMP	OUT	
01061	700301		KSF		/READER?
01062	601065		JMP	.*3	/NO.ERROR.
01063	621064		JMP*	.*1	
01064	000000	VCTR	0		
01065	740040		HLT		/UNEXPECTED INTERRUPT
01066	754000	OUT	CLA:CLL		
01067	200064		LAC	LINK	
01070	740010		RAL		/RESTORE LINK
01071	200065		LAC	AC	/RESTORE AC
01072	700042		ION		/ENABLE INTERRUPT
01073	620000		JMP*	0	/TO MAINLINE
01074	000000	PSTUP	0		/PUNCH SET UP
01075	100322		SETLOC		/SET DATA ADDRESS
01076	001140		PADDR		
01077	003401		BLOCKA		
01100	100533		MOVE		/SET BLOCK LENGTH
01101	000057		RLKCNT		
01102	001137		PCTR		
01103	777777		-1		
01104	621074		JMP*	PSTUP	/EXIT
01105	000000	POCR	0		/PUNCH DATA CHAR SUB.
01106	221140		LAC*	PADDR	/SET DATA
01107	441140		ISZ	PADDR	/UPDATE DATA ADDRESS
01110	100376		JMS	PUNCH	/PUNCH/PRINT DATA
01111	621105		JMP*	POCR	/EXIT
			.EJECT		

01112	000000	PBLK	0		/PUNCH DATA BLOCK, FULL SPEED
01113	101074		JMS	PSTUP	/DO PUNCH SET UP
01114	101105		JMS	PDCR	/GO PUNCH CHARACTER
01115	441137		ISZ	PCTR	/ALL CHARACTERS PUNCHED?
01116	601114		JMP	.-2	/NO. REPEAT
01117	621112		JMP*	PBLK	/YES. EXIT.
01120	000000	PBLKR	0		/PUNCH DATA BLOCK, STALLS.
01121	101074		JMS	PSTUP	/DO PUNCH SETUP
01122	101273		JMS	DLCNTP	/FILL DELAY BLOCK
01123	100322		SETLOC		/DBLK ADDRESS TO DAP
01124	001136		DAP		
01125	004001		DBLK		
01126	221136		LAC*	DAP	/GET STALL COUNT
01127	040023		DAC	DELAYM	/STORE AT DELAYM
01130	441136		ISZ	DAP	/UPDATE DAP ADDRESS.
01131	100333		DELAY		/STALL.
01132	101105		JMS	PDCR	/GO PUNCH CHARACTER
01133	441137		ISZ	PCTR	/ALL CHARACTERS PUNCHED?
01134	601126		JMP	.-6	/NO. REPEAT.
01135	621120		JMP*	PBLKR	/YES. EXIT
01136	000000	DAP	0		
01137	000000	PCTR	0		
01140	000000	PADDR	0		
01141	000000	RRDY	0		/WAIT FOR READER NOT BUSY SUR.
01142	200063		LAC	RBUSY	/FETCH R BUSY
01143	750200		SZA!CLA		/BUSY?
01144	601142		JMP	.-2	/YES.
01145	621141		JMP*	RRDY	/NO. EXIT.
01146	000000	RSTUP	0		/READER SETUP SUBROUTINE.
01147	101141		JMS	RRDY	/WAIT FOR READER NOT BUSY.
01150	440063		ISZ	RBUSY	/SET READER BUSY.
01151	100322		SETLOC		/SET DATA ADDRESS.
01152	001204		RADDR		
01153	003401		BLOCKA		
01154	100533		MOVE		/SET BLOCK LENGTH
01155	000057		RLKCNT		
01156	001205		RBCTR		
01157	777777		-1		
01160	140054		DZM	FRRCTR	/CLEAR ERROR COUNTER.
01161	621146		JMP*	RSTUP	/EXIT
01162	000000	RDRLK	0		/READ DATA BLOCK, FULL SPEED.
01163	101146		JMS	RSTUP	/DO READER SET UP
01164	100322		SETLOC		/SET READER SERVICE ADDRESS
01165	001064		VCTR		/TO RDSRV
01166	001212		RDSRV		
01167	700042		ION		/ENABLE INTERRUPT.
01170	621162		JMP*	RDRLK	/EXIT
			.EJECT		

01171	000000	RDBLKR	0		/READ DATA BLOCK, STALLS.
01172	101146		JMS	RSTUP	/DO READER SETUP
01173	100322		SETLOC		/SET READER SERVICE ADDRESS
01174	001064		VCTR		/TO RDRSRV.
01175	001206		RDRSRV		
01176	100322		SETLOC		/SET DELAY BLOCK ADDRESS.
01177	001203		DAR		
01200	004001		DBLK		
01201	700042		ION		/ENABLE INTERRUPT.
01202	621171		JMP*	RDBLKR	/EXIT.
01203	000000	DAR	0		
01204	000000	RADDR	0		
01205	000000	RBCTR	0		
01206	221203	RDRSRV	LAC*	DAR	/GET STALL COUNT
01207	040026		DAC	DELAYS	/STORE AT DELAYS
01210	441203		ISZ	DAR	/UPDATE DAR.
01211	101254		JMS	DLMSR	/STALL
01212	221204	RDSRV	LAC*	RADDR	/GET EXPECTED DATA
01213	041220		DAC	SB	/STORE AT SB
01214	441204		ISZ	RADDR	/UPDATE EXPECTED DATA ADDR.
01215	700312		KRR		/READ CHARACTER, SELECT READER
01216	700322		KRA		
01217	100575		JMS	CHCK	/TO CHECK IT.
01220	000000	SB	0		
01221	601223		JMP	ERROR	/ERROR.
01222	601240		JMP	RUDONE	/OK.
01223	040053	ERROR	DAC	ERRCR	/STORE BAD CHARACTER.
01224	440054		ISZ	ERRCTR	/+1 TO ERROR COUNTER
01225	601230		JMP	+3	
01226	750001		CLA: CMA		/OFLO.
01227	040054		DAC	ERRCTR	/RESTORE ERRCTR TO 7777.
01230	750004		LAS		/READ SWITCHES
01231	500052		AND	SR3MSK	
01232	751200		SNA: CLA		/HALT ON ERROR?(ACS3)
01233	601240		JMP	RUDONE	/NO.
01234	200053		LAC	ERRCR	/YES. GET BAD CHARACTER
01235	740040		HLT		/ERROR HALT. BAD CHAR IN AC.
01236	201220		LAC	SB	
01237	740040		HLT		/GOOD CHARACTER IN AC.
01240	441205	RUDONE	ISZ	RBCTR	/ALL DONE?
01241	601066		JMP	OUT	/NO. TO MAINLINE
01242	200054		LAC	ERRCTR	/YES. GET ERROR COUNT.
01243	741200		SNA		/ANY ERRORS?
01244	741000		SKP		/NO.
01245	740040		HLT		/HALT. ERROR COUNT IN AC.
01246	754000		CLA: CLL		
01247	140063		DZM	RBUSY	/CLEAR READER BUSY.
01250	200064		LAC	LINK	
01251	740012		RAL		/RESTORE LINK
01252	200065		LAC	AC	/RESTORE AC
01253	620000		JMP*	0	/TO MAINLINE
			.EJECT		

01254	000000	DLMSR	0		/READER DELAY
01255	200026		LAC	DELAYS	/SUBROUTINE
01256	041271		DAC	RCTRA	
01257	621260		JMP*	+.1	
01260	001261		+.1		
01261	200041		LAC	MIL1	
01262	041272		DAC	RCTRB	
01263	441272		ISZ	RCTRB	
01264	601263		JMP	-.1	
01265	441271		ISZ	RCTRA	
01266	601257		JMP	-.7	
01267	754000		CLA:CLL		
01270	621254		JMP*	DLMSR	
01271	000000	RCTRA	0		
01272	000000	RCTRB	0		
01273	000000	DLCNTP	0		/SUB TO FILL DELAY BLOCK.
01274	100533		MOVE		/SET BLOCK LENGTH.
01275	000057		BLKCNT		
01276	001317		DCTR		
01277	777777		-1		
01300	100322		SETLOC		/DBLK ADDR TO DADDR
01301	001316		DADDR		
01302	004001		DBLK		
01303	100411	GNRND	JMS	RANGEN	/GET RANDOM NUMBER.
01304	500055		AND	OLYSK	/REMOVE EXCESS BITS
01305	741200		SNA		/0?
01306	601303		JMP	GNRND	/YES. GET ANOTHER NUMBER.
01307	740001		CMA		/2'S COMPLEMENT IT
01310	340071		TAD	K1	
01311	061316		DAC*	DADDR	/STORE IN DELAY BLOCK.
01312	441316		ISZ	DADDR	/UPDATE DELAY ADDRESS
01313	441317		ISZ	DCTR	/DONE?
01314	601303		JMP	GNRND	/NO.
01315	621273		JMP*	DLCNTP	/YES.EXIT.
01316	000000	DADDR	0		
01317	000000	DCTR	0		
01320	000000	PSYNC	0		
01321	750001		CLA:CMA		
01322	100376		JMS	PUNCH	
01323	621320		JMP*	PSYNC	
			.EJECT		

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/PUNCH TEST NORMAL TEST SEQUENCE
01324 000000 NTST 0
01325 140063 DZM RBUSY /CLEAR READER BUSY
01326 221324 LAC* NTST /SELECT PUNCH MODE
01327 041332 DAC NTSTA
01330 100776 JMS PLTLR /PUNCH LEADER
01331 101320 JMS PSYNC /PUNCH SYNC CHARACTER
01332 000000 NTSTA 0 /PUNCH DATA BLOCK
01333 101011 JMS RSYNC /SYNC READER
01334 101162 JMS RDBLK /READ DATA BLOCK
01335 100776 JMS PLTLR /PUNCH TRAILER
01336 101141 JMS RRDY /WAIT FOR READER NOT BUSY
01337 600260 JMP CHAIN /CHAIN

/PUNCH TESTS SPECIAL TEST SEQUENCE
01340 000000 STST 0
01341 140063 DZM RBUSY /CLEAR READER BUSY
01342 221340 LAC* STST /SELECT PUNCH MODE
01343 041347 DAC STSTA
01344 041352 DAC STSTC
01345 100776 JMS PLTLR /PUNCH LEADER
01346 101320 JMS PSYNC /PUNCH SYNC CHARACTER
01347 000000 STSTA 0 /PUNCH DATA BLOCK
01350 101011 JMS RSYNC /SYNC READER
01351 101162 STSTB JMS RDBLK /READ DATA BLOCK
01352 000000 STSTC 0 /PUNCH DATA BLOCK
01353 601351 JMP STSTB /GO READ AGAIN

/COMBINED TEST NORMAL TEST SEQUENCE.
01354 000000 CNTST 0
01355 140063 DZM RBUSY /CLEAR READER BUSY.
01356 100776 JMS PLTLR /PUNCH LEADER
01357 101320 JMS PSYNC /PUNCH SYNC CHARACTER
01360 101112 JMS PBLK /PUNCH DATA BLOCK (NO STALLS)
01361 101011 JMS RSYNC /SYNC READER
01362 101171 JMS RDBLKR /READ DATA BLOCK (STALLS)
01363 101120 JMS PBLKR /PUNCH DATA BLOCK (STALLS)
01364 101162 JMS RDBLK /READ DATA BLOCK (NO STALL)
01365 100776 JMS PLTLR /PUNCH TRAILER
01366 101141 JMS RRDY /WAIT FOR READER NOT BUSY.
01367 600260 JMP CHAIN /CHAIN.

.EJECT

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01370	000000	/TYPE LINE OF 3 CHARACTERS (NO DELAY)	
01371	140023	TYPLN3 0	
01372	221370	DZM	DELAYM /CLEAR DELAYM
01373	041376	LAC*	TYPLN3 /GET AND STORE DATA ADDRESS.
01374	441370	DAC	.+3
01375	100631	ISZ	TYPLN3
01376	000000	JMS	FBF3 /GO FILL BUFFER WITH DATA
01377	101401	0	
01400	621370	JMS	TYPE /TYPE LINE OF DATA
		JMP*	TYPLN3 /EXIT.
		/TYPE LINE OF ASCII PRINTABLE CHARACTERS	
01401	000000	TYPE 0	
01402	100322	SETLOC	/-76 TO TCTR
01403	001422	TCTR	
01404	777664	-114	
01405	100322	SETLOC	/DATA ADDRESS TO FETCH.
01406	001421	FETCH	
01407	003401	BLOCKA	
01410	200023	TYPEA LAC	DELAYM
01411	740200	SZA	/STALL?
01412	100333	DELAY	/YES.
01413	221421	LAC*	FETCH /GET CHARACTER
01414	100376	JMS	PUNCH /PRINT IT
01415	441421	ISZ	FETCH /UPDATE DATA ADDRESS
01416	441422	ISZ	TCTR /DONE?
01417	601410	JMP	TYPEA /NO. REPEAT.
01420	621401	JMP*	TYPE /YES. EXIT
01421	000000	FETCH 0	
01422	000000	TCTR 0	
01423	000000	ASCCN 0	
01424	221423	LAC*	ASCCN
01425	041460	DAC	WASC
01426	441423	ISZ	ASCCN
01427	221423	LAC*	ASCCN
01430	041461	DAC	SASC
01431	441423	ISZ	ASCCN
01432	201463	LAC	K7700
01433	521460	AND*	WASC
01434	746020	RTR:CLL	
01435	742020	RTR	
01436	742020	RTR	
01437	101446	JMS	CNV
01440	441461	ISZ	SASC
01441	201463	LAC	K7700
01442	740001	CMA	
01443	521460	AND*	WASC
01444	101446	JMS	CNV
01445	621423	JMP*	ASCCN
		.EJECT	

01446	000000	CNV	0	
01447	041462		DAC	ASCT
01450	742010		RTL	
01451	740010		RAL	
01452	501464		AND	K0707
01453	341462		TAD	ASCT
01454	501464		AND	K0707
01455	341465		TAD	K6060
01456	061461		DAC*	SASC
01457	621446		JMP*	CNV
01460	000000	WASC	0	
01461	000000	SASC	0	
01462	000000	ASCT	0	
01463	007700	K7700	7700	
01464	000707	K0707	0707	
01465	006060	K6060	6060	
01466	000247	A33WP4	247	/'
01467	000337		337	/LEFT ARROW
01470	000327		327	/W
01471	000257		257	//
01472	000247	A33WPS	247	/'
01473	000240		240	/SP
01474	000337		337	/LEFT ARROW
01475	000240		240	/SP
01476	000327		327	/W
01477	000240		240	/SP
01500	000257		257	//
01501	000240		240	/SP
01502	000247	A35WP4	247	/'
01503	000333		333	/(
01504	000277		277	/?
01505	000303		303	/C
01506	000247	A35WPS	247	/'
01507	000240		240	/SP
01510	000333		333	/[
01511	000240		240	/SP
01512	000277		277	/?
01513	000240		240	/SP
01514	000303		303	/C
01515	000240		240	/SP
01516	000301	A	301	
01517	000302		302	
01520	000303		303	
01521	000304	D	304	
01522	000305		305	
01523	000306		306	
01524	000307	G	307	
01525	000310		310	
01526	000311		311	

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01527	000312	J	312
01530	000313		313
01531	000314		314
01532	000315	M	315
01533	000316		316
01534	000317		317
01535	000320	P	320
01536	000321		321
01537	000322		322
01540	000323	S	323
01541	000324		324
01542	000325		325
01543	000326	V	326
01544	000327		327
01545	000330		330
01546	000331	Y	331
01547	000332		332
01550	000260		260
01551	000261	ONE	261
01552	000262		262
01553	000263		263
01554	000264	FOUR	264
01555	000265		265
01556	000266		266
01557	000267	SEVEN	267
01560	000270		270
01561	000271		271
01562	000241	C241	241
01563	000242		242
01564	000243		243
01565	000244	C244	244
01566	000245		245
01567	000246		246
01570	000247	C247	247
01571	000250		250
01572	000251		251
01573	000252	C252	252
01574	000253		253
01575	000254		254
01576	000255	C255	255
01577	000256		256
01600	000257		257
01601	000272	C272	272
01602	000273		273
01603	000274		274
01604	000275	C275	275
01605	000276		276
01606	000277		277
01607	000300	C300	300
01610	000333		333
01611	000334		334

.EJECT

01612	000335	C335	335	
01613	000336		336	
01614	000337		337	
01615	000001	SLID1	1	
01616	000002		2	
01617	000004		4	
01620	000010		10	
01621	000020		20	
01622	000040		40	
01623	000100		100	
01624	000200		200	
01625	000100		100	
01626	000040		40	
01627	000020		20	
01630	000010		10	
01631	000004		4	
01632	000002		2	
01633	000376	SLID0	376	
01634	000375		375	
01635	000373		373	
01636	000367		367	
01637	000357		357	
01640	000337		337	
01641	000277		277	
01642	000177		177	
01643	000277		277	
01644	000337		337	
01645	000357		357	
01646	000367		367	
01647	000373		373	
01650	000375		375	
01651	004003	CRTST	4003	/SP, C
01652	002240		2240	/R, SP
01653	002405		2405	/T, E
01654	002324		2324	/S, T
01655	000001		0001	/END CODE
01656	004022	RMTST	4022	/SP, R
01657	001107		1107	/I, G
01660	001024		1024	/H, T
01661	004015		4015	/SP, M
01662	000122		0122	/A, R
01663	000711		0711	/G, I
01664	001640		1640	/N, SP
01665	002405		2405	/T, E
01666	002324		2324	/S, T
01667	000001		0001	/END CODE

.EJECT

01670	004023	SPTST	4023	/SP,S
01671	002071		2001	/P,A
01672	000305		0305	/C,E
01673	004024		4024	/SP,T
01674	000523		0523	/E,S
01675	002400		2400	/T
01676	000100		0100	/END CODE
01677	004014	LFTST	4014	/SP,L
01700	000640		0640	/F,SP
01701	002405		2405	/T,E
01702	002324		2324	/S,T
01703	000001		0001	/END CODE
01704	004003	CHRTST	4003	/SP,C
01705	001001		1001	/H,A
01706	002201		2201	/R,A
01707	000324		0324	/CT
01710	000522		0522	/E,R
01711	004024		4024	/SP,T
01712	000523		0523	/E,S
01713	002423		2423	/T,S
01714	000001		0001	/END CODE
01715	004027	WCPTST	4027	/SP,W
01716	001722		1722	/O,R
01717	002324		2324	/S,T
01720	004003		4003	/SP,C
01721	000123		0123	/A,S
01722	000540		0540	/E,SP
01723	002001		2001	/P,A
01724	002424		2424	/T,T
01725	000522		0522	/E,R
01726	001640		1640	/N,SP
01727	002405		2405	/T,E
01730	002324		2324	/S,T
01731	000015		0015	/CR
01732	000012		0012	/LF
01733	000001		0001	/END CODE
01734	000015	KMSG1	0015	/CR
01735	000012		0012	/LF
01736	004001		4001	/SP,A
01737	002322		2322	/S,R
01740	006363		6363	/3,3
01741	005763		5763	/1,3
01742	006540		6540	/5,SP
01743	001331		1331	/K,Y
01744	000204		0204	/B,D
01745	004024		4024	/SP,T
01746	000523		0523	/E,S
01747	002400		2400	/T
01750	001500		1500	/CR
01751	001200		1200	/LF
01752	000100		0100	/END CODE

.EJECT

		/KMSG2. TYPE: PRESS A KEY	
01753	000015	KMSG2	0015 /CR
01754	000012		0012 /LF
01755	004020		4020 /SP,P
01756	002205		2205 /R,E
01757	002323		2323 /S,S
01760	004001		4001 /SP,A
01761	004013		4013 /SP,K
01762	000531		0531 /E,Y
01763	005600		5600 /.
01764	001500		1500 /CR
01765	001200		1200 /LF
01766	000100		0100 /END CODE
01767	000015	KMSG3	0015 /CR
01770	000012		0012 /LF
01771	004005		4005 /SP,E
01772	000310		0310 /C,H
01773	001740		1740 /O,SP
01774	002405		2405 /T,E
01775	002324		2324 /S,T
01776	000015	KMSG3A	0015 /CR
01777	000012		0012 /LF
02000	004003		4003 /SP,C
02001	001001		1001 /H,A
02002	002201		2201 /R,A
02003	000324		0324 /C,T
02004	000522		0522 /E,R
02005	002340		2340 /S,P
02006	001305		1305 /K,E
02007	003105		3105 /Y,E
02010	000440		0440 /D,SP
02011	002711		2711 /W,I
02012	001414		1414 /L,L
02013	004002		4002 /SP,B
02014	000540		0540 /E,SP
02015	002431		2431 /T,Y
02016	002005		2005 /P,E
02017	000456		0456 /D..
02020	000015		0015 /CR
02021	000012		0012 /LF
02022	004022		4022 /SP,R
02023	002502		2502 /U,B
02024	001725		1725 /O,U
02025	002440		2440 /T,SP
02026	000516		0516 /E,N
02027	000423		0423 /D,S
.EJECT			

02030	024022		4022	/SP,R
02031	001725		1725	/O,U
02032	002411		2411	/T,I
02033	001605		1605	/N,E
02034	005600		5600	/.
02035	001500		1500	/CR
02036	001200		1200	/LF
02037	001500		1500	/CR
02040	001200		1200	/LF
02041	000100		0100	/END CODE
02042	000015	KMSG4	0015	/CR
02043	000012		0012	/LF
02044	000012		0012	/LF
02045	004017		4017	/SP,0
02046	000324		0324	/C,T
02047	000114		0114	/A,L
02050	004005		4005	/SP,E
02051	002125		2125	/O,U
02052	001126		1126	/I,V
02053	000114		0114	/A,L
02054	000516		0516	/E,N
02055	002440		2440	/T,SP
02056	002405		2405	/T,E
02057	002324		2324	/S,T
02060	000015		0015	/CR
02061	000001		0001	/END CODE
02062	000015	KMSG5	0015	/CR
02063	000012		0012	/LF
02064	004040	OCTEQV	4040	
02065	004040		4040	
02066	000015		0015	/CR
02067	000012		0012	/LF
02070	000001		0001	/END CODE

.EJECT

02071	100613	PRG0	JMS	STAF	/SET UP BUFFER AREA
02072	100322		SETLOC		/INITIAL ROUTINE ADDRESS
02073	000020		KSTART		/TO KSTART
02074	002076		P0TS0		
02075	600233		JMP	SRSET	/GO GET STARTED
			/CARRIAGE RETURN TEST		
02076	000000		P0TS0	0	
02077	002131		P0TS1		
02100	100361		JMS	CRLF	/CRLF
02101	777776		-2		/TWICE
02102	100451		JMS	TYPSTG	/PRINT TEST TITLE
02103	001651		CRTST		
02104	100361		JMS	CRLF	/CRLF
02105	777776		-2		/TWICE
02106	200070		LAC	C334	/GET "\ " CODE
02107	100376		JMS	PUNCH	/PRINT IT
02110	200077		LAC	M111	
02111	040045		DAC	UTEMP	/-73 TO UTEMP
02112	440045	CRTSTA	ISZ	UTEMP	/ALL DONE?
02113	741000		SKP		/NO.
02114	600260		JMP	CHAIN	/YES. CHAIN
02115	200045	CRTSTB	LAC	UTEMP	
02116	040046		DAC	UTEMP1	/C(UTEMP) TO UTEMP1.
02117	200066		LAC	SPACE	/SET "SPACE" CODE
02120	100376		JMS	PUNCH	/PRINT IT.
02121	440046		ISZ	UTEMP1	/SPACED PER C(UTEMP1)?
02122	602117		JMP	.-3	/NO. SPACE AGAIN.
02123	200060		LAC	CR	/YES. GET "CR" CODE
02124	100376		JMS	PUNCH	/PRINT IT
02125	100376		JMS	PUNCH	/DUMMY CYCLE.
02126	200067		LAC	C257	/GET "/" CODE
02127	100376		JMS	PUNCH	/PRINT IT
02130	602112		JMP	CRTSTA	
			.EJECT		

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/RIGHT MARGIN TEST
POTS1
02131 000001
02132 002163
02133 100361
02134 777776
02135 100451
02136 001656
02137 100361
02140 777776
02141 200074
02142 040045
02143 100451
02144 002146
02145 602152
02146 005555
02147 005555
02150 001100
02151 000100
02152 440045
02153 602143
02154 100451
02155 002157
02156 602162
02157 005511
02160 005500
02161 000100
02162 600260

POTS2
JMS CRLF /CRLF
-2 /TWICE
JMS TYPSTG /PRINT TEST TITLE
PMTST
JMS CRLF /CRLF
-2 /TWICE
LAC M16. /-14 TO UTEMP
DAC UTEMP
RMTSTA JMS TYPSTG /PRINT "----!"
.+2
JMP .+5
5555
5555
1100
0100
ISZ UTEMP /DONE 14 TIMES?
JMP RMTSTA /NO. REPEAT
JMS TYPSTG /YES. PRINT "-I-"
.+2
JMP .+4
5511
5500
0100
JMP CHAIN /CHAIN
.EJECT

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/SPACE TEST
02163 000002 POTS2 ?
02164 002230 POTS3
02165 100361 JMS CRLF /CRLF
02166 777776 -2 /TWICE
02167 100451 JMS TYPSTG /PRINT TEST TITLE
02170 001670 SPTST
02171 100361 JMS CRLF /CRLF
02172 777776 -2 /TWICE
02173 200075 LAC M44 /-36 TO UTEMP
02174 040045 DAC UTEMP
02175 100451 SPTSTA JMS TYPSTG /PRINT\,SP
02176 002200 .+2
02177 602202 JMP .+3
02200 003440 /"\,SP
02201 000001 0001 /END CODE
02202 440045 ISZ UTEMP /DONE 36 TIMES?
02203 602175 JMP SPTSTA /NO, DO IT AGAIN
02204 200075 LAC M44
02205 040045 DAC UTEMP /-36 TO UTEMP
02206 200072 LAC M1 /GET -1
02207 040046 SPTSTB DAC UTEMP1 /AC TO UTEMP1
02210 040047 DAC UTEMP2 /AND UTEMP2
02211 200060 LAC CR /GET "CR" CODE
02212 100376 JMS PUNCH /PRINT IT
02213 100376 JMS PUNCH /DUMMY CYCLE
02214 200066 LAC SPACE /GET "SPACE" CODE
02215 100376 JMS PUNCH /PRINT IT
02216 440047 ISZ UTEMP2 /DONE SPACING?
02217 602214 JMP .-3 /NO, REPEAT.
02220 200067 LAC C257 /YES, GET "1" CODE
02221 100376 JMS PUNCH /PRINT IT
02222 440045 ISZ UTEMP /DONE 36 TIMES?
02223 741000 SKP /NO.
02224 600260 JMP CHAIN /YES, CHAIN
02225 200073 LAC M2 /-2 TO AC
02226 340046 TAD UTEMP1 /ADD C(UTEMP1)
02227 602207 JMP SPTSTB
.EJECT

```

```

/LINE FEED TEST
02230 000003 POTS3 3
02231 002254 POTS4
02232 100361 JMS CRLF
02233 777776 -2
02234 100451 JMS TYPSTG
02235 001677 LFTST
02236 100361 JMS CRLF
02237 777776 -2
02240 200076 LAC M110
02241 040045 DAC UTEMP
02242 200070 LFTSTA LAC C334
02243 100376 JMS PUNCH
02244 200061 LAC LF
02245 100376 JMS PUNCH
02246 440045 ISZ UTEMP
02247 741000 SKP
02250 600260 JMP CHAIN
02251 100350 JMS DLCNT
02252 100333 DELAY
02253 602242 JMP LFTSTA
.EJECT

/-72 TO UTEMP
/GET "\" CODE
/PRINT IT
/GET "LF" CODE
/PRINT IT
/DONE?
/NO.
/YES. CHAIN
/DELAY COUNT GENERATE.
/DELAY .

```

02254	000004	P0TS4	4		
02255	002267		P0TS5		
02256	100361		JMS	CRLF	/CRLF
02257	777776		-2		/TWICE
02260	100451		JMS	TYPSTG	/PRINT TITLE
02261	001704		CHRTST		
02262	100361		JMS	CRLF	/CRLF
02263	777776		-2		/TWICE
02264	101370		JMS	TYPLN3	/PRINT LINE OF ABC
02265	001516		A		
02266	600260		JMP	CHAIN	/CHAIN
02267	000005	P0TS5	5		
02270	002274		P0TS6		
02271	101370		JMS	TYPLN3	/PRINT LINE OF DEF
02272	001521		D		
02273	600260		JMP	CHAIN	
02274	000006	P0TS6	6		
02275	002301		P0TS7		
02276	101370		JMS	TYPLN3	/PRINT LINE OF GHI
02277	001524		G		
02300	600260		JMP	CHAIN	
02301	000007	P0TS7	7		
02302	002306		P0TS10		
02303	101370		JMS	TYPLN3	/PRINT LINE OF JKL
02304	001527		J		
02305	600260		JMP	CHAIN	
02306	000010	P0TS10	10		
02307	002313		P0TS11		
02310	101370		JMS	TYPLN3	/PRINT LINE OF MNO
02311	001532		M		
02312	600260		JMP	CHAIN	
02313	000011	P0TS11	11		
02314	002320		P0TS12		
02315	101370		JMS	TYPLN3	/PRINT LINE OF PQR
02316	001535		P		
02317	600260		JMP	CHAIN	
02320	000012	P0TS12	12		
02321	002325		P0TS13		
02322	101370		JMS	TYPLN3	/PRINT LINE OF STU
02323	001540		S		
02324	600260		JMP	CHAIN	
02325	000013	P0TS13	13		
02326	002332		P0TS14		
02327	101370		JMS	TYPLN3	/PRINT LINE OF VWX
02330	001543		V		
02331	600260		JMP	CHAIN	
02332	000014	P0TS14	14		
02333	002337		P0TS15		
02334	101370		JMS	TYPLN3	/PRINT LINE OF YZ0
02335	001546		Y		
02336	600260		JMP	CHAIN	
			.EJECT		

02337	000015	P0TS15	15		
02340	000344		P0TS16		
02341	101370		JMS	TYPLN3	/PRINT LINE OF 123
02342	001551		ONE		
02343	600260		JMP	CHAIN	
02344	000016	P0TS16	16		
02345	002351		P0TS17		
02346	101370		JMS	TYPLN3	/PRINT LINE OF 456
02347	001554		FOUR		
02350	600260		JMP	CHAIN	
02351	000017	P0TS17	17		
02352	002356		P0TS20		
02353	101370		JMS	TYPLN3	/PRINT LINE OF 789
02354	001557		SEVEN		
02355	600260		JMP	CHAIN	
02356	000020	P0TS20	20		
02357	002363		P0TS21		
02360	101370		JMS	TYPLN3	/PRINT LINE OF!"#
02361	001562		C241		
02362	600260		JMP	CHAIN	
02363	000021	P0TS21	21		
02364	002370		P0TS22		
02365	101370		JMS	TYPLN3	/PRINT LINE OF \$%&
02366	001565		C244		
02367	600260		JMP	CHAIN	
02370	000022	P0TS22	22		
02371	002375		P0TS23		
02372	101370		JMS	TYPLN3	/PRINT LINE OF'()
02373	001570		C247		
02374	600260		JMP	CHAIN	
02375	000023	P0TS23	23		
02376	002402		P0TS24		
02377	101370		JMS	TYPLN3	/PRINT LINE OF *+.
02400	001573		C252		
02401	600260		JMP	CHAIN	
02402	000024	P0TS24	24		
02403	002407		P0TS25		
02404	101370		JMS	TYPLN3	/PRINT LINE OF -./
02405	001576		C255		
02406	600260		JMP	CHAIN	
02407	000025	P0TS25	25		
02410	002414		P0TS26		
02411	101370		JMS	TYPLN3	/PRINT LINE OF :;<
02412	001601		C272		
02413	600260		JMP	CHAIN	
02414	000026	P0TS26	26		
02415	002421		P0TS27		
02416	101370		JMS	TYPLN3	/PRINT LINE OF =>?
02417	001604		C275		
02420	600260		JMP	CHAIN	
			.EJECT		

02421	000027	P0TS27	27		
02422	002426		P0TS30		
02423	101370		JMS	TYPLN3	/PRINT LINES OF @\
02424	001607		C300		
02425	600260		JMP	CHAIN	
02426	000030	P0TS30	30		
02427	002433		P0TS31		
02430	101370		JMS	TYPLN3	/PRINT LINES OF J+ AND LEFT ARROW.
02431	001612		C335		
02432	600260		JMP	CHAIN	
02433	000031	P0TS31	31		
02434	002441		P0TS32		
02435	100652		JMS	FBALL	/PRINT LINE OF ALL CHARACTERS
02436	140023		D2M	DELAYM	
02437	101401		JMS	TYPE	
02440	600260		JMP	CHAIN	
02441	000032	P0TS32	32		
02442	002447		P0TS33		
02443	100652		JMS	FBALL	/PRINT LINE OF ALL CHARACTERS.
02444	100350		JMS	DLCNT	/FIXED DELAY BETWEEN
02445	101401		JMS	TYPE	/CHARACTERS
02446	600260		JMP	CHAIN	
02447	000033	P0TS33	33		
02450	002466		P0TS34		
		/PRINT 6 LINES OF ASR33 WORST CASE PATTERN, NO DELAY			
02451	100361		JMS	CRLF	/CRLF
02452	777776		-2		/TWICE
02453	100451		JMS	TYPSTG	/PRINT TITLE
02454	001715		WCPTST		
02455	100706		JMS	FW334	/PATTERN TO BUFFER
02456	140023		D2M	DELAYM	/0 TO DELAYM
02457	100322		SETLOC		/-6 TO CTRA
02460	000050		CTRA		
02461	777772		-6		
02462	101401		JMS	TYPE	/TYPE LINE
02463	440050		ISz	CTRA	/ALL LINES TYPED?
02464	602462		JMP	.-2	/NO. REPEAT
02465	600260		JMP	CHAIN	/YES. CHAIN
		.EJECT			

02466	000034	P0TS34	34		
02467	002501		P0TS35		
02470	100706	/PRINT	6 LINES	OF ASR33	WORST CASE PATTERN. FIXED STALL BETWEEN CHARS.
02471	100322		JMS	FW334	/PATTERN TO BUFFER
02472	000050		SETLOC		/-6 TO CTRA
02473	777772		CTRA		
02474	100350		-6		
			JMS	DLCNT	/GENERATE DELAY COUNT
02475	101401		JMS	TYPE	/TYPE LINE
02476	440050		ISZ	CTRA	/ALL LINES TYPED?
02477	602474		JMP	.-3	/NO. REPEAT.
02500	600260		JMP	CHAIN	/YES. CHAIN
02501	000035	P0TS35	35		
02502	002514		P0TS36		
02503	100742	/PRINT	6 LINES	OF ASR35	WORST CASE PATTERN. NO DELAY
02504	140023		JMS	FW354	/PATTERN TO BUFFER
02505	100322		DZM	DELAYM	/0 TO DELAYM
02506	000050		SETLOC		/-6 TO CTRA
02507	777772		CTRA		
02510	101401		-6		
02511	440050		JMS	TYPE	/TYPE LINE.
02512	602510		ISZ	CTRA	/ALL LINES TYPED?
02513	600260		JMP	.-2	/NO. REPEAT
02514	000036		JMP	CHAIN	/YES. CHAIN
02515	777777	P0TS36	36		
02516	100742		777777		
02517	100322	/PRINT	6 LINES	OF ASR35	WORST CASE PATTERN. FIXED STALL BETWEEN CHARS.
02520	000050		JMS	FW354	/PATTERN TO BUFFER
02521	777772		SETLOC		/-6 TO CTRA
02522	100350		CTRA		
02523	101401		-6		
02524	440050		JMS	DLCNT	/GENERATE DELAY COUNT
02525	602522		JMS	TYPE	/TYPE LINE
02526	600260		ISZ	CTRA	/ALL LINES TYPED?
			JMP	.-3	/NO. REPEAT
			JMP	CHAIN	/YES. CHAIN
			.EJECT		

```

/PROGRAM 1. PUNCH FUNCTION TEST
02527 100322 PRG1 SETLOC /SET INTERRUPT SERVICE
02530 000002 2 /ADDRESS TO INTSVC
02531 001051 INTSVC
02532 100322 SETLOC /SET BLOCK COUNT TO
02533 000057 BLKCNT /-256.
02534 777400 -400
02535 100322 SETLOC /INITIAL ROUTINE ADDRESS
02536 000020 KSTART /TO KSTART
02537 002541 P1T0
02540 600233 JMP SRSET /GET STARTED

/ROUTINE 0
/PUNCH AND READ CHECK BLOCK OF ALL 0'S.
02541 000000 P1T0 0
02542 002552 P1T1
02543 143401 DZM BLOCKA /0 TO BLOCKA
02544 100533 MOVE /FILL BUFFER
02545 003401 BLOCKA
02546 003402 BLOCKA +1
02547 777401 -377
02550 101324 JMS NTST /GO TO NORMAL TEST
02551 101112 JMS PBLK /USE THIS CALL.

/ROUTINE 1.
/PUNCH AND READ CHECK BLOCK OF CHANNEL 1.
02552 000001 P1T1 1
02553 002564 P1T2
02554 143401 DZM BLOCKA
02555 443401 ISZ BLOCKA /1 TO BLOCKA
02556 100533 MOVE /FILL BUFFER
02557 003401 BLOCKA
02560 003402 BLOCKA+1
02561 777401 -377
02562 101324 JMS NTST /GO TO NORMAL TEST.
02563 101112 JMS PBLK /USE THIS CALL.

/ROUTINE 2.
/PUNCH AND READ CHECK BLOCK OF CHANNEL 2.
02564 000002 P1T2 2
02565 002577 P1T3
02566 100322 SETLOC /2 TO BLOCKA
02567 003401 BLOCKA
02570 000002 ?
02571 100533 MOVE /FILL BUFFER
02572 003401 BLOCKA
02573 003402 RLOCKA+1
02574 777401 -377
02575 101324 JMS NTST /GO TO NORMAL TEST.
02576 101112 JMS PBLK /USE THIS CALL
.EJECT

```

```

02577 000003
02600 002612
02601 100322
02602 003401
02603 000004
02604 100533
02605 003401
02606 003402
02607 777401
02610 101324
02611 101112

/ROUTINE 3.
/PUNCH AND READ CHECK BLOCK OF CHANNEL 3.
P1T3 3
      P1T4
      SETLOC /4 TO BLOCKA
      BLOCKA
      4
      MOVE /FILL BUFFER
      BLOCKA
      BLOCKA+1
      -377
      JMS NTST /GO TO NORMAL TEST
      JMS PBLK /USE THIS CALL

/ROUTINE 4
/PUNCH AND READ CHECK BLOCK OF CHANNEL 4.
P1T4 4
      P1T5
      SETLOC /10 TO BLOCKA
      BLOCKA
      10
      MOVE
      BLOCKA
      BLOCKA+1
      -377
      JMS NTST /GO TO NORMAL TEST
      JMS PBLK /USE THIS CALL

/ROUTINE 5.
/PUNCH AND READ CHECK BLOCK OF CHANNEL 5.
P1T5 5
      P1T6
      SETLOC /20 TO BLOCKA
      BLOCKA
      20
      MOVE /FILL BUFFER
      BLOCKA
      BLOCKA+1
      -377
      JMS NTST /GO TO NORMAL TEST
      JMS PBLK /USE THIS CALL
      .EJECT

```

```

/ROUTINE 6.
/PUNCH AND READ CHECK BLOCK OF CHANNEL 6.
P1T6 6
      P1T7
      SETLOC          /40 TO BLOCKA
      BLOCKA
      40
      MOVE            /FILL BUFFER
      BLOCKA
      BLOCKA+1
      -377
      JMS      NTST          /GO TO NORMAL TEST.
      JMS      PBLK         /USE THIS CALL.

/ROUTINE 7
/PUNCH AND READ CHECK BLOCK OF CHANNEL 7.
P1T7 7
      P1T10
      SETLOC          /100 TO BLOCKA.
      BLOCKA
      100
      MOVE            /FILL BUFFER
      BLOCKA
      BLOCKA+1
      -377
      JMS      NTST          /GO TO NORMAL TEST.
      JMS      PBLK         /USE THIS CALL.

/ROUTINE 10.
/PUNCH AND READ CHECK BLOCK OF CHANNEL 8.
P1T10 10
      P1T11
      SETLOC          /200 TO BLOCKA
      BLOCKA
      200
      MOVE            /FILL BUFFER
      BLOCKA
      BLOCKA+1
      -377
      JMS      NTST          /GO TO NORMAL TEST
      JMS      PBLK         /USE THIS CALL.

/ROUTINE 11
/PUNCH AND READ CHECK BLOCK OF SLIDING AND PATTERN.
P1T11 11
      P1T12
      MOVE            /FILL BUFFER WITH
      SLID1           /SLIDING 1 PATTERN.
      BLOCKA
      -16
      MOVE
      BLOCKA
      BLOCKA+1
      -362
      JMS      NTST          /GO TO NORMAL TEST
      JMS      PBLK         /USE THIS CALL
      .EJECT

```

02640 00000
02641 002653
02642 100322
02643 003401
02644 000040
02645 100533
02646 003401
02647 003402
02650 777401
02651 101324
02652 101112

02653 000007
02654 002666
02655 100322
02656 003401
02657 000100
02660 100533
02661 003401
02662 003402
02663 777401
02664 101324
02665 101112

02666 000010
02667 002701
02670 100322
02671 003401
02672 000200
02673 100533
02674 003401
02675 003402
02676 777401
02677 101324
02700 101112

02701 000011
02702 002715
02703 100533
02704 001015
02705 003401
02706 777762
02707 100533
02710 003401
02711 003417
02712 777416
02713 101324
02714 101112

```

/ROUTINE 12
/PUNCH AND READ CHECK BLOCK OF SLIDING 0 PATTERN.
P1T12  12
      P1T13
      MOVE          /FILL BUFFER WITH
      SLID0        /SLIDING 0 PATTERN
      BLOCKA
      -16
      MOVE
      BLOCKA
      BLOCKA+16
      -362
      JMS          NTST      /GO TO NORMAL TEST
      JMS          PBLK     /USE THIS CALL

/ROUTINE 13
/PUNCH AND READ CHECK BLOCK OF ONES AND ZEROS.
P1T13  13
      P1T14
      CLA:CMA
      AND          PTMSK
      DAC          BLOCKA   /377 TO BLOCKA
      DZM          BLOCKA+1 /0 TO BLOCKA+1
      MOVE
      BLOCKA        /FILL BUFFER WITH
      BLOCKA+2     /ONES AND ZEROES.
      -376
      JMS          NTST      /GO TO NORMAL TEST
      JMS          PBLK     /USE THIS CALL

/ROUTINE 14.
/PUNCH AND READ CHECK BLOCK OF ONES AND ZEROES. RANDOM
/STALLS BETWEEN CHARACTRERS PUNCHED.
P1T14  14
      P1T15
      CLA:CMA
      AND          PTMSK
      DAC          BLOCKA   /377 TO BLOCKA
      DZM          BLOCKA+1 /0 TO BLOCKA+1
      MOVE
      BLOCKA        /FILL BUFFER WITH
      BLOCKA+2     /ONES AND ZEROES.
      -376
      JMS          NTST      /GO TO NORMAL LIST
      JMS          PBLKR    /USE THIS CALL.
      .EJECT

```

02715	000012
02716	002731
02717	100533
02720	001633
02721	003401
02722	777762
02723	100533
02724	003401
02725	003417
02726	777416
02727	101324
02730	101112
02731	000013
02732	002745
02733	750001
02734	500564
02735	043401
02736	143402
02737	100533
02740	003401
02741	003403
02742	777402
02743	101324
02744	101112
02745	000014
02746	002761
02747	750001
02750	500564
02751	043401
02752	143402
02753	100533
02754	003401
02755	003403
02756	777402
02757	101324
02760	101120

```

/ROUTINE 15
/PUNCH AND READ CHECK BLOCK OF BINARY COUNT PATTERN.
P1T15 15
      P1T16
      JMS   FWBIN      /GO FILL WITH BINARY PATTERN
      JMS   NTST      /GO TO NORMAL TEST
      JMS   PBLK      /USE THIS CALL

/ROUTINE 16.
/PUNCH AND READ CHECK BLOCK OF BINARY COUNT PATTERN.
/RANDOM STALLS BETWEEN CHARACTERS PUNCHED.
P1T16 16
      777777
      JMS   FWBIN      /GO FILL WITH BINARY PATTERN
      JMS   NTST      /GO TO NORMAL TEST
      JMS   PBLKR     /USE THIS CALL.
FWBIN 0
      SETLOC          /BLOCKA ADDRESS TO TEMPU
      TEMPU
      BLOCKA
      SETLOC          /-256 TO CTRA
      CTRA
      -400
      JMS   INITPT    /INITIALIZE PATTERN.
      JMS   GETPTT    /GET BINARY CHARACTER
      DAC*  TEMPU     /STORE PER TEMPU
      ISZ   TEMPU     /+1 TO TEMPU
      ISZ   CTRA      /DONE?
      JMP   FWRINA    /NO.
      JMP*  FWRIN     /YES. EXIT
      .EJECT

```

```

02761 000015
02762 002766
02763 102773
02764 101324
02765 101112

```

```

02766 000016
02767 777777
02770 102773
02771 101324
02772 101120
02773 000000
02774 100322
02775 000044
02776 003401
02777 100322
03000 000050
03001 777400
03002 100557
03003 100565
03004 060044
03005 440044
03006 440050
03007 603003
03010 622773

```

FWBIN

FWRINA


```

03011 100322 /PROGRAM 2. KEYBOARD TEST
03012 000020 PRG2 SETLOC /INITIAL ROUTINE ADDRESS
03013 003017 KSTART /TO KSTART
03014 100451 P2T0
03015 001734 JMS TYPSTG /PRINT TITLE
03016 600233 KMSG1
JMP SRSET /GET STARTED.

/Routine 0
/CHECK THAT KSF COMMAND SKIPS WITH FLAG=1. 1000 TIMES.
P2T0 0
P2T1
SETLOC /-1000 TO CTRA.
CTRA
-1750
CAF /CLEAR ALL FLAGS.
JMS TYPSTG /PRINT INSTRUCTION
KMSG2
KSF /WAIT FOR FLAG 1.
JMP .-1
KSF /SKIP ONE FLAG.
JMP P2E0 /NO SKIP. ERROR.
ISZ CTRA /DONE 1000 TIMES?
JMP .-3 /NO. REPEAT.
JMP CHAIN /YES. CHAIN
P2E0 HLT:CLA /ERROR. FAILED TO SKIP.
KSF /SCOPE LOOP. SKIP ON FLAG 1.
JMP .-1 /REPEAT
JMP .-2 /REPEAT

/Routine 1.
/ECHO TEST. CHARACTER RECEIVED IS TYPED, KEYED AND PRINTED CHARACTER
/SHOULD MATCH. RUBOUT CHARACTER ENDS ROUTINE.
P2T1 1
P2T2
CAF
JMS TYPSTG /PRINT INSTRUCTION
KMSG3
P2T1A KSF /READY?
JMP .-1 /WAIT
KRB /READ CHARACTER.
TLS /PRINT IT
TSF /DONE TYPING?
JMP .-1 /NPO. WAIT.
TAD MRROUT
SZA /RUBOUT?
JMP P2T1A /NO. REPEAT
JMP CHAIN /YES. CHAIN
.EJECT

```

```

/ROUTINE 2.
/OCTAL EQUIVALENT TEST. THE OCTAL EQUIVALENT OF ANY CHARACTER
/KEYED IS PRINTED. RUBOUT ENDS ROUTINE.
P2T2 2
      777777
      CAF
      JMS TYPSTG /PRINT INSTRUCTION
      KMSG4
      JMS TYPSTG
      KMSG3A
P2T2A KSF /READY?
      JMP .-1 /NO. WAIT
      KRB /YES. READ KEYBOARD
      DAC P2T2W
      JMS ASCCN /CONNECT CHARACTER TO
      P2T2W /PRINTABLE OCTAL
      OCTEQV
      JMS TYPSTG /PRINT OCTAL EQUIVALENT
      KMSG5
      LAC P2T2W
      TAD MRROUT
      SZA /RUBOUT?
      JMP P2T2A /NO.
      JMP CHAIN /YES. CHAIN
P2T2W 0
      .EJECT

```

```

03001 000002
03002 777777
03003 703302
03004 100451
03005 002042
03006 100451
03007 001776
03008 700301
03009 603070
03010 700312
03011 043106
03012 101423
03013 003106
03014 002064
03015 100451
03016 002062
03017 203106
03018 340062
03019 740200
03020 603070
03021 600260
03022 000000

```

```

/PROGRAM 3. COMBINED READER, PRINTER, PUNCH TEST
03107 100322 PRG3 SETLOC /SET INTERRUPT SERVICE TO
03110 000002 2 /INTSVC
03111 001051 INTSVC
03112 100322 SETLOC /SET BLOCK COUNT
03113 000057 BLKCNT /TO -150
03114 777552 -226
03115 100613 JMS STRF /SET UP RUFFER.
03116 100322 SETLOC /INITIAL ROUTINE
03117 000020 KSTART /ADDRESS TO KSTART
03120 003122 P3T0
03121 600233 JMP SRSET /GET STARTED.
03122 000000 P3T0 0
03123 003127 P3T1
03124 100631 JMS FBF3 /DATA:ABC
03125 001516 A
03126 101354 JMS CNTST
03127 000001 P3T1 1
03130 003134 P3T2
03131 100631 JMS FBF3 /DATA:DEF
03132 001521 D
03133 101354 JMS CNTST
03134 000002 P3T2 2
03135 003141 P3T3
03136 100631 JMS FBF3 /DATA:GHI
03137 001524 C
03140 101354 JMS CNTST
03141 000003 P3T3 3
03142 003146 P3T4
03143 100631 JMS FBF3 /DATA:JKL
03144 001527 J
03145 101354 JMS CNTST
03146 000004 P3T4 4
03147 003153 P3T5
03150 100631 JMS FBF3 /DATA:MNO
03151 001532 M
03152 101354 JMS CNTST
03153 000005 P3T5 5
03154 003160 P3T6
03155 100631 JMS FBF3 /DATA:PQR
03156 001535 P
03157 101354 JMS CNTST
03160 000006 P3T6 6
03161 003165 P3T7
03162 100631 JMS FBF3 /DATA:STU
03163 001540 S
03164 101354 JMS CNTST
.EJECT

```

03165	000007	P3T7	7		
03166	003172		P3T12		
03167	100631		JMS	FBF3	/DATA:VWY
03170	001543		Y		
03171	101354		JMS	CNTST	
03172	000010	P3T10	10		
03173	003177		P3T11		
03174	100631		JMS	FBF3	/DATA:YZ0
03175	001546		Y		
03176	101354		JMS	CNTST	
03177	000011	P3T11	11		
03200	003204		P3T12		
03201	100631		JMS	FBF3	/DATA:123
03202	001551		ONE		
03203	101354		JMS	CNTST	
03204	000012	P3T12	12		
03205	003211		P3T13		
03206	100631		JMS	FBF3	/DATA:456
03207	001554		FOUR		
03210	101354		JMS	CNTST	
03211	000013	P3T13	13		
03212	003216		P3T14		
03213	100631		JMS	FBF3	/DATA:789
03214	001557		SEVEN		
03215	101354		JMS	CNTST	
03216	000014	P3T14	14		
03217	003223		P3T15		
03220	100631		JMS	FBF3	/DATA:!"#
03221	001562		C241		
03222	101354		JMS	CNTST	
03223	000015	P3T15	15		
03224	003230		P3T16		
03225	100631		JMS	FBF3	/DATA:\$\$%
03226	001565		C244		
03227	101354		JMS	CNTST	
03230	000016	P3T16	16		
03231	003235		P3T17		
03232	100631		JMS	FBF3	/DATA:'()
03233	001570		C247		
03234	101354		JMS	CNTST	
03235	000017	P3T17	17		
03236	003242		P3T20		
03237	100631		JMS	FBF3	/DATA:++.
03240	001573		C252		
03241	101354		JMS	CNTST	
			.EJECT		

03242	000020	P3T20	20		
03243	003247		P3T21		
03244	100631		JMS	FBF3	/DATA:~./
03245	001576		C255		
03246	101354		JMS	CNTST	
03247	000021	P3T21	21		
03250	003254		P3T22		
03251	100631		JMS	FBF3	/DATA:~;<
03252	001601		C272		
03253	101354		JMS	CNTST	
03254	000022	P3T22	22		
03255	003261		P3T23		
03256	100631		JMS	FBF3	/DATA:~>?
03257	001604		C275		
03260	101354		JMS	CNTST	
03261	000023	P3T23	23		
03262	003266		P3T24		
03263	100631		JMS	FBF3	/DATA:~\
03264	001607		C300		
03265	101354		JMS	CNTST	
03266	000024	P3T24	24		
03267	003273		P3T25		
03270	100631		JMS	FBF3	/DATA:~+ AND LEFT ARROW
03271	001612		C335		
03272	101354		JMS	CNTST	
03273	000025	P3T25	25		
03274	003277		P3T26		
03275	100652		JMS	FBALL	/DATA: ALL PRINTABLE ASCII.
03276	101354		JMS	CNTST	
03277	000026	P3T26	26		
03300	003303		P3T27		
03301	100706		JMS	FW334	/DATA: ASR33 PRINTER WORST
03302	101354		JMS	CNTST	/CASE PATTERN.
03303	000027	P3T27	27		
03304	003307		P3T30		
03305	100724		JMS	FW335	/DATA: ASR33 PRINTER WORST CASE
03306	101354		JMS	CNTST	/PATTERN WITH INTERSPERSED BLANKS.
03307	000030	P3T30	30		
03310	003313		P3T31		
03311	100742		JMS	FW354	/DATA: ASR35 PRINTER WORST CASE
03312	101354		JMS	CNTST	/PATTERN.
03313	000031	P3T31	31		
03314	003317		P3T32		
03315	100760		JMS	FW355	/DATA: ASR35 PRINTER WORST CASE
03316	101354		JMS	CNTST	/PATTERN WITH INTERSPERSED BLANKS.

.EJECT

03317	000032	P3T32	32	
03320	777777		777777	
03321	750001		CLA:OMA	/DATA: ONE'S AND ZEROS.
03322	500564		AND	PTRSK
03323	043403		DAC	RLOCK1
03324	143404		DZM	BLOCK1+1
03325	100533		MOVE	
03326	003403		RLOCK1	
03327	003405		BLOCK1+2	
03330	777672		-106	
03331	100533		MOVE	
03332	003403		BLOCK1	
03333	003515		BLOCK2	
03334	777670		-110	
03335	101354		JMS	CNTST
			/PROGRAM 4. PRINT LINES OF DATA IN LOC 00021 AND 00022.	
			/IF ACS0=0, FULL SPEED. IF ACS0=1 STALL BETWEEN CHARACTERS.	
03336	100613	PRG4	JMS	STPF
03337	100670		JMS	FBTMP
03340	140023		DZM	DELAYM
03341	750004		LAS	/READ ACS
03342	751100		SPA:CLA	/STALL?
03343	100350		JMS	OLCNT
03344	101401		JMS	TYPE
03345	603340		JMP	PRG4+2
			/PROGRAM 5. PUNCH AND READ CHECK DATA BLOCKS WITH DATA IN LOC 00021 AND	
			/00022. IF ACS0=0, FULL SPEED. IF ACS0=1 STALL BETWEEN CHARACTERS	
03346	204403	PRG5	LAC	(INTSVC
03347	040002		DAC	2
03350	204404		LAC	(-400
03351	040057		DAC	BLKCNT
03352	100533		MOVE	/FILL BUFFER WITH DATA.
03353	000021		PTEMP	
03354	003401		BLOCKA	
03355	777776		-2	
03356	100533		MOVE	
03357	003401		BLOCKA	
03360	003403		BLOCKA+2	
03361	777402		-376	
03362	204405	PRG5A	LAC	(JMS PRLK
03363	043372		DAC	PRG5V
03364	750004		LAS	/READ ACS.
03365	750100		SMA:CLA	/STALL?
03366	603371		JMP	PRG5V-1
03367	204406		LAC	(JMS PRLKR
03370	043372		DAC	PRG5V
03371	101340		JMS	STST
03372	000000	PRG5V		/GO TO SPECIAL SUBROUTINE
				/JMS PRLK, OR JMS PBLKR
			.EJECT	

```

/PROGRAM 6. PUNCH AND READ CHECK BLOCKS OF BINARY COUNT PATTERN.
/IF ACS0=0, FULL SPEED. IF ACS0=1 RANDOM STALLS BETWEEN CLASS PUNCHED.
03373 204403  PRG6  LAC  (INTSVG  /SET INTERRUPT SERVICE TO INTSVG
03374 040002  DAC  2
03375 204404  LAC  (-400  /SET BLOCK COUNT TO -256
03376 040057  DAC  BLKCNT
03377 102773  JMS  FWBIN  /FILL BUFFER WITH BINARY COUNT.
03400 603362  JMP  PRG5A

/
03401 000215  BLOCKA 215  /CR
03402 000212  212  /LF
03403 000000  BLOCK1 0
03513 000215  .LOC BLOCK1+110
03513 000215  BLOCKB 215  /CR
03514 000212  212  /LF
03515 000000  BLOCK2 0
03625 000215  .LOC BLOCK2+110
03625 000215  BLOCKC 215  /CR
03626 000212  212  /LF
04001 000000  .LOC BLOCKA+400
04001 000000  DBLK 0
04401 000000  .LOC DBLK+400
000000 .END
04401 000450 *L
04402 000440 *L
04403 001051 *L
04404 777400 *L
04405 101112 *L
04406 101120 *L
SIZE=04407 NO ERROR LINES

```

A	01516
AC	00065
ASCCN	01423
ASCT	01462
A33WPS	01472
A33WP4	01466
A35WPS	01506
A35WP4	01502
BLK CNT	00057
BLOCKA	03401
BLOCKB	03513
BLOCKC	03625
BLOCK1	03403
BLOCK2	03515
CHAIN	00260
CHCK	00575
CHRTST	01704
CLOF	700004
CLON	700044
CLSF	700001
CNTST	01354
CNV	01446
CR	00060
CRCTR	00375
CRLF	00361
CRTST	01651
CRTSTA	02112
CRTSTB	02115
CTRA	00050
CTRB	00051
CURTST	00034
C100	00105
C240	00106
C241	01562
C244	01565
C247	01570
C252	01573
C255	01576
C257	00067
C272	01601
C275	01604
C300	01607
C334	00070
C335	01612
D	01521
DADDR	01316
DAP	01136
DAR	01203
DBLK	04001
DCTR	01317
DELAY	100333
DELAYM	00023
DELAYS	00026
DLCNT	00350
DLCNTP	01273

DLMSR	01254
DLYMS	00333
DLYMSK	00055
EEM	707702
ERRCR	00053
ERRCTR	00054
FRROR	01223
FADDR	00554
FBALL	00652
FBF3	00631
FBTMP	00670
FETCH	01421
FLAG	00102
FORWD	00277
FOUR	01554
FWRIN	02773
FWBINA	03003
FW33S	00724
FW334	00706
FW35S	00760
FW354	00742
G	01524
GETPTT	00565
GETRDY	00234
GNRND	01303
INCRTN	00256
INITPT	00557
INTSVC	01051
J	01527
KMSG1	01734
KMSG2	01753
KMSG3	01767
KMSG3A	01776
KMSG4	02042
KMSG5	02062
KRA	700322
KRP	700312
KSF	700301
KSTART	00020
K0707	01464
K1	00071
K6060	01465
K77	00103
K7700	01463
LDCDE	01010
LEM	707704
LF	00061
LFTST	01677
LFTSTA	02242
LINK	00064
LTRCTR	01007
M	01532
MCTR	00556
MILCTR	00040
MIL1	00041

MOVE	100533
MOVEA	00545
MOVVE	00533
MRROUT	00062
MSCTR	00037
M1	00072
M110	00076
M111	00077
M16	00074
M2	00073
M40	00104
M44	00075
NTST	01324
NTSTA	01332
NXTST	00035
OCTEQV	02064
ONE	01551
OUT	01066
P	01535
PADDR	01140
PBLK	01112
PBLKR	01120
PCF	700202
PCTR	01137
PDCR	01105
PFLAG	00056
PLTLR	00776
PRGADR	00221
PRGEN0	00275
PRGLIM	00031
PRGMSK	00030
PRGNUM	00027
PRGTAB	00111
PRG0	02071
PRG1	02527
PRG2	03011
PRG3	03107
PRG4	03336
PRG5	03346
PRG5A	03362
PRG5V	03372
PRG6	03373
PRINT	00524
PSA	700204
PSR	700244
PSF	700201
PSTUP	01074
PSW	00032
PSYNC	01320
PTEMP	00021
PTEMP1	00022
PTMSK	00564
PT0	00562
PT1	00563
PUNCH	00376

P0TS0	02076
P0TS1	02131
P0TS10	02306
P0TS11	02313
P0TS12	02320
P0TS13	02325
P0TS14	02332
P0TS15	02337
P0TS16	02344
P0TS17	02351
P0TS2	02163
P0TS20	02356
P0TS21	02363
P0TS22	02370
P0TS23	02375
P0TS24	02402
P0TS25	02407
P0TS26	02414
P0TS27	02421
P0TS3	02230
P0TS30	02426
P0TS31	02433
P0TS32	02441
P0TS33	02447
P0TS34	02466
P0TS35	02501
P0TS36	02514
P0TS4	02254
P0TS5	02267
P0TS6	02274
P0TS7	02301
P1T0	02541
P1T1	02552
P1T10	02666
P1T11	02701
P1T12	02715
P1T13	02731
P1T14	02745
P1T15	02761
P1T16	02766
P1T2	02564
P1T3	02577
P1T4	02612
P1T5	02625
P1T6	02640
P1T7	02653
P2E0	03036
P2T0	03017
P2T1	03042
P2T1A	03047
P2T2	03061
P2T2A	03070
P2T2W	03106
P3T0	03122
P3T1	03127

P3T10	03172
P3T11	03177
P3T12	03204
P3T13	03211
P3T14	03216
P3T15	03223
P3T16	03230
P3T17	03235
P3T2	03134
P3T20	03242
P3T21	03247
P3T22	03254
P3T23	03261
P3T24	03266
P3T25	03273
P3T26	03277
P3T27	03303
P3T3	03141
P3T30	03307
P3T31	03313
P3T32	03317
P3T4	03146
P3T5	03153
P3T6	03160
P3T7	03165
RADDR	01204
RANCON	00436
RANDEX	00437
RANGEN	00411
RANSAV	00450
RANTAD	00426
RANTBL	00440
RBCTR	01205
RBUSY	00063
RCF	700102
RCTRA	01271
RCTRB	01272
RDRLK	01162
RDRLKR	01171
RDRSRV	01206
RDSRV	01212
RMTST	01656
RMTSTA	02143
RRR	700112
RRDY	01141
RSA	700104
RSB	700144
RSCTR	01026
RSF	700101
RSSERV	01027
RSTUP	01146
RSYNC	01011
RTNNO	00033
RUDONE	01240
S	01540

SASC	01461
SB	01220
SETLOC	100322
SEVEN	01557
SHALT	00313
SKIPMA	00107
SKIPPA	00110
SLID0	01633
SLID1	01615
SPACE	00066
SPTST	01670
SPTSTA	02175
SPTSTB	02207
SRSET	00233
SR3MSK	00052
START	00200
STBF	00613
STCTR	00322
STST	01340
STSTA	01347
STSTR	01351
STSTC	01352
SWITCH	00526
TADDR	00555
TCF	700402
TCTR	01422
TEMP	00042
TEMPU	00044
TEMP1	00043
TENO	00100
TEMR	00101
TLS	700406
TSC1	00456
TSC2	00467
TSF	700401
TSTMSK	00036
TYPAT	00500
TYPE	01401
TYPEA	01410
TYPLN3	01370
TYPSP	00504
TYPSTG	00451
UTEMP	00045
UTEMP1	00046
UTEMP2	00047
V	01543
VCTR	01064
WASC	01460
WCHK	00612
WCPTST	01715
Y	01546
.EOT	00000

.ECT	00000
KSTART	00000
PTEMP	00001
PTEMP1	00002
DELAYM	00003
DELAYS	00006
PRGNUM	00007
PRGMSK	00000
PRGLIM	00001
PSW	00002
RTNNO	00003
CURTST	00004
NXTST	00005
TSTMSK	00006
MSCTR	00007
MILCTR	00000
MIL1	00001
TEMP	00002
TEMP1	00003
TEMPU	00004
UTEMP	00005
UTEMP1	00006
UTEMP2	00007
CTRA	00000
CTRB	00001
SRJMSK	00002
ERRCR	00003
ERRCTR	00004
OLYMSK	00005
PFLAG	00006
BLKCNT	00007
CR	00000
LF	00001
MRROUT	00002
RBUSY	00003
LINK	00004
AC	00005
SPACE	00006
C257	00007
C334	00000
K1	00001
M1	00002
M2	00003
M16	00004
M44	00005
M110	00006
M111	00007
TEMQ	00100
TEMR	00101
FLAG	00102
K77	00103
M40	00104
C100	00105
C240	00106
SKIPMA	00107

SKIPPA	00110
PRGTAB	00111
START	00200
PRGADR	00221
SRSET	00233
GETRDY	00234
INCRTN	00256
CHAIN	00260
PRGENO	00275
FORWD	00277
SHALT	00313
STCTR	00322
DLYMS	00333
DLCNT	00350
CRLF	00361
CRCTR	00375
PUNCH	00376
RANGEN	00411
RANTAD	00426
RANCON	00436
RANDEX	00437
RANTBL	00440
RANSAY	00450
TYPSTG	00451
TSC1	00456
TSC2	00467
TYPAT	00500
TYPSP	00504
PRINT	00524
SWITCH	00526
MOVEE	00533
MOVEA	00545
FADDR	00554
TADDR	00555
MCTR	00556
INITPT	00557
PTA	00562
PT1	00563
PTMSK	00564
GETPTT	00565
CHK	00575
WCHK	00612
STRF	00613
FRF3	00631
FRAL	00652
FRTP	00670
FW334	00706
FW335	00724
FW354	00742
FW355	00760
PLTLR	00776
LTRCTR	01007
LDCDE	01010
RSYNC	01011
RSCTR	01012

RSSERV	01027
INTSVC	01051
VCTR	01064
OUT	01066
PSTUP	01074
PDCR	01105
PBLK	01112
PBLKR	01120
DAP	01136
PCTR	01137
PADDR	01140
RRDY	01141
RSTUP	01146
RDBLK	01162
RDBLKR	01171
DAR	01203
RADDR	01204
RBCTR	01205
RDRSRV	01206
RDSRV	01212
SB	01220
ERROR	01223
RUDONE	01240
OLMSR	01254
RCTRA	01271
RCTRB	01272
OLCNTP	01273
GNRND	01303
DADDR	01316
DCTR	01317
PSYNC	01320
NTST	01324
NTSTA	01332
STST	01340
STSTA	01347
STSTB	01351
STSTC	01352
CNTST	01354
TYPLN3	01370
TYPE	01401
TYPEA	01410
FETCH	01421
TCTR	01422
ASCCN	01423
CNV	01446
WASC	01460
SASC	01461
ASCT	01462
K7700	01463
K0707	01464
K6060	01465
A33WP4	01466
A33WPS	01472
A35WP4	01502
A35WPS	01506

A	01516
D	01521
G	01524
J	01527
H	01532
P	01535
S	01540
V	01543
Y	01546
ONE	01551
FOUR	01554
SEVEN	01557
C241	01562
C244	01565
C247	01570
C252	01573
C255	01576
C272	01601
C275	01604
C300	01607
C335	01612
SLID1	01615
SLID0	01633
CRTST	01651
RMTST	01656
SPTST	01670
LFTST	01677
CHRTST	01704
WCPTST	01715
KMSG1	01734
KMSG2	01753
KMSG3	01767
KMSG3A	01776
KMSG4	02042
KMSG5	02062
OCTEQV	02064
PRG0	02071
P0TS0	02076
CRTSTA	02112
CRTSTB	02115
P0TS1	02131
RMTSTA	02143
P0TS2	02163
SPTSTA	02175
SPTSTR	02207
P0TS3	02230
LFTSTA	02242
P0TS4	02254
P0TS5	02267
P0TS6	02274
P0TS7	02301
P0TS10	02306
P0TS11	02313
P0TS12	02319
P0TS13	02326

P0TS14	02332
P0TS15	02337
P0TS16	02344
P0TS17	02351
P0TS20	02356
P0TS21	02363
P0TS22	02370
P0TS23	02375
P0TS24	02402
P0TS25	02407
P0TS26	02414
P0TS27	02421
P0TS30	02426
P0TS31	02433
P0TS32	02441
P0TS33	02447
P0TS34	02466
P0TS35	02501
P0TS36	02514
PRG1	02527
P1T0	02541
P1T1	02552
P1T2	02564
P1T3	02577
P1T4	02612
P1T5	02625
P1T6	02640
P1T7	02653
P1T10	02666
P1T11	02701
P1T12	02715
P1T13	02731
P1T14	02745
P1T15	02761
P1T16	02766
FWBIN	02773
FWRINA	03003
PRG2	03011
P2T0	03017
P2F0	03036
P2T1	03042
P2T1A	03047
P2T2	03061
P2T2A	03070
P2T2W	03106
PRG3	03107
P3T0	03122
P3T1	03127
P3T2	03134
P3T3	03141
P3T4	03146
P3T5	03153
P3T6	03160
P3T7	03165
P3T10	03172

P3T11	03177
P3T12	03204
P3T13	03211
P3T14	03216
P3T15	03223
P3T16	03230
P3T17	03235
P3T20	03242
P3T21	03247
P3T22	03254
P3T23	03261
P3T24	03266
P3T25	03273
P3T26	03277
P3T27	03303
P3T30	03307
P3T31	03313
P3T32	03317
PRG4	03336
PRG5	03346
PRG5A	03362
PRG5V	03372
PRG6	03373
RLOCKA	03401
RLOCK1	03403
RLOCKB	03513
RLOCK2	03515
RLOCKC	03625
DBLK	04001
SETLOC	100322
DELAY	100333
MOVE	100533
CLSF	700001
CLOF	700004
CLON	700044
RSF	700101
RCF	700102
RSA	700104
RRR	700112
RSP	700144
PSF	700201
PCF	700202
PSA	700204
PSR	700244
KSF	700301
KRR	700312
KRA	700322
TSF	700401
TCF	700402
TLS	700406
FEM	707702
LEM	707704