Binary Code (Punch = 1)	8 7	6 5 4	Tape Channel S	3 2 1
Octal Code	1 0	1 1 0	(Sprocket)	1 0 0

Teleprinter Control

Refer to Data Communications Equipment Options—KL8-E Asynchronous Data Control.

PAPER TAPE READER AND PUNCH OPTIONS

The options available for paper tape facilities are listed below.

PR8-E Reader (with Control Unit)
PC8-E Reader/Punch (with Control Unit)

Type PR8-E Paper Tape Reader

The PR8-E is available in two versions: the rack mounted version (PR8-EA) and the Table Top version (PR8-EB).

The PR8-E reader senses eight-hole unoiled grey perforated paper tape photoelectrically at a maximum rate of 300 characters per second. The control unit of the PR8-E plugs into the OMNIBUS and controls the action of the reader from program instructions. All connections between the control unit and the reader are made using a BC08-K cable.

A read operation is initiated by an RFC instruction from the computer. The control unit, in turn, initiates tape movement and sensing of a character, transfers the character to its reader buffer (RB), and sets its device flag to indicate that a character is available for transfer to the computer. The computer senses the reader flag by issuing an RSF instruction, and transfers the character from the RB to AC04 through 11 by issuing an RRB instruction. The RRB instruction also clears the reader flag to ready the unit for another read operation.

The control unit also contains an interrupt enable flip-flop. This flip-flop, controlled by program instructions, determines whether the reader can generate an interrupt request to the program interrupt facility. When set by an RPE instruction or initialize input, this flip-flop enables generation of an interrupt request from the reader flag being set. When cleared by a PCE instruction, this flip-flop inhibits interrupt requests.

Programming

Instructions for operating the reader are as follows:

Set Reader/Punch Interrupt Enable (RPE)

Octal Code: 6010
Operation: Sets the reader/punch interrupt enable flip-flop so that an interrupt request can be generated when reader or punch flag is set.

Skip on Reader Flag (RSF)

Octal Code: 6011
Operation: Senses the reader flag; if it contains a binary one, increments the PC by one so that the next sequential instruction is skipped.

Read Reader Buffer (RRB)

Octal Code: 6012
Operation: ORs the content of the reader buffer into AC4-11 and clears the reader flag. This command does not clear the AC.

Reader Fetch Character (RFC)

Octal Code: 6014

Operation: Clears the reader flag, loads one character into the RB from the tape, and sets the reader flag when the RB is full.

Read Buffer and Fetch New Character (RRB, RFC)

Octal Code: 6016

Operation: Combines RRB and RFC. The contents of the reader buffer is ORed into the AC. The flag is immediately cleared, and a new character is read from tape into the reader buffer. The flag is then set.

Clear Reader/Punch Interrupt Enable (PCE)

Octal Code: 6020

Operation: Clears the reader/punch interrupt enable flip-flop so that interrupt requests cannot be generated.

A program sequence loop to read a character from perforated tape can be written as follows:

```
        RFC         /FETCH CHARACTER FROM TAPE
LOOK,   RSF         /SKIP IF READER FLAG = 1
        JMP LOOK    /JUMP BACK & TEST FLAG AGAIN
        CLA         /CLEAR AC
        RRB         /LOAD AC FROM RB, CLEAR READER FLAG
```

PC8-E Reader/Punch

The PC8-E is available in two versions: the rack mountable version (PC8-EA) and the table top version (PC8-EB).

The PC8-E consists of a reader and punch mounted on the same chassis and a control unit which plugs into the OMNIBUS and controls the action of the reader/punch from program instructions. All connections between the control unit and reader/punch are made using two BC08-K cables.

	Specifications
Tape Type	1-inch fan-folded unoiled grey paper
Channels	8 data channels plus feedhole
Read Character Rate (Continuous)	300 characters/second
Read Character Rate (Start-Stop Mode)	25 characters/second
Punch Character Rate	50 characters/second

The reader portion of the PC8-E operates in the same manner as the PR8-E. The punch portion executes the following additional instructions:

Set Reader/Punch Interrupt Enable (RPE)

Octal Code: 6010

Operation: Sets the reader/punch interrupt enable flip-flop so that an interrupt request can be generated when punch or reader flag is set.

Clear Reader/Punch Interrupt Enable (PCE)
Octal Code: 6020
Operation: Clears the reader/punch enable flip-flop so that interrupt requests cannot be generated.

Skip on Punch Flag (PSF)
Octal Code: 6021
Operation: Senses the punch flag; if it contains a binary one, increments the PC by one so that the next sequential instruction is skipped.

Clear Punch Flag (PCF)
Octal Code: 6022
Operation: Clears the punch flag in preparation for receiving a new character from the computer.

Load Punch Buffer and Punch Character (PPC)
Octal Code: 6024
Operation: Transfers the eight-bit character in AC4-11 into the PB, then punches that character. The instruction does not clear the punch flag or the PB.

Load Punch Buffer Sequence (PLS)
Octal Code: 6026
Operation: Clears the punch flag, transfers the contents of AC4-11 into the punch buffer, punches the character in the PB on tape, and sets the punch flag when the operation is completed.

A program sequence loop to punch a character when the punch buffer is free can be written as follows:

```
FREE,PSF        /SKIP IF PUNCH FLAG = 1
     JMP FREE   /JUMP BACK & TEST FLAG AGAIN
     PLS        /CLEAR PUNCH FLAG & PB, LOAD PB
                /FROM AC, PUNCH CHARACTER, SET
                /PUNCH FLAG WHEN DONE
```