PRINTECH II
USERS MANUAL

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TABLE OF CONTENTS

INTRODUCTION

The Printech II is a parallel printer card designed for use in the Apple II microcomputers. It is fully compatible with APPLE's Parallel Printer Card, and will function correctly in any application calling for the APPLE Parallel Printer Card.

The Printech II has its own custom SMT on-board program which allows the user to program the card, using simple control characters to vary printer line lengths, insert extra linefeed characters after carriage returns when required, and to turn off the monitor screen when printing, if desired, and enable or disable the 8th bit.

The Printech II can be used with most printers equipped with a 7 or 8 bit parallel interface. It can send characters to a printer at speeds up to 5,000 characters per second, but since most printers have limited data buffer storage capacity actual character throughput will be substantially lower.

The Printech II can also be used as a general purpose, 8-bit parallel output port, if desired.

INSTALLING THE PRINTECH II CARD

NOTE: Failure to follow these instructions may result in damage to both the Printech II and your Apple computer.

CAUTION !!!!

(1)   Turn the printer and the Apple "OFF". (Power should be off when inserting or removing any card).

(2)   Take off the lid and look at the row of connectors towards the rear of the APPLE's circuit board.   Each connector is numbered (0 through 7) in back of the connector.   These numbered connectors are called "slots".   They are numbered 0-7. from L to R viewed from the front, except Apple IIe which is numbered 1 to 7.

(3)   Plug the 26-pin flat cable connector into the mating connector on the Printech II card matching pin 1 on the card to the arrow on the connector.   So that the flat cable comes out of the connector away from the board not across the board.

(4)   Install the Printech II . card with the components facing to the right, as viewed from the front of the APPLE, and the cable to the back.   Plug the card into any unused slot except slot #0.   If possible, use slot #1.   This is the most commonly used slot for printers, and, if you are using PASCAL or CP/M, you must use slot #1.

(5) Drape the cable over the back of the case and put the APPLE's cover back on. The pressure between the lid and the case will act as a cable clamp, so that a tug on the cable will not put stress on the connector of the Printech II card.

(6) Plug the other end of the cable into your printer's interface connector.

(7) Turn Power to the Printer and APPLE "on".

STROBE EDGE AND WIDTH SELECTION

STR

J1 ⟨figure⟩ J2

Figure 1: Position of Jumper Pads

Jumper pad Number 1 = Strobe Edge
Jumper pad Number 2 = Strobe Width

There are two sets of jumper pads on the Printech II, marked J1 and J2. These pads are preconfigured for operation with standard printers, and you probably dont need to change them. In fact, SMT knows of no existing printer that will require you to reconfigure the pads.

Most printers require a negative edge triggered STROBE, and this is the factory preset condition of the Printech II. To change to a positive edge triggered STROBE, cut the trace between the left and middle pads of J1, and solder a jumper wire between the right and middle pads.

The pads marked J2 are preset for a STROBE width of 1 microsecond. To increase the STROBE width to 3 microseconds, cut the trace between the right and middle pads of J2, and install a wire between the left and middle pads.

If you have problems operating a printer with the Printech II after initial connection, check the printer manual to see if it requires a positive edge triggered STROBE or a STROBE longer than 1 microseconds. You may also experiment by

trying each of the four possible configurations to achieve operability.

As a final word of **WARNING**, the J1 and J2 jumper pads probably will not help in case of a printer inoperability. Requirement of anvthing evcent the factory preset configuration would be highly unusual.

PRINTER OPERATION WITH THE
PRINTECH II CARD

In the discussion that follows, we will assume that the Printech II card is installed in slot #1. If you have used some other slot, change all reference to slot #1 to the slot you have used. The term (return) as used below signifies a single depression of the "RETURN" key.

With your Printech II card properly installed, the cable connected to the printer, the APPLE and printer powered up (with printer selected "on-line")˙ type: PR#1 (RETURN)

This command turns the printer card on.   If everything is working properly, you will see the printer do one or two carriage returns and print the prompt symbol.   From this point on until you type in   PR#   0   (RETURN)   or   hit   RESET, everything you type in will be printed on the printer, and the monitor.   Any program listing you do with "LIST" will be sent to the printer after a PR # 1 command.

If nothing happens when you type in "PR#1", check to make sure your printer is plugged in and turned on, and that you have typed in the correct slot number (remember, slot 1 is actually the second slot , Apple II, II+ only, since the slot numbers start at 0).   If the incorrect slot number is typed, all output will go to the wrong slot and you will "lock up" the APPLE.   Depress the RESET key and begin again if this should occur.

Now type in: PRINT 7/3 (RETURN)

The statement and its result should appear on the printer and on the monitor.

Type in: PR#0 (RETURN)
and then,   PRINT &/# (RETURN)

The "PR#0" command will turn off the Printech
II card and return to the monitor as the only
output device.   Now the second statement and its
result appear only on the monitor.

You may use the PR#1 and PR#0 commands in
your own BASIC programs to selectively print
portions of your program's output.   For example:

100 PRINT "THIS LINE WILL NOT PRINT"
110 PR#1
120 PRINT "THIS LINE WILL NOT PRINT"
130 PR#0
140 END

This will send only the text in line 120 to the
printer and monitor while the text in line 100
will be sent to the monitor only.

If you are working on a BASIC program and
would like to get a program listing on your
printer, type in: PR#1 (RETURN) and LIST
(RETURN).

This will result in your program listing being sent
to the printer.   After the listing is done, type
in: PR#0   to kill subsequent output to the
printer.

PRINTER COMMANDS

Upon initialization, (PR#1) a certain number of default conditions automatically exist. This allows the user to immediately use his Printech II without any additional commands. These conditions are:

    Auto Line Feed After Carriage Return - ON
    Screen Display - ON
    Eighth Bit - OFF
    40 Character Printing

All of these commands may be altered as required.

The printer commands are described below. They can be all typed in directly from the APPLE's keyboard or can be inserted in BASIC program to achieve the desired effect:

Note: In the following discussion (CTRL-I) means typing the letter " I " while holding down the CTRL key.

PR# (slot no.) (RETURN)

Turns the printer card on. The slot no. entered must be the number of the slot containing the printer card (from 1 to 7).

PR#0 (RETURN)
Turns the printer off.

Printer commands are effective only after the printer card has been turned on with PR# (slot

no.) command.   If you turn the card off and back on, it will again come up in its default condition:

   Output to printer and monitor.
   Card set for 40 columns per line.
   Auto line feed turned ON.
   Eighth Bit OFF.

Should you desire a different configuration, you will have to repeat your command sequence each time you turn the card on.

(CTRL-I) nN
Prints "n" columns per line on the printer.   The number of columns may be any number from 40 to 255.   Any line sent to the printer while doing a Basic Listing command, if it is linger than the number of columns specified, will be "wrapped around" (a carriage return, linefeed will be inserted after the specified number of characters have been transmitted and the remainder of the line will be printed) on the next line.

Example: (CTRL-I) 132N will set Printech II card up to output lines 132 characters (at most) long. Note: The only time that this command has any effect is while doing a "BASIC" program "LIST" with the screen turned off.

(CTRL-I) I
Turns on the monitor display while sending characters to the printer.   Note: Whenever screen is turned on "BASIC" listings will default to 40 columns.
(CTRL-I) K
Disables the automatic printer line feed option. The APPLE adds a carriage return to the end of every line, and the Printech II card adds a line feed character after each carriage return.   If your printer automatically adds its own line feed

character after each carriage return, double spacing of printing lines may occur. If desired, the (CTRL-I)K command may be used to eleiminate this extra line feed.

<div align="center">(CTRL-I) A</div>

Re-enables the automatic line feed option.

<div align="center">(CTRL-I) (CTRL-letter)</div>

Changes the printer command control character recognized by the printer.

HIGH ORDER BIT ENABLE/DISABLE

Some graphics printers require the use of the eighth, or high order bit which is normally masked off during the transmission of text to printers. The high order bit may be enabled or disabled through two different techniques.

<div align="center">(CTRL-I) H or CHR$ (9) ,"H",</div>

Enables high order bit for graphics routines.

<div align="center">(CTRL-I) X or CHR$ (9) ," X ",</div>

Disables the high order bit.

<div align="center">PRINT CHR$ (9) ," H ",</div>

(To enable 8th bit.)

<div align="center">PRINT CHR$ (9) ," X ",</div>

(to disable 8th bit.)

These two commands work regardless of the slot location (Slot 1-7) of the printer interface card.

The other manner in which the graphics capability of the Printech may be enabled or disabled, is through the use of POKE instructions. The address of the POKE will depend upon the slot in which your Printech II is located.

HEX Adress	to enable high order bit	to disable high order bit
1 04F9	POKE 1273,255	POKE 1273,127
2 04FA	POKE 1274,255	POKE 1274,12/
3 04FB	POKE 1275,255	POKE 1275,127
4 04FC	POKE 1276,255	POKE 1276,12/
5 04FD	POKE 1277,255	POKE 1277,127
6 04FE	POKE 1278,255	POKE 1278,127
/ 04FF	POKE 1279,255	POKE 1279,127

Note: On initialization the high order bit is
DISABLED.

TEST PROGRAM FOR GRAPHICS USING ESCAPE COMMANDS OR POKES:

```
100 PR#1
110 PRINT
120 PRINT CHR$(9);"H"
130 FOR I=1 TO 72
140 PRINT CHR$(213);
150 NEXT I
160 PRINT
170 FOR I=1 TO 72
180 PRINT CHR$(213):
190 NEXT I
200 PRINT
210 POKE 1273,255
220 FOR I=1 TO 72
230 PRINT CHR$(170):
240 NEXT I
250 PRINT
260 POKE 1273,127
270 FOR I=1 TO 72
280 PRINT CHR$(170):
290 NEXT I
300 PRINT
310 PR#0
```

COMMAND SUMMARY

PR# N
Turn on printer card

(CTRL-I) K
Kill auto - LF

(CTRL-I) A
Append line feed to carriage return

(CTRL-I) nN
Turn off display and print n columns wide

(CTRL-I) I
Turn on display

(CTRL-I) H
Enable high order bit

(CTRL-I) X
Disable high order bit

USING THE PRINTECH II AS AN 8-BIT OUTPUT PORT

The Printech II card can be used as a general purpose 8-bit parallel output port to drive a variety of peripheral devices. A POKE to a particular memory address will result in the number POKE'd appearing on the DATA lines and a pulse on the STROBE line. The address used in the POKE statment will depend on the slot in which the printer card is installed:

Slot used	Decimal Address	Hex Address

Each time a byte is sent to the Printech II card, the strobe · signal is generated. The strobe has the polarity indicated by the setup of the jumper configuration block.

If an acknowledge signal is provided, it can be tested for by reading location $CNC1 (where N=slot number) or decimal 49345 + (N*256).

If BIT 7 is set, no acknowledge has been received, if BIT 7 is clear an acknowledge was received.

SLOT #1 EXAMPLE:

10 IF PEEK (49345 + 1*256)<128 THEN PRINT "ACKNOWLEDGE RECEIVED":GOTO 30

20 GOTO 10:REM WAIT FOR ACK

30 POKE (16240), DATA

40 GOTO 10