

**INSTRUCTION MANUAL**

**RV-611E  
PARALLEL PRINTER INTERFACE SLOTWARE(TM)  
For Apple II/II+/IIE  
Microcomputers  
Using Parallel Printers**

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**OTHER SLOTWARE(TM) BY MICROTEK:**

**APPLE and FRANKLIN COMPUTERS**

RV-611C	Parallel Printer Interface
DUMPLING-GX	Hi-Res Graphics Printer Interface
DUMPLING-64	64K Spooler Buffer
SCAMP SERIES	RS-232C Serial Interface Cables
BAM-16MM	16K Memory Expansion with Software
BAM-128	64/128K Memory Expansion, Software
Q-DISC with Pre-boots	128K Disc Emulator with MagiCalc For Dos 3.3, Pascal, or CP/M
MAGNUM-80	80-Column Text Card
MAGNUM-80e	80-Column Text Card for IIe
MAGNUM-80Me	80-Column Text & 64K Memory for IIe
VIZ-E-EXPAND	Visicalc Expansion Software
VIZ-E-EXPAND-80	Adds 80-Column to VIZ-E-EXPAND
VIZ-E-PAC	BAM 128, MAGNUM-80 and VIZ-E-EXPAND
Q-PAC	Q-DISC, MAGNUM-80 and VIZ-E-EXPAND
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## Chapter 1

## INTRODUCTION

The RV-611E is a parallel printer interface designed for use in the Apple II/II+/IIE microcomputer. 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 RV-611E has its own custom Microtek on-board program that allows you to program the card, using simple control characters, to accomplish these functions:

- 1) Vary the printer line lengths.
- 2) Insert extra linefeed characters after carriage returns.
- 3) Turn off the monitor screen when printing.
- 4) Enable and disable the 8th bit.

The RV-611E 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 RV-611E can also be used as a general purpose, 8-bit parallel output port, if desired.

Chapter 2  
**INSTALLATION**

**A. Jumpers**

The RV-611 has two jumpers to configure its strobe edge and width to the needs of your system. These jumpers are shown as J1 and J2 on the drawing below.

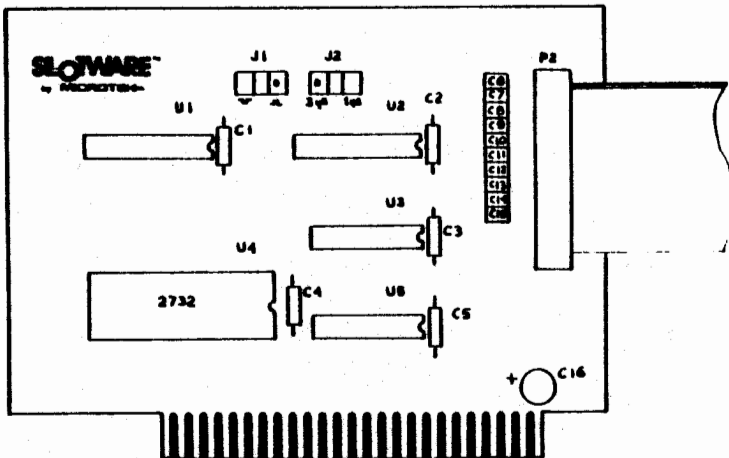


Figure 1  
 Jumper Blocks J1 and J2

Jumper Block J1 = Strobe Edge  
 Jumper Block J2 = Strobe Width

Most printers require a "negative edge triggered strobe". Jumper Block J1 is factory preset for this requirement, with the jumper connecting the center pin and the left pin.

The second Jumper Block, J2, is typically placed in the right position, with the jumper connecting the center pin and the right pin. If your printer requires a strobe of length greater than 1 microsecond, place the jumper block (J2) in the left position.

If the Strobe Edge and Strobe Width signals are not clearly defined in your printer manual, try each position of the Jumper Blocks (J1 and J2). The printer works properly when the correct configuration is found, and no damage is done to either the printer or the Apple when the configuration is wrong.

#### B. Installing the Card

**CAUTION:** Failure to follow these instructions may result in damage to both the RV-611E and to your Apple Computer.

Installation of the RV-611E is very simple and straightforward. After the jumpers are set, just follow these simple steps.

- 1) Inspect the Microtek box, the card and the cable. If there appears to be any PHYSICAL damage at all, contact your dealer or the Service Department at Microtek immediately.  
DO NOT ATTEMPT TO INSTALL ANY ELEC-

**TRONIC COMPONENT THAT IS PHYSICALLY DAMAGED. IT COULD CAUSE ADDITIONAL DAMAGE TO YOUR COMPUTER.**

**2) Turn Off the Power**

**TURN OFF THE POWER** on your computer and your printer. This is very important. If the power is on while you connect or disconnect anything to or from the computer, you will be likely to damage the circuits in both your computer and the peripheral device. Do not unplug the computer, just turn it off. If you unplug the computer, you will isolate it from earth ground and leave it vulnerable to static discharges.

**3) Remove the lid by pulling up on the rear until each side pops.**

**4) Plug the 26-pin flat cable connector into the mating connector on the RV-611E card. Be sure to match pin 1 on the card to the arrow on the connector. When the cable is plugged into the connector, the cable should extend past the end of the card. If the cable loops back over the card, it is installed wrong and should be turned around.**

**5) Notice that there are 8 "slots" at the rear of the Apple II. They are numbered from 0 to 7 from left to right with the keyboard nearest you. In the Apple IIe, the slots are numbered 1 - 7 and the 8th slot is the "auxiliary connector".**

With the components facing to the right (as viewed from the front), plug the RV-611E into any 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.

- 6) 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 a stress on the connector of the RV-611E card.
- 7) Plug the other end of the cable into your printer's interface connector.
- 8) Power up the Apple and the printer.
- 9) The RV-611E is now installed and ready for use.



## Chapter 3

## OPERATIONS

In the discussion that follows, we will assume that the RV-611E card is installed in Slot #1. If you have used another slot, change all references to Slot #1 to the number of the slot you have used.

The term CTRL-I as used below signifies typing "I" while holding down the CTRL key. The term (RETURN) signifies a single depression of the "RETURN" key.

With your RV-611E card properly installed, the cable connected to the printer, and Apple and printer powered up (with the printer selected "on-line") type:

**PR#1 (RETURN)**

This command turns on the RV-611E Slotware (TM) card. 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 displayed on the monitor screen. 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 that your printer is plugged in and turned on and that you have typed in the correct slot number. Remember, Slot #1 is the second slot since the slots start at 0. If the incorrect slot number is typed, all output will go to the wrong slot, and you will "hang up" the Apple. If this happens, press the RESET key and start over. 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 7/3 (RETURN)
```

The "PR#0" command will turn off the RV-611E 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 PRINT"
130 PR#0
140 END
```

This program 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 the 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 (RETURN)

to kill subsequent output to the printer.

#### A. Printer Commands

When you turn on the RV-611E by typing PR#1, a certain number of default conditions automatically exist. This allow you to immediately use your RV-611E Slotware(TM) card without any additional commands.

The default conditions are:

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

All of these conditions 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 programs to achieve the desired effect.

Note: In the following discussion, the term CTRL-I signifies typing "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

Turns the printer card off.

Printer card commands are effective only after the printer card has been turned on with a PR#(slot no.) command. If you turn the card off and back on, it will again come up in its default condition:

Auto Line Feed	-----	ON
Screen Display	-----	ON
Eighth Bit	-----	Off
40 Character Printing	-----	ON

If you desire another 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 no longer than the number of columns specified, will be "wrapped around".

Example: (CTRL-I) 132N will set the RV-611E card up to output lines 132 characters (at most) long.

Note: The only time 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 the screen is turned on, BASIC program listings default to 40 columns.

**(CTRL-I) K**

Disables the automatic printer linefeed option. The Apple adds a carriage return to the end of every line, and the RV-611E adds a line feed character after every carriage return. If your printer automatically adds its own line feed character after each carriage return, double spacing of printed lines may occur. If desired, the (CTRL-I) K command may be used to eliminate this extra linefeed.

(CTRL-I) A

Re-enables the automatic linefeed option.

(CTRL-I) (CTRL-letter)

Changes the printer command control character recognized by the printer.

Example: (CTRL-I)(CTRL-A) changes the control character recognized by the printer to a (CTRL-A).

NOTE: (CTRL-A)(CTRL-I) changes the control character back.

Before using the printer to list a program which has printer control commands in it, change the control character from (CTRL-I) to some other character. When your listing is finished, re-set (CTRL-I) as the control character before running the program. If you neglect this procedure, the printer commands in your program will affect the printer card during the listing of your program.

B. 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 the printer. The high order bit may be enabled or disabled through two different techniques.

(CTRL-I) H or CHR\$(9);"H";

Enables high order bit for graphics routines.

```
(CTRL-I) X or CHR$(9);"X";
```

Disables the high order bit.

```
PRINT CHR$(9);"H";
      (to enable 8th bit)
```

```
PRINT CHR$(9);"X";
      (to disable 8th bit)
```

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

The other manner in which the graphics capability of the RV-611E may be enabled or disabled is through the use of POKE instructions. The address of the POKE depends upon the slot in which your RV-611E is located.

Slot No.	HEX Address	To ENABLE 8th bit	To DISABLE 8th bit
1	04F9	POKE 1273,255	POKE 1273,127
2	04FA	POKE 1274,255	POKE 1274,127
3	04FB	POKE 1275,255	POKE 1275,127
4	04FC	POKE 1276,255	POKE 1276,127
5	04FD	POKE 1277,255	POKE 1277,127
6	04FE	POKE 1278,255	POKE 1278,127
7	04FF	POKE 1279,255	POKE 1279,127

NOTE: On initialization, the 8th bit is disabled.

## TEST PROGRAM FOR GRAPHICS:

```

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
165 PRINT CHR$(9);"X";
170 FOR I=1 TO 72
180 PRINT CHR$(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

```

## C. Command Summary

PR#N	Turn on Printer Card
(CTRL-I)K	Kill Auto-Line Feed
(CTRL-I)A	Append line feed to (RETURN)
(CTRL-I)nN	Turn off Display and Print N columns wide
(CTRL-I)I	Turn on display
(CTRL-I)H	Enable 8th bit
(CTRL-I)X	Disable 8th bit

## D. Using the RV-611E as an 8-Bit Output Port

The RV-611E can be used as a general purpose 8-bit 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 appearing on the Strobe line. The address used in the POKE statement will depend on the slot in which the printer card is installed. See the following table for the appropriate memory addresses.



Slot	Decimal Address	Hex Address
1	-16240	\$CO90
2	-16224	\$COA0
3	-16208	\$COB0
4	-16192	\$COC0
5	-16176	\$COD0
6	-16160	\$COE0
7	-16144	\$COF0

Each time a byte is sent to the RV-611E 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
```

### E. Custom Interfacing to Your Printer

The RV-611E card includes a cable with a standard Centronics-type printer connector. This connector will plug directly into Centronics, Epson, Anadex, and most parallel interface printers.

The twenty-six pin header pinout is illustrated in Figure 1 below. Only 10 to 12 wires (depending on the printer used) must be connected to the printer. If you are preparing your own cable, connect the wires to your printer (referring to the interface information supplied with your printer) in the following manner:

RV-611CE	Cable Wire	Printer
All Grounds	2-24 even	logic ground
Data Lines	3-17 odd	data lines
Strobe Line	1	strobe line
ACK Line	19	ACK line

PIN	SIGNAL
1	STROBE
3	DATA BIT 1
5	DATA BIT 2
7	DATA BIT 3
9	DATA BIT 4
11	DATA BIT 5
13	DATA BIT 6
15	DATA BIT 7
17	DATA BIT 8
19	ACKNOWLEDGE
2-24	EVEN GROUND
23	NO CONNECT
25	NO CONNECT
26	NO CONNECT

**Cable Connection Example:**

**Centronics Printers.** All standard Centronics printers use the same interface. Centronics printers require an Amphenol #47-30360 connector (or equivalent). This connector should be wired as follows:

Apple II	Microtek Pin	Centronics Pin
GND	2-24 even	19-29 odd
ACK	19	10
STR	1	1
DATA BIT 1	3	2
DATA BIT 2	5	3
DATA BIT 3	7	4
DATA BIT 4	9	5
DATA BIT 5	11	6
DATA BIT 7	15	8
DATA BIT 8	17	9

**Some Notes About Printer Interface Connections:**

- 1) Data Bit 1 (cable wire 2) must go to the lowest numbered signal name (least significant bit) in the printer. The lowest signal name is usually number 0, but it may be number 1, depending on the printer.
- 2) Data Bits 2-8 (cable wires 3-17 odd) connect to sequentially higher numbered signal names. Some printers only use seven data lines. If this is the case, leave signal Data Bit 8 (cable wire 17) unconnected.

- 3) ACK (ACKnowledge) is a signal sent from the printer back to the computer. It signals that the printer has accepted data from the interface card. It may have a different name (i.e., DATA ACCEPTED), depending on the type of printer used.
- 4) STROBE is a signal sent by the computer to the printer. It denotes that data on the data lines is ready for acceptance by the printer. It may have a different name (i.e., DATA READY) depending on the type of printer used.
- 5) Centronics type printers have a signal called BUSY. This signal is not used by the RV-611E card and nothing should be connected to it.
- 6) Do not connect the ground signals (wires 2-24 even) to the printer's "chassis" or "AC" ground. This is a logic ground connection.

**HARDWARE WARRANTY**

MICROTEK, INC. warrants to the original owner of this product that the product shall be free of defects resulting from faulty manufacture of the product or of its components for a period of TWO (2) YEARS from date of purchase. Microtek makes no warranties regarding the satisfactory performance, merchantability, or fitness for any particular purpose, of the product or its associated software.

During the warranty period, MICROTEK will, at its option, repair or replace, at no charge, any defective components, provided that the defective slotware is returned freight prepaid to MICROTEK, INC., 5555 H Magnatron Ave., San Diego, California 92111. ALL RETURNED ITEMS MUST BE ACCOMPANIED BY AN R.A. (RETURN AUTHORIZATION) NUMBER ON THE OUTSIDE OF THE SHIPPING CARTON. This number may be obtained by calling MICROTEK's Service Department at (619) 569-0900.

There are no warranties, express or implied, including but not limited to those of merchantability or fitness for a particular purpose, which extend beyond the description and duration set forth herein.

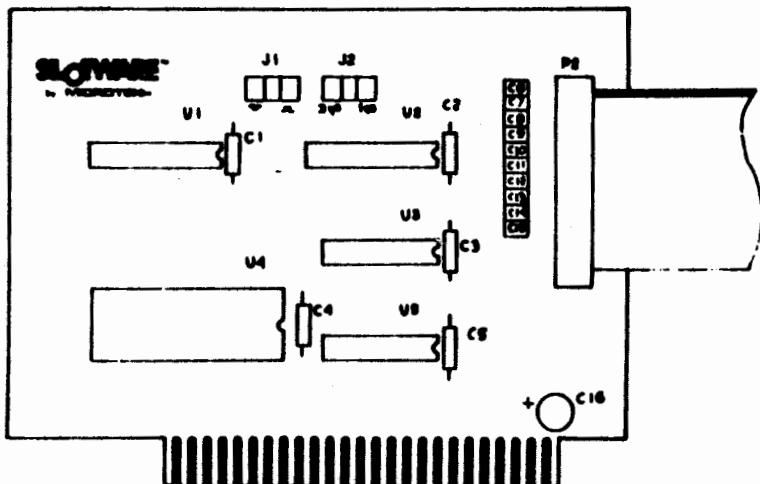
Microtek's sole obligation under this warranty is limited to the repair or replacement of a defective product and Microtek shall not, in any event, be liable for any incidental or consequential damages of any kind resulting from use or possession of this product.

Unless the warranty has been registered with MICROTEK, a dated proof of purchase must be included with the defective board. This warranty does not cover damage caused by accident, misuse, misapplication, or unauthorized service or modification.

## NOTICE

The RV-611C comes in two versions, which are functionally identical but not identical in appearance.

Use either the picture below or Figure 1 in the manual to locate the jumper blocks on the card. These jumpers are discussed on page 3 of the manual.



**RV-611C Revision A  
Jumper Blocks J1 and J2**

**Jumper Block J1 = Strobe Edge  
Jumper Block J2 = Strobe Width**