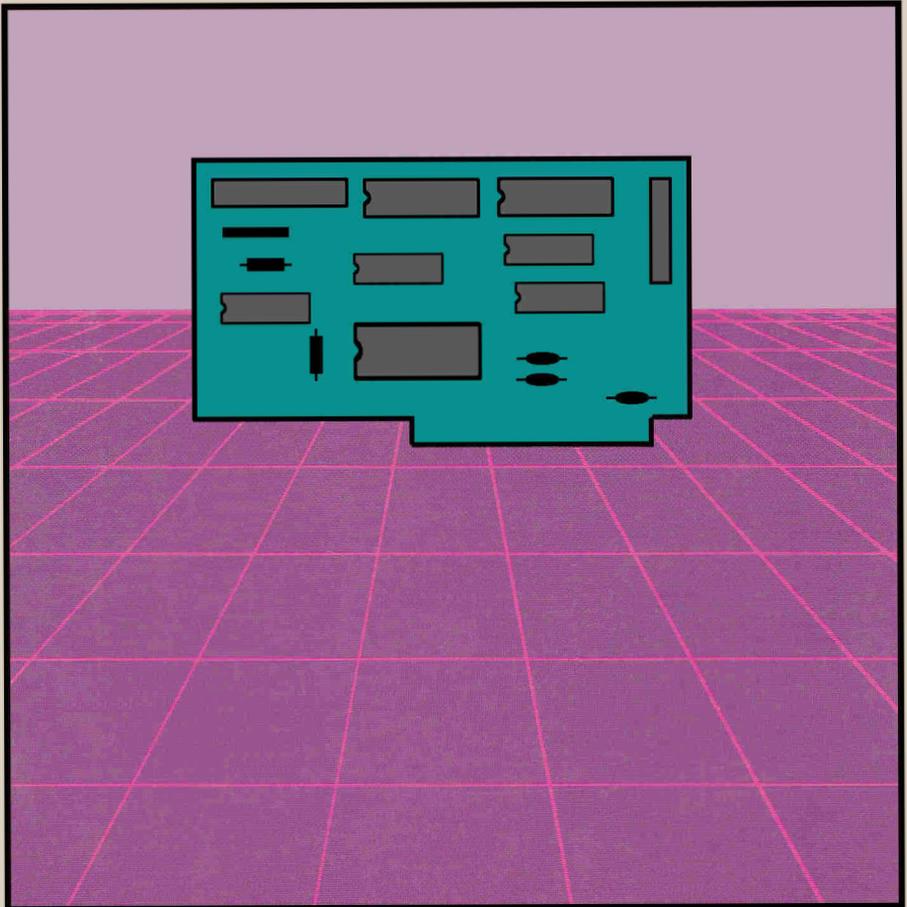


UniPrint Parallel Printer Interface

Installation and Operation Manual





PRODUCT REGISTRATION FORM

Name of product: _____

Serial Number: _____

Date of purchase: _____

Place of purchase: _____

Name: _____

Address: _____

City: _____ State: _____ Zip: _____

Phone: _____ Other phone: _____

PLACE
STAMP
HERE

Videx, Inc.

1105 N.E. CIRCLE BLVD.
CORVALLIS, OR 97330



UniPrint

Parallel Printer Interface

**First Edition
February, 1984**

Notice:

Videx, Inc. reserves the right to make improvements or changes in the product described in this manual at any time without notice.

Disclaimer of All Warranties and Liability

Videx, Inc. makes no warranties, neither express nor implied except as explicitly set forth in the Limited Warranty below, with respect to this manual nor with respect to the product described in this manual, its quality, performance, merchantability or fitness for any purpose. Videx, Inc. software is sold or licensed "as is". The entire risk as to its quality and performance is with the buyer. Should the programs prove defective following their purchase, the buyer (and not Videx, Inc., its distributors, or its retailers) assumes the entire cost of all necessary servicing, repair, or correction and any incidental or consequential damages. In no event will Videx, Inc. be liable for direct, indirect, incidental, or consequential damages resulting from any defect or the possibility of such damages. Some states do not allow the exclusion or limitation of implied warranties or liability for incidental or consequential damages, so the above limitation or exclusion may not apply to you.

Limited Warranty:

Videx, Inc. warrants this product to be free from defects in material and workmanship for a period of ninety (90) days from the date of original purchase. Videx, Inc. agrees to repair or, at our option, replace any defective unit without charge. Videx, Inc. assumes no responsibility for any special or consequential damages. No other warranty, neither express nor implied, is authorized by Videx, Inc. Some states do not allow the exclusion or limitation of implied warranties or liability for incidental or consequential damages, so the above limitation or exclusion may not apply to you.

Copyright Notice:

This manual is Copyrighted. All rights are reserved. This document may not, in whole or in part, be copied, photocopied, reproduced, translated or reduced to any electronic medium or machine-readable form without prior consent, in writing, from Videx, Inc.

© 1983 by Videx, Inc.
1105 NE Circle Blvd.
Corvallis, Oregon 97330
(503) 758-0521

UltraTerm, Videoterm and UniPrint are all trademarks of Videx, Inc.

Apple][, Apple][Plus, Apple //e, Apple DOS, Apple ProDOS, Apple Pascal, Apple Dot Matrix Printer, and Applesoft are all trademarks of Apple Computer, Inc.

CP/M is a trademark of Digital Research Corporation.

VisiCalc is a trademark of VisiCorp.

Prowriter, Prowriter II and Gorilla Banana are trademarks of Leading Edge.

Spirit-80 is a trademark of Mannesman Tally.

Gemini 10 and 15 are trademarks of Star Micronics, Inc.

Prism and uPrism are trademarks of Data Products.

Epson is a trademark of Epson America.

Anadex is a trademark of Anadex, Inc.

Radio Shack DMP-100 is a trademark of Tandy Corp.

Okidata is a trademark of Okidata.

Sekiosha GP-100A is a trademark of Sekiosha.

VIC is a trademark of Commodore Business Computers.

C. Itoh 8510 is a trademark of C. Itoh Electronics, Inc.

Tec 8510 is a trademark of Tec.

NEC is a trademark of NEC Information Systems, Inc.

Downloaded from www.Apple2Online.com

Table Of Contents

Chapter 1.	Introduction	1—1
Chapter 2.	Installation and Checkout	2—1
Chapter 3.	Text Mode Operation	3—1
Chapter 4.	Graphics Mode Operation	4—1
Chapter 5.	The Hardware and Software Interface	5—1
Appendix A.	The ASCII Character Set	A—1
Appendix S.	Schematic Diagram and Parts List	S—1
Appendix T.	Cable and Connector Specifications	T—1
Appendix Y.	Theory of Operation	Y—1
Glossary		

Chapter One. Introduction

- 1.a How to Use This Manual
 - 1.a.1 Manual Organization
 - 1.a.2 Notation
- 1.b Product Overview
 - 1.b.1 The Printed Circuit Board
 - 1.b.2 Software Features
- 1.c Hardware Requirements
- 1.d Product Registration

CHAPTER ONE. Introduction

In this chapter we will give you a brief description of your UniPrint card and some directions on how you can best use this manual. Please take a few minutes to read this chapter, then decide which other chapters of the manual you will need to examine. The time spent with this manual will make the installation of your UniPrint an easier, faster, and more satisfying procedure.

Section 1.a How to Use This Manual

We have written this manual with three goals in mind. They are:

1. To provide orientation and installation instructions for all users.
2. To provide a tutorial presentation for new users.
3. To provide complete and concise reference information for advanced users.

You should need no other documents to completely understand and successfully use your UniPrint. Please let us know if you find any area of our documentation inadequate.

Section 1.a.1 Manual Organization

We have designed this manual to be useful to beginners as well as advanced users. To help us organize our presentation more effectively, we have divided this manual into five major parts:

- Part I (Overview, Installation and Checkout) [Ch. 1 & 2] This part will acquaint you with the basic features of the UniPrint and show you how to install and test the card in your Apple][. It also includes a troubleshooting section in case you have any difficulty.
- Part II (Product Definition and Use) [Ch. 3 & 4] This section will help you to learn to use the full power of your UniPrint. The complete command structure and all the user options are described in this section. Both beginners and advanced users will find this section useful.
- Part III (The Software Interface) [Ch. 5] In this section we will describe the ways in which the UniPrint can be used with specific software systems to produce both text and graphics printouts.
- Part IV (The Hardware Interface) [Ch. 5] In this section we will describe the interaction of the UniPrint with the most popular printers used with the Apple][.
- Part V (Technical Notes) [Appendices] We have included a complete schematic diagram and technical specifications for your card in this section. This section will be useful primarily to advanced users.

We have included a Glossary to make this manual easier to use. There is also a reference card located at the back of the manual, which contains a concise list of the UniPrint commands.

Section 1.a.2 Notation

When we are referring to characters or keys on your Apple's keyboard, we will enclose them in single quotation marks. For example:

Pressing the 'A' key will cause the letter 'A' to appear at the position of the cursor on the video display.

When we refer to control characters and shifted characters, we will specify the keys which need to be pressed, separated by a hyphen, inside the single quotation marks. When we are referring to single control characters, we will use 'CTRL'. For example:

Pressing 'CTRL-G' while in BASIC will cause the Apple's speaker to produce a beep. The 'SHIFT-1' key will cause an exclamation mark to be displayed.

If we are referring to a keyboard entry which does not produce a visible character, or if we refer to a character by a name or abbreviation, we will enclose the character in triangular brackets. For example:

Pressing 'CTRL-1' will generate the <TAB> character.

Whenever we refer to character sequences using the control and shift keys, you must hold down the first key while you strike the second.

Section 1.b Product Overview

Your UniPrint card is a versatile, yet low-cost parallel interface card which you can use to connect your Apple][to a wide variety of printers. This card allows you to print both text and graphics images from your Apple's Hi-Res screens. The firmware on the card makes it completely compatible with Basic, Pascal and CP/M (the card must be in slot #1 to operate with Pascal and CP/M). Hi-Res Screen images can be printed in three sizes and several orientations on many different printers. You can even print images in color if you have a Data Products (IDS) Prism color printer.

Section 1.b.1 The Printed Circuit Board

Your UniPrint package contains a printed circuit (PC) board and a cable to connect the card to a printer with a Centronics-type connector. The functional areas of the PC board are shown in Figure 1.1 and described in the following paragraphs.

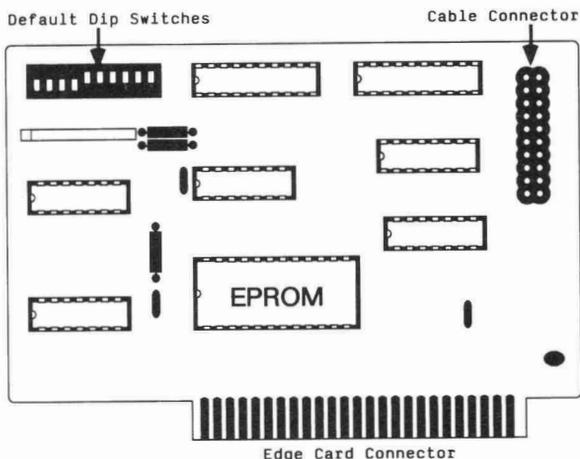


Figure 1.1 Block diagram of pc board

Edge Card Connector — These gold-plated fingers plug into one of the expansion slots at the back of your Apple. The connector allows transfer of the signals necessary to control the UniPrint between your Apple and the UniPrint circuitry.

Firmware EPROM — This is a Read-Only-Memory chip which contains a program that is used by your Apple to control the operation of the UniPrint card.

Output Cable Connector — The cable that connects your printer to the UniPrint card is attached to this connector.

Default DIP Switches — These switches are used to set the default (normal) operating mode of your UniPrint card. They are used to set options such as page length, printer type, strobe, and acknowledge signal polarities.

Section 1.b.2 Software Features

- Full-width BASIC listings where keywords are not broken
- Default page widths of 80, 96, or 132 columns
- Default page lengths of 54, 57, or 60 lines with automatic skip over perforations
- Software-selected Auto Linefeed and screen echo
- Graphics printouts of either Page 1 or Page 2 Hi-Res Screens
- 90 or 180-degree rotation of graphics images
- Normal, Double, and Triple-size graphics printouts
- Normal or inverted black/white graphics printouts
- Color image printouts with Data Products Prism printer

- Black-and-White extended Hi-Res Pictures on Apple //e with Extended Memory Card.
- Default parameter selection for 6 printer types

Section 1.c Hardware Requirements

Your UniPrint card must be plugged into an Apple II, Apple II Plus or Apple //e computer to take full advantage of its hardware and firmware capabilities. The card will also work in many other Apple-compatible computers, however we are not able to guarantee that all the features of the card will be available in these systems.

The cable on the UniPrint card must be plugged into a printer which has a standard Centronics-type connector. If your printer does not have this type of connector, you or your dealer will have to provide a special cable to connect the card to your printer. The signals available on the cable connector are specified in Appendix T.

Section 1.d Product Registration

We have attached a Product Registration Form at the front of this manual. We would like you to fill out this form and mail it to us. This information is NOT necessary to validate the warranty on your UniPrint, but it will help us to better understand the needs and background of our customers.

Please answer all questions as completely as possible. If you have any additional comments, please write us a letter. These comments will be submitted to our technical staff.

Chapter Two. Installation and Checkout

- 2.a Complete Installation Instructions
 - 2.a.1 Pre-installation Checkout
 - 2.a.2 Installation and Cable Connection
 - 2.a.3 Final Instructions
- 2.b Short Form Installation Checklist
- 2.c Checkout
- 2.d Troubleshooting

CHAPTER TWO. Installation and Checkout

This chapter will guide you through the installation of your UniPrint card. We will tell you how to install it in your computer and carry out a simple check to make sure it is working properly. We will also help you to diagnose any problems that may occur with your card. Note: advanced users may wish to skim this section and proceed directly to section 2.b — Short Form Installation Checklist.

Section 2.a Complete Installation Instructions

Your UniPrint card will function properly in any of your Apple's expansion slots, except slot 0 and in the Auxiliary slot of an Apple //e. However, many operating systems such as Apple Pascal make certain assumptions about the use of the expansion slots. These assumptions are:

Slot	Device
0	Language Card (not used in //e)
1	Printer Interface
2	MODEM
3	External Console (UltraTerm or Videoterm)
4	Additional Disk Drive Controller
5	Additional Disk Drive Controller
6	First Disk Drive Controller
7	User-defined devices (except Apple disk drives)

For the Pascal and CP/M operating systems to treat your UniPrint as a printer interface, it must be plugged into slot #1. In deference to the users of these systems, we will present the rest of the installation instructions as if the UniPrint card will be installed in slot #1. If you are going to use a different slot for your card, you should have no problem with the installation and testing — just remember to change the slot number when it is referred to in the instructions and test programs.

Section 2.a.1 Pre-installation Checkout.

We carefully inspect and test each UniPrint card before shipping it to your dealer. Each card is carefully packed to prevent damage during shipping. In spite of these precautions, you should inspect your card to be sure that no obvious damage has occurred in transit.

- () UniPrint card in good condition — no missing or damaged components.
- () Apple II computer is operating properly. If your computer has any intermittent problems, or will not run Applesoft BASIC properly, it will be very difficult to verify proper operation of your UniPrint card.

Section 2.a.2 Installation and Cable Connection

- () Turn off your Apple.

- () Disconnect the power cord from the back of the computer.
- () Remove the lid from your Apple. Do this by placing the heels of your hands on the back corners of the case and pulling straight up on the back edge of the lid with your fingers until it pops loose. Lift the back edge about one inch then slide the lid to the rear until the front edge is clear of the case. You can then lift the lid free and set it aside. (If you lift the rear edge too far, the front edge of the lid may hit and possibly damage components attached to your keyboard.)
- () Locate the end of the cable included with your UniPrint card, which has a connector with two closely-spaced rows of small holes. We call this a 'Transition Connector'.
- () Locate expansion slot #1. Looking at the computer with the keyboard in its proper orientation, the slots are numbered 0 to 7 from left to right. (If you have an Apple //e, there is no slot #0.) The slot numbers are also printed on the main PC board near each of the slots.
- () Lead the transition connector on the end of the cable into your computer, through one of the slots in the back panel. If you have an Apple //e, you will have to remove the plastic cover from one of the openings in the back panel. Use the slot or opening nearest Expansion Slot #1.
- () Attach the transition connector to the matching set of pins on your UniPrint card as shown in Figure 2.1. Be sure that the cable leads AWAY from the center of the card.

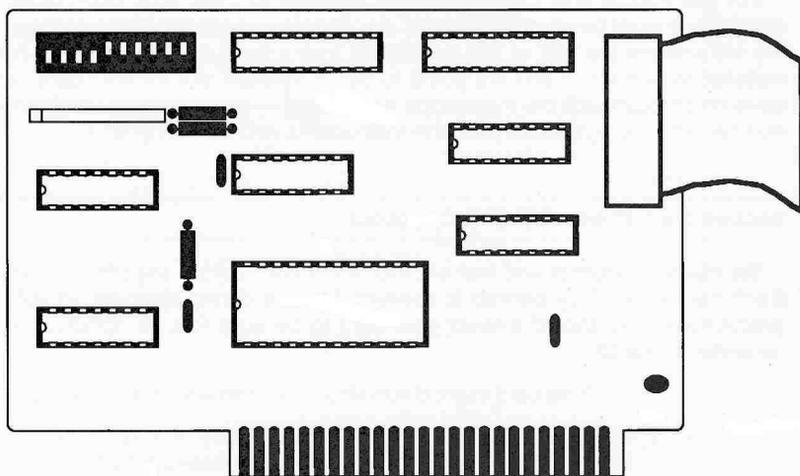


Figure 2.1 illustration showing transition connector attached to UniPrint card.

- () Set the Default DIP Switches as shown in Figure 3.1, Section 3.b. Refer to Section 5.a for the settings to use for switches 1-3.
- () Press the UniPrint card straight down into the expansion slot connector. When it is properly seated, the top of the card will be level and parallel to your Apple's main circuit board.

- () Connect the free end of the cable to your Printer. This end of the cable has a connector which will fit the Centronics-type connector found on most parallel printers. If your printer does not have a Centronics-type connector you or your dealer will have to construct one using the information in Appendix T.

Note: We call this a 'Centronics-type' connector because it is the same type of connector found on most Centronics printers. This does not mean that your UniPrint card has exactly the same signals used by all Centronics printers. Additionally, most printer manufacturers refer to their input connectors as 'Centronics-Compatible.'

Section 2.a.3 Final Instructions

- () Put the cover back on your Apple. When you insert the front edge of the cover under the top of the keyboard, be careful not to disturb the keyboard connectors. Press firmly on the back edges of the cover and it will snap into place.
- () Re-connect the power cable to your computer.

Section 2.b Short Form Installation Checklist

- () Turn off power, disconnect power cord, and remove cover from Apple.
- () Lead the cable end with the transition connector into your Apple.
- () Attach transition connector to UniPrint card with cable leading away from center of card.
- () Set the Default DIP Switches as shown in Figure 3.1, Section 3.b. Refer to Section 5.a for the settings to use for switches 1-3.
- () Install UniPrint card in Slot #1.
- () Attach Centronics-type connector to your printer.
- () Replace Apple cover and reconnect power cord.

Section 2.c Checkout

This section contains a few simple tests which will help you make sure that your UniPrint card is working properly. The test program is written in Applesoft BASIC.

Note: If you have an Apple][with Integer BASIC in ROM and do not have an Applesoft ROM card, you will need 64K of memory and DOS 3.3 to LOAD and use Applesoft. If you do not have both of these your UniPrint will still work correctly but you will have to modify the test procedure given below.

If you have an Integer BASIC Apple]]:

- () Put your DOS System Master Disk in your Boot drive.

- () Turn on your Apple. Your disk drive should start and the 'IN USE' light should come on. The Hello program on the system master disk should load Applesoft into RAM for you. If you normally start up your system with a 6:CTRL-P, use this procedure now. If your disk drive does not come on, immediately turn off the power to your Apple and refer to Section 2.d — Troubleshooting.

- () Type the 'FP' command to switch to Applesoft BASIC.

Note: Some older Apples without language cards use a slightly different version of Applesoft. If you have a system like this, load Applesoft in your usual manner.

If you have an Apple][Plus or Apple //e:

- () Put your DOS System Master or ProDOS disk in your Boot drive.
- () Turn on your Apple. Your disk drive should start and the 'IN USE' light should come on. If your disk drive does not come on, immediately turn off the power to your Apple and refer to Section 2.d — Troubleshooting.
- () If you start up using the ProDOS User's Disk, press 'B' to enter Applesoft BASIC.

For all users:

- () Your video display should show the Applesoft prompt (']') followed by a flashing cursor block.
- () Turn on your printer and be sure it is 'On Line' or selected.
- () Type 'PR#1' followed by <RETURN>. Output is now being sent to your UniPrint card.
- () Type some random lines of text (ending each with <RETURN>) and look at the display on your printer. You should see the lines you have typed plus some lines with 'SYNTAX ERROR.'
- () Type 'PR#0' followed by <RETURN>. Output is once again being sent to your screen.
- () Enter the following program. End each line with a <RETURN>. (This program assumes you are using Apple DOS or ProDOS and have Booted your system as instructed above.)

```
NEW
10 PRINT CHR$(4);"PR#1":REM CHR$(4) = <CTRL-D>
20 PRINT CHR$(9);"80N" :REM CHR$(9) = <CTRL-I>
30 FOR LN=1 TO 5
40 FOR CH=33 TO 112
50 PRINT CHR$(CH);
60 NEXT CH
70 PRINT
80 NEXT LN
90 PRINT CHR$(4);"PR#0"
```

- () Type 'RUN' <RETURN>. Your printed output should look like figure 2.2.

```

!*##%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^_`abcde fgh i j k l m n o p
!*##%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^_`abcde fgh i j k l m n o p
!*##%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^_`abcde fgh i j k l m n o p
!*##%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^_`abcde fgh i j k l m n o p
!*##%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^_`abcde fgh i j k l m n o p

```

Figure 2.2. Photo of printout from test program.

- () Your initial checkout is complete. You may proceed to Chapter Three for more complete operating instructions.

Section 2.d Troubleshooting

RELAX! This may be hard but you can save a great deal of effort (and possibly expense) by carefully following our troubleshooting instructions. Remember, to prevent costly repairs you **MUST** have the power to your Apple turned off before inserting or removing ANY cards.

In this section we will try to help you diagnose and correct any problems you may have with your UniPrint card. Since all of our peripheral cards are tested before we ship them, we find that most problems can be traced to errors in connecting or activating the card. Before you call us or your dealer, please verify that you have followed the Installation and Checkout instructions and haven't skipped any steps.

Here is a brief troubleshooting checklist:

- () Apple computer works properly without UniPrint Installed.
- () All cables, switches, and connections checked. (If you have a custom cable, recheck its wiring using the information in Appendix T.)
- () Turn power off, remove all other peripheral cards and test UniPrint again. If UniPrint now works properly, plug your other peripheral cards back in, one at a time, until you find which card is not compatible with the UniPrint. At this point, you may wish to call our service department at (503) 758-0521 .
- () If your UniPrint still doesn't work, see if you can have your dealer test it with another Apple and another printer.
- () Check your printer manual and verify that you have your printer set up properly. You may have to set some switches to select parallel, rather than serial, operation. The proper switch settings for several popular printers are included in Chapter 5.
- () See if your dealer can test your UniPrint with another cable. The cable is the most fragile element in your system. A broken or shorted wire can cause intermittent failures which are very hard to diagnose.

CHAPTER THREE. Text Mode Operation

This chapter will explain the use of your UniPrint card in the text mode. We will show you the different printer control commands and how the default switches are set to control the operation of your interface.

Section 3.a Initializing the Interface

If you are using Applesoft or Integer BASIC, your UniPrint card is initialized using the standard 'PR#' command. If your card is installed in slot #1, typing the following command will activate the card and begin sending output characters to the printer:

```
'PR#1' followed by <RETURN>
```

After you send this command, your computer will send all output, including the BASIC prompt character, to the printer.

If you use this command in a program while you are running the Apple Disk Operating System (DOS), your DOS will be disconnected. If you use the following command to activate your printer, the DOS will remain active:

```
1000 PRINT CHR$(4);"PR#1"
```

Please remember that the DOS command character (CTRL-D or CHR\$(4)) must immediately follow a carriage return. The best way to guarantee this is to use an extra PRINT statement just before you turn the printer on.

When you want to direct output back to your video display, you simply use another 'PR#.' If you are using the Apple's 40-column display, the following command would switch you back to video display:

```
'PR#0<RETURN>'
```

If you are using an 80-column video card (the Apple //e 80-column text card, a Videoterm or an UltraTerm), you would use

```
'PR#3<RETURN>'
```

to start using the video display again. If you are switching the printer off from within a program you will have to use

```
2000 PRINT CHR$(4);"PR#3"
```

to turn off the printer and begin sending the program output to the 80-column screen once again (PR#0 for 40 columns).

As a last resort, you can stop sending characters to your printer by pressing the <RESET> key. (Newer Apples require that you press both <CTRL> and <RESET> at the same time.) If your printer has a large built-in buffer, it may not stop printing for several lines.

Note: Many programs such as VisiCalc (tm) and word-processing programs have special commands to cancel printing in the middle of an operation. Using <RESET> to stop the printer may cause problems. Please consult the instruction manuals for any specialized software you may be using.

Section 3.b Default Switch Settings

When you activate your UniPrint card (with a 'PR#1' command) your card's firmware will read a set of default values from the Dual In-line Package (DIP) switch on the card. These default values control the manner in which text is printed on your printer. You can change the switch settings if you want to change these default operating modes. The factory-set values of these switches are shown in Figure 3.1. Note that 0 is OFF and 1 is ON.

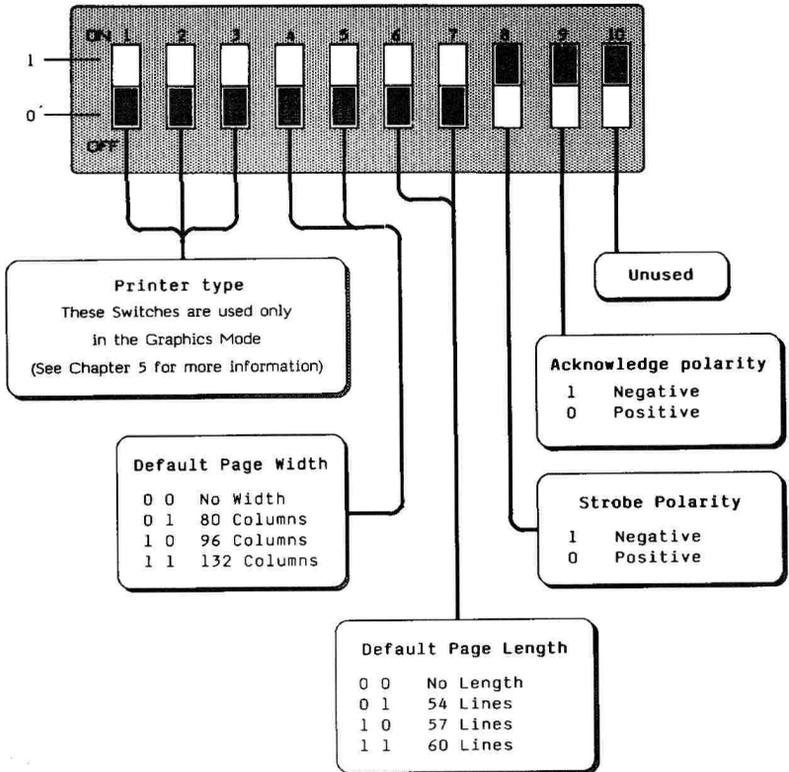


Figure 3.1 Default Switch Settings.

Switches 1, 2 and 3 are used only in the Graphics mode and will be discussed in the next chapter.

Section 3.b.1 Default Page Width

Switches 4 and 5 control the Default Page Width. This is the number of characters that your card will send to the printer before it automatically starts a new line. The page width setting is also used to correctly format long lines in BASIC listings so that key words are not broken.

If you set the page width to zero, your UniPrint will never automatically send a <Carriage-Return> character to start a new line. If you are doing a lot of programming in Basic you should normally set switches 4 and 5 to match the normal width of your printer and the paper you use. We ship UniPrint cards with switches 4 & 5 OFF to accommodate the widest variety of software, including word processors. Many word processors require that you set the default page width to zero.

Section 3.b.2 Default Page Length

Switches 6 and 7 control the page length. This is the number of lines of text that will be printed on a standard 11-inch page. If you have set the switches to OFF and ON respectively, your UniPrint card will send a <Form-Feed> character to the printer after the end of the 54th line. You are responsible for checking to see that your printer advances to the top of the next page when this character is sent. Most printers have their own set of DIP switches or special commands which determine how many lines constitute a page.

If you set both switches 6 and 7 to OFF, your UniPrint card will never send a <Form-Feed> character. This setting should be used if your printer automatically skips to the top of the next page after a certain number of lines. You would also use this setting for word processors which format pages by adding <Carriage-Return> characters to reach the top of the next page. Your UniPrint is shipped to you with switches 6 and 7 OFF. This setting will accommodate the widest variety of software.

If your program sends a <Form-Feed> character to the printer, the paper will advance to the next sheet. The UniPrint's internal counter, which keeps track of the number of lines since the last <Form-Feed>, is set to zero every time it "sees" this <Form-Feed> character. This way the line count will always be correct for the position of the paper in your printer.

Section 3.b.3 Strobe Signal Polarity

Switch 8 controls the polarity of the strobe signal sent to your printer. This signal tells your printer that a character is available on the data lines. Most printers require a strobe which stays at a high level (5.0 volts) until a character is present, then switches to a low level (less than 0.8 volts) for at least one microsecond. We set the strobe output for this type of negative-polarity signal. You can change this switch if your printer requires a positive-going strobe (Some models of Centronics printers require this type of strobe.).

Section 3.b.4 Acknowledge Signal Polarity

Switch 9 is used to define the polarity of the acknowledge pulse recognized by your UniPrint card. This pulse is sent by your printer to tell the UniPrint card that the

printer has received the last character sent and is now ready for the next character. Most of the printers we use send a negative-going acknowledge pulse, so we have set your card for this signal.

Switch number 10 is not used.

Section 3.c Printer Control Commands

This section describes the commands you can send to your UniPrint card to change the manner in which it sends text to your printer. These commands allow you to change the format of the printed page, echo the printed output on your video screen and send special characters to control your printer.

Before we begin describing the commands, we want to be sure that you understand the purpose of the Leadin character. The Leadin is a special character which you (or your program) send to the printer interface. This character tells the firmware on your UniPrint card that the following information should be used to control the operation of the interface. The Leadin, and any following characters which are part of the command, are not sent on to the printer. Rather, your UniPrint firmware uses the characters to control its own operation, then discards them. (Apple's DOS 3.3 uses the <CTRL-D> character in the same way to control disk operations when a program is running.) When you start up your computer and first use your UniPrint card, the Leadin character is set to <CTRL-I>.

Section 3.c.1 Page Formatting Commands

These commands allow you to control the format of the lines that your UniPrint sends to your printer. You can use these commands to change the width of the printed lines, the number of lines per page, and whether or not a Line-Feed character is sent at the end of the line. These commands will override values set in the Default DIP switches. These commands will control your card only until the next time you use the 'PR#1' command to initialize your UniPrint card. The default DIP switch setting will then be used once again.

Form Length

<Leadin><NNN>F — This command sets the form length. The <NNN> part of the command stands for a one to three digit number which controls the number of lines which are printed before a <Form-Feed> is sent to the printer. If the number is 0, then your interface will never send <Form-Feed>s unless you actually send the character from your program. If you have a printer that automatically skips over the perforations in fanfold paper, you would use this option. You can also use this command to set shorter form lengths. For example, to print bills or invoices which are shorter than 11 inches, you would have to make sure that your printer advanced to the start of the next form when it received a <Form-Feed> character.

Line Feed Off

<Leadin>K — This command tells your UniPrint firmware that you do not want to automatically add a Line-Feed character at the end of each line. You would use this command if your printer automatically advanced to the

next line when it receives a Carriage-Return character. If your printouts are always double-spaced, then you need to use this command. You could also use this command if you wanted to overstrike a line.

Line Feed On

⌘Leadin⌘L — This command does just the opposite of the previous command. It tells your UniPrint firmware to automatically add a Line-Feed character after each Carriage-Return. This command is set by default when you activate your card. The most popular parallel printers require that your interface send a Line-Feed when you want to advance the paper. This allows them to return the carriage and overstrike the same line for enhanced print quality, underlining, or graphics generation when the interface does not automatically add the Line-Feed character. If your UniPrint card did not add the Line-Feed while printing normal text, the paper would never advance and you would get a very black bar across your paper after a few lines.

Set Left Margin

⌘Leadin⌘NNN⌘M — If your printed lines begin too close to the edge of your paper, you can use this command to move all the text to the right by ⌘NNN spaces. If you print a line which is longer than the print width you have set (with ⌘CTRL-⌘I-80N, for example), the text will wrap around and begin at the left margin position. However, if the sum of the left margin plus the length of the printed line is greater than the width your printer can handle, the text will wrap around to column zero. If you don't specify a number (by using ⌘Leadin⌘M), the left margin will be set to zero.

NOTE: This command will also move graphics printouts to the right.

Section 3.c.2 Screen Echo Control

These commands allow you to have the text that you are printing also appear on the video screen. This allows you to see the text as it is being sent to the printer. You may find this useful if your printer is not located right next to your computer. However, we usually find the screen distracting because it disturbs our carefully-formatted displays and menus.

Note: Many printers have a built-in memory (a BUFFER), which allows them to receive characters from a computer much faster than they can actually print. If you have a printer with a large buffer, you may see a large block of text printed on the screen while the printer is still working on the first few characters. If you send a lot of text very quickly, you will fill the printer's buffer. The screen output will then slow down to match the actual print speed of the printer.

Screen Echo On

⌘Leadin⌘I — This command simply turns on the screen echo. The video device to which the text will be sent and the number of characters per line are set by the following commands.

Turn On Screen Echo And Set Page Width

⌘Leadin⌘NNN⌘I — This command not only turns on the screen echo, but also sets the page width. The width will be set to the value represented by the

number 'NNN.' This value may range from 0 to 255. If you use a value of zero, your UniPrint card will never automatically insert a Carriage-Return character into the output. You would normally set this value to the length of the line you want. (This is usually the number of characters your printer can print on a line.) The page width will control the width of the line on the printer, but it may not produce the same format on the video screen. If you set the printed page width to a value greater than the width of the Apple screen (40 columns), the video display will automatically 'wrap around' and continue on the next line.

Screen Echo Off

⟨Leadin⟩N — You should use this command to turn off the screen echo. It does not affect the page width. This command is selected by default when you initialize your UniPrint card. The width of the printed line will depend on the setting of the Default Page Width DIP switches unless you have set another page width with the following command.

Turn Screen Echo Off And Set Page Width

⟨Leadin⟩NNN⟩N — This command turns off the screen echo and sets the printed page width to the number represented by the 'NNN.' This value may range from 0 to 255. This is normally used to override the default page width set in the DIP switches.

Echo To Slot N

⟨Leadin⟩⟨N⟩R — You can use this command to direct the screen echo to a video output board instead of the Apple 40-column screen. This allows you to send the screen echo to a video display card in slot #3, for instance. (We hope you're using a Videoterm or UltraTerm!) The number of the slot containing the video card is represented by the number 'N' in the command. This number must be between 0 and 7. If the number is zero, the command acts just like a ⟨Leadin⟩N; it turns the screen echo off. (If you want to echo to the Apple screen, use a ⟨Leadin⟩I.) You can also use this command to send characters to a second printer or a serial port with a MODEM.

Section 3.c.3 Special Mode Commands

These commands allow you to change the Lead-In character and set special operating modes for your UniPrint Interface.

Change Leadin Character

⟨Leadin⟩⟨CTRL⟩ — This command allows you to specify a new Lead-In character for your UniPrint card. You might need to use it if you have a printer that responds to TAB commands. The ASCII Horizontal Tab character is ⟨CTRL-I⟩, the default Lead-In character for your UniPrint card. The new Lead-In must be a Control character also.

Set Transparent Mode

⟨Leadin⟩T — This sets the Transparent output state on your UniPrint card. In this state your card will send to the printer only the characters that you send it. The firmware on your card will not insert any Line Feeds or Form Feeds

into the output. This command can be cancelled only by sending another 'PR#' command to re-initialize your UniPrint card.

NOTE: For the technically oriented, in the transparent mode the UniPrint card will send the output data EXACTLY as it is received. The status of Bit 7 will be preserved. In all other modes, Bit 7 of ASCII data may be changed (see <Leadin>H and <Leadin>X).

Cancel Leadin Character

<Leadin>Z — This command will disable the recognition of the Lead-In character until you re-initialized your UniPrint card. This gives you another way to allow your card to send the TAB (<CTRL-I>) character to your printer, however, you will not be able to use any commands to change the print width etc. Your UniPrint will continue to obey the page-formatting and screen echo commands that were in effect before you sent this command.

Set High Bit On

<Leadin>H — This command sets Bit 7 of all output to a 1. Most of you will never have to worry about Bit 7. However, on some printers setting bit 7 allows you to use an alternate character set.

Set High Bit Off

<Leadin>X — This command will clear Bit 7 of all output sent to your printer. This is the default mode for your UniPrint.

Section 3.d Printer Control from Pascal Programs

Your UniPrint card can be used with Pascal programs when it is installed in slot #1. The Pascal operating system will automatically initialize the card. Whenever you send output to the 'PRINTER:' device, it will be sent to your UniPrint for transfer to the printer. Several of the text mode commands are not available when you are using Pascal. The commands which will NOT work are:

Turn on Screen Echo <Leadin>I — The Pascal text screen is managed by different software than the Basic text display. The firmware routines used to echo to the screen in BASIC will not work with Pascal. If you want to send output to the screen as well as the printer, you should write your program to use two separate WRITE statements:

Write (Printdev,textline); (this sends textline to printer)
Write (Screendev,textline); (send same textline to screen)

Turn off Screen Echo and Set Page Width <Leadin>{NNN}N This command will have no effect on printed output. You should set the print width by controlling the print statements in your program.

Echo to Slot N <Leadin>N>R — Directing screen echo to another slot violates the Pascal protocol which says that each device is to be treated individually. When you direct output to a particular device, it should appear on only that device.

Valid commands may be sent from within Pascal programs by using the CHR function to send the leadin character. The Pascal system will filter out control characters in

strings entered from the keyboard, so it is not possible to enter the Leadin character directly from the keyboard. The following Procedure would set the form length to 63 lines:

```
PROCEDURE SETLENGTH;  
  VAR OUTDEV : TEXT;  
  BEGIN  
    REWRITE (OUTDEV, 'PRINTER:');  
    WRITE(OUTDEV,CHR(9),'63F');  
  END;
```

For complete details of the methods for opening output devices (such as your printer), you will need to refer to your Pascal manuals. Most applications programs written in Pascal will have no difficulty in using the UniPrint and printer to produce hardcopy output.

Chapter Four. Graphics Mode Operations

- 4.a Setting the Default DIP Switches
- 4.b Initializing your UniPrint Card
- 4.c Graphics Mode Commands
 - 4.c.1 Selecting the Picture Size
 - 4.c.2 Rotating the Picture
 - 4.c.3 Miscellaneous Commands
- 4.d Sample Commands and Pictures
- 4.e Pascal Graphics

CHAPTER FOUR. Graphics Mode Operation

Your UniPrint card can be used to print pictures of the display on your Apple's Hi-Res graphics screen. To print these pictures, you must have a printer which is capable of printing graphics. Furthermore, your printer must be capable of accepting graphic data in one of the formats which your UniPrint will transmit. In this chapter we will describe the graphics printing capabilities of your UniPrint card and show you how to control the format of the pictures you print.

Section 4.a Setting the Default DIP Switches

Before you can send a picture from your Hi-Res screen to your printer, you must set the default DIP switches on your UniPrint. The first three switches in the block tell your UniPrint firmware what type of printer will receive the graphics data. This allows your UniPrint to send the data in the proper graphics format. These switches allow you to select one of eight possible types of printers. The switch settings corresponding to the printers we support are shown in Figure 4.1.

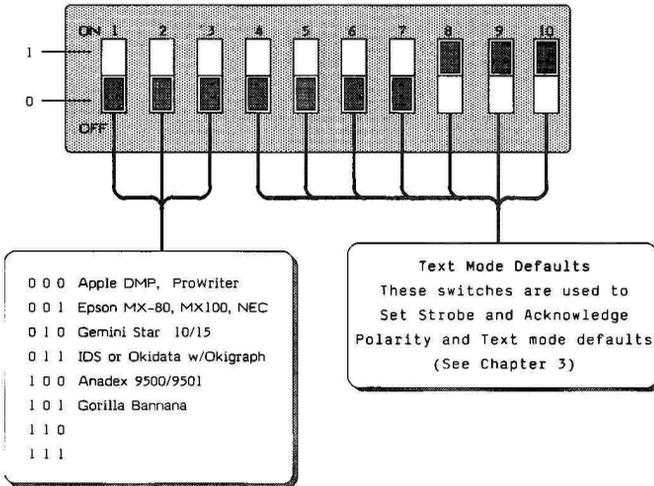


Figure 4.1 Graphics Printer type.

These switches must be set to match your printer before you initialize your UniPrint card with a 'PR#1'. You will have to set these switches only once — unless you change printers. A complete list of the printers we have found to be compatible with your UniPrint is included in Section 5.a.

Section 4.b Initializing Your UniPrint Card

Your UniPrint must be initialized before it will transfer a picture from your computer to the printer. Your card is initialized for graphics, just as it is for text, with a 'PR#'

command. As you might expect, you also have to use the <CTRL-D> or 'CHR\$(4)' character before the command if you are running a program under DOS. The command for a printer in slot #1 would be:

```
'PR#1<RETURN>'
```

or, if you are writing a program:

```
1000 PRINT CHR$(4);"PR#1"
```

This initialization just turns on your UniPrint. It does not tell it whether you expect to send text or graphics data. The specific commands that prepare your UniPrint for graphics data are covered in the next section.

Section 4.c Graphics Mode Commands

These commands allow you to specify the way you want your picture to appear on your printer and to start the printing of the picture. The format of a graphics transfer command is shown in Figure 4.2.

Note: These graphics commands must be entered each time you print a picture. The commands which alter the format of the picture are not 'remembered' by your UniPrint card.

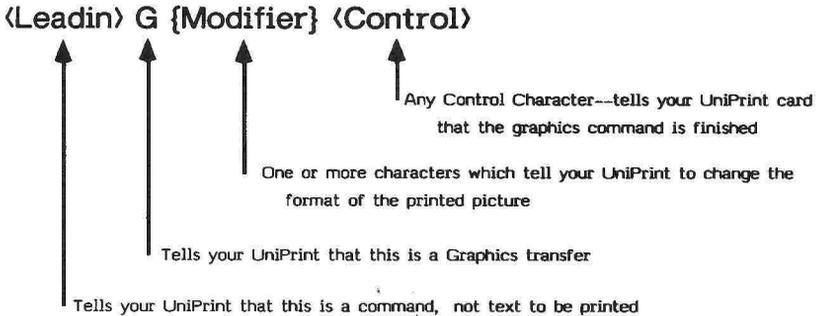


Figure 4.2 Format of a Graphics Command

Section 4.c.1 Selecting the Picture Size

Your UniPrint can print pictures in three different sizes. We call the three sizes, Normal, Double Expansion and Triple Expansion. A normal picture is about 3-½ inches wide by 2-½ inches tall when printed on an Apple Dot-Matrix printer. Pictures on other printers may be somewhat larger than this. A double-expansion picture is twice as large as a normal picture. On an Apple printer a Double Expansion picture uses up nearly the entire width of the 8-½ inch paper. Triple Expansion pictures are too large to fit on 8-½ inch paper unless they are rotated 90 degrees to place the long axis of the picture along the length of the paper. However if you are using a printer which will accept 11 or 14-inch wide paper (an Anadex 9501, or Epson MX-100 for example), you can print triple-expansion pictures without rotating them.

Note: Expanding your printed pictures will not increase the detail (resolution) in the picture. The picture will still show only the 280 by 192 dots which are shown on the Hi-Res screen. Your UniPrint will simply make each one of the dots two or three times as large.

The valid modifier characters for changing the picture size are as follows:

D — Sets the Double-Expansion mode

T — Sets the Triple-Expansion mode

Please note that we have picked modifier characters that are easy to remember. If you should happen to send both the 'T' and 'D' modifiers in the same command, the results may be surprising! Generally, you will get a normal-size picture, but we can't guarantee that result on all printers.

Section 4.c.2 Rotating the Picture

Your UniPrint will recognize graphics command modifiers, which will allow you to rotate the printed picture in increments of 90 degrees. This allows you to turn the picture sideways so that an expanded picture will fit on 8-½ inch paper. The valid modifier characters for rotating the picture are:

R — Rotate the printed picture clockwise 90 degrees

U — Rotate the picture 180 degrees

It may help you to think of 'R' for Rotation and 'U' for upside-down. You may include both of these modifiers in the same command. The result will be a picture rotated 270 degrees (the top of the picture will be on the left-hand edge of the paper).

Section 4.c.3 Miscellaneous Commands

Your UniPrint will recognize four other modifiers in graphics mode commands. These modifiers are:

2 — This modifier tells your UniPrint to print the picture displayed on Hi-Res graphics page 2. Without this modifier your UniPrint will print the picture displayed on Hi-Res graphics page 1.

- C — This modifier will print a color picture if you use it with a Data Products (IDS) Prism printer. On other printers the results are unpredictable, and will usually take a long time. This modifier will tell the printer to print each line several times (once for each color).
- I — This modifier Inverts the normal representation of black and white dots in the picture. You will now get a white dot for each white or colored dot on your computer screen. (Your UniPrint normally prints a black dot for each white or colored dot on the screen.) If you are printing a color picture, this modifier will alter only the black and white dots — it will not change any of the colored dots.

Note: If you are printing a color picture, the black dots on the screen are normally printed as black dots . . . they are not inverted as is the case with black-and-white pictures. Your UniPrint firmware makes this change so that color pictures will appear just as they do on the screen.

- X — This modifier will print an extended Hi-Res picture if you have an Apple //e with an extended memory card. This modifier will print only black-and-white extended Hi-Res pictures. If you try to use this modifier with a normal Hi-Res screen, or on an Apple II Plus or an Apple //e without the extended memory, your picture will look very strange!

Section 4.d Sample Commands and Pictures

This section will help you get familiar with the graphics transfer commands. Remember that when something is enclosed in angle brackets, it means that you press one or more keys at the same time. For instance <CTRL-I> means hold down the CONTROL key while you press 'I.'

Note: On the Apple //e, the TAB key produce the same control character as <CTRL-I>.

To begin printing a picture in the default graphics mode (normal size, right-side up):

```
<CTRL-I>G<Back Arrow>
```

The <Back Arrow> key generates an ASCII <Backspace> character. This control character will terminate the graphics command and start printing the picture. Any other control character (including <RETURN>) will work just as well. Many people prefer the <BACK ARROW> key because you will not get the "?SYNTAX ERROR" message printed until you hit the <RETURN> key. This pause allows you to remove your complete picture (or advance the paper) to avoid all of your masterpieces inadvertently becoming titled "?SYNTAX ERROR."

If you want a triple-expanded picture printed along the length of the paper, you would use:

```
<CTRL-I>GTR<Back arrow>
```

To stop a graphics transfer once it has started you may press the <ESC> key <CTRL-RESET> will also stop the transfer at any time. Remember, if your printer has a buffer it may continue printing for some time.

If you want to add a picture printing capability to a program that uses Hi-Res graphics you would use these commands:

```
1000 PRINT CHR$(4);"PR#1":REM TURN ON PRINTER CARD
```

```
1010 PRINT CHR$(9);"GTR": REM SEND CTRL-I, MODIFIERS AND  
CARRIAGE RETURN
```

```
1020 PRINT CHR$(4);"PR#0":REM BACK TO APPLE VIDEO
```

Please note that the PRINT statement in line 1010 will automatically be ended with a Carriage Return character. This character will act as the Control Character to end the graphics command. You would need to change the numbers of these lines to put them in the appropriate place in your program.

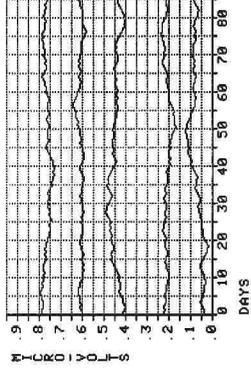
The following figures are examples of graphics printouts produced on an Apple Dot-Matrix Printer. Just above each picture is the graphics command used to print the picture. The pictures have been reduced to fit on the page, but the relative sizes of the different pictures have been preserved.

Section 4.e Pascal Graphics

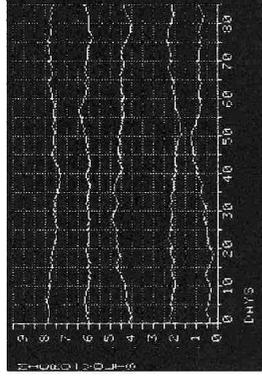
The Graphics Commands work exactly the same in Pascal, except that you cannot start the transfer by issuing the commands from the keyboard, as you can in BASIC. The WRITELN statement is used to begin printing a Hi-Res screen from Pascal. The following example illustrates the use of the UniPrint card to transfer a triple-expanded picture printed along the length of the paper.

```
PROCEDURE PRINTPIX;  
  VAR OUTDEV : TEXT;  
  BEGIN  
    REWRITE (OUTDEV, 'PRINTER:');  
    WRITELN (OUTDEV, CHR(9),'GTR');  
  END;
```

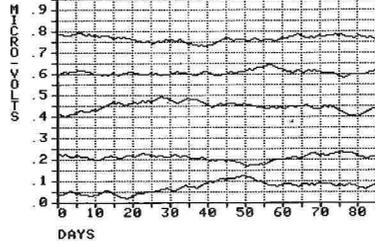
ICG



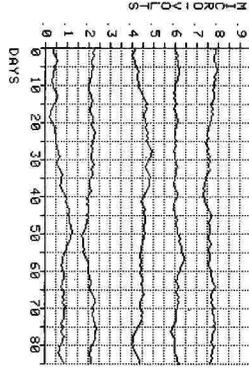
ICGI



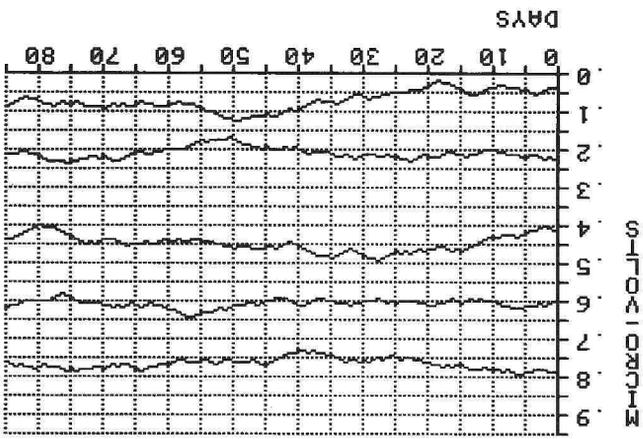
ICGR



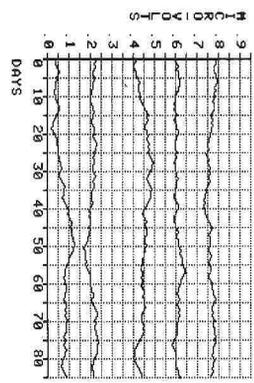
ICGU



LOG D



LOG R U



Chapter Five. The Hardware and Software Interface

- 5.a The Hardware Interface
 - 5.a.1 Setting the Graphics Printer Type Switches
 - 5.a.2 Configuring Your Printer

- 5.b The Software Interface
 - 5.b.1 Applesoft, Integer BASIC & DOS
 - 5.b.2 Apple Pascal
 - 5.b.3 CP/M
 - 5.b.4 Assembly Language
 - 5.b.5 ProDOS

CHAPTER FIVE. The Hardware and Software Interface

In this chapter we will list the printers that are compatible with each of the settings of the graphics printer type switches. We will also tell you how to set up some of these printers which require special configuration to work best with your UniPrint. In Section 5.b we will discuss compatibility with the most popular operating systems.

Section 5.a The Hardware Interface

You should find the UniPrint card completely compatible with a whole host of Apple][and Apple //e peripherals. The UniPrint card follows Apple][and Apple //e OEM guidelines. These guidelines ensure compatibility with all other devices following the guidelines — which include most commercially available peripherals and software systems.

Section 5.a.1 Setting the Graphics Printer Type Switches

Your UniPrint can be set to print pictures from the Hi-Res screen on any of more than 31 different printers. In the following list, you will find the printers that work with each of the different settings of the Graphics Printer Type switches.

Note: Printers that we believe to be compatible, but have not actually tested, are indented in the list.

DIP SW			
1	2	3	<u>Printer Type</u>
0	0	0	Apple Dot-Matrix Printer C. Itoh 8510 NEC 8023A Tec 8510 Leading Edge Prowriter Leading Edge Prowriter II
0	0	1	Epson MX-80 Epson MX-100 Mannesman Tally 160L Epson FX-80 Epson FX-100 Epson RX-80 Epson RX-100 Mannesman Tally 160I Mannesman Tally Spirit-80
0	1	0	Gemini 10 Gemini 15
0	1	1	Data Products (IDS) 440 Data Products (IDS) 460 Data Products (IDS) Prism Data Products (IDS) uPrism Okidata 82A

	Okidata 83A
	Okidata 92A
	Okidata 93A
1 0 0	Anadex 9501. Anadex 9000 Anadex 9000A Anadex 9001 Anadex 9001A Anadex 9500A Anadex 9501A
1 0 1	Leading Edge Gorilla Banana (GX-100) Commodore VIC Printer Radio Shack DMP-100 Sekiosha GP-100A
1 1 0	Centronics 739-1
1 1 1	Reserved for future use

Section 5.a.2 Configuring Your Printer

In this section we will describe any special configuration steps you must take to set up your printer to work with your UniPrint card. We will limit this discussion to the printers we have actually tested. These configuration steps usually involve setting one or more DIP switches on the printer. We will specify only those settings which are different from the settings in effect when you first receive your printer. If you have changed any of the settings on your printer you will need to restore the default settings. We simply do not have the room in this manual to specify all the settings for all the printers which can be used with your UniPrint card.

Apple Dot-Matrix Printer
C. Itoh 8510
NEC 8023A

Set SW1-7 to 1

Epson MX-80
Epson MX-100

Set to Manufacturers
defaults

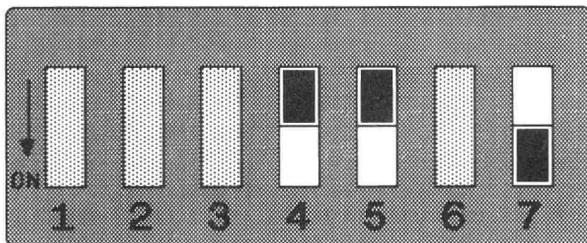
Mannesman Tally 160L

Form Length	11 inches
LPI	6
CPI	10
* CR implies LF	NO
LF at full line	Yes
* POPC	Yes
(Print on Paper Motion Command)	
LF implies CR	NO
Char Set	USA
Slash Zero	No
* Aux code set	E. codes
Buffer Size	Max
* Interface Type	Parallel

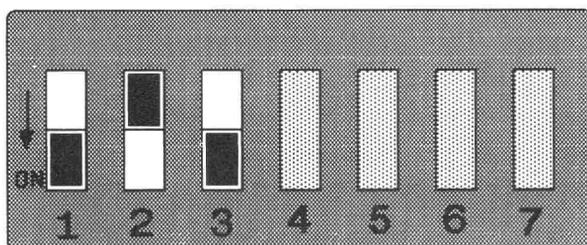
* These codes directly affect compatibility between your UniPrint and printer.

Gemini 10

Set to Defaults



Dip SW 4



Dip SW 3

Figure 5.1 DIP switch settings for Data Products (IDS) 460.

Section 5.b The Software Interface

The UniPrint card is compatible with virtually all known software environments. This includes Applesoft, Integer BASIC, DOS, Pascal, CP/M, Assembly language and ProDOS.

Section 5.b.1 Applesoft, Integer BASIC & DOS

The UniPrint card is compatible with Applesoft and Integer BASIC, with and without DOS. There is no reason why any program using these operating environments should not work.

The UniPrint card is activated whenever you access its slot via the 'PR#n' command, where the UniPrint is plugged into slot n. Remember that when issuing a 'PR#' command from within a BASIC program with DOS booted that you may disconnect DOS. The DOS 3.3 Manual addresses this issue on pages 100 through 102 (pages 25-28 and 35 in the new DOS Programmer's Manual). What the DOS 3.3 manual does not tell you is that you may reconnect DOS by using a CALL 1002 statement. Otherwise be sure to observe the <CTRL-D> conventions as stated in the manuals.

Section 5.b.2 Apple Pascal

The UniPrint is completely compatible with Apple Pascal, provided you have installed it according to our recommendations in chapter two (specifically, it must be installed in slot #1). The printer connected to your UniPrint may be accessed from a Pascal program, or the Operating System, by using its Volume Number (#6:) or Volume Name (PRINTER:).

Section 5.b.3 CP/M

The UniPrint is completely compatible with CP/M, provided you have installed it according to our recommendations in chapter two (specifically, it must be installed in slot #1).

Section 5.b.4 Assembly Language

The UniPrint may be used to output text to your printer from assembly language programs or subroutines. The cleanest way to do this is to use the DOS I/O hooks as follows:

- 1) STA the address of the UniPrint entry point in CSWL and CSWH (\$C100 for slot #1).
- 2) JSR \$3EA to reconnect DOS (Same as CALL 1002 in BASIC).
- 3) Load character to print into A and JSR to COUT (\$FDED). This does a JMP Indirect to CSWL.
- 4) To return output to the 40 column screen do a JSR to SETVID at \$FE93 followed by a JSR \$3EA to reconnect DOS.

Section 5.b.5 ProDOS

The UniPrint is completely compatible with ProDOS, provided you have installed it according to our recommendations in chapter two.

Character Code

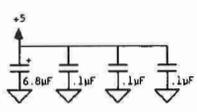
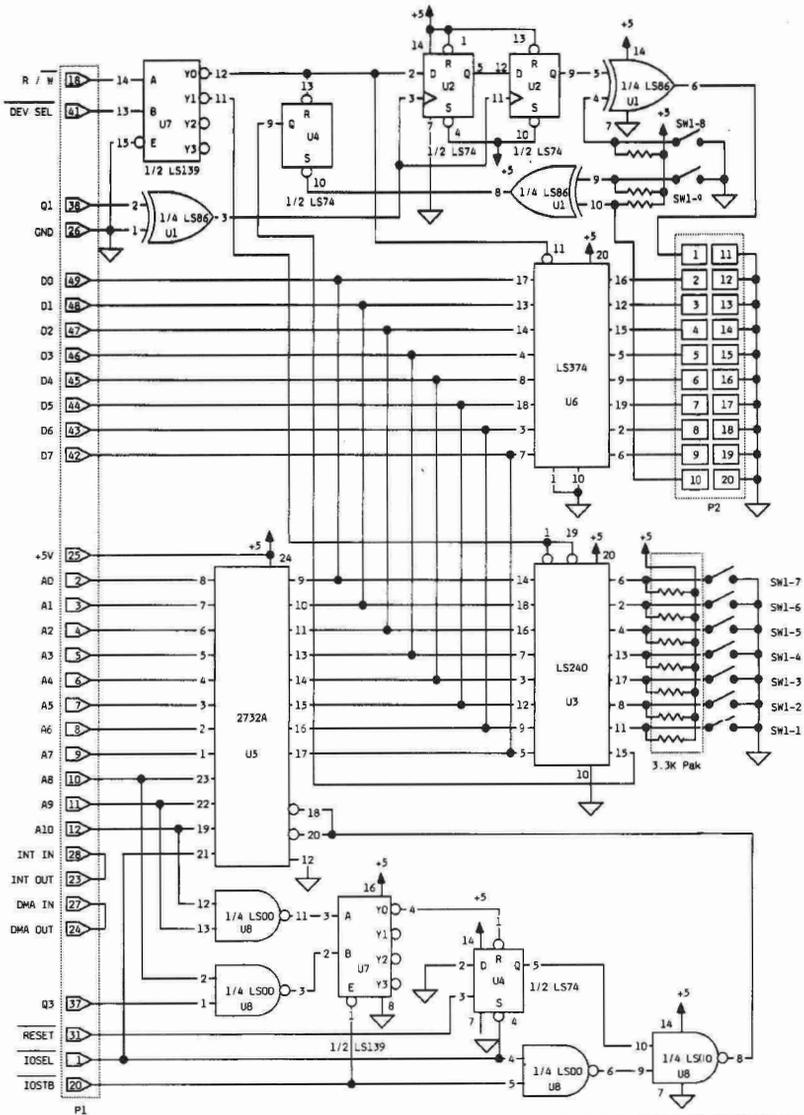
THE ASCII CHARACTER CODE CHART (7 & 8 BITS)

Decimal:	0	16	32	48	64	80	96	112	
or:	128	144	160	176	192	208	224	240	
Hex:	\$00	\$10	\$20	\$30	\$40	\$50	\$60	\$70	
or:	\$80	\$90	\$A0	\$B0	\$C0	\$D0	\$E0	\$F0	
0	\$0	@ ^c Nul	P ^c Dle	0	@	P	\	p	
1	\$1	A ^c Soh	Q ^c Dc1	!	1	A	Q	a	q
2	\$2	B ^c Stx	R ^c Dc2	"	2	B	R	b	r
3	\$3	C ^c Etx	S ^c Dc3	#	3	C	S	c	s
4	\$4	D ^c Eot	T ^c Dc4	\$	4	D	T	d	t
5	\$5	E ^c Enq	U ^c Nak	%	5	E	U	e	u
6	\$6	F ^c Ack	V ^c Syn	&	6	F	V	f	v
7	\$7	G ^c Bel	W ^c Etb		7	G	W	g	w
8	\$8	H ^c Bs	X ^c Can	(	8	H	X	h	x
9	\$9	I ^c Ht	Y ^c Em	)	9	I	Y	i	y
10	\$A	J ^c Lf	Z ^c Sub	*	:	J	Z	j	z
11	\$B	K ^c Vt	[^c Esc	+	;	K	[	k	{
12	\$C	L ^c Ff	\ ^c Fs	,	<	L	\	l	|
13	\$D	M ^c Cr	] ^c Gs	-	=	M	]	m	}
14	\$E	N ^c So	^ ^c RS	.	>	N	^	n	~
15	\$F	O ^c Si	_ ^c Us	/	?	O	_	o	rub

HOW TO READ THE ASCII CHARACTER CODE CHART

The ASCII value of any character in the chart may be determined by adding the value at the top of its column with the value to the left of its row. The table may be used to find values in either decimal (base ten) or hexadecimal. The first two columns of characters are the control characters. They are followed by their ASCII names.

Example: A control G is represented by: G^c Bel. "Bel" is a short hand notation for "bell", meaning the bell character. Its ASCII value is \$7 or \$87 (hexadecimal) or 7 or 135 (decimal).



Videx, Inc.

September 29, 1983

UniPrint parallel printer interface

Schematic Diagram

©1983 Videx, Inc.

Appendix T. Cable and Connector Specifications

The cable which comes with your UniPrint card is designed to connect your card to a Centronics type printer. The configuration of the pins onto which the transition connector is placed are shown in the following figure:

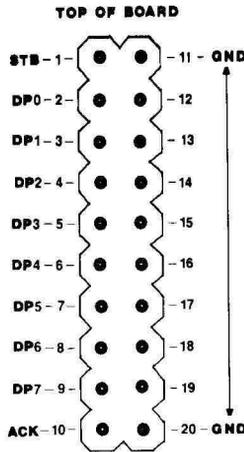


Figure T.1 Transition Connector Pins on UniPrint. Pins are on 0.10" centers.

Transition Connector		Centronics style Connector
1	_____ Strobe	_____ 1
2	_____ Data bit 0	_____ 2
3	_____ Data bit 1	_____ 3
4	_____ Data bit 2	_____ 4
5	_____ Data bit 3	_____ 5
6	_____ Data bit 4	_____ 6
7	_____ Data bit 5	_____ 7
8	_____ Data bit 6	_____ 8
9	_____ Data bit 7	_____ 9
10	_____ Acknowledge	_____ 10
11-20	_____ Ground	_____ 19-28

Figure T.2 Pin Specifications for Printer part #57F-36 or equivalent.

connector is Amphenol

The following Centronics-type lines are supported by your UniPrint card:

Strobe Output — The UniPrint card sends a 1 us. pulse over this line when there is valid data on the eight data lines. This tells the printer to accept this character. The polarity of this signal is determined by DIP switch 8.

Data Bit 0 — This is the least significant bit of the eight bit data byte output to the printer.

Data Bit 7 — This is the most significant bit of the eight bit data byte output to the printer.

Acknowledge — The UniPrint Acknowledge input. The receiving device (usually a printer) sends a pulse over this line when it has successfully received the data from the eight data lines. DIP switch 9 determines the polarity of the signal the UniPrint will look for. The Acknowledge signal tells the UniPrint to send the next character.

GND — Signal Ground.

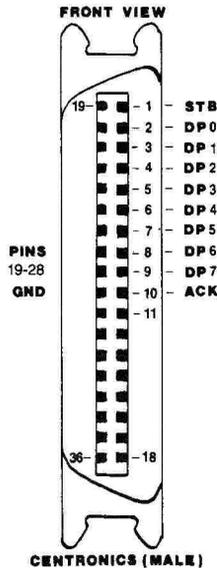


Figure T.3 Pin numbering scheme of a standard Centronics-type connector.

Appendix Y. Theory of Operation

This appendix is a short description of the operation of your UniPrint card. You should refer to the schematic diagram in Appendix S as you read this appendix. This description assumes you are familiar with the memory addressing and operation of the Apple I/O slots.

Integrated circuits (ICs) U7, U8, and part of U4 form the Apple bus decoding circuit for the firmware EPROM, U5. This EPROM contains six copies of the sections of firmware, which appear in the CN00 region. It also contains the code which appears at C800. The appropriate page of firmware for each slot is selected by address lines A8, A9, and A10. These address lines are also decoded by U7 and U8 to switch off the C900 ROM, when an address greater than CF00 is addressed. The output data from the EPROM is directly connected to the Apple Data Bus.

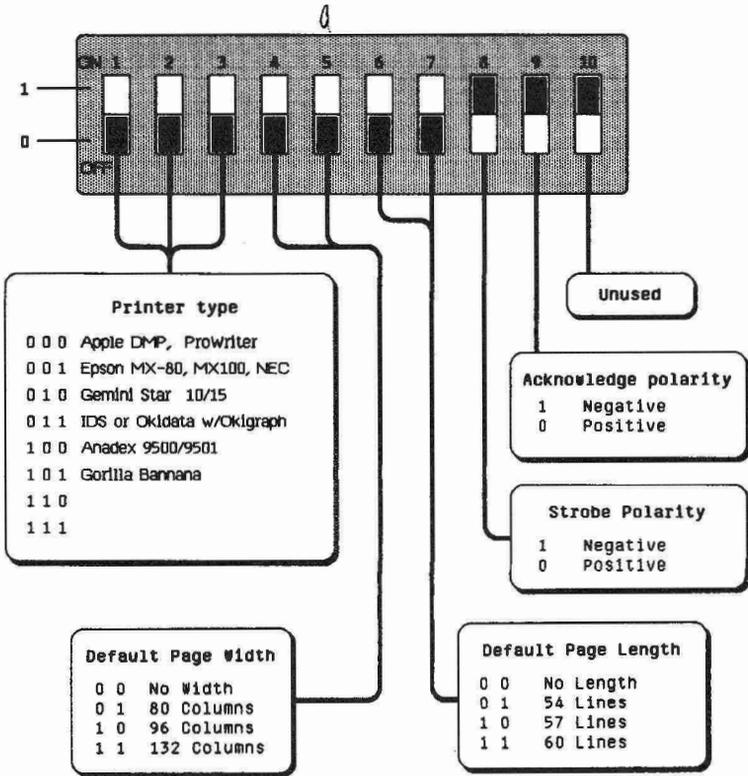
ICs U1 and U2, along with parts of U4 and U7, control the input and output ports. These circuits also control the Strobe and Acknowledge signals. The R/W signal determines whether the data on the Apple bus will be latched for output by U6 or the DIP switch values will be gated onto the Apple Bus. Since there is no address decoding of these signals, data may be read from, or written to, all the memory locations from C0N0 to CONF. Two sections of U1 are used as selectable inverters to control the polarity of the Strobe and Acknowledge signals.

The Acknowledge pulse is latched by one half of U4. The output of the latch appears as data bit 7 when the status port at C0N0 is read. The acknowledge status is cleared when the next byte of output data is written to the output port. Reading the status port also gates onto the data bus the values of DIP switches SW-1 through SW-7.

Glossary

- APPLICATION PROGRAM** An application program is a program which is written to accomplish a specific task. The program may be written in BASIC, Pascal or Machine Language. A payroll program or an accounting package are examples of applications programs.
- ASCII** This is an acronym for American Standard Code for Information Interchange. This standard defines the way the alphabet, numbers and control characters are encoded by your computer. The ASCII codes use only seven of the eight bits in a byte, so we use the last bit to set special attributes for a displayed character.
- BANDWIDTH** This is a measure of the range of frequencies which an electronic device can faithfully reproduce. If the bandwidth of a device such as a display monitor is too small, it cannot preserve all the information contained in the video signal.
- BASIC** This is an acronym for Beginner's All-purpose Symbolic Instructional Code. It is the computer language, originally developed at Dartmouth University, which is used on most personal computers. APPLESOFT is a version of BASIC.
- CRTC** This is an acronym for Cathode Ray Tube Controller. This is an integrated circuit which automatically scans a block of memory, then converts the ASCII data in the memory to video signals. The CRTC also provides horizontal and vertical synchronization signals, and a cursor.
- CURSOR** The cursor is the solid or flashing block on your display which indicates where the next character that you enter will appear on the video display. Different programs may alter the appearance of the cursor by changing certain registers inside the CRTC.
- FIRMWARE** A program which is stored in an EPROM is firmware. It is called this because it is somewhere between hardware and software. Hardware cannot be changed, at least not without great difficulty and a knowledge of electrical engineering. Software is easily changed — if you know how to program your computer. Firmware can be changed, but it requires a special programming device. The firmware programs on your UltraTerm card control the operation of the card and its interaction with your computer.
- HARDWARE** Your Apple][and UniPrint are hardware. The electronic circuits which go together to make a particular device are called hardware.
- KEYBOARD ECHO** When your computer sends all characters that you enter on the keyboard to the output device (the video display), your system is using keyboard echo. This allows you to use output commands by simply typing them on the keyboard.
- OPERATING SYSTEM** This is the supervisor program that controls the use of the resources of your computer. The Pascal Operating System is responsible for processing input and output and executing commands which allow you to run utility or application programs. Apple DOS 3.3 is an operating system which allows floppy disks to be used with BASIC.

SWITCHES



RMA Form
Please call
(503-758-0521) for RMA #
before returning item(s)

RMA # _____

Serial # _____

Previous Service RMA _____

Name _____

Shipping Address:

Organization _____

Name _____

Addr. _____

Addr. _____

Shipping Instr.

Phone # (days) _____

Phone # (evenings) _____

Date purchased _____

Received _____

System Configuration:

Autostart ROM

Old Monitor ROM

Apple][plus

Apple][

Apple //e

Apple ///

Resident Language:

AppleSoft

Integer

Operating System:

Pascal

CP/M

Number of disc drives: _____

List on the back of the page all products installed in the Apple at the time the failure occurred, and any software that was in use:

For problems that occurred during installation, did you get a:

power light?

display?

power-up beep?

Were there any installation errors?

Describe, in detail, the nature of the problem.

Describe, in detail, the circumstances under which the problem occurred.

Does the problem occur only several minutes after power-up?

Yes No

COMMENTS:



CORVALLIS, OR 97330
503/758-0521