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REFERENCE CARD
INTRODUCTION

Your new Silentype printer is quiet, versatile, compact and easy to use. It can print both upper and lower case letters at a speed of up to 40 characters per second. This manual will show you how to install it (easy) and how to print both text and high-resolution graphics with it (even easier).

You don't have to know how to write computer programs to use the printer. In fact, you can use the Silentype printer effectively without doing any programming at all. However, if you do know how to program in BASIC, Pascal, or machine language, you can write routines that will make your Silentype printer even more useful.

This manual contains three chapters. The first chapter tells you step-by-step how to install your printer and its interface card. The second chapter gets you started printing and discusses some special printing modes (printing high-resolution graphics, for example). The third chapter discusses more complex details like changing the printer parameters, and contains some sample programs that can make printing more fun.

In addition to these three chapters, you will find five appendices and a tear-out quick reference card in this manual. The first of the appendices, Appendix A, tells you how to care for the printer to insure that it has a long and useful life. The second one, Appendix B, contains useful tables. Appendix C tells how to use information in this manual to construct a BASIC Parameter Editing program, and Appendix D tells how to do something similar with Pascal. Appendix E shows both upper and lower case alphabets. The reference card contains lists of commands and other information that is helpful to have at your fingertips.

This manual uses some special symbols to indicate particularly noteworthy pieces of information. If you see the symbol

\[\text{\textsto}\]

it means that the following paragraph discusses some possibly unexpected Apple behavior. The symbol

\[\text{\textpcp}\]

means that the following paragraph contains special information that may be useful to you. Read these sections carefully.

Keep in mind that this is a "hands on" manual. That means you should do all the examples as they are presented. The learning process will be much quicker and more effective if you do. So limber up your fingers and turn the page to begin.
CHAPTER 1
GETTING READY

WHAT YOU WILL NEED

The Silentype printer is easy to please. It will operate in any of these Apple languages: Integer BASIC, Applesoft BASIC, Pascal or the Monitor. In fact, the Silentype can be used with any Apple II or Apple II Plus with at least 16K bytes of memory. It doesn't even need to be plugged into an electrical outlet because it gets its power from the Apple's power supply.

The package your printer came in should contain the following items:

1) The Silentype printer
2) A roll of heat-sensitive paper (already installed in the printer)
3) A printed-circuit card (the printer interface card)
4) A warranty card
5) This manual
6) A Packing List

If you haven't already done so, carefully unpack all the items in the box. Save the packing material in case you wish to transport your printer, or in the unlikely event that you must return it for service. If you didn't fill out your warranty card with your Apple dealer, fill it out and send it in now.

CHECKING THE PAPER

It is inevitable that a package will be jolted and bumped as it is being shipped. Though your Silentype printer was carefully packed to protect it from such jostling, it is possible that the roll of paper it holds has slipped out of position. You should check the placement of the paper roll before you use the printer.

The roll of paper sits just inside the rear of the printer, beneath the dark-toned portion of the printer casing. To get to the paper, push the dark portion backwards with your thumb and forefinger as shown in the photograph. The dark-toned "lid" is hinged at the back bottom corners and will open easily, revealing the roll of paper.
Check that the small black bearings on either side of the paper roll are sitting firmly in the deepest notches as shown in the photograph. If the paper roll has slipped out of place, carefully line up the bearings with the appropriate notches. Then press in on the bearings, and the paper roll should fall into position.

PLUGGING IN THE INTERFACE

Read this section carefully, even if you have installed Apple peripheral interface cards before. The Silentype's interface card is easy to install, but it is important to install it correctly. If you follow all the instructions here, you should have no trouble with the plugging in procedure.

Before connecting or disconnecting anything on the Apple, turn off the power with the switch on the back left corner. THIS IS A MUST. If you try to connect or disconnect anything from the inside of your Apple when the power is on, you are likely to damage its electronics and anything currently stored in RAM (Random Access Memory).

Turn the power switch on the back left of your Apple to the off position. Do not unplug the Apple, just turn it off. If you unplug it, you will have isolated it from the common earth ground, leaving it vulnerable to static discharges.

The next step is to remove the Apple's cover. Pull up on the back of the cover until the two corner fasteners pop apart. Then slide the cover backwards until it comes free.

Next look inside your Apple and find the power supply case. It is the rectangular metal box in the left rear corner. Touch the power supply with one hand. This will ground any static that may be in your body.
Along the back inside edge of your Apple you will see eight long narrow slots called "connector slots". They are numbered from 0 in the leftmost corner to 7 in the rightmost corner. (The slots on some older Apples are not numbered.) The numbers are written in white along the back edge, behind the connector slots. Any peripheral cards installed in your Apple are plugged into these slots. The following photograph shows the position of the slots inside the Apple.

![slot positions](image)

Just as it is customary to plug disk controller cards into slot #6, printer interface cards are usually plugged into slot #1. Unless you are using Pascal, the printer card will work in any slot except #0. But, unless you have a specific reason not to, it is a good idea to use the conventional slot. This manual assumes that you are using slot #1.

The Silentype interface card contains a C800 ROM "chip". If you have another interface card that has a C800 ROM, such as a Serial card or a Graphics Tablet card, plugged into your Apple, the Apple may get the cards confused and send information to the wrong one. This problem can only arise when the other C800 card is in the numerically lower adjacent slot to the printer card (for instance, if the printer card is in slot #3 and the other card is in slot #2). To avoid this possibility plug your printer card into slot #1 or, if that is not practical, put any interface card with a C800 ROM in a slot that's numerically higher than the one your printer card is in.

Handle the interface card as you would handle a high-quality, expensive phonograph record. Grasp it only by the corners or edges, and try not to touch the delicate components or pins. Don't grasp the card by the gold or silver colored "fingers" -- they are the medium
through which the Apple communicates to the printer, and their efficiency is decreased if they are dirty or scratched. The interface card is a precision instrument and should be treated with care.

Now grasp the two top corners of the interface card between your thumbs and forefingers and gently but firmly push the "fingers" portion of the card into slot #1, rear edge first. The card should be level and seated firmly as shown in the photograph.

The final step is plugging the printer's cable into the interface card. There is a socket on the interface card that matches the plug attached to the Silentype printer cord. The socket faces toward the Apple keyboard when the interface card is installed. Simply plug the printer cable into the socket, then run the cable through the second short notch from the right (with the keyboard facing you) on the back of the Apple's case, and push the cable all the way to the bottom of the notch. It is important that the cable be seated firmly in the notch so that it will minimize possible strain on the cable and the interface card. The following photograph shows the correct placement of the printer cord.
Do not connect or disconnect the printer cable when your Apple is on. If you do, anything stored in RAM may be destroyed.

Slide the Apple's top into place and press down on the rear corner fasteners until they pop into place. Now your Silentye printer is completely installed and ready to use.
CHAPTER 2
BEGINNING TO PRINT

STARTING UP

If you've taken the steps outlined in Chapter 1, your Silentype printer should be completely installed now and ready to print. It seems, however, that we've forgotten one small detail: your Apple's power isn't turned on. Reach around to the power switch on the left rear corner of your Apple and flip it to the ON position. Now you are ready to begin.

In several places, this manual refers to special characters called control characters. Control characters cannot be seen on your video screen, and your printer will not print them. Most control characters are ignored by the Apple, but the ones it does not ignore activate special functions instead of printing characters on the screen.

Control characters are activated by pressing the CTRL key and, while holding down the CTRL key, pressing another key. From now on we will indicate a control character like this: CTRL-P

One additional note: although the Apple keyboard and monitor can do all the examples we mention in Chapters 2 and 3, some types of external terminals lack the ability to do the graphics that we describe.

PRINTING WITH PASCAL

If you do not plan to use the Pascal language, skip to the section called "Back to BASIC".

You can use the Silentype with Pascal in two ways: by transferring a file to it using the Filer's Transfer option or by using it as an output file in a Pascal program. Both of these methods require that the Silentype's interface card be plugged into slot #1.

To print a file using the first method, get the Apple into the Pascal editor and type in the sample program listed below. Or, if you have a short Pascal program handy, enter the Pascal editor as if to edit your existing program.
PROGRAM CIRCLE (INPUT,OUTPUT):
 (* FINDS THE AREA OF A CIRCLE. *)

CONST PI=3.1415:
VAR RADIUS, AREA:REAL;

BEGIN
  WRITELN ('WHAT IS THE RADIUS OF THE CIRCLE?');
  WRITELN;
  READLN(RADIUS);
  AREA := PI * SQR(RADIUS);
  WRITELN;
  WRITELN ('THE AREA OF THE CIRCLE IS', AREA:4:3, '.')
END.

Save the program under the filename of your choice. To print the
program listing, choose the T (for Transfer) option from the Filer
prompt line, type the name of the file, and when the Filer asks "TO
WHERE?", specify the Silentype either by
PRINTER:
or by
#6:

#6: is the Pascal volume number assigned to the printer. The Pascal
system automatically initializes the printer for you and prints your
text file.

You can use this method to print any Pascal text file, but sometimes
it may be advantageous to use the Silentype as an output file in a
program. To use the Silentype as an output file, you must first
declare an internal identifier for it with either TEXT or
INTERACTIVE as the type:

  VAR SITYP:INTERACTIVE;

Then in the program body you must open the file, using REWRITE and
supplying the name PRINTER:

  REWRITE(SITYP, 'PRINTER:')

Don't forget the colon in PRINTER:. Now you can conveniently print
lines of text by using WRITELN statements like

  WRITELN(SITYP, 'ANY LINE OF TEXT I CARE TO PRINT!')

If you want to use WRITE instead of WRITELN, you will need some
additional information that can be found in Chapter 3.

Since the printer is not a block-structured device, you cannot use
BLOCKWRITE with it; however you can use UNITWRITE. The Apple Pascal

To use Silentype for immediate-mode typing, put the interface card
in slot 3, and from the Filer, type T for Transfer, and then type
CONSOLE:, CONSOLE:
Notice that you can Transfer the CONSOLE: to the PRINTER: . The CONSOLE: means the keyboard and screen. When you do this, whatever you type after specifying the transfer will be printed, until you type a CTRL-C. Characters are not printed as soon as they are typed; the Silentype stores characters until you either come to the end of a line, type a RETURN, or type the final CTRL-C. In this section, you'll see why this is a useful trick.

Use the Pascal Editor to enter this program that uses Turtlegraphics to generate a lovely spiral pattern:

```pascal
PROGRAM SPIRO;

USES TURTLEGRAPHICS, APPLESTUFF;
VAR ANGLE, DISTANCE : INTEGER;

BEGIN
  ANGLE := 0;
  WHILE NOT KEYPRESS DO
  BEGIN
    INITTURTLE;
    PENCOLOR (WHITE);
    FOR DISTANCE := 0 TO 99 DO
    BEGIN
      MOVE (2 * DISTANCE);
      TURN (ANGLE);
    END;
    ANGLE := ANGLE + 5;
  END;
TEXTMODE
END.

Compile this program and run it; the Apple Pascal manuals tell how. When the program is through running, it leaves the spiral pattern stored in memory. To get the Silentype to print the graphics you must send a CTRL-Q to the Silentype (not to the Apple itself). Here's how:

1) Choose the Transfer option from the Filer command line and transfer the CONSOLE: to the PRINTER:

2) Press CTRL-Q followed by CTRL-C

If you've done everything correctly, the Silentype will proceed to print the high-resolution screen. Make sure you didn't forget the colons in step 1.

If, for some reason, you wish to stop the Silentype in mid-picture, press the RESET key.

If you plan to use only Pascal with your Silentype printer, you can skip the rest of this chapter as the remaining portion deals only with BASIC and the Monitor.
If you are using Integer BASIC or Applesoft BASIC, first put the Apple in BASIC. (If you don't know how, see the Apple II BASIC Programming Manual or the Applesoft Tutorial.) Then LOAD a short BASIC program, or type the following program:

```
100 PRINT:PRINT "GAME CONTROL ZERO IS ";PDL(0)
110 PRINT:PRINT "AND CONTROL ONE IS ";PDL(1);"."
120 END
```

This program will work in either Applesoft or Integer BASIC. Use the LIST command to list the program on your video screen, and check that you typed it correctly.

Before you can print anything, you must "initialize" the printer. When you initialize the printer, you are, in effect, telling the Apple to route information through the printer interface card by indicating the slot number into which it is plugged. From either BASIC type `PR#` followed by a 1, or whatever number slot your printer card is plugged into. Then press the RETURN key. You should hear a muffled click, and the printer "head" (the small white square you can see beneath the clear plastic shield) will shift its position slightly or move to the left margin if it isn't already there. This means the printer is ready.

Type `LIST` as if to list the program on the screen but don't press the RETURN key. The word "LIST" doesn't appear on your screen, nor does it appear on the paper in the printer. Don't worry; this is normal. Now press the RETURN key. The screen remains unchanged, but the word "LIST" is printed by the Silentype, followed by the program lines you typed earlier.

There is a particular reason why the things you type appear only on the printer's paper and not on the video screen when the printer is activated. It has to do with the way BASIC handles the Apple's 40-character screen.

The program listing you generated a few paragraphs back should still be on your video screen. Compare the program listing on your screen with the one the Silentype printed. You'll notice that the program lines listed on the screen are less than 40 characters wide, while the lines listed on the Silentype's paper can be much longer (up to 80 characters). If the Apple is using a video monitor, BASIC automatically breaks any lines of more than 40 characters by moving the cursor to the beginning of the next line. So, if a BASIC program listing had been sent to the printer AND the video monitor, it would have been formatted to have lines of 40 characters or less, and the printer's capability to print more than that would be ignored.
When you wish to quit printing, type
PR#0
to tell the Apple to quit sending information to the Silentlyte
interface card.

FROM THE MONITOR

If you wish, you can use the printer from the Monitor which is
indicated by the * prompt. To initialize the printer from the
Monitor, type the number of the slot containing the printer card,
followed by a CTRL-P. This works just like the initialization from
BASIC except that you will be left in the Monitor instead of BASIC.

To quit using the printer from the Monitor, type
0 CTRL-P

If you want to use DOS (the Disk Operating System) with the
Silentlyte printer and the Monitor, do not initialize the printer
with the method described above. Instead, initialize the printer
from BASIC first, and then enter the Monitor. If you initialize the
printer from the Monitor when you are using DOS, the Silentlyte may
be disconnected at an inopportune time.

ECHOING TO THE SCREEN

If you are using BASIC or the Monitor, you can use the printer and
the screen simultaneously if you wish by giving up the Silentlyte's
80-character line capability. This is accomplished through the use
of a control character, CTRL-T. Press CTRL-T, and then press the
RETURN key.

If the Apple is in Integer BASIC, the Silentlyte will cause the paper
to advance one line, and the Integer BASIC prompt > , followed by
the blinking cursor, will appear on the screen.

If the Apple is in Applesoft BASIC, your Apple will beep and give
you the message:

?SYNTAX ERROR

Usually syntax errors are ominous indications, but this one is
nothing to worry about; the CTRL-T will still work normally. After
the message has been displayed, the printer will execute a line
feed, and the Applesoft prompt ] , followed by the blinking cursor,
will appear on the screen on the line below the message. If you
don't want the error message to appear, you can press CTRL-T, press
the backspace key once to backspace over the CTRL character, and
then press RETURN.
Now try listing the BASIC program you entered earlier. Each line of the program will appear on the screen as it is printed by the Silentype, and the listing from the printer will have the same format as the listing on the screen.

If you would like the Silentype to print 80-character lines again, simply use CTRL-T again. Whatever is on the screen will remain unchanged. The "computerese" term for going back and forth from echoing to the screen to not echoing to the screen is "toggling the screen echo". It may help you to remember which control character to use if you know that the T in CTRL-T stands for toggle.

If you change the size of the Apple's "window", the screen echo may give strange and unpredictable results. If you use the screen echo feature, it is recommended that you do not change the window size.

BASIC TABS AND THE SILENTYPE

The BASIC tab feature was designed to work with a 40-column screen. The tab feature behaves in a way you might not expect when more than 40 columns are available, for instance, when the Silentype printer is being used. If you want to use BASIC tabs with the Silentype you should be aware of these tabbing eccentricities.

Tabbing to columns 0 through 39 works as described in your Integer BASIC and Applesoft BASIC manuals. However, if you wish to tab to a column that does not appear on the video screen (to the right of column 39), BASIC will generate a RETURN so that whatever you are tabbing will appear on the video screen. If you don't want that RETURN at column 40, you can use a POKE instead of the tab command. To print a 0 in column 59, use

```
POKE 36,59:PRINT 0
```

You can't tab backwards, but you can tab to any column up to column 80 by changing the "59" to the appropriate column number.

THE BUFFER

From BASIC, keep an eye on your printer while you type the following two sentences from a traditional folk song on your Apple, making sure you don't press the RETURN key.

```
I'LL EAT WHEN I'M HUNGRY AND DRINK WHEN I'M DRY. IF A TREE DON'T FALL ON ME I'LL LIVE 'TIL I DIE
```
If you watched your printer, you saw that the words you typed were not printed right away. Each character was stored in a "buffer" as it was typed. The Silentype’s interface card contains the buffer, which holds the characters you type until the Silentype receives a signal that tells it to print them. One such signal is a RETURN.

When one full line is stored in the buffer, a RETURN is automatically generated by the Silentype. This causes the contents of the buffer to be printed. That is what happened when you typed the two sentences at the beginning of this section.

Now, press the RETURN key. The last line you typed will be printed. Pressing RETURN on the keyboard will cause the buffer to print its contents at the beginning of the next line just like the forced RETURN at the end of a line.

Another way to print the buffer’s contents is to use the CTRL-F command, for Flush Buffer. Type a few words and then, before you reach the end of the line, press CTRL-F. The contents of the buffer will be printed wherever the printer head was when the CTRL-F was pressed.

This feature can be very useful for getting letter-by-letter intensity control within a program. See Chapter 3 for more information on controlling print intensity.

The buffer’s contents will also be printed when the buffer reaches its maximum capacity of 172 character spaces. Since the Silentype generates a RETURN at the end of each line, the buffer rarely reaches its capacity. To fill the buffer you must type lots of non-printing characters such as the backspace (or left-pointing arrow). For example, if you typed the word "APPLE" 18 times, pressing the backspace key 5 times after each "APPLE", the buffer would have reached its capacity, and its contents would be printed.

**SILENT TYPING**

In Typing Mode, the Silentype prints each character you type as it is typed from the keyboard. By invoking Typing Mode, you can use your printer instead of a video monitor.

When you are using Integer BASIC or Applesoft BASIC, you initialize Typing Mode similarly to the way you initialized the printer earlier
In this chapter. Instead of typing the standard
PR#1
you type
IN#1

If you're not using DOS, you can use Typing Mode from the Monitor if you wish. From the Monitor, typing Mode is invoked with the command:
1 CTRL-K

Put your printer into Typing mode with the method that is appropriate for the language you are using. When you've done that, type your first name. Each character is printed as it is typed from the keyboard. Notice that when you finished typing, the printer head moved one space to the right so you could see the last character that was typed.

Now press the space bar once and type your last name. The printer head automatically moved back to its previous position one space to the left before it began to print your last name.

If you type continuously the printer head will move evenly, printing each character as it is typed. If you pause for one second or more the printer head will move out of the way so the last character typed may be viewed until you resume typing.

When you type to the end of a line you must wait for the printer head to return to the left margin before typing anything more. Any characters you type while the printer head is moving, will be ignored. This is because the buffer is disabled and cannot store the characters until it is convenient to print them. You may also notice that the Silentype prints only from left to right when Typing Mode is invoked, not bi-directionally as it normally does. This is also because the buffer is disabled.

The screen echo feature is not available in Typing mode. Neither are POKEd tabs. Any POKEd tabs you try to use will be ignored.

To quit Typing Mode, do one of the following, depending on the Apple language you are using:

* From Integer BASIC or Applesoft BASIC, type
  IN#0
  and then type
  PR#0

* From the monitor type
  0 CTRL-K
  and then
  0 CTRL-P

If you are using DOS, you can make Typing Mode behave like an ordinary typewriter. Get into the Monitor and type the following line exactly as shown:

300: 20 18 FD 20 ED FD 4C 00 03
Then press RETURN and type
BSAVE TYPER, A768, L9

You can then return to BASIC and use the following program:

```
10 D$="": REM CTRL-D
20 PRINT D$;"IN#1"
30 PRINT D$;"BLOAD TYPER"
40 CALL 768
50 END
```

Line 10 contains a CTRL character which does not appear on the screen when listed. To enter line 10, type
10 D$=""
then press CTRL-D and type
"": REN CTRL-D

After saving this program, you'll be able to use the Silentype as if it were a typewriter just by running this program. To stop the program, press RESET.

Typing Mode interprets a line feed as if it was a RETURN. If you use a line feed (CTRL-J) while you are in Typing Mode, the print head will move one line down and to the left edge of the paper instead of just moving one line down.

**PRINTING BASIC GRAPHICS**

To see the Silentype's graphics capabilities in BASIC, you must first have something on the high-resolution screen. You may have written or purchased some software that has high-resolution pictures (many programs from the Apple Software Bank contain them), or you can write a program in Integer BASIC, Applesoft BASIC, or machine language to create a picture. Here is an Applesoft program that does just that. You will need Apple game control and either firmware or Language Card Applesoft.

```
100 HGR: REM SET HIGH-RESOLUTION GRAPHICS
110 HCOLOR= 3: REM WHITE
120 GOSUB 1000
130 GOSUB 2000
140 HPLOT X,Y
150 GOTO 120
1000 X= PDL(0) / .913
1010 RETURN
2000 Y= PDL(1) / 1.6
2010 RETURN
```
If you are using this program to create a high-resolution picture, run the program and turn the game control knobs to draw something on the screen. When your picture is finished, press CTRL-C. If you are not using this program, load a high-resolution picture into the Apple from existing software. Once your picture is loaded, make sure the printer is initialized, press CTRL-C to stop the program, and press CTRL-Q followed by a RETURN. Your Silentype printer will print the picture in about a minute. After the picture has been printed, Applesoft will give you a SYNTAX ERROR message. This message is nothing to be alarmed about. It is just like the one you got when you used CTRL-T earlier. If you don't want to get this message, you can backspace over the CTRL character before your press RETURN. Chapter 3 has some hints for improving the picture.

If at any time you wish to stop the printing of the BASIC high-resolution screen, simply use a CTRL-C. To remove the high-resolution screen, type TEXT

If you want to print the high-resolution screen from within a BASIC program, you can put CTRL-Q in a print statement. The CTRL-Q must always be the first character in that print statement. From an Applesoft program you can use the CHR$ function to print the CTRL-Q.
CHAPTER 3
GETTING FANCY

If you have read chapters one and two of this manual and have done the examples, you now know how to print both text and graphics on your Silentype printer. It may interest you to know, however, that the Silentype printer is more talented than has so far been revealed. With the slightly more technical information in this chapter, you can change the printer's output format to make your documents much more elegant by changing the printer's parameters.

The Silentype's changeable parameters are:

- form feed
- line spacing
- print direction (bi- or uni-directional)
- print intensity (from 0 to 7)
- left margin
- right margin
- high-resolution page
- inverse or normal graphics

Pascal and BASIC use different approaches to printing. The section called "Using Pascal" contains information for Pascal users, including a set of Pascal procedures that enable you to change the Silentype's parameters from within a Pascal program.

BASIC users will find that the section called "Using BASIC and the Monitor" has all the information they need to print elegant documents. In addition, this section contains sample programs that, when added to the other sample programs in the section, make up a handy parameter editing program.

The Silentype itself does no error checking. You must be especially careful not to give parameter values that are out of bounds, unless, of course, you are changing the parameters from inside a program which does check that the values are legal. If you do set a parameter to an illegal value, you may have to implement a Coldstart to recover.

A Coldstart resets the printer's parameters to their default settings, as opposed to a Warmstart, which reinitializes the printer but leaves the parameters as they are. You can implement a Coldstart in one of two ways: you can turn the Apple off and then on again, thus losing
anything stored in RAM, or you can POKE the number zero into memory location -12506 (CF26 from the Monitor), thus leaving RAM intact, and reinitialize the printer as if you were doing a Warmstart. To implement a Warmstart, reinitialize the printer with the procedures discussed in Chapter 2.

The Pascal procedures and BASIC program given in this chapter check that your input is acceptable to the Silentype. If you change parameters only with these programs, you won't need to encounter Coldstarts.

USING PASCAL

This section tells how to use a set of Pascal procedures and functions to control the Silentype from a Pascal program. The Pascal source text for these procedures and functions is given in Appendix D. To make these procedures and functions available in your program, simply insert the text from Appendix D into your program.

If you are using the Pascal procedures discussed here, make sure the Silentype interface card is the only interface card in your Apple that has a C800 ROM. If you have two such interface cards, for example, if you have a High Speed Serial card or a Graphics Tablet card in addition to your Silentype interface card, the Apple may get the interface cards confused and send information to the wrong one.

THE PRINTER AS A PASCAL FILE

As mentioned in Chapter 2, the way to access the Silentype from a Pascal program is to declare a file of type TEXT or INTERACTIVE, and open it with a REWRITE statement using the title PRINTER: . Example:

```pascal
VAR SILENT: INTERACTIVE;
...
BEGIN (*Beginning of main program*)
  REWRITE(SILENT, 'PRINTER:');
...
  WRITELN(SILENT, 'THIS LINE GETS PRINTED')
...
  (*etc.*)
```
Chapter 2 discussed how WRITELN statements are a convenient way to print lines of text from a Pascal program. But WRITELN always finishes a line with a RETURN, making it impossible to use another statement to add something else to the line. To print one line using more than one statement, you must use WRITE instead of WRITELN.

But if you simply use the WRITE statement to print out, say, half a line of text, you will see that nothing is printed. The reason is that all characters sent to the Silentype to be printed are first stored in a memory area called the printer buffer. When you type a RETURN or the buffer contains enough characters to fill a line, all the characters in the buffer are printed, the print head is positioned for the next line, and the buffer is cleared. But until a RETURN is sent or there are enough characters to fill a line, nothing is printed. The characters just sit unobtrusively in the buffer.

This can be inconvenient when you are using the WRITE statement. Fortunately you can use the Pascal procedure called PRINTBUFFER. The PRINTBUFFER procedure causes the characters in the buffer to be printed, but doesn't position the print head for the next line. The buffer is cleared, but the next thing printed will appear on the same line. The PRINTBUFFER procedure takes no parameters, so its format is

\textbf{PRINTBUFFER}

To give you complete control over the buffer, one other procedure is provided to clear the buffer without printing anything. This procedure, CLEARBUFFER, simply throws out the characters currently stored in the buffer. It takes no parameters, so its format is

\textbf{CLEARBUFFER}

It is a good idea to use CLEARBUFFER at the beginning of your program, just in case a previous program has left anything in the printer buffer.

RESTORING THE DEFAULTS

While we're on the subject of good things to do at the beginning of a program, it is wise to use the RESTORE procedure before doing any printing. RESTORE sets all of the Silentype's parameters to their default values, just in case a previous program has altered them. RESTORE takes no parameters, so it has the format

\textbf{RESTORE}

FORM FEED, OR, GETTING TO THE BOTTOM OF THINGS

The FORMFEED procedure sends a form feed command to the Silentype.
It takes no parameters, so it has the format
FORMFEED

The Silentype interprets the form feed command as an instruction to advance the paper a specified number of steps so that the printed portion can be torn off intact. The default value for the form feed is 40 paper steps, or about 1 inch, but the value can be set to any number of paper steps from 1 to 255.

The SETFORM procedure allows you to set the form feed to the number of steps you would like. It takes one parameter, so it has the format
SETFORM (LENGTH);
where LENGTH is an INTEGER value which should be from 1 to 255. If you assign a value that is less than 1, the SETFORM procedure will set the value to 1. If you assign a value greater than 255, the value will be set to 255.

The FORM function returns the current setting of the parameter for SETFORM. It takes no parameters, so it has the format
FORM

LINE SPACING

By changing the Silentype's line spacing, you can create nice-looking tables or make your printed listings easier to read. You can probably think of a number of other situations when changing the Silentype's line spacing would be desirable.

Line spacing is measured in the same paper steps as the form feed. The default value the Silentype automatically sets for line spacing is 2 paper steps. The SETSPACE procedure lets you set the line spacing to any number from 1 to 252. It takes one parameter, so the format is
SETSPACE (LENGTH)
where LENGTH is an INTEGER value.

If length is less than 1, SETSPACE changes it to 1; if LENGTH is greater than 252, SETSPACE changes it to 252. For example, to set the line spacing to 11, use the statement
SETSPACE (11)

The SPACE function returns the current setting for line spacing. It takes no parameters. For example, to double the current line spacing, use the statement
SETSPACE(2*SPACE)

Note that if the value of 2*SPACE turns out to be greater than 252, it will be changed to 252.
BI- OR UNI-DIRECTIONAL?

By default, the Silentype operates in bi-directional mode. In this mode it can print from left to right, or from right to left. Each time the printer is ready to print a line, bi-directional mode lets the printer determine which direction will result in the smallest amount of printer head movement. The line will then be printed either from left to right or from right to left, depending on which direction the printer found optimal.

For most applications, bi-directional printing is quite satisfactory. The print head is recalibrated each time it reaches the left edge of the paper (every two lines in bi-directional mode). If you want greater accuracy (for instance, if you are printing high-resolution pictures), you may want to use the slower and more accurate unidirectional mode.

Uni-directional mode prints only from left to right. For this reason it prints at about half the speed of bi-directional mode; however, it recalibrates the print head at the beginning of every line. If you choose to use uni-directional mode, you will be rewarded for your patience with a more perfectly aligned printout. The following pictures were printed on a Silentype printer. Notice the wavy edge on the picture on the left—it was printed in bi-directional mode. The picture on the right was printed in uni-directional mode.

The SETUNIDIRECT procedure sets uni-directional printing, and the SETBIDIRECT procedure sets bi-directional printing. They take no parameters, so they have the formats

SETUNIDIRECT

and

SETBIDIRECT

The function UNIDIRECT is a Boolean function which returns the value TRUE if uni-directional mode is set or FALSE if bi-directional mode is set. It takes no parameters, so it has the format

UNIDIRECT

After you have done some uni-directional printing you may notice that there is occasionally a slight discrepancy in the margin widths.
A variance of one dot is not abnormal. The illustration below shows the acceptable margin discrepancy.
PRINT INTENSITY

The Silentype can print at 8 different levels of intensity, from intensity 0, which is almost invisible, to intensity 7, which is quite dark. The following table illustrates the available intensities.

<table>
<thead>
<tr>
<th>INTENSITY LEVEL 0</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>INTENSITY LEVEL 1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>INTENSITY LEVEL 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>INTENSITY LEVEL 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>INTENSITY LEVEL 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>INTENSITY LEVEL 5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>INTENSITY LEVEL 6</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>INTENSITY LEVEL 7</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>
The Silentype sets the default intensity to 5. The SETDARK procedure lets you change the intensity to any of the 8 available levels. It takes one parameter, so it has the format

```
SETDARK (INTENSITY)
```

where INTENSITY is an INTEGER value which should be from 0 to 7. If INTENSITY is less than 0, SETDARK changes it to 0; if INTENSITY is greater than 7, SETDARK changes it to 7.

For example, to set the printer intensity to 6, use the following statement:

```
SETDARK (6)
```

The function DARK returns the current intensity setting. It takes no parameters, so it has the format

```
DARK
```

For example, the following statement will set the intensity to twice as dark as the current setting, or to 7--whichever is lower:

```
SETDARK(2*DARK)
```

**RESETTING THE MARGINS**

The Silentype’s printing line is divided into 83 character spaces numbered from 0 to 82. The default margin settings are 2 for the left margin and 81 for the right margin, leaving an 80-character printing line and margins of 2 character spaces on the left and 1 on the right.

So far we have used only the Silentype’s default margin settings. Using the SETLEFTMARGIN and SETRIGHTMARGIN procedures, you can change the margin widths to whatever you like within the following limits:

1. The left margin must actually be to the left of the right margin. If you try to set it to a value equal to or greater than the right margin, the value you give will be changed to one less than the right margin.

2. The right margin must actually be to the right of the left margin. If you try to set it to a value equal to or less than the left margin, the value you give will be changed to one greater than the left margin.

3. Neither margin can be set to a value less than 0. If you give a value less than 0, it will be changed to 0.

4. Neither margin can be set to a value greater than 82. If you give a value greater than 82, it will be changed to 82.

SETLEFTMARGIN and SETRIGHTMARGIN each take one parameter, so they have the formats

- `SETLEFTMARGIN (POSITION)`
- `SETRIGHTMARGIN (POSITION)`
where POSITION is an INTEGER value. If necessary, the SETLEFTMARGIN or SETRIGHTMARGIN procedure will change the value of POSITION to make sure it agrees with the rules given above.

For example, let's say you want to leave a 10-character margin on either side of your printout. Use this statement to place the left margin at the tenth character:

```pascal
SETLEFTMARGIN (10)
```

To start the right margin 10 characters from the right edge of the paper, use the following statement:

```pascal
SETRIGHTMARGIN (73)
```

The LEFTMARGIN function returns the current left margin setting, and the RIGHTMARGIN function returns the current right margin setting. These functions take no parameters.

For example, suppose you want to set the left margin 5 spaces to the left of its current position. Use the statement

```pascal
SETLEFTMARGIN(LEFTMARGIN+5)
```

**GRAPHICS**

If you've read Chapter 2, you already know one way to print Pascal high-resolution graphics on the Silentype. The PRINTPIC procedure lets you print high-resolution graphics from within a Pascal program. PRINTPIC takes no parameters, so it has the format

```pascal
PRINTPIC
```

PRINTPIC does something extra for you: since uni-directional printing gives a better picture, PRINTPIC automatically sets uni-directional printing. If the Silentype was originally in bi-directional mode, PRINTPIC puts it back in bi-directional mode after printing the picture.

**NEGATIVE PRINTING**

You can get some interesting graphic effects by causing the Silentype to print the "negative" of what appears on the high-resolution screen. Printing this way is known as printing in inverse mode. The SETNEGATIVE procedure sets negative printing mode (which affects only graphics printing, not character printing). SETNEGATIVE takes no parameters, so it has the format

```pascal
SETNEGATIVE
```

For example, to print a negative of the current graphics screen, use the following two-statement sequence:

```pascal
SETNEGATIVE;
PRINTPIC
```
Enough of this negative thinking! The SETPOSITIVE procedure does away with inverse mode and causes the Silentype to print graphics normally again. For example, to print a positive picture after printing a negative, use

```
SETPOSITIVE;
PRINTPIC
```

The NEGATIVE function is a Boolean function that returns the value TRUE if negative printing mode is set, or FALSE if positive printing mode is set.

**USING BASIC AND THE MONITOR**

With the Silentype printer and the information in this chapter, you can create nicely formatted program listings, tables, letters, graphic displays, and more.

A BASIC Parameter program is given in parts in this section of the manual. Put all these program parts together to construct a program that will allow you to change the Silentype's parameters quickly and easily without typing a lot of programming statements. DOS commands are used in the Parameter program so you must have a disk drive to use it. If you don't have access to DOS, change all the program's lines that contain "D$", replacing

```
PRINT D$; "PR#"; SLOT
```

with

```
PR# SLOT
```

The Silentype printer must be initialized before you use the BASIC and Monitor commands discussed in this chapter. Any commands you give to the printer before it is initialized will not work.

Pay special attention to the 0s in the BASIC and Monitor commands given in this chapter. It is easy to accidentally type a letter 0 when you mean to type a zero, and vice versa. If you type the wrong kind of 0, the command will not work.

If you have used the Apple's Monitor before, you are probably familiar with hexadecimal (base 16) notation. All the Monitor commands given in this chapter are in hexadecimal notation. Since most people have 10 fingers and not 16, Appendix B in the back of this book contains an ASCII character table which can be used to translate hexadecimal numbers to the more familiar decimal numbers.
THE PROGRAM

The BASIC Parameter program is a set of subroutines that each control one of the Silentype's changeable parameters. Listed below is the main program that makes the subroutines work. Notice the control character in line 120. To type this line, first type 120 D$=" Then press CTRL-D and finish typing the line: ": REM CTRL-D Line 130 is typed the same way, except that you use CTRL-G instead of CTRL-D.

The first part of the program (lines 100-240) sets constants used later in the program. It also establishes some initial conditions. The second part of the program (lines 250-900) displays a menu from which you may call the subroutines described in the rest of this chapter.

100  DIM ANSWER$(255)
110  GOSUB 9000: REM SLOT FIND
120  D$ = "": REM   CTRL-D
130  BEL$ = "": REM   CTRL-G BELL
140  TEXT : NOTRACE
150  POWERUP = -12506
160  FRMFEED = -12531
170  SPACING = -12530
180  DIRECT = -12529
190  DARKNESS = -12528
200  LEFT = -12527
210  RIGHT = -12526
220  HPAGE = -16525
230  INVER = -12524
240  GOSUB 1000: REM INIT PRINTER
250  CALL -936: REM PUT CURSOR AT TOP LEFT OF SCREEN
260  PRINT
270  PRINT "THE CURRENT VALUES ARE:"
280  PRINT : PRINT " 1. FORM FEED = ";
290  PRINT " 2. LINE SPACING = ";
300  IF PEEK (SPACING) < 5 THEN PRINT " SINGLE"
310  IF PEEK (SPACING) >= 5 AND PEEK (SPACING) < 11 THEN PRINT " DOUBLE"

(cont’d.)
330 IF PEEK (SPACING) > 11 THEN PRINT " TRIPLE"
340 PRINT " 3. PRINT DIRECTION =";
350 IF PEEK (DIRECT) <= 127 THEN PRINT " BI-DIRECTIONAL"
360 IF PEEK (DIRECT) > 127 THEN PRINT "UNI-DIRECTIONAL"
370 PRINT " 4. INTENSITY = ";
380 PRINT " ; PEEK (DARKNESS)
390 PRINT " 5. LEFT MARGIN = ";
400 PRINT " ; PEEK (LEFT)
410 PRINT " 6. RIGHT MARGIN = ";
420 PRINT " ; PEEK (RIGHT)
430 PRINT " 7. GRAPHICS PAGE = ";
440 PRINT PEEK (HPAGE) / 32
450 PRINT " 8. INVERSE = ";
460 IF PEEK (INVER) <= 127 THEN PRINT " TRUE"
470 IF PEEK (INVER) > 127 THEN PRINT " FALSE"
480 PRINT
490 PRINT "ENTER NUMBER OF PARAMETER TO CHANGE"
500 PRINT " (0 = SET DEFAULTS; 9 = EXIT): ";
510 INPUT REPLY
520 IF REPLY = 0 THEN POKE POWERUP,0
530 IF REPLY = 0 THEN GOSUB 1000: REM INITIALIZE PRINTER
540 IF REPLY = 1 THEN GOSUB 2000: REM FORM FEED
550 IF REPLY = 2 THEN GOSUB 3000: REM LINE SPACING
560 IF REPLY = 3 THEN GOSUB 4000: REM PRINT DIRECTION
570 IF REPLY = 4 THEN GOSUB 5000: REM PRINT INTENSITY
580 IF REPLY = 5 THEN GOSUB 6000: REM SET LEFT MARGIN
590 IF REPLY = 6 THEN GOSUB 6100: REM SET RIGHT MARGIN
600 IF REPLY = 7 THEN GOSUB 7000: REM HIGH-RESOLUTION PAGE
610 IF REPLY = 8 THEN GOSUB 8000: REM INVERSE GRAPHICS
620 IF REPLY = 9 THEN END
630 GOTO 250
900 END
The first subroutine in the program doesn't change any parameters; it just makes sure the printer is initialized. Here are the lines that do that.

```
1000 REM  INIT PRINTER
1010 IF PEEK (POWERUP) = 183 THEN RETURN : REM PRINTER HAS BEEN
1020 PRINT D$;"PR#";SLOT: PRINT
1030 PRINT D$;"PR#0"
1040 RETURN
```

**FORM FEED**

Some printers interpret the form feed command as an instruction to advance the paper to the next page. The Silentype's form feed behaves more like a RETURN. However, instead of advancing one line, it causes a fixed increment of paper to be advanced so that the printed portion can be torn off intact.

If you want the standard form feed (because you are editing text, for example), use a text editing program or system. Many text editors, such as Apple Writer, contain standard form feed commands in addition to any commands that may be available through the printer.

To produce a form feed, press CTRL-L from either BASIC or the Monitor. Do that now.

The Silentype automatically sets the form feed increment to 40 paper steps, or about 1 inch. With a single command you can change the increment to any number of steps from 1 to 255. For example, to change the increment to 100 steps, if you are in BASIC, type

```
POKE -12531,100
```

From the monitor type

```
CF0D:64
```

to get the same results. Now press

CTRL-L

to force a form feed. The paper should advance about two and a half times as far as it did before you changed the increment. Try the form feed several times, changing the value for the paper increment each time.
Setting the form feed to 0 will cause the paper to advance 256 units. If you try to set the form feed to a number greater than 255 or to a negative number, you will get nothing but a "beep" and a nasty error message for your pains.

Following is a BASIC subroutine that allows you to choose the length of the form feed.

2000  REM   FORM FEED
2010  PRINT
2020  PRINT "HOW LONG SHOULD THE FORM FEED BE"
2030  PRINT "(0 TO 255 STEPS)";
2040  INPUT ANSWER
2050  IF ANSWER > = 1 AND ANSWER < = 255 THEN GOTO 2080
2060  GOSUB 10000: REM   YOUR ANSWER WAS NOT VALID
2070  GOTO 2000: REM   TRY AGAIN
2080  POKE FRMFEED,ANSWER
2090  RETURN

LINE SPACING

By changing the Silentype's line spacing, you can create nice-looking tables or make your printed program listings easier to read. You can probably think of a number of other situations in which you would like to change the Silentype's line spacing.

To cause a line feed, press RETURN. Line spacing is measured in paper steps, just like the form feed. The Silentype automatically sets line spacing to 2 paper steps. This causes the line feed to advance the paper the height of the tallest character (4 paper steps) plus 2 paper steps. If you print a program listing, the space between each line will be 2 steps wide. We can switch to double spacing by adding 6 steps to the default setting, setting the new line spacing to 8 steps. In BASIC, type POKE -12530,8

To do the same thing from the Monitor, type CF0E:8

CTRL-J will force a line feed, leaving the cursor in the same vertical column. Use CTRL-J to test your results. Print something, perhaps a program listing, to see how your double spacing looks.

If you try to set the line feed to 0 or to a number from 253 to 255, your printed lines will overlap. If you try to set the line feed increment to a negative number or to a number greater than 255, you will get an error message.
Here is a BASIC subroutine that uses the line feed parameter to allow you to choose single, double, or triple spacing for your listings:

```
3000  REM   LINE SPACING
3010  ANSWER$ = ""
3020  PRINT
3030  PRINT "WOULD YOU LIKE SINGLE, DOUBLE, OR"
3040  PRINT "TRIPLE LINE SPACING (S,D,T)?":
3050  INPUT ANSWER$
3060  IF ANSWER$ = "S" THEN  POKE SPACING,2
3070  IF ANSWER$ = "D" THEN  POKE SPACING,8
3080  IF ANSWER$ = "T" THEN  POKE SPACING,14
3090  IF ANSWER$ = "S" OR ANSWER$ = "D" OR ANSWER$ = "T" THEN  GOTO 3120
3100  GOSUB 10000: REM   YOUR ANSWER WAS NOT VALID
3110  GOTO 3000: REM   TRY AGAIN
3120  RETURN
```

**BI- OR UNI-DIRECTIONAL?**

Your Silentype printer is usually in bi-directional mode. In this mode it can print from left to right, or from right to left. Each time the printer is ready to print a line, bi-directional mode lets the printer determine which direction will result in the smallest amount of printer head movement. The line will then be printed either from left to right or from right to left, depending on which direction the printer found optimal.

You can leave bi-directional printing mode and print in only one direction if you choose. This is called uni-directional printing. Uni-directional printing is only about half as fast as bi-directional printing, but the print alignment is more accurate because the printer head is recalibrated each time it reaches the left edge of the paper, twice as often as it does in bi-directional mode. You may want to use this option when accuracy is important, for example, when you are printing a high-resolution picture.

The following pictures were printed by the Silentype printer. The one on the left was printed in bi-directional mode; the one on the right, in uni-directional mode. Notice the wavy edge on the bi-directional picture.
The Apple sets bi-directional mode at the value 0 and uni-directional mode at the value 255. You can change to uni-directional mode either from BASIC or from the monitor by changing the number in the appropriate memory location. To change to uni-directional mode from BASIC, type
POKE -12529,255

From the monitor, type
CF0F:FF

Actually, any number from 0 to 127 will set bi-directional mode, and any number from 128 to 255 will set uni-directional mode. We used the numbers, 0 and 255 for the sake of simplicity. If you try to use a negative number or a number that is greater than 255, however, you will get an error message.

Put the printer into uni-directional mode and load something onto the high-resolution screen. Then use CTRL-Q to print the screen and see the difference yourself.

If you look carefully at your uni-directional printed pictures, you may notice that there is a very slight discrepancy in the margin widths. A variance of one dot is not abnormal. The picture below shows the acceptable margin discrepancy.

If you wish to return to bi-directional mode, you can either turn your Apple off and then turn it back on again, or you can type
POKE -12529,0
from BASIC, or
CF0F:0
from the Monitor.

The following BASIC subroutine allows you to choose bi-directional or unidirectional mode without poking anything.
4000  REM    DIRECTION OF PRINT
4010  PRINT
4020  PRINT "DO YOU WANT TO PRINT UNI-DIRECTIONALLY"
4030  PRINT "OR BI-DIRECTIONALLY (U/B)";
4040  INPUT ANSWER$
4050  IF ANSWER$ = "U" THEN POKE DIRECT,255
4060  IF ANSWER$ = "B" THEN POKE DIRECT,0
4070  IF ANSWER$ = "U" OR ANSWER$ = "B" THEN GOTO 4100
4080  GOSUB 10000: REM    YOUR ANSWER WAS NOT VALID
4090  GOTO 4000: REM    TRY AGAIN
4100  RETURN
The Silentype can print at eight different levels of intensity, from intensity 0, which is almost invisible, to intensity 7, which is quite dark. The following table illustrates the intensities that are available.

<table>
<thead>
<tr>
<th>INTENSITY LEVEL</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Intensity 0, almost invisible</td>
</tr>
<tr>
<td>1</td>
<td>Intensity 1</td>
</tr>
<tr>
<td>2</td>
<td>Intensity 2</td>
</tr>
<tr>
<td>3</td>
<td>Intensity 3</td>
</tr>
<tr>
<td>4</td>
<td>Intensity 4</td>
</tr>
<tr>
<td>5</td>
<td>Intensity 5</td>
</tr>
<tr>
<td>6</td>
<td>Intensity 6</td>
</tr>
<tr>
<td>7</td>
<td>Intensity 7, quite dark</td>
</tr>
</tbody>
</table>
The default value (the value that the Silentype automatically sets) for the print intensity is 5. To change the intensity to 7, if you are in BASIC, type

POKE -12528,7

If you are in the Monitor, type

CF10:7

Print something at intensity 7, and compare the results with things you have printed at intensity 5.

The following BASIC subroutine allows you to change the Silentype's print intensity by choosing a number.

5000 REM INTENSITY OF PRINT
5010 PRINT
5020 PRINT "WHAT PRINT INTENSITY DO YOU WANT (0/7)?";
5030 INPUT ANSWER
5040 IF ANSWER >= 0 AND ANSWER <= 7 THEN GOTO 5070
5050 GOSUB 10000: REM YOUR ANSWER WAS NOT VALID
5060 GOTO 5000: REM TRY AGAIN
5070 POKE DARKNESS, ANSWER
5080 RETURN

With what you now know about changing the Silentype's print intensity, you can use the Flush Buffer feature (CTRL-F), described in Chapter 2, to get character-by-character intensity control. The following program shows the CTRL-F in action. This program does NOT belong in your BASIC Parameter program. Remember to type a CTRL-F between the quote marks in line 20.

10 PRINT : PRINT
20 F$="": REM CTRL-F
30 DARK= Peek (-12528)
40 POKE -12528,2: PRINT "THIS SHOWS “;F$;
50 POKE -12528,7: PRINT “THE BUFFER “;F$;
60 POKE -12528,2: PRINT “IN ACTION.”
70 POKE -12528,DARK
80 END

If you want to save this program, save it separately from your BASIC Parameter program.

RESETTING MARGINS

Up to now we've been utilizing the Silentype's standard 80-character line. An 80-character line is convenient for many applications, but wider margins and fewer characters per line are sometimes desirable. The Silentype lets you change the left and right margins to almost anything you like.
Unlike the form feed and line spacing features, the margins are measured by character spaces. The Silentype has a maximum of 83 character spaces per line, numbered from 0 to 82. The default setting for the right margin is 2, and the default setting for the left margin is 81, leaving 80 character spaces for your listings. The Silentype can actually print up to 83 characters per line by setting the Margins a little farther apart.

Let's change the margin spacing so that both the left and right margins are 10 character spaces wide. To change the left margin, if you are using BASIC, type

POKE -12527,10

To change the right margin, type

POKE -12526,73

If your Apple is in the Monitor, type
CF11:A
to change the left margin, and
CF12:49
to change the right margin.

Negative values and values over 255 will not be accepted for margin settings. If you attempt to set either margin to such a number, you will get an error message from your Apple.

If you try to set the margin to a value that is out of bounds but not illegal, (a number less than 0 or greater than 82) the Silentype will accept the number, but, in trying to carry out your instructions, the printer will repeatedly try to print off the edge of the paper. It will continue to do so until it runs out of things to print, or until you stop it by pressing the RESET key or turning the Apple's power off.

The right margin must be set to a number that is greater than the left margin setting. If you set the line width to 4 spaces or less, you will not have enough room to type PR#0 to stop the printer. A press of the RESET key will remedy this.

This BASIC subroutine lets you change the Silentype's left and right margins and checks that you give an acceptable margin setting.
HIGH-RESOLUTION PAGE 2

In addition to the regular Apple high-resolution screen, there is a second high-resolution screen. The regular screen is called high-resolution page 1, and the second screen is called high-resolution page 2. So far we have printed graphic displays only from high-resolution page 1. To print Apple's high-resolution page 2, from BASIC type
POKE -12525,64
or, type
CF13:40
from the Monitor.

To print page 1 again, from BASIC type
POKE -12525,32
or, type
CF13:20
from the Monitor.

Notice that the number you poked into memory location -12525 was 32 times the number of the high-resolution page you wished to print. If you know how to make the Apple store pictures in other memory locations you can use this trick to make the Silentype print them. For example, if you wish to print "page 3" or the contents of locations $6000 to $7FFF, simply POKE 96 into memory location -12525.
Here's a BASIC subroutine that lets you print either high-resolution page 1 or 2 without having to POKE into memory locations.

```
7000  REM   HIGH-RESOLUTION PAGE
7010  PRINT
7020  PRINT "WHICH HIGH-RESOLUTION PAGE DO YOU WANT"
7030  PRINT "TO PRINT (1 OR 2)"
7040  INPUT ANSWER$
7050  IF ANSWER$ = "1" THEN  POKE HPAGE,32
7060  IF ANSWER$ = "2" THEN  POKE HPAGE,64
7070  IF ANSWER$ = "1" OR ANSWER$ = "2" THEN  GOTO 7100
7080  GOSUB 10000: REM   YOUR ANSWER WAS NOT VALID
7090  GOTO 7000: REM   TRY AGAIN
7100  RETURN
```

INVERSE MODE

The Silentype printer can print a negative (black on white) version of the high-resolution screen just as easily as it can print graphics in the normal way. This kind of printing is called "inverse", and the mode in which it is done is called "inverse mode".

To set inverse mode from BASIC, type
POKE -12524,0
or, from the Monitor, type
CF14:0

Now load a high-resolution picture into your Apple and use CTRL-Q to print the high-resolution screen.

Inverse mode works only with high-resolution graphics. You cannot print negative text.

Any attempt to give parameter values that are out of bounds will result in an error message or unusual behavior on the part of the Silentype. Use only 0 or 255.

Inverse mode, while not particularly useful for printing photograph-like pictures, can make all the difference in the world for line drawings and graphs. Try drawing something with the Applesoft sketching program in Chapter 2, or load an existing program that uses line drawings. These should look great printed in inverse mode.

To return to regular high-resolution screen printing, Coldstart your Apple, or from BASIC, type
POKE -12524,255
or, from the Monitor, type
CF14:FF

Use this BASIC subroutine to choose inverse or normal mode.

8000 REM INVERSE GRAPHICS
8010 PRINT
8020 PRINT "DO YOU WANT TO USE INVERSE MODE (Y/N)";
8030 INPUT ANSWER$
8040 IF ANSWER$ = "N" THEN POKE INVER,255
8050 IF ANSWER$ = "Y" THEN POKE INVER,0
8060 IF ANSWER$ = "N" OR ANSWER$ = "Y" THEN GOTO 8090
8070 GOSUB 10000: REM YOUR ANSWER WAS NOT VALID
8080 GOTO 8000: REM TRY AGAIN
8090 RETURN

Now add these last few program lines to complete your BASIC Parameter program.

9000 REM SLOT FIND
9010 FOR SLOT = 1 TO 7
9020 SADDR = -16384 + 256 * SLOT
9030 IF PEEK(SADDR + 23) = 201 AND PEEK(SADDR + 55) = 207 AND
PEEK(SADDR + 76) = 234 THEN RETURN
9040 NEXT SLOT
9050 PRINT : PRINT "NO SILENTYPE PRINTER INSTALLED!"
9060 PRINT "PROGRAM ABORTED!"
9070 POP : END
10000 REM YOUR ANSWER WAS NOT VALID
10010 PRINT
10020 PRINT BEL$;BEL$;BEL$
10030 PRINT "***************************************************************************"
10040 PRINT "YOUR ANSWER WAS NOT VALID. TRY AGAIN."
10050 PRINT "***************************************************************************"
10060 RETURN

Run the program to make sure it works correctly. If it doesn’t, check your typing.
APPENDIX A
CARING FOR THE PRINTER
REPLACING THE PAPER

When the paper roll is nearing its end, a pink stripe appears along one edge of the paper. The stripe indicates that you have about five more feet of paper before the roll ends.

When the Silentype gets to the end of the roll, the paper stops feeding although the printer head continues to move back and forth until it finishes the listing. You can use the RESET key to stop the printer, but anything stored in RAM may be lost. To preserve the contents of RAM, you may want to wait for the printer to stop of its own accord.

Use only specially treated thermal paper in your Silentype printer. Your Apple dealer can sell you additional rolls.

To remove the empty paper roll, open your Silentype's lid with your thumb and forefinger and take out the empty cardboard cylinder. Removing the paper roll reveals a diagram that shows the proper way to feed the paper through the printer.

Now unwrap the new roll of thermal paper, and remove the adhesive strip. Then, if the end of the paper is ragged, cut it off with a scissors so that the paper has a clean edge. Feed the end through the printer, making sure the paper goes under the roller as illustrated in the photograph below and in the diagram inside the Silentype. Remove the black bearings from the empty cardboard cylinder and insert them into the center of the paper roll, with the squared ends outward.

Turn the large, round knob on the right side of the printer to advance the paper a few inches. Then put the paper roll in place and push in on the squared, black bearings in the paper cylinder while fitting them into the deepest of the two notches on either side of the roll.
Now close the Silentype's lid, making sure the loose end of the paper is free.

If you buy extra rolls of paper you should store them away from heat and light. The paper will last much longer if you do. If you want to keep permanent records of things you have printed on the Silentype, it is recommended that you make photocopies of the actual printouts for storage. Thermal paper will eventually darken (after several months) and become unreadable. Storing printouts in a cool, dark place, such as a standard file cabinet, will greatly prolong the life of the paper.

**DIAGNOSTIC ERROR MESSAGE**

From BASIC, it is possible for the printer to warn you of a serious problem by disconnecting itself and causing the Apple to print ERR on the screen. If this happens, it probably means that the Silentype can't find the left margin. To recover, you must disable the printer by pressing RESET, typing PR#0 from BASIC, or typing 0 CTRL-P from the Monitor. If you have this problem, check that nothing is obstructing the path of the printer head. If nothing is in the path of the printer head, check that the Silentype interface card and its cord are properly plugged in. Sometimes an improperly installed printer will generate the message. If the printer seems to be installed correctly, but you still get the message, take your printer to an authorized Apple Service Center for service.

With very little care, your Silentype printer should have a long and useful life. It needs no routine maintenance and will probably never require service. In the rare event that your printer does need to be serviced, take it to an authorized Apple Service Center in your area.
APPENDIX B
TABLES

PARAMETER TABLE

This table gives information about the Silentype's changeable parameters.

Don't use out-of-range values for the parameters in this table. Even though no damage should result, the behavior of the printer would become unpredictable.

<table>
<thead>
<tr>
<th>FUNCTION</th>
<th>MONITOR ADDRESS</th>
<th>BASIC ADDRESS</th>
<th>COLDSTART VALUE</th>
<th>POSSIBLE VALUES</th>
</tr>
</thead>
<tbody>
<tr>
<td>form feed</td>
<td>CF0D</td>
<td>-12531</td>
<td>40</td>
<td>$28</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>from 0 ($0) TO 255 ($FF)</td>
</tr>
<tr>
<td>line</td>
<td>CF0E</td>
<td>-12530</td>
<td>2</td>
<td>$2</td>
</tr>
<tr>
<td>increment</td>
<td></td>
<td></td>
<td></td>
<td>from 0 ($0) TO 255 ($FF)</td>
</tr>
<tr>
<td>direction</td>
<td>CF0F</td>
<td>-12529</td>
<td>0</td>
<td>$0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>bi-directional = 0 ($0) to 127 uni-directional=128 to 255 ($FF)</td>
</tr>
<tr>
<td>intensity</td>
<td>CF10</td>
<td>-12528</td>
<td>5</td>
<td>$5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>from 0 ($0) to 7 ($7)</td>
</tr>
<tr>
<td>left</td>
<td>CF11</td>
<td>-12527</td>
<td>2</td>
<td>$2</td>
</tr>
<tr>
<td>margin</td>
<td></td>
<td></td>
<td></td>
<td>from 0 ($0) to 82 ($53) must be less than right margin</td>
</tr>
<tr>
<td>right</td>
<td>CF12</td>
<td>-12526</td>
<td>81</td>
<td>$51</td>
</tr>
<tr>
<td>margin</td>
<td></td>
<td></td>
<td></td>
<td>from 1 ($1) to 83 ($54) must be greater than left margin</td>
</tr>
<tr>
<td>hi-res page</td>
<td>CF13</td>
<td>-12525</td>
<td>32</td>
<td>$20</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>hi-res page 1 = 32 ($20) hi-res page 2 = 64 ($40)</td>
</tr>
<tr>
<td>hi-res</td>
<td>CF14</td>
<td>-12524</td>
<td>255</td>
<td>$FF</td>
</tr>
<tr>
<td>inverse</td>
<td></td>
<td></td>
<td></td>
<td>normal = 255 ($FF) (white on black) inverse = 0 ($0) (black on white)</td>
</tr>
</tbody>
</table>
CONTROL FUNCTIONS

The following table lists the special control functions used by the Silentype. In the Pascal language, these functions can be used from within a program or from the keyboard, using the Filer’s Transfer command (see the section on Pascal in Chapter 2). They can be used from either the keyboard or from a program in BASIC or the Monitor.

<table>
<thead>
<tr>
<th>CHARACTER</th>
<th>FUNCTION</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTRL-C</td>
<td>stops hi-res screen print</td>
<td>BASIC and Monitor keyboard only</td>
</tr>
<tr>
<td>CTRL-F</td>
<td>prints content of buffer</td>
<td></td>
</tr>
<tr>
<td>CTRL-H</td>
<td>backspace</td>
<td></td>
</tr>
<tr>
<td>CTRL-J</td>
<td>line feed</td>
<td></td>
</tr>
<tr>
<td>CTRL-L</td>
<td>form feed</td>
<td></td>
</tr>
<tr>
<td>CTRL-M</td>
<td>return</td>
<td></td>
</tr>
<tr>
<td>CTRL-Q</td>
<td>prints the hi-res screen</td>
<td>default=hi-res page 1</td>
</tr>
<tr>
<td>CTRL-T</td>
<td>toggles screen echo/no echo</td>
<td>default=no echo</td>
</tr>
</tbody>
</table>

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**ASCII TABLE OF CHARACTERS**

DEC = ASCII decimal code  
HEX = ASCII hexadecimal code  
CHAR = ASCII character name  
n/a = not accessible directly from the APPLE II keyboard

Note: you may use CHR$ to print lower case alphabetical characters.

<table>
<thead>
<tr>
<th>DEC</th>
<th>HEX</th>
<th>CHAR</th>
<th>TYPE</th>
<th>DEC</th>
<th>HEX</th>
<th>CHAR</th>
<th>TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>00</td>
<td>NULL</td>
<td>ctrl @</td>
<td>32</td>
<td>20</td>
<td>SPACE</td>
<td>space</td>
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<tr>
<td>1</td>
<td>01</td>
<td>SOH</td>
<td>ctrl A</td>
<td>33</td>
<td>21</td>
<td>!</td>
<td>!</td>
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<tr>
<td>2</td>
<td>02</td>
<td>STX</td>
<td>ctrl B</td>
<td>34</td>
<td>22</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td>3</td>
<td>03</td>
<td>ETX</td>
<td>ctrl C</td>
<td>32</td>
<td>23</td>
<td>#</td>
<td>#</td>
</tr>
<tr>
<td>4</td>
<td>04</td>
<td>ET</td>
<td>ctrl D</td>
<td>36</td>
<td>24</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>5</td>
<td>05</td>
<td>ENQ</td>
<td>ctrl E</td>
<td>37</td>
<td>25</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>6</td>
<td>06</td>
<td>ACK</td>
<td>ctrl F</td>
<td>38</td>
<td>26</td>
<td>&amp;</td>
<td>&amp;</td>
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<tr>
<td>7</td>
<td>07</td>
<td>BEL</td>
<td>ctrl G</td>
<td>39</td>
<td>27</td>
<td>'</td>
<td>'</td>
</tr>
<tr>
<td>8</td>
<td>08</td>
<td>BS</td>
<td>ctrl H or &lt;-</td>
<td>40</td>
<td>28</td>
<td>(</td>
<td>(</td>
</tr>
<tr>
<td>9</td>
<td>09</td>
<td>HT</td>
<td>ctrl I</td>
<td>41</td>
<td>29</td>
<td>)</td>
<td>)</td>
</tr>
<tr>
<td>10</td>
<td>0A</td>
<td>LF</td>
<td>ctrl J</td>
<td>42</td>
<td>2A</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>11</td>
<td>0B</td>
<td>VT</td>
<td>ctrl K</td>
<td>43</td>
<td>2B</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>12</td>
<td>0C</td>
<td>FF</td>
<td>ctrl L</td>
<td>44</td>
<td>2C</td>
<td>,</td>
<td>,</td>
</tr>
<tr>
<td>13</td>
<td>0D</td>
<td>CR</td>
<td>ctrl M or RETURN</td>
<td>45</td>
<td>2D</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>14</td>
<td>0E</td>
<td>SO</td>
<td>ctrl N</td>
<td>46</td>
<td>2E</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td>15</td>
<td>0F</td>
<td>SI</td>
<td>ctrl O</td>
<td>47</td>
<td>2F</td>
<td>/</td>
<td>/</td>
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<tr>
<td>16</td>
<td>10</td>
<td>DLE</td>
<td>ctrl P</td>
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<td>30</td>
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<td>0</td>
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<td>17</td>
<td>11</td>
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<td>ctrl Q</td>
<td>49</td>
<td>31</td>
<td>1</td>
<td>1</td>
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<tr>
<td>18</td>
<td>12</td>
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<td>ctrl R</td>
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<td>19</td>
<td>13</td>
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<td>ctrl S</td>
<td>51</td>
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<td>14</td>
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<td>ctrl T</td>
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<td>21</td>
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<td>NAK</td>
<td>ctrl U or -&gt;</td>
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<td>6</td>
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<td>23</td>
<td>17</td>
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<td>ctrl W</td>
<td>55</td>
<td>37</td>
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<td>7</td>
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<td>24</td>
<td>18</td>
<td>CAN</td>
<td>ctrl X</td>
<td>56</td>
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<td>25</td>
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### ASCII Lower Case Characters

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</tr>
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</tr>
<tr>
<td>95</td>
<td>5F</td>
<td>_</td>
<td>95</td>
</tr>
</tbody>
</table>

Note: ASCII lower case characters are not directly accessible from the Apple keyboard without special hardware or software. Apple Writer is an example of software which allows you to use the Apple keyboard to produce lower case characters.
APPENDIX C

THE BASIC PARAMETER PROGRAM

This is a listing of the entire BASIC Parameter program.

10 REM BASIC PARAMETER EDIT PROGRAM
20 REM FOR SILENTYPE PRINTER
30 REM (C) 1980 APPLE COMPUTER INC.

100 DIM ANSWER$(255)
110 GOSUB 9000: REM SLOT FIND
120 D$ = "": REM CTRL-D
130 BEL$ = "":" REM CTRL-G BELL
140 TEXT : NOTRACE
150 POWERUP = - 12506
160 FRMFEED = - 12531
170 SPACING = - 12530
180 DIRECT = - 12529
190 DARKNESS = - 12528
200 LEFT = - 12527
210 RIGHT = - 12526
220 HPAGE = - 16525
230 INVER = - 12524
240 GOSUB 1000: REM INIT PRINTER
250 CALL - 936: REM PUT CURSOR AT TOP LEFT OF SCREEN
260 PRINT
270 PRINT " THE CURRENT VALUES ARE:"
280 PRINT " 1. FORM FEED = "; PEEK (FRMFEED)
290 PRINT " 2. LINE SPACING = ";
300 IF PEEK (SPACING) < 5 THEN PRINT " SINGLE"
310 IF PEEK (SPACING) > 5 AND PEEK (SPACING) < 11 THEN PRINT " DOUBLE"
320 IF PEEK (SPACING) > 11 THEN PRINT " TRIPLE"
330 PRINT " 3. PRINT DIRECTION = ";
340 IF PEEK (DIRECT) < 127 THEN PRINT " BI-DIRECTIONAL"
350 IF PEEK (DIRECT) > 127 THEN PRINT " UNI-DIRECTIONAL"
360 PRINT " 4. INTENSITY = ";
370 PRINT " 5. LEFT MARGIN = ";
380 PRINT " 6. RIGHT MARGIN = ";
390 PRINT " 7. GRAPHICS PAGE = ";
400 PRINT PEEK (HPAGE) / 32
410 PRINT " 8. INVERSE = ";
420 IF PEEK (INVER) < 127 THEN PRINT " TRUE"
470 IF PEEK (INVER) > 127 THEN PRINT "FALSE"
480 PRINT
490 PRINT "ENTER NUMBER OF PARAMETER TO CHANGE"
500 PRINT “ (0 = SET DEFAULTS; 9 = EXIT): “;
510 INPUT REPLY
520 IF REPLY = 0 THEN POKE POWERUP,0
530 IF REPLY = 0 THEN GOSUB 1000: REM INITIALIZE PRINTER
540 IF REPLY = 1 THEN GOSUB 2000: REM FORM FEED
550 IF REPLY = 2 THEN GOSUB 3000: REM LINE SPACING
560 IF REPLY = 3 THEN GOSUB 4000: REM PRINT DIRECTION
570 IF REPLY = 4 THEN GOSUB 5000: REM PRINT INTENSITY
580 IF REPLY = 5 THEN GOSUB 6000: REM SET LEFT MARGIN
590 IF REPLY = 6 THEN GOSUB 6100: REM SET RIGHT MARGIN
600 IF REPLY = 7 THEN GOSUB 7000: REM HIGH-RESOLUTION PAGE
610 IF REPLY = 8 THEN GOSUB 8000: REM INVERSE GRAPHICS
620 IF REPLY = 9 THEN END
630 GOTO 250
640 END
1000 REM INIT PRINTER
1010 IF PEEK (POWERUP) = 183 THEN RETURN: REM PRINTER HAS BEEN POWERED UP
1020 PRINT D$;”PR#”;SLOT: PRINT
1030 PRINT D$;”PR#0”
1040 RETURN
2000 REM FORM FEED
2010 PRINT
2020 PRINT “HOW LONG SHOULD THE FORM FEED BE”
2030 PRINT “(0 TO 255 STEPS)”;
2040 INPUT ANSWER
2050 IF ANSWER > = 1 AND ANSWER < = 255 THEN GOTO 2080
2060 GOSUB 10000: REM YOUR ANSWER WAS NOT VALID
2070 GOTO 2000: REM TRY AGAIN
2080 POKE FRMFEED,ANSWER
2090 RETURN
3000 REM LINE SPACING
3010 ANSWER$ = “”
3020 PRINT
3030 PRINT “WOULD YOU LIKE SINGLE, DOUBLE, OR”
3040 PRINT “TRIPLE LINE SPACING (S,D,T)”;
3050 INPUT ANSWER$
3060 IF ANSWER$ = “S” THEN POKE SPACING,2
3070 IF ANSWER$ = “D” THEN POKE SPACING,8
3080 IF ANSWER$ = “T” THEN POKE SPACING,14
3090 IF ANSWER$ = “S” OR ANSWER$ = “D” OR ANSWER$ = “T” THEN GOTO 3120
3100 GOSUB 10000: REM YOUR ANSWER WAS NOT VALID
3110 GOTO 3000: REM TRY AGAIN
3120 RETURN
4000 REM DIRECTION OF PRINT
4010 PRINT
4020 PRINT “DO YOU WANT TO PRINT UNI-DIRECTIONALLY”
4030 PRINT “OR BI-DIRECTIONALLY (U/B)”;
4040 INPUT ANSWER$
4050 IF ANSWER$ = “U” THEN POKE DIRECT,255
4060 IF ANSWER$ = "B" THEN POKE DIRECT,0
4070 IF ANSWER$ = "U" OR ANSWER$ = "B" THEN GOTO 4100
4080 GOSUB 10000: REM YOUR ANSWER WAS NOT VALID
4090 GOTO 4000: REM TRY AGAIN
4100 RETURN
5000 REM INTENSITY OF PRINT
5010 PRINT
5020 PRINT "WHAT PRINT INTENSITY DO YOU WANT (0/7)?";
5030 INPUT ANSWER
5040 IF ANSWER $ > = 0 AND ANSWER $ < = 7 THEN GOTO 5070
5050 GOSUB 10000: REM YOUR ANSWER WAS NOT VALID
5060 GOTO 5000: REM TRY AGAIN
5070 POKE DARKNESS, ANSWER
5080 RETURN
6000 REM MARGIN SETTINGS
6010 PRINT
6020 PRINT "WHERE SHOULD THE LEFT MARGIN BE (0-78)?";
6030 INPUT LANSWER
6040 IF LANSWER > = 0 AND LANSWER < = 78 THEN GOTO 6080
6050 GOSUB 10000: REM YOUR ANSWER WAS NOT VALID
6060 GOTO 6000: REM TRY AGAIN
6070 IF LANSWER > PEEK (RIGHT) - 4 THEN GOTO 6170
6080 POKE LEFT, LANSWER
6090 RETURN
6100 PRINT
6110 PRINT "WHERE SHOULD THE RIGHT MARGIN BE (4-82)?";
6120 INPUT RANSWER
6130 IF RANSWER > = 0 AND RANSWER < = 78 THEN GOTO 6160
6140 GOSUB 10000: REM YOUR ANSWER WAS NOT VALID
6150 GOTO 6000: REM TRY AGAIN
6160 IF PEEK (LEFT) < = RANSWER - 4 THEN GOTO 6220
6170 GOSUB 10000: REM YOUR ANSWER WAS NOT VALID
6180 PRINT "LEFT MARGIN MUST BE 4 LESS THAN RIGHT MARGIN."
6190 PRINT
6200 GOSUB 6000: REM SET LEFT AGAIN
6210 GOTO 6100: REM SET RIGHT AGAIN
6220 POKE RIGHT, RANSWER
6230 RETURN
7000 REM HIGH-RESOLUTION PAGE
7010 PRINT
7020 PRINT "WHICH HIGH-RESOLUTION PAGE DO YOU WANT"
7030 PRINT "TO PRINT (1 OR 2)?";
7040 INPUT ANSWER$
7050 IF ANSWER$ = "1" THEN POKE HPAGE,32
7060 IF ANSWER$ = "2" THEN POKE HPAGE,64
7070 IF ANSWER$ = "1" OR ANSWER$ = "2" THEN GOTO 7100
7080 GOSUB 10000: REM YOUR ANSWER WAS NOT VALID
7090 GOTO 7000: REM TRY AGAIN
7100 RETURN
8000 REM INVERSE GRAPHICS
8010 PRINT
8020 PRINT "DO YOU WANT TO USE INVERSE MODE (Y/N)?";
8030 INPUT ANSWER$
8040 IF ANSWER$ = "N" THEN POKE INVER,255
8050 IF ANSWER$ = "Y" THEN POKE INVER,0
APPENDIX D
THE PASCAL PARAMETER
PROCEDURES

To be able to use the Pascal procedures and functions described in Chapter 3, your Pascal program must contain the following procedure and function definitions. Enter them into your program exactly as shown. Note that the first four (ROMENABLE, SETBYTEVALUE, BYTEVALUE, and SEND) are used by other procedures and functions; you should not try to use them in your main program.

PROCEDURE ROMENABLE; (*Don’t use in main program*)
  CONST ROMSOFF=-12289;
    ROMON= -16128;
  TYPE WINDOW=PACKED ARRAY[0..0] OF 0..255;
  VAR ADDR:INTEGER;
      P:^WINDOW;
  BEGIN
    ADDR:=ROMSOFF;
    MOVELEFT(ADDR,P,2);
    P^[0]:=0;
    ADDR:=ROMON;
    MOVELEFT(ADDR,P,2);
    P^[0]:=0;
  END;

PROCEDURE SETBYTEVALUE(LOC,VALUE:INTEGER); (*Don’t use in main program*)
  TYPE WINDOW=PACKED ARRAY[0..0] OF 0..255;
  VAR ADDR:INTEGER;
      P:^WINDOW;
  BEGIN
    ROMENABLE;
    ADDR:=LOC;
    MOVELEFT(ADDR,P,2);
    P^[0]:=VALUE
  END;

FUNCTION BYTEVALUE(LOC:INTEGER):INTEGER; (*Don’t use in main program*)
  TYPE WINDOW=PACKED ARRAY[0..0] OF 0..255;
  VAR ADDR:INTEGER;
      P:^WINDOW;
  BEGIN
    ROMENABLE;
    ADDR:=LOC;
    MOVELEFT(ADDR,P,2);
    BYTEVALUE:=P^[0]
  END;
PROCEDURE SEND(CH:CHAR); (*Don’t use in main program*)
  CONST PRINTUNIT=6;
  BEGIN
    UNITWRITE(PRINTUNIT,CH,1,0,12)
  END;

PROCEDURE SETUNIDIRECT;
  CONST MAXBYTE=255;
     DIRECTION=-12529;
  BEGIN
    SETBYTEVALUE(DIRECTION, MAXBYTE)
  END;

PROCEDURE SETBIDIRECT;
  CONST MINBYTE=0;
     DIRECTION=-12529;
  BEGIN
    SETBYTEVALUE(DIRECTION, MINBYTE)
  END;

FUNCTION UNIDIRECT: BOOLEAN;
  CONST MAXBYTE=255;
     MINBYTE=0;
     DIRECTION=-12529;
  BEGIN
    CASE BYTEVALUE(DIRECTION) OF
        MINBYTE: UNIDIRECT:=FALSE;
        MAXBYTE: UNIDIRECT:=TRUE
    END
  END;

PROCEDURE SETNEGATIVE;
  CONST MINBYTE=0;
     FLIP=-12524;
  BEGIN
    SETBYTEVALUE(FLIP, MINBYTE)
  END;

PROCEDURE SETPOSITIVE;
  CONST MAXBYTE=255;
     FLIP=-12524;
  BEGIN
    SETBYTEVALUE(FLIP, MAXBYTE)
  END;
FUNCTION NEGATIVE: BOOLEAN;
CONST MAXBYTE=255;
   MINBYTE=0;
   FLIP=-12524;
BEGIN
   CASE BYTEVALUE(FLIP) OF
      MINBYTE: NEGATIVE:=TRUE;
      MAXBYTE: NEGATIVE:=FALSE
   END
END;

PROCEDURE SETDARK(DARKNESS: INTEGER);
CONST INTEN=-12528;
BEGIN
   IF DARKNESS<0 THEN DARKNESS:=0;
   IF DARKNESS>7 THEN DARKNESS:=7;
   SETBYTEVALUE(INTEN, DARKNESS)
END;

FUNCTION DARK: INTEGER;
CONST INTEN=-12528;
BEGIN
   DARK:=BYTEVALUE(INTEN)
END;

PROCEDURE SETFORM(LENGTH: INTEGER);
CONST FORMLENGTH=-12531;
BEGIN
   IF LENGTH<0 THEN LENGTH:=0;
   IF LENGTH>255 THEN LENGTH:=255;
   SETBYTEVALUE(FORMLENGTH, LENGTH)
END;

FUNCTION FORM: INTEGER;
CONST FORMLENGTH=-12531
BEGIN
   FORM:=BYTEVALUE(FORMLENGTH)
END;

PROCEDURE SETSPACE(LENGTH: INTEGER);
CONST INCR=-12530;
BEGIN
   IF LENGTH<1 THEN LENGTH:=1;
   IF LENGTH>252 THEN LENGTH:=252;
   SETBYTEVALUE(INCR, LENGTH)
END;

FUNCTION SPACE: INTEGER;
CONST INCR=-12530;
BEGIN
   SPACE:=BYTEVALUE(INCR)
END;
FUNCTION LEFTMARGIN: INTEGER;
    CONST LMAR=-12527;
    BEGIN
        LEFTMARGIN:=BYTEVALUE(LMAR)
    END;

FUNCTION RIGHTMARGIN: INTEGER;
    CONST RMAR=-12526;
    BEGIN
        RIGHTMARGIN:=BYTEVALUE(RMAR)
    END;

PROCEDURE SETLEFTMARGIN(POSITION: INTEGER);
    CONST LMAR=-12527;
    BEGIN
        IF POSITION>=RIGHTMARGIN THEN POSITION:=RIGHTMARGIN-1;
        IF POSITION<0 THEN POSITION:=0;
        SETBYTEVALUE(LMAR,POSITION)
    END;

PROCEDURE SETRIGHTMARGIN(POSITION: INTEGER);
    CONST RMAR=-12526
    BEGIN
        IF POSITION<=LEFTMARGIN THEN POSITION:=LEFTMARGIN+1;
        IF POSITION>83 THEN POSITION:=83;
        SETBYTEVALUE(RMAR,POSITION)
    END;

PROCEDURE PRINTBUFFER;
    CONST CF=6; (*ASCII CODE FOR CONTROL-F*)
    BEGIN
        SEND(CHR(CF))
    END;

PROCEDURE CLEARBUFFER;
    CONST PRINTUNIT=6;
    BEGIN
        UNITCLEAR(PRINTUNIT)
    END;

PROCEDURE FORMFEED;
    CONST FF=12; (*ASCII CODE FOR FORM-FEED*)
    BEGIN
        SEND(CHR(FF))
    END;
PROCEDURE PRINTPIC;
    CONST CQ=17; (*ASCII CODE FOR CONTROL-Q*)
    VAR BIDIRECT:BOOLEAN;
    BEGIN
        BIDIRECT:=NOT UNIDIRECT;
        IF BIDIRECT THEN SETUNIDIRECT;
        SEND(CHR(CQ));
        IF BIDIRECT THEN SETBIDIRECT
    END;

PROCEDURE RESTORE;
    BEGIN
        SETBIDIRECT;
        SETPOSITIVE;
        SETDARK(5);
        SETFORM(40);
        SETSPACE(2);
        SETLEFTMARGIN(2);
        SETRIGHTMARGIN(81)
    END;

If you are an experienced Apple Pascal user, you may wish to create an Intrinsic UNIT containing these procedures and functions, and place it in the SYSTEM.LIBRARY file. Then you can use the procedures and functions in Pascal programs without having to define them in each program. The Apple Pascal Language Reference Manual contains the necessary information for creating such a UNIT.

The following is a summary of the procedure and function calls you can use in a Pascal program if it contains the definitions given above.

SETUNIDIRECT
This procedure sets unidirectional printing.

SETBIDIRECT
This procedure sets bidirectional printing (this is the default).

UNIDIRECT
This is a Boolean function which returns TRUE if unidirectional printing is set or FALSE if bidirectional printing is set.

SETNEGATIVE
This procedure sets negative printing of graphics.

SETPOSITIVE
This procedure sets positive printing of graphics (this is the default).

NEGATIVE
This is a Boolean function which returns TRUE if negative printing is set or FALSE if positive printing is set.

SETDARK(DARKNESS)
This procedure sets the Silentype’s darkness parameter to DARKNESS,
which should be an integer value from 0 to 7. If DARKNESS is less than 0 it will be changed to 0; if DARKNESS is greater than 7 it will be changed to 7. The default is 5.

**DARK**
This integer function returns the current darkness setting.

**SETFORM(LENGTH)**
This procedure sets the amount of vertical space, in printer units, to be sent by the FORMFEED procedure to LENGTH, which should be an integer value from 0 to 255. If LENGTH is less than 0 it will be changed to 0; if LENGTH is greater than 255, it will be changed to 255. The default is 40.

**FORM**
This integer function returns the current amount of vertical space, in printer units, to be produced by the FORMFEED procedure.

**SETSPACE(LENGTH)**
This procedure sets the number of printer units between lines to LENGTH, which should be an integer value from 1 to 252. If LENGTH is less than 1, it will be changed to 1; if LENGTH is greater than 252, it will be changed to 252. The default is 2.

**SPACE**
This integer function returns the current number of printer units between lines.

**LEFTMARGIN**
This integer function returns the current left margin setting.

**RIGHTMARGIN**
This integer function returns the current right margin setting.

**SETLEFTMARGIN(POSITION)**
This procedure sets the left margin to POSITION, which should be an integer value greater than or equal to 0 and less than the current right margin setting. If POSITION is less than 0, it will be changed to 0, and if POSITION is greater than or equal to the current right margin, it will be changed to RIGHTMARGIN-1. The default is 2.

**SETRIGHTMARGIN (POSITION)**
This procedure sets the right margin to POSITION, which should be an integer value less than or equal to 84 and greater than the current left margin setting. If POSITION is greater than 84, it will be changed to 84; and if POSITION is less than or equal to the current left margin, it will be changed to LEFTMARGIN+1. The default is 81.

**FORMFEED**
This procedure causes the printer to execute a form-feed (i.e., it moves the paper a certain number of units of vertical space.) The amount of vertical space can be changed by the SETFORM procedure. The default is 40 units.
PRINTPIC
This procedure causes the printer to print the current graphics display.

RESTORE
This restores all the printer's parameters to their default values.

PRINTBUFFER
This procedure causes the contents of the printer's internal buffer to be printed.

CLEARBUFFER
This procedure causes the contents of the printer's internal buffer to be thrown away.
APPENDIX E
SAMPLE CHARACTER SET

This appendix shows the character set printed by the Silentype when you use both upper and lower case alphabets. For example, you may use both upper and lower case when you edit text using Apple Writer.

Here is an example of an Apple Writer file, printed by the Silentype printer, showing both upper and lower case letters. And here is a barberpole showing the whole character set:
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