SILENTYPE™

OPERATION AND
REFERENCE MANUAL

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SILENTYPE™ PRINTER
OPERATION AND REFERENCE MANUAL

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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 is 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

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

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.
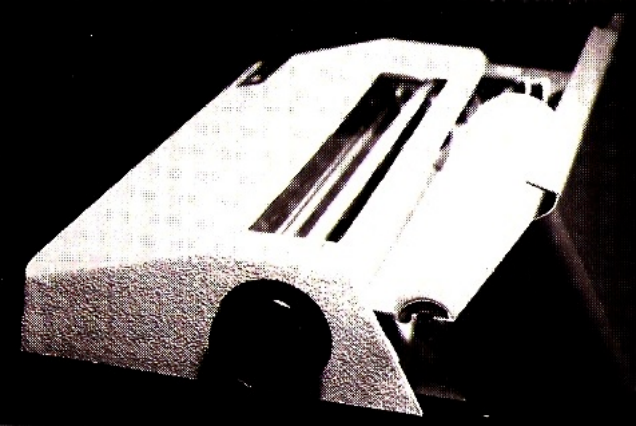
Check that the small black bearings on either side of the paper roll are sitting firmly in the deepest notches as shown in the photograph. If the paper roll has slipped out of place, carefully line up the bearings with the appropriate notches. Then press in on the bearings, and the paper roll should 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.
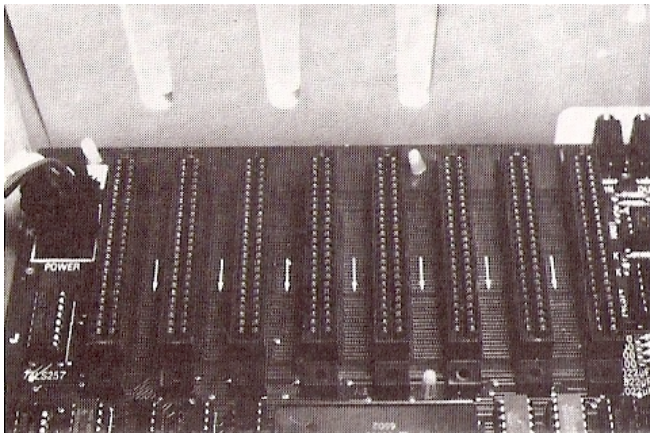
Just as it is customary to plug disk controller cards into slot #6,
printer interface cards are usually plugged into slot #1. Unless you
are using Pascal, the printer card will work in any slot except #0.
But, unless you have a specific reason not to, it is a good idea to
use the conventional slot. This manual assumes that you are using
slot #1.

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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

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.
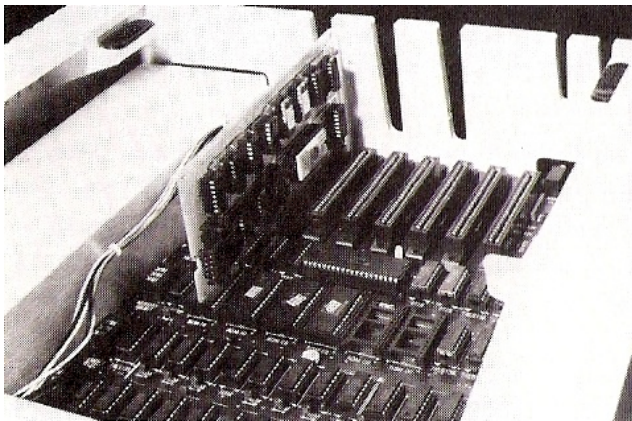
The final step is plugging the printer's cable into the interface
card. There is a socket on the interface card that matches the plug
attached to the Silentype printer cord. The socket faces toward the
Apple keyboard when the interface card is installed. Simply plug the
printer cable into the socket, 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.
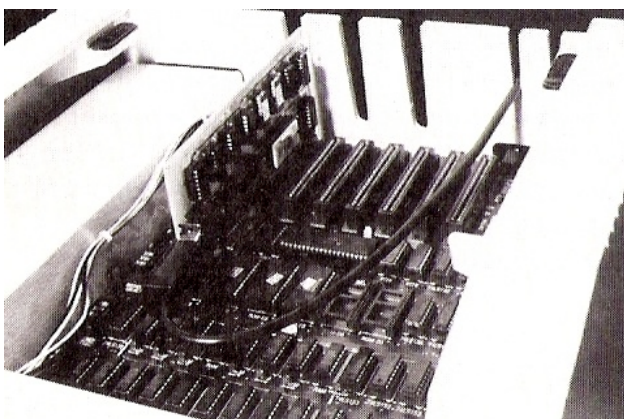
Do not connect or disconnect the printer cable when your Apple is on. If you do, anything stored in RAM may be destroyed.

Slide the Apple's top into place and press down on the rear corner fasteners until they pop into place. Now your Silentype 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 Language Reference Manual tells how.

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:

PASCAL GRAPHICS

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:

```
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 l.

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.

BACK TO BASIC

If you are using Integer BASIC or Applesoft BASIC, first put the
Apple in BASIC. (If you don't know hou, 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(l);"."
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.

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When you wish to quit printing, type
PR#0
to tell the Apple to quit sending information to the Silentype
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

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If you want to use DOS (the Disk Operating System) with the
Silentype 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 Silentype 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 Silentype'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 Silentype 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.

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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 GOSU8 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.

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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:

```
VAR SILENT: INTERACTIVE;
...

BEGIN (*Beginning of main program*)
  REWRITE(SILENT, 'PRINTER:')
...

  WRITELN(SILENT, 'THIS LINE GETS PRINTED')

... (*etc.*)
```

USING WRITE STATEMENTS
THE PRINTER BUFFER

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
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
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
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 l. 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.
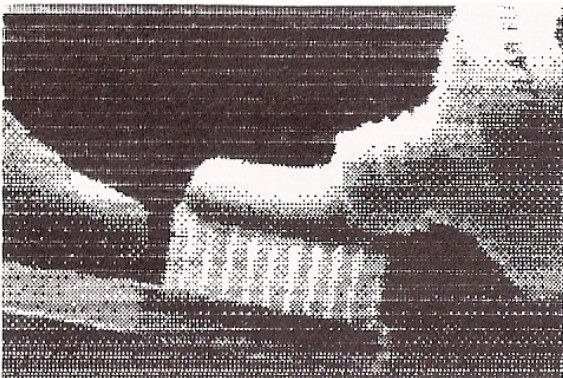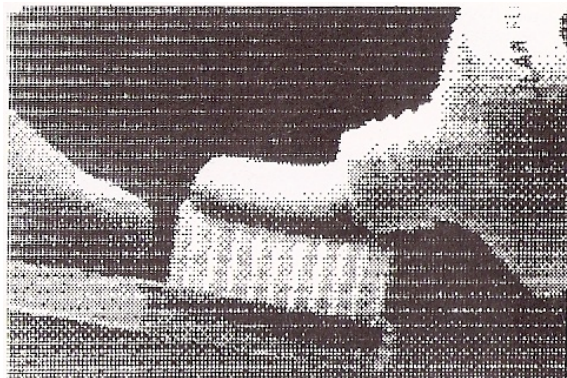
            bi-directional   uni-directional

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.

INTENSITY LEVEL 0

INTENSITY LEVEL 1

INTENSITY LEVEL 2

INTENSITY LEVEL 3

INTENSITY LEVEL 4

INTENSITY LEVEL 5

INTENSITY LEVEL 6

INTENSITY LEVEL 7

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:

l. 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)
and
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 l0-character margin on
either side of your printout. Use this statement to place the left
margin at the tenth character:
SETLEFTMARGIN (10)

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

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

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 O 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 "      "; PEEK (FRMFEED)
300  PRINT "    2. LINE SPACING = ";
310  IF  PEEK (SPACING) < 5 THEN  PRINT "    SINGLE"
320  IF  PEEK (SPACING) >  = 5 AND  PEEK (SPACING) < 11 THEN  PRINT
     "    DOUBLE"
```

```
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
      POWERED UP
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" OF 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.
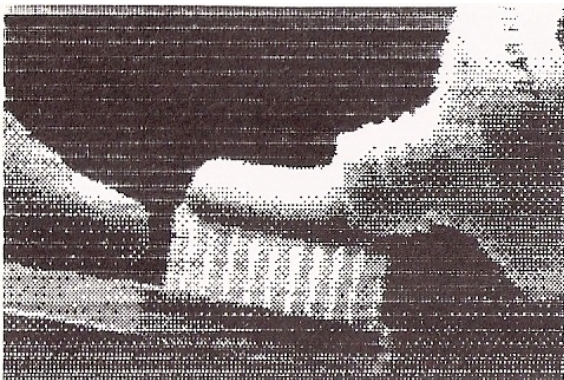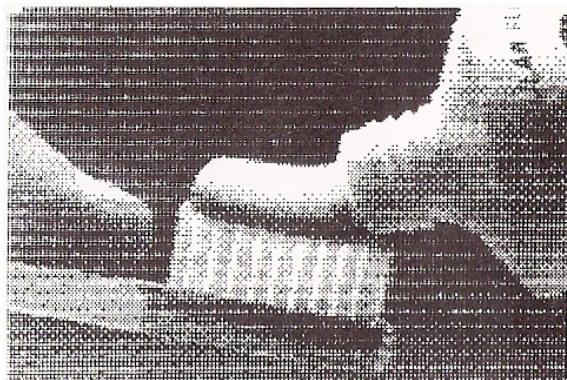
bi-directional   uni-directional

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
```

PRINT INTENSITY

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.

INTENSITY LEVEL 0

INTENSITY LEVEL 1

INTENSITY LEVEL 2

INTENSITY LEVEL 3

INTENSITY LEVEL 4

INTENSITY LEVEL 5

INTENSITY LEVEL 6

INTENSITY LEVEL 7

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.

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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.

```
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
```

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.
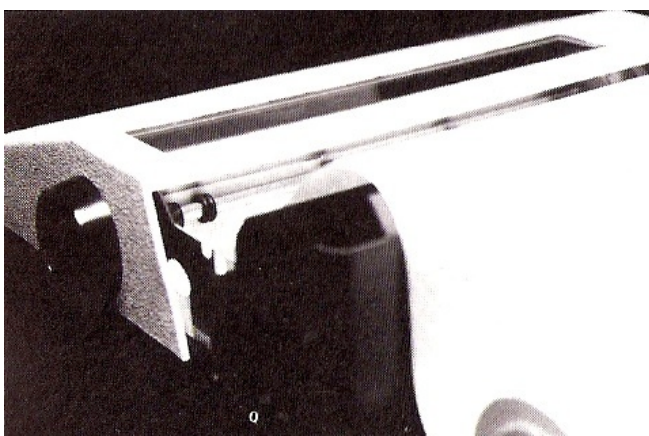
Turn the large, round knob on the right side of the printer to
advance the paper a few inches. Then put the paper roll in place and
push in on the squared, black bearings in the paper cylinder while
fitting them into the deepest of the two notches on either side of
the roll.

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.

FUNCTION	MONITOR ADDRESS	BASIC ADDRESS	COLDSTART VALUE dec	hex	POSSIBLE VALUES
form feed	CF0D	-12531	40	$28	from 0 ($0) TO 255 ($FF)
line increment	CF0E	-12530	2	$2	from 0 ($0) TO 255 ($FF)
direction	CF0F	-12529	0	$0	bi-directional = 0 ($0) to 127 uni-directional=128 to 255 ($FF)
intensity	CF10	-12528	5	$5	from 0 ($0) to 7 ($7)
left margin	CF11	-12527	2	$2	from 0 ($0) to 82 ($53)--must be less than right margin
right margin	CF12	-12526	81	$51	from 1 ($1) to 83 ($54)--must be greater than left margin
hi-res page	CF13	-12525	32	$20	hi-res page 1 = 32 ($20) hi-res page 2 = 64 ($40)

hi-res inverse	CF14	-12524	255	$FF	normal = 255 ($FF)
					          (white on black)
					inverse = 0 ($0)
					          (black on white)

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.

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

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.

DEC	HEX	CHAR	TYPE		DEC	HEX	CHAR	TYPE
0	00	NULL	ctrl @		32	20	SPACE	space
1	01	SOH	ctrl A		33	21	!	!
2	02	STX	ctrl B		34	22	"	"
3	03	ETX	ctrl C		32	23	#	#
4	04	ET	ctrl D		36	24	$	$
5	05	ENQ	ctrl E		37	25	%	%
6	06	ACK	ctrl F		38	26	&	&
7	07	BEL	ctrl G		39	27	'	'
8	08	BS	ctrl H or <-		40	28	(	(
9	09	HT	ctrl I		41	29	)	)
10	0A	LF	ctrl J		42	2A	*	*
11	0B	VT	ctrl K		43	2B	+	+
12	0C	FF	ctrl L		44	2C	,	,
13	0D	CR	ctrl M or RETURN		45	2D	-	-
14	0E	SO	ctrl N		46	2E	.	.
15	0F	SI	ctrl O		47	2F	/	/
16	10	DLE	ctrl P		48	30	0	0
17	11	DC1	ctrl Q		49	31	1	1
18	12	DC2	ctrl R		50	32	2	2
19	13	DC3	ctrl S		51	33	3	3
20	14	DC4	ctrl T		52	34	4	4
21	15	NAK	ctrl U or ->		53	35	5	5
22	16	SYN	ctrl V		54	36	6	6
23	17	ETB	ctrl W		55	37	7	7
24	18	CAN	ctrl X		56	38	8	8
25	19	EM	ctrl Y		57	39	9	9
26	1A	SUB	ctrl Z		58	3A	:	:
27	1B	ESCAPE	ESC		59	3B	;	;
28	1C	FS	n/a		60	3C	<	<
29	1D	GS	ctrl shift-M		61	3D	=	=
30	1E	RS	ctrl ^		62	3E	>	>
31	1F	US	n/a		63	3F	?	?

DEC	HEX	CHAR	TYPE		DEC	HEX	CHAR	TYPE
64	40	@	@		96	60	`	`
65	41	A	A		97	61	a	a
66	42	B	B		98	62	b	b
67	43	C	C		99	63	c	c
68	44	D	D		100	64	d	d
69	45	E	E		101	65	e	e
70	46	F	F		102	66	f	f
71	47	G	G		103	67	g	g
72	48	H	H		104	68	h	h
73	49	I	I		105	69	i	i
74	4A	J	J		106	6A	j	j
75	4B	K	K		107	6B	k	k
76	4C	L	L		108	6C	l	l
77	4D	M	M		109	6D	m	m
78	4E	N	N		110	6E	n	n
79	4F	O	O		111	6F	o	o
80	50	P	P		112	70	p	p
81	51	Q	Q		113	71	q	q
82	52	R	R		114	72	r	r
83	53	S	S		115	73	s	s
84	54	T	T		116	74	t	t
85	55	U	U		117	75	u	u
86	56	V	V		118	76	v	v
87	57	W	W		119	77	w	w
88	58	X	X		120	78	x	x
89	59	Y	Y		121	79	y	y
90	5A	Z	Z		122	7A	z	z
91	5B	[	n/a		123	7B	{	{
92	5C	\	n/a		124	7C	|	|
93	5D	]	] (shift-M)		125	7D	}	}
94	5E	^	^		126	7E	~	~
95	5F	_	n/a		127	7F		n/a

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 : PRINT "    1. FORM FEED = ";
290  PRINT "       "; PEEK (FRMFEED)
300  PRINT "    2. LINE SPACING = ";
310  IF  PEEK (SPACING) < 5 THEN  PRINT "   SINGLE"
320  IF  PEEK (SPACING) >  = 5 AND  PEEK (SPACING) < 11 THEN  PRINT
     "    DOUBLE"
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
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" OF 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
```

```
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
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
```

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 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:

 !"#$%&'( )*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`ab
!"#$%&'( )*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abc
"#$%&'( )*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcd
#$%&'( )*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcde
$%&'( )*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdef
%&'( )*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefg
&'( )*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefgh
'( )*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghi
( )*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghij
)*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijk
*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijkl
+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklm
,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmn
-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmno
./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnop
/0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopq
0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqr
123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrs
23456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrst
3456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstu
456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuv
56789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvw
6789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwx
789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxy
89:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz
9:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{
:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|
;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}
<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~
=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~▓
>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~▓
?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~▓ !
@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~▓ !"
ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~▓ !"#
```

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