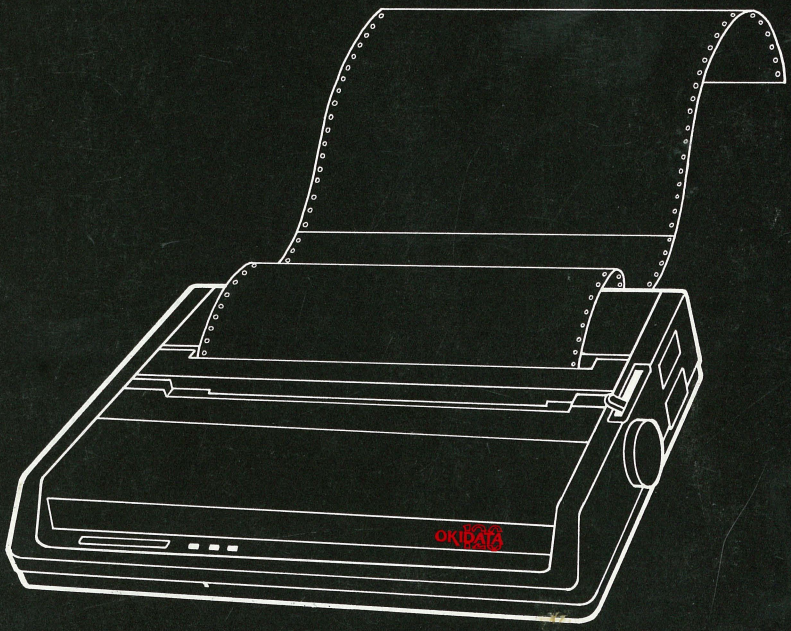
OKIDATA® 120

For Commodore® Computers



Printer Handbook

OKIDATA® has made every effort to ensure the information in this handbook is complete, accurate and up-to-date. OKIDATA® does not assume responsiblity for the results of errors beyond its control, and cannot guarantee that changes in software and equipment made by other manufacturers and referred to in this handbook will not affect the applicability of the information in it.

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#ODCBM1.0

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YOUR NEW PRINTER

The OKIDATA 120 connects to your Commodore personal computer to provide quality, high-performance printing. Its small size and light weight make the printer an ideal desk-top companion for your Commodore.

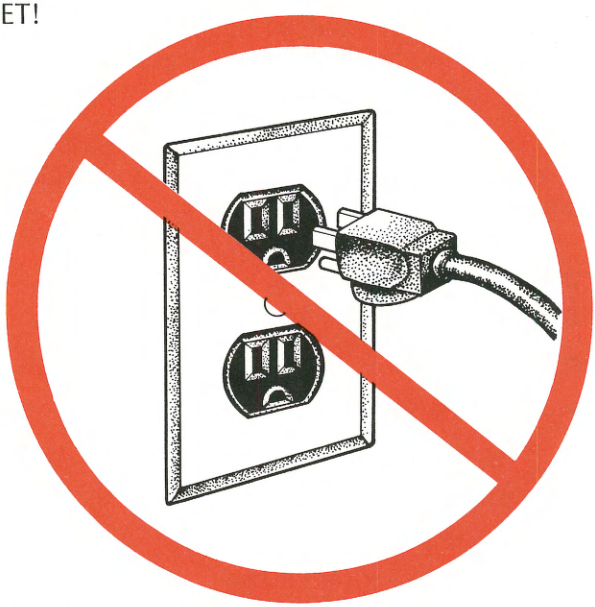
When you unpack the printer and accessories, (save the box for later storage or shipping) check to make sure you have everything:

- OKIDATA 120 printer
- Ribbon cartridge
- Platen knob
- A spare fuse
- Printer cable
- Power cord
- Sprocket paper
- This handbook, of course

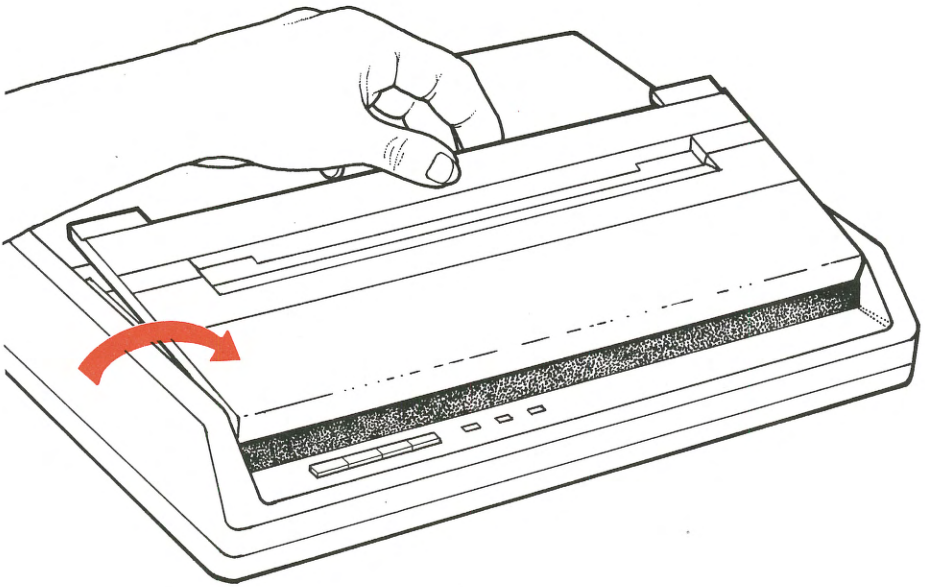
If anything's missing, contact your dealer right away.

Now follow the illustrated steps on the next few pages to set up your printer and get it running.

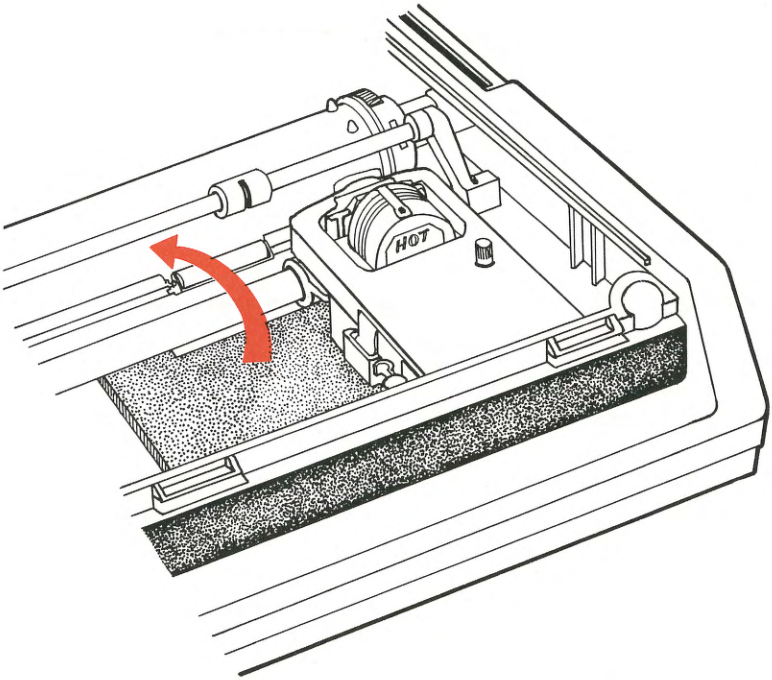
1) NOT YET!



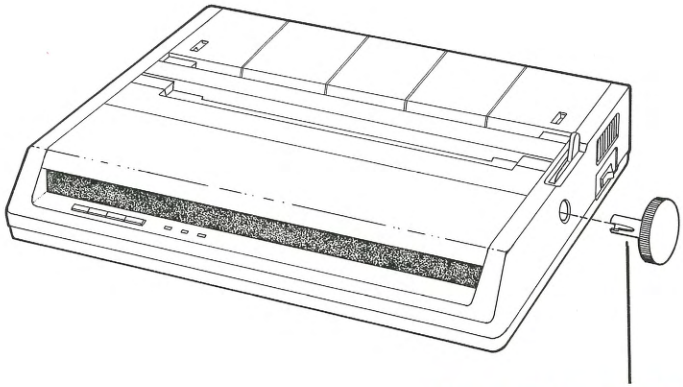
2) Lift off access cover.



3) Remove the cardboard retainer. (Save it in case you have to ship your printer.)



4) Install the platen knob.



LINE UP THE NOTCH IN THE PLATEN KNOB WITH THE PIN ON THE SHAFT AND PUSH IN.

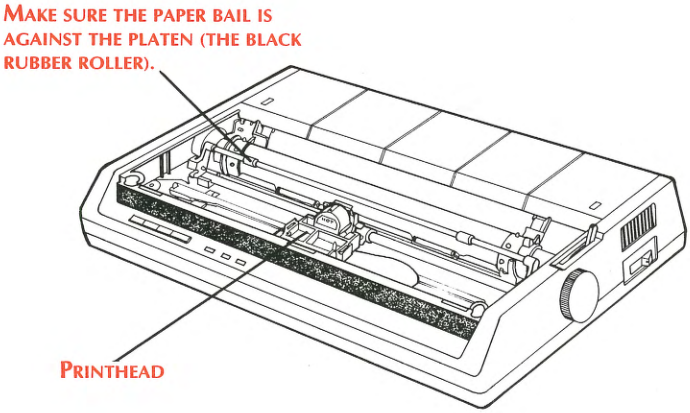
Where to put your printer

- in a well-ventilated place away from direct sunlight or heat-generating equipment.
- on a slotted stand if you're feeding paper from the bottom.

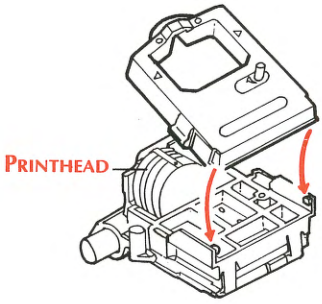
DON'T put diskettes on top of the printer—the printhead's permanent magnet may zap your data!

Load the ribbon cartridge

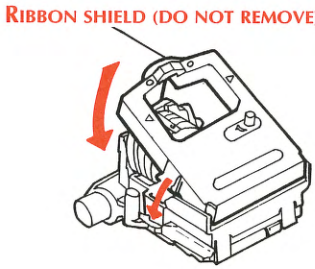
1) Center the printhead.



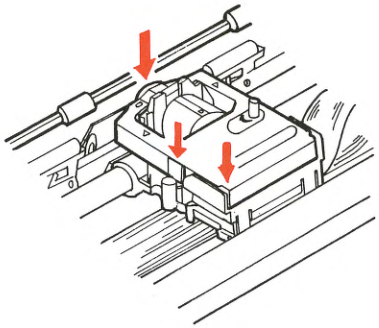
2) Insert the flat end of the cartridge into the carriage with the blue knob facing up.



3) Lower the front of the cartridge over the printhead.



4) Press the cartridge until it snaps into place.

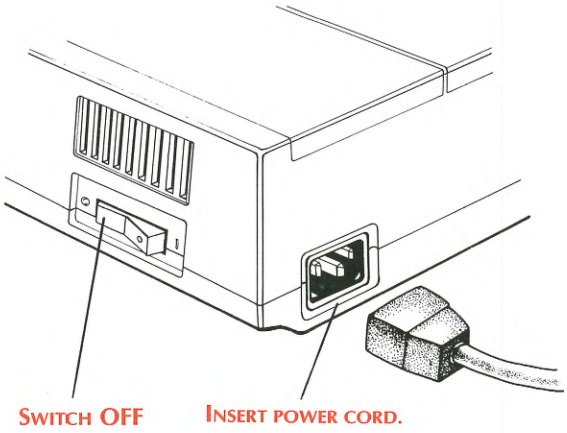


Be careful not to snag the clear ribbon shield.

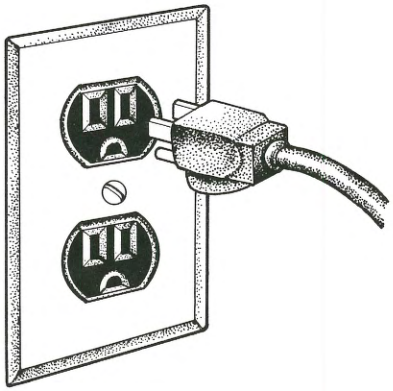
5) To replace the cartridge, just lift up.

Use genuine OKIDATA ribbon cartridges or other OKIDATA-approved brands only. Other brands may damage the printhead!

6) Switch OFF.



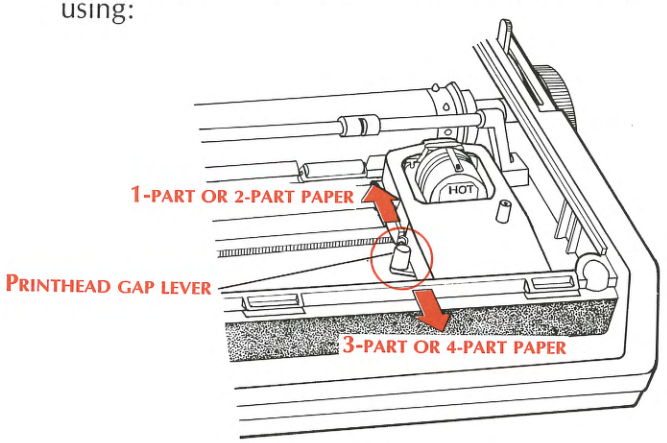
7) Now plug it in. You must use a grounded outlet!



Loading paper

The OKIDATA 120 can print on standard single sheet paper or, using the built-in pin feed mechanism, you can print on computer paper.

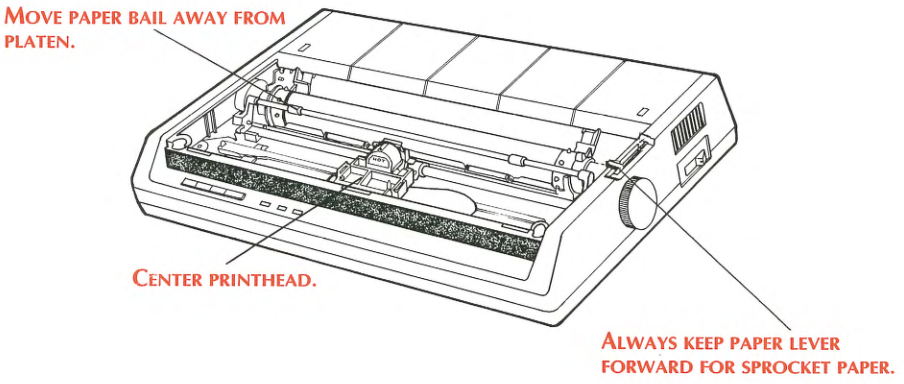
You can use multi-part paper as well (up to 4-parts). Just set the printhead gap lever for the kind of paper you're using:



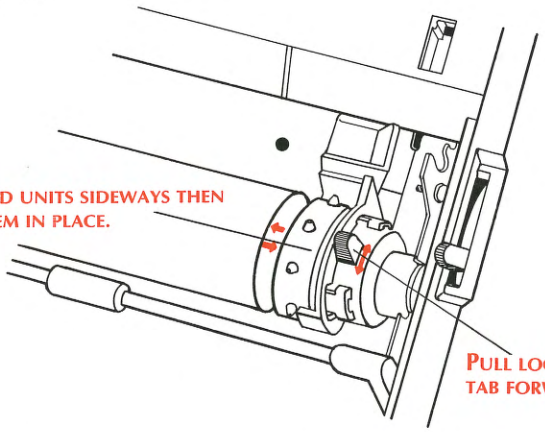
Inserting computer paper

The feed pins on the OKIDATA 120 adjust to handle sprocketed computer paper between 9 1/2 and 10 inches wide. (Actual paper width without borders is 8 1/2 to 9 inches.)

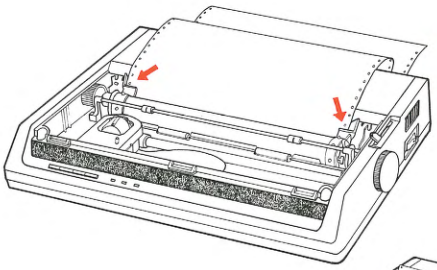
1) Remove the access cover.



2) The left and right pin feed units slide to adjust for various paper sizes. MAKE SURE THESE ARE PROPERLY ADJUSTED FOR YOUR PAPER SIZE. Insert the paper as far as you can into the slots provided by the black paper guides. The pins should fit into the sprocket holes and move the paper along the platen.

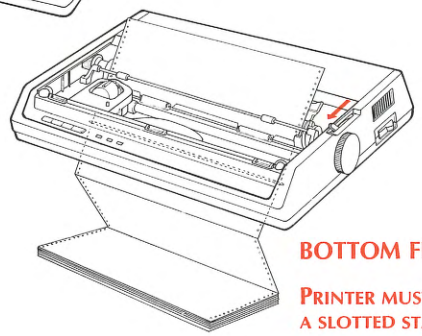


3) Use the platen knob to advance paper to first printing line. Again, make sure the pins move the paper properly.



REAR FEED:

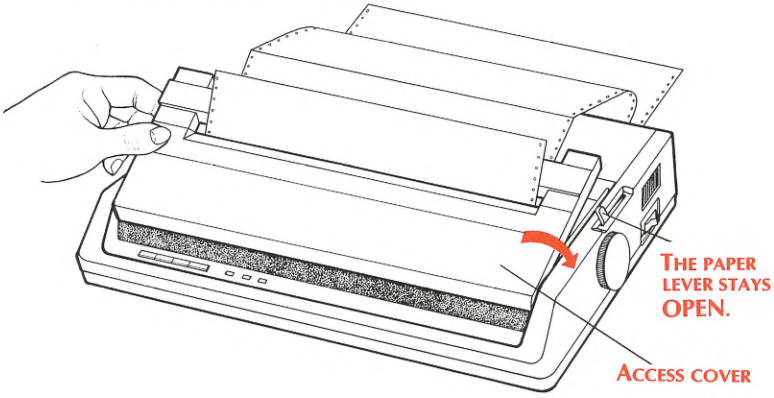
PAPER GOES IN THE GUIDES.



BOTTOM FEED:

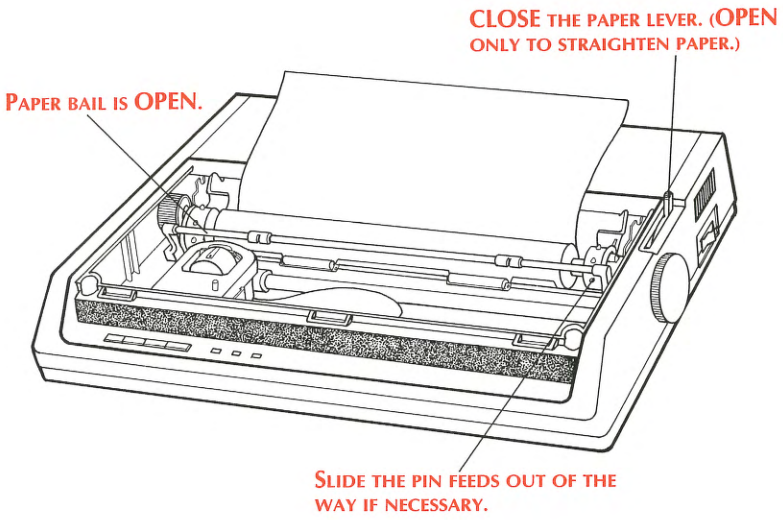
PRINTER MUST BE ON A SLOTTED STAND.

4) Push the paper bail against the platen and replace the access cover.



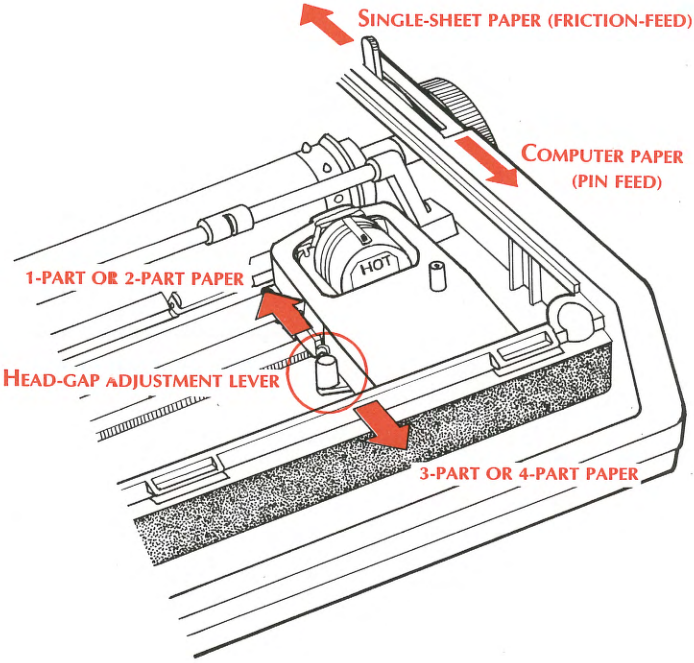
Inserting single sheets

1) You load single sheets of paper like you load paper into a typewriter.



2) Push the paper bail against the platen and replace the access cover before printing.

Double-check the paper controls

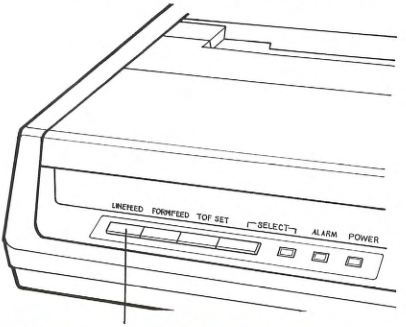


Self-test

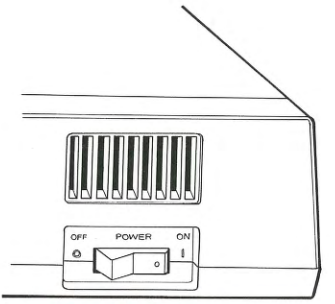
This built-in test lets you check out the printer before you connect it to your computer. It's a good idea to run this test any time you want to make sure the printer is working properly.

1) Make sure the printer is ready to run, with the ribbon cartridge in place and the paper loaded.

2) Press the LINEFEED button and, while holding it down, turn on the printer.



HOLD THE LINEFEED BUTTON.



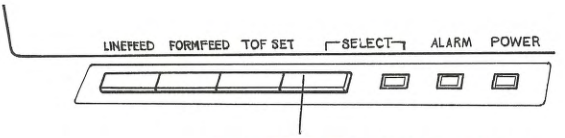
TURN ON HERE.

3) When you release the LINEFEED button, here's what you'll see:

```
 /0123456789:;<=>?@ABCDEFGHIJKLMNOPQ
/0123456789:;<=>?@ABCDEFGHIJKLMNOPQR
0123456789:;<=>?@ABCDEFGHIJKLMNOPQRS
123456789:;<=>?@ABCDEFGHIJKLMNOPQRST
23456789:;<=>?@ABCDEFGHIJKLMNOPQRSTU
3456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUV
456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVW
56789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWX
6789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXY
789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ
89:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[
```

CHARACTER DISPLAY

4) To stop the test, turn your printer OFF or press the SELECT button.



PRESS SELECT BUTTON TO STOP TEST.

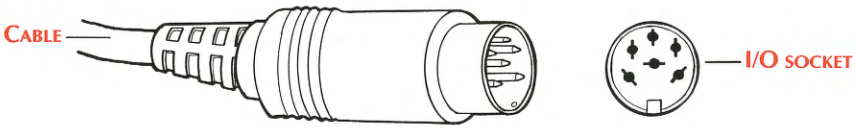
Connecting the OKIDATA 120 to your Commodore

...is easy. We've designed the OKIDATA 120 so you don't have to do anything more than plug it into your VIC-20, Commodore 64, SX-64, +/4, C-16 or C-128.

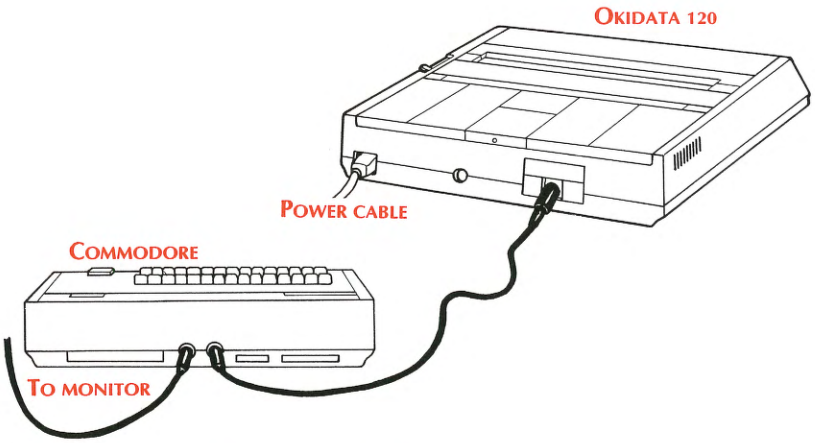
Be sure all equipment is turned OFF before connecting.

If you have peripherals (like a disk drive, cassette recorder, or another printer) advance to Step 3. Otherwise follow only steps 1 and 2.

1) Plug one end of the cable into the I/O socket on the back of your printer. (The plug and socket are keyed, so it will fit only one way. You shouldn't have to force it.)



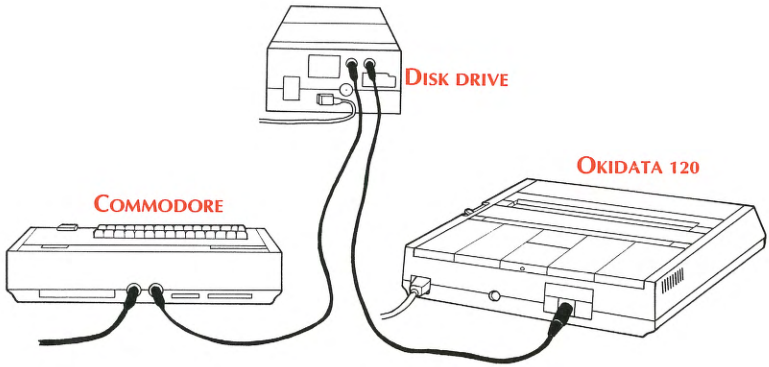
2) Plug the other end of the cable into the serial socket of the computer.



OKIDATA 120 DIRECT CONNECTION:
OKIDATA 120 TO COMMODORE

3) If you have other peripherals (like a disk drive, data cassette or second printer), plug the printer cable into one socket on the back of the peripheral. The peripheral's cable runs from the other socket to the serial socket of the computer.

The OKIDATA 120 has only one I/O socket, so the printer has to be the last item in the peripheral chain.



SAMPLE MULTIPLE CONNECTION:
OKIDATA 120 TO DISK DRIVE TO C-64

Now you're set to go!

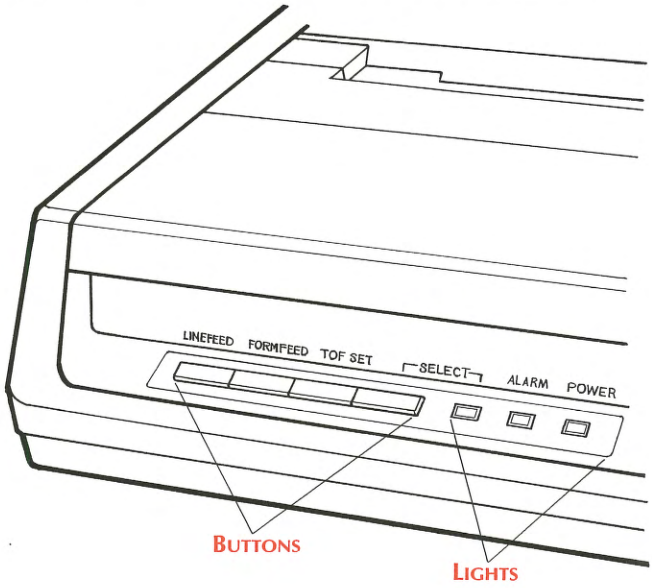
The OKIDATA 120 is preset at the factory for normal operation with Commodore computers. For special applications, you can take advantage of some extra OKIDATA features by resetting a few switches inside the printer. You can select:

- special characters for foreign languages.
- page lengths other than 11 inches.
- high resolution bit image graphics.
- alternate device number (if you have two printers).
- cancel automatic line feed.

The appendix will explain these features.

The printer controls

Now that you've set up your printer, let's take a closer look at lights, buttons and levers on the OKIDATA 120.



POWER LIGHT: Lights when the power is switched on.

ALARM LIGHT: Lights when the printer runs out of paper or if the paper jams.

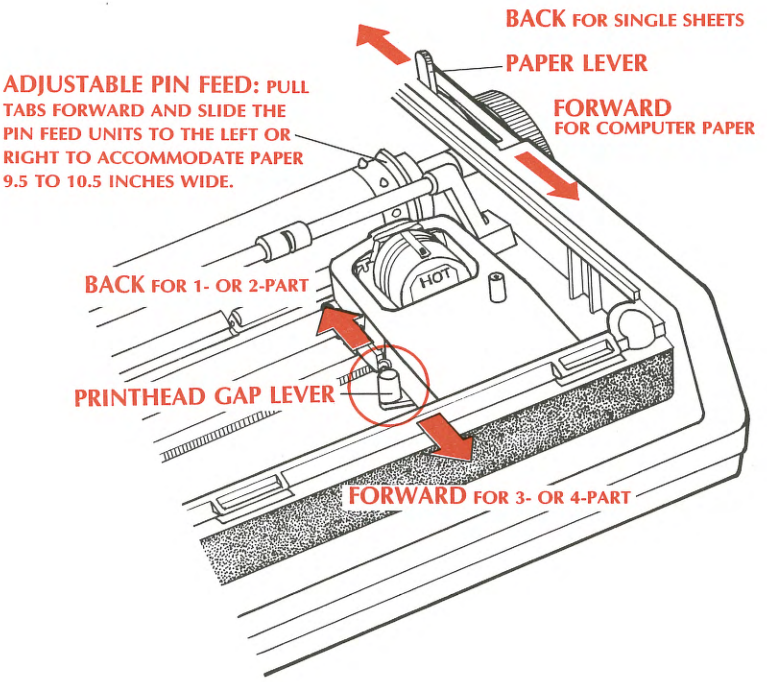
SELECT LIGHT: Lights when the printer is selected (ready to print). Off when the printer is deselected (not ready to print).

SELECT BUTTON: Selects or deselects the printer. When the printer is selected, the SEL light comes on and the printer is ready to receive data from the computer. When the printer is deselected, it won't print (unless you're running a self-test), but you can perform some of the printer functions described below.

TOF (Top Of Form) SET BUTTON: Sets the first printing line of each page. To set TOF, deselect the printer and then press the TOF button. You can also select fine print (page 26) with this button. Just hold the TOF button down while you're switching on the printer.

FORM FEED: Advances paper to the top of the next page. Press this button while the printer is deselected.

LINE FEED: Advances the paper one line. Press this button while the printer is deselected. You can also use this button to perform a self-test. Hold this button down while switching on the printer.



PAPER LEVER: Always move the lever FORWARD (towards the front of the printer) when using computer sprocket paper. Always move it BACK when using single sheets, except if you're adjusting the paper.

PRINTHEAD GAP LEVER: Move the lever towards the front of the printer when printing on three- or four-part paper. Move it towards the platen when printing on single sheets or two-part paper.

WORKING WITH THE OKIDATA 120

Now that you've set up your OKIDATA 120 and connected it to your Commodore, it's time to start printing.

Generally speaking, there are two ways you can use your printer:

- With commercial software packages, you can produce all kinds of information: letters, home budgets, recipe files...even computerized horoscopes and personality profiles. Your OKIDATA 120 will increase the packages' usefulness by giving you attractive printed copies of your work. We'll give you some general information on how packages handle printers, as well as a few pointers on getting the most out of the OKIDATA 120 and your software.
- If you do your own programming, you can easily add a printout. We'll explain how Commodore's version of BASIC controls the printer, and show you how you can program the OKIDATA 120's many special features to spruce up your printouts.

Printing with software packages

Most likely, you'll do most of your printing using a software package, like word processing or a spreadsheet program. There are many other kinds of software as well: recipe filers, gardening design programs, stamp cataloguers, and self-help packages. As a rule, most programs like this that produce information on the screen will let you make a printed copy. For example, Infocom's adventure games, like "Hitchhiker's Guide to the Galaxy," let you print out each step of your adventure. Waveform's Musicalc 2, part of a music synthesizer package, can print out a score for you. Brøderbund's Printshop lets you create banners and other printer "special effects." Even a few graphic drawing packages can print a black and white copy of your doodles.

The first and most important step:

STUDY THE INSTRUCTIONS THAT CAME WITH YOUR SOFTWARE!

These manuals should tell you how to print. The information may be hard to find, but it will be there.

When you're reading the instrutions you may see references to TRUE ASCII and COMMODORE (or PET) ASCII. Follow the directions for COMMODORE ASCII!

Here's why:

ASCII (American Standard Code for Information Interchange) is a system for numerical coding of characters so that computers and peripherals can communicate with each other. Almost all personal computers use it...but Commodore doesn't. Commodore computers use a different coding system, usually called PET ASCII or Commodore ASCII. Some software packages have different setup procedures, depending on whether you have a Commodore printer or another model that uses the ASCII standard. The OKIDATA 120 is designed to use Commodore ASCII. So follow any instructions for Commodore printers or Commodore ASCII. If you don't, you may end up with upper and lower case letters mixed up with a strange assortment of graphic symbols.

Some packages are simple. For example, in some Infocom text adventure games, all you have to do is enter SCRIPT at any point in the game, and you'll get a printout of each following move and the game's response. (Enter UNSCRIPT to cancel.) Because the game assumes you have a Commodore or Commodore-compatible printer, which the OKIDATA 120 is, you don't have to make choices.

With some packages, you do have to make choices. Often the software will have some kind of installation procedure, which sets it up for the particular printer you have. Usually, you'll have to pick from a "menu" (list) of printer types. Look for:

OKIDATA 120
or
COMMODORE MPS PRINTER (Such as 801, 802, 1525)
or
COMMODORE ASCII CHARACTER SET (See explanation above)
or
OKIMATE 10

Don't pick any other OKIDATA printer (like Microline). It won't work properly!

If you choose the Commodore MPS selection, you may not be able to use some of the OKIDATA 120 exclusive features (underlining, foreign language characters) without doing some customizing. Your software documentation is the best source of information on how to do this.

Using printing features with software packages

Special codes control the printer's features, like changing character size, underlining, and so on. How the computer sends these codes to the printer varies with the package.

There are four general ways codes are handled:

- Separate files (sometimes called "drivers") assign codes to particular keys. Usually, the package comes with files for particular printers. You can customize these ready-made files, or create your own. Easyscript uses this method.
- You assign a list of codes to particular keys and insert the list into each document file. Paper Clip, Speedscript, and Wordpro 3+ work this way.
- You press a particular series of keys before and after the codes at the place inside the file where you want to use a printing feature.
- In some accounting and spreadsheet programs, you have the option of adding codes when you give the command to print a document. You can use this option to change printing styles for the entire document, to print in condensed type, for example.

Again, check your software's instructions to find out what to do.

Where do the codes come from?

The chart in the appendix of this book gives you a summary of the OKIDATA 120's printing features. For more details, see the Programmer's Reference Section. The control

codes are listed in two formats, labeled decimal and hexadecimal. Be sure to use the form your software instructions tell you to use.

Remember, your software may not let your OKIDATA 120 do everything it's capable of. You may not be able to turn a feature on and off in the middle of a line, for example, or you may only be able to print an entire file using a particular feature.

PROGRAMMING ON YOUR OWN

In addition to printing with commercial software, you can also write your own programs for the OKIDATA 120, controlling all the printing features directly. Many Commodore computer owners won't have to read this section. It explains the programming codes used by your printer. If you don't plan on writing programs, skip this section for now. You may need it later if you plan to write programs or if you have software that requires you to enter printer codes.

We'll explain how to program your printer, and show you some examples in BASIC. You will, however, need at least a little knowledge of programming in order to do something useful. For more details on programming, see your computer's Owner's Guide or Programmer's Reference Guide. There are also a number of books available that teach BASIC.

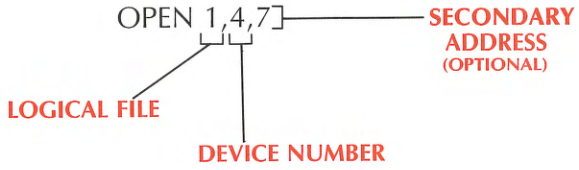
To start printing with Commodore BASIC, you'll need these three statements:

```
OPEN 1,4,0
PRINT#1,
CLOSE1
```

The statements above are the ones any program needs in order to control the printer. Let's look at them one at a time:

- The OPEN statement opens a line of communication

with a peripheral (printer, disk drive, or data cassette). It looks like this:



The LOGICAL FILE number represents the file name of the channel open to the printer. We use a 1 here, but you can choose any number between 1 and 255. Your printer has a DEVICE NUMBER assigned to it. Usually, the printer will be device 4.

If you use two printers, you'll have to name one printer device 4 and the other device 5.

Using the SECONDARY ADDRESS gives you the choice of several printing modes. Page 39 explains this feature in detail. This number is optional, you don't need to include it in your OPEN statement if you want the standard printing mode.

- The PRINT#1 statement sends a line of data to the printer. Use the logical file number in this command (we use #1 here).
- A CLOSE1 statement closes the channel to the printer that you opened with the OPEN statement. The number in your CLOSE command must be the logical file number. If you don't close the file, you'll get a ?FILEOPEN error message when you try to open it again.
- A fourth command, the CMD 1 statement, makes your printer act like a monitor. Anything that would normally print out on the screen now prints out on the printer instead. Any PRINT or LIST command goes directly to the printer. To end a CMD command, write a program line with nothing but a PRINT# command, followed by a program line with a CLOSE statement.

Putting it together

Here's a sample program that illustrates these statements:

```
10  OPEN 1,4,0
20  PRINT#1, "THE OKIDATA 120"
30  PRINT#1, "PRINTS LIKE THIS."
40  CMD 1
50  PRINT "THIS PRINTS, TOO..."
60  PRINT#1,
70  CLOSE1
```

Using control codes

If you use a PRINT# command followed only by text, OKIDATA 120 gives you standard printing:

```
HERE'S NORMAL PRINTING
```

By using "control codes," you can spice up this standard printing with headlines, underlining, and different type sizes. You can control spacing and page length. The codes even let you print graphics.

When the computer sends the OKIDATA 120 a control code, the printer responds by changing one of its printing features. Changes aren't permanent, however; they can be canceled by sending certain other codes or by switching the printer off.

When you write a program, you should insert the control code right before you want the "special effect" to take place. Here's an example:

```
10  OPEN 1,4
20  PRINT#1,"HERE'S NORMAL PRINTING"
30  PRINT#1, CHR$(14);"DOUBLE WIDTH"
40  CLOSE1
```

```
HERE'S NORMAL PRINTING
DOUBLE WIDTH
```

The CHR$(14) code is a non-printing control code that tells your printer to print in double-width size. The printer reads the number 14 as a Commodore ASCII decimal code number, a standard code system used by Commodore computers. Notice the CHR$ code and the quotation mark are separated by a semicolon.

Sometimes, for more complex features, the OKIDATA 120 uses combinations of CHR$ codes. The first code in this combination is usually CHR$(27), called the "ESCAPE" code. This code tells the printer to interpret the codes that follow as part of an instruction. For example:

```
10  OPEN 1,4
20  PRINT#1,"THIS CODE ";CHR$(27);CHR$(67);
    "STARTS UNDERLINING,"
30  PRINT#1,"AND THIS CODE ";CHR$(27);CHR$(68);
    "STOPS IT."
40  CLOSE1
```

```
THIS CODE STARTS UNDERLINING,
AND THIS CODE STOPS IT.
```

Characters in commands

Commodore ASCII decimal code numbers 32 through 126 represent printable characters, including letters, numbers and symbols. The chart in Appendix C shows these characters and codes. Using a PRINT# with one of these codes causes it to print the corresponding character. For example, CHR$(65) equals the letter "A":

```
10  OPEN 1,4
20  PRINT#1 CHR$(65)
```

causes the letter "A" to be printed.

This works in reverse, too. When an ASCII decimal code used in a command also represents a printable character, you can substitute the decimal number with the actual character, surrounded by quotes. To clarify this, we'll use

an example. The code for underlining is CHR$(27); CHR$(67). If you check the Commodore ASCII chart in Appendix B, you'll see the decimal code CHR$(67) also represents the character "C". To underline, you can use this command:

```
CHR$(27);"C"
```

The C wasn't printed; it is used as part of the non-printing ESCape sequence.

Since many people find these character sequences easier to read and remember than a sequence of decimal commands, we use them often throughout this section.

This certainly isn't all there is to programming, of course, but it should be enough to get you started as you go through the descriptions shown for programming features here. First, we'll discuss how to program features that affect the appearance of printing, like underlining or character size. Then, we'll outline features that control the format of your printed page, like line spacing and page length. Next, graphics will be discussed. Finally, we'll review miscellaneous programming features.

Sample program

The printout below demonstrates many of the printing features described in this reference guide. It is followed by the BASIC program needed to produce this printout. You may try typing and running it on your own computer or just use it for reference when writing other programs.

```
CHECK OUT SOME OF OKIDATA 120'S FEATURES:

OKIDATA 120 PRINTS IN PICA, FINE AND ELITE
DOUBLE-WIDTH. . . BACK TO NORMAL

START UNDERLINING...UNDERLINE CANCELED

SUPERSCRIPTS: OKIDATA™
SUBSCRIPTS: H₂O

EMPHASIZED PRINT...NORMAL
ENHANCED PRINT...NORMAL

SPANISH CHARACTERS: ! O ¡ Ñ ¿
AMERICAN CHARACTERS: # Ø @ [ ]

SIX LINES PER INCH
SIX LINES PER INCH
SIX LINES PER INCH

EIGHT LINES PER INCH
EIGHT LINES PER INCH
EIGHT LINES PER INCH

THIS IS REVERSE PRINTING BACK TO STANDARD
      PRINTING TEXT INDENTED 15 SPACES

BACK TO NORMAL
```

And here is the program:

```
10  OPEN 1,4
20  PRINT#1,"CHECK OUT SOME OF OKIDATA
    120'S FEATURES:"
25  PRINT#1," "
30  PRINT#1,"OKIDATA 120 PRINTS IN ";CHR$(15);
    "PICA, ";
35  PRINT#1, CHR$(29);"FINE ";CHR$(28);
    "AND ELITE"
40  PRINT#1,CHR$(15);CHR$(14);"DOUBLE-
    WIDTH...";CHR$(129);"BACK TO NORMAL"
45  PRINT#1," "
50  PRINT#1,CHR$(27);"C";"START UNDERLINING...";
    CHR$(27);"D";"UNDERLINE CANCELED"
55  PRINT#1," "
60  PRINT#1,"SUPERSCRIPTS: OKIDATA";CHR$(27);
    "J";"TM";CHR$(27);"K"
65  PRINT#1,"SUBSCRIPTS: H";CHR$(27);"L";"2";
    CHR$(27);"M";"O"
70  PRINT#1," "
75  PRINT#1,CHR$(27);"T";"EMPHASIZED PRINT...";
    CHR$(27);"I";"NORMAL"
80  PRINT#1,CHR$(27);"H";"ENHANCED PRINT...";
    CHR$(27);"I";"NORMAL"
85  PRINT#1," "
90  PRINT#1,CHR$(27);"!";CHR$(67);
    "SPANISH CHARACTERS: # □ @ [ ]"
95  PRINT#1,CHR$(27);"!";CHR$(64);
    "AMERICAN CHARACTERS: # □ @ [ ]"
100 PRINT#1," "
105 FOR X = 1 TO 3
110 PRINT#1, CHR$(27);"6";"SIX LINES PER INCH"
115 NEXT X
120 PRINT#1," "
125 FOR X = 1 TO 3
130 PRINT#1, CHR$(27);"8";"EIGHT LINES PER INCH"
135 NEXT X
140 PRINT#1," "
145 PRINT#1, CHR$(18); "THIS IS
    REVERSE PRINTING"
150 PRINT#1, CHR$(146); "BACK TO
    STANDARD PRINTING"
155 PRINT#1, CHR$(16);"15";
    "TEXT INDENTED 15 SPACES"
160 PRINT#1, CHR$(24)
165 PRINT#1, "BACK TO NORMAL"
170 CLOSE1
```

Printing Style

The following features let you change the printing style of your OKIDATA 120. It includes such features as print size and underlining.

Character Size

Function:	Code:
Pica (10 CPI)	CHR$(15)
Elite (12 CPI)	CHR$(28)
Fine (17.1 CPI)	CHR$(29)

Your printer normally prints 10 Characters Per Inch (CPI), like a pica typewriter. With control codes, you can change the character size to elite—12 CPI, or fine print—17.1 CPI. Use the CHR$(28) command for elite printing and CHR$(29) for fine print. To return to pica, use the CHR$(15) command.

Double-Width Characters

Function:	Code:
5 CPI	CHR$(15);CHR$(14)
6 CPI	CHR$(28);CHR$(14)
8.5 CPI	CHR$(29);CHR$(14)
Stop double-width	CHR$(129)

For a "headline" effect, you can double the width of your printing. This turns 10 CPI pica print into 5 CPI, 12 CPI elite print into 6 CPI, and 17.1 CPI fine print into 8.5 CPI. Double width prints for one line only.

The CHR$(14) code doubles the width of the print size you're currently using. To print 6 CPI, for example, combine the elite code, CHR$(28), with the double-width code to get the CHR$(28);CHR$(14) code.

NOTE: This feature doubles the width of pica, elite and fine printing only. It won't double the width of superscript and subscript characters or custom-designed graphics.

Underlining

Function:	Code:
Start underlining	CHR$(27);"C"
Stop underlining	CHR$(27);"D"

To add emphasis to a word or phrase, you can underline it. Use the CHR$(27);"C" code to start underlining, and the CHR$(27);"D" to stop it.

NOTE: Underlining won't work with reverse printing, or custom-designed graphics.

Super-/Subscript

Function:	Code:
Start subscript	CHR$(27);"L"
Stop subscript	CHR$(27);"M"
Start superscript	CHR$(27);"J"
Stop superscript	CHR$(27);"K"

Subscripts and superscripts are small block-style characters used when writing formulas, equations and trademark symbols.

Superscript characters print slightly higher than normal characters. If you want to program superscript, use the CHR$(27);"J" command before you type the characters you want printed that way. To cancel the superscript command, use the CHR$(27);"K" code.

Subscript characters print slightly below the print line. To program a subscript, use the CHR$(27);"L" command before you type your subscript characters. To cancel the subscript command, use a CHR$(27);"M" code.

NOTE: The subscript command will automatically cancel superscripts. Likewise, a superscript command will cancel subscripts.

Enhanced/Emphasized

Function:	Code:
Start enhanced	CHR$(27);"H"
Start emphasized	CHR$(27);"T"
Stop emphasized/enhanced	CHR$(27);"I"

Emphasized and enhanced printing give your printing a

darker, bolder look that's useful when you want to call attention to a word or phrase. Each character is printed twice, with the second printing slightly offset from the first.

In enhanced print, each character is printed twice by shifting the dots vertically. To program enhanced printing use a CHR$(27);"H" command. To stop it, use the CHR$(27);"I" command.

In emphasized printing, each character has a slight horizontal offset. To start emphasized printing, use the CHR$(27);"T" command. To stop it, use the CHR$(27);"I" command.

You can combine emphasized and enhanced for extra-bold printing. Use the two codes together like this: CHR$(27);"T";CHR$(27);"I" in your program. To cancel, use the CHR$(27);"I" command.

NOTE: The Commodore graphics characters, superscript and subscript characters, and custom-designed graphics won't print in enhanced or emphasized modes.

Character Sets

Function:	**Code:**
Commodore modes:	
Cursor Up mode	CHR$(145)
Cursor Down mode	CHR$(17)
Language features:	
Slashed zero	CHR$(27);"!";CHR$(64)
Unslashed zero	CHR$(27);"!";CHR$(65)
French Canadian	CHR$(27);"!";CHR$(66)
Spanish	CHR$(27);"!";CHR$(67)

As your computer manuals explain, the Commodore computer gives you the choice of using the Cursor Up character mode or the Cursor Down character mode.

Commodore's Cursor Up mode offers upper case letters and graphic symbols. If you want your printer to print these symbols, use a CHR$(145) code.

Commodore's Cursor Down mode gives you upper and lower case letters. It is useful for word processing applications. To switch to Cursor Down mode, use the CHR$(17) code.

Once you have chosen which Commodore mode you will use, you may wish to choose particular character set options:

Slashed/unslashed zeros

The slashed zero set gives you standard Commodore characters, and the zeros have slash bars through them. Slashed zeros are useful in computer applications and other cases where it's important to distinguish between a zero and the letter "O". If you don't want a slashed zero, choose the unslashed zero selection.

Spanish/French-Canadian

When you use the command for one of these character sets, you can print symbols and characters unique to these languages. You see standard characters on the screen, but they'll print out as language characters. For example, if you enter the Spanish character set by using the CHR$(27);"!";CHR$(67) command, and then type the @ key, it will appear on the screen as @. But when your document is printed, the @ will be replaced by the Spanish ¡ symbol.

The chart below shows how your OKIDATA 120 prints symbols in various character sets.

Language	Character													
Commodore Ø	#	&	Ø	@	[	£	]	↑	←	–	+	▒	|	π
Commodore 0	#	&	0	@	[	£	]	↑	←	–	+	▒	|	π
French-Canadian	ü	ë	0	à	â	ç	ê	î	ï	ô	é	ù	è	û
Spanish	!	&	0	¡	Ñ	ñ	¿	ü	←	á	é	í	ó	ú
Decimal	**35**	**38**	**48**	**64**	**91**	**92**	**93**	**94**	**95**	**96**	**123**	**124**	**125**	**126**

Reverse Print

Function:	Code:
Start reverse print	CHR$(18)
Stop reverse print	CHR$(14€)

This feature creates white letters on a black background. It works only with pica (10 CPI) and 5 CPI printing. The

CHR$(18) command starts reverse printing and the CHR$(146) returns the printer to normal black on white printing.

Reverse printing is automatically canceled at the end of each line. If you want more than one line, add CHR$(18) at the beginning of each new line.

Heavy use of reverse printing can damage the OKIDATA 120's printhead. Don't print more than five consecutive lines in reverse printing.

Forms control

These features let you control the length, width and format of your printed page.

Carriage Return

Function:	Code:
CR with LF	CHR$(13)
CR without LF	CHR$(141)

A Carriage Return (CR) with Line Feed (LF) command—CHR$(13)—causes the printer to print a line of data and then advance the paper one line. A CR without a LF—CHR$(141)—prints a line of data but does not cause the paper to advance.

NOTE: The CR with LF command works only if function switch 5 is ON. See Appendix A for details.

Line Spacing

Function:	Code:
Line feed	CHR$(10)
6 LPI	CHR$(27);"6"
8 LPI	CHR$(27);"8"
Multiples of n/144"	CHR$(27);CHR$(10);CHR$(n)

NOTE: n = a number between 0 and 255.

Sending a Line Feed (LF) command makes the printer advance the paper one line. The standard line spacing is 6 Lines Per Inch (LPI). You can reset the line spacing to 8 Lines Per Inch by sending a CHR$(27);"8" command. To return to 6 LPI, use the CHR$(27);"6" command.

For special applications, like graphics, you can adjust the line feeds by multiples of 1/144 inch with the CHR$(27);CHR$(10);CHR$(n) command. The letter n equals n/144 inch line feed. You can choose any number between 0 and 255.

For example, if you wanted to add 72/144 inch line feed, you would use the code CHR$(27);CHR$(10);CHR$(72).

NOTE: If n = 0 then you will add a 256/144 inch line feed.

Form Length

Function:	Code:
Advance to next page (Form Feed)	CHR$(12)
Set page length by lines	CHR$(27);"F";"nn"

NOTE: nn = A two-digit number between 01 and 99 that indicates the number of lines per page.

When you send a "Form Feed" command—CHR$(12)—the paper automatically advances to the top of the next page.

The length of each page is determined by an Internal Switch setting (see page A-1). The factory setting is 11 inches, the size of a standard typewriter sheet.

You can program your printer's page length with the CHR$(27);"F";"nn" command. Here, nn equals the number of lines per page. It can be any two-digit number from 01 to 99. For example, if you wanted a page that was 50 lines long, use a CHR$(27);"F";"50" command.

Skip Over Perforation

Function:	Code:
Start auto-skip	CHR$(27);"A"
Stop auto-skip	CHR$(27);"B"

The CHR$(27);"A" command causes the printer to automatically advance to the top of the next page when there is only 1 inch remaining on a page. (The printer ingores this command if you've set the form length to less than 1 inch.)

Unless you send this command, this feature is turned off, because some software packages perform their own skip over perforation.

Override Paper-Out Sensor

Function:	Code:
Paper sensor OFF	CHR$(27);"E";"1"
Paper sensor ON	CHR$(27);"E";"0"

A sensor in your printer can detect the end of a paper sheet or roll so whenever OKIDATA 120 comes to within 1 inch of the paper's end, printing stops and the paper alarm lights. This feature is normally OFF. To turn the sensor ON, use the CHR$(27);"E";"0" command.

To disable the sensor again, use the CHR$(27);"E";"1" command.

Don't print beyond the edge of the paper! Printing on the platen can damage the printhead.

Print Start Position

Function:	Code:
Set starting position by character column	CHR$(16);"cc"
Set starting position by dot column	CHR$(27);CHR$(16);CHR$(d1);CHR$(d2)

NOTE: cc = a two-digit number indicating the starting character column.
d1 = tens digit of nn.
d2 = ones digit of nn.
nn = number of dot columns.

This feature lets you start printing at a specific distance from the left margin. You can program this distance in character columns, or, for more exact placement, dot columns.

If you want to set the distance by character columns, use the CHR$(16);"cc" command. The "cc" is a two-digit number that equals the number of columns from the left margin that you want printing to start. For example, if you wanted to print 10 columns in from the left margin, use a

CHR$(16);"10" command. If you're printing in pica (10 CPI), "cc" can't be greater than 79 columns. If you're printing in elite (12 CPI), "cc" can't be higher than 95 columns.

If you're printing in fine print, "cc" can't be higher than 135. Remember, "cc" must be a two-digit number, so if your value is higher than 99, you must use substitute the numbers with these codes:

#	Code	#	Code	#	Code	#	Code
100	:0	110	;0	120	<0	130	=0
101	:1	111	;1	121	<1	131	=1
102	:2	112	;2	122	<2	132	=2
103	:3	113	;3	123	<3	133	=3
104	:4	114	;4	124	<4	134	=4
105	:5	115	;5	125	<5	135	=5
106	:6	116	;6	126	<6		
107	:7	117	;7	127	<7		
108	:8	118	;8	128	<8		
109	:9	119	;9	129	<9		

For example, if the value of "cc" is 134, you would use this command:

```
CHR$(16);"=4"
```

If you're printing graphics, you may want a more precise starting position. The CHR$(27);CHR$(16);CHR$(d1); CHR$(d2) command lets you specify an exact dot column where you want your printing to begin.

Suppose you wanted to start printing at the 180th dot column, which is 3 inches from the margin. Add this command:

```
PRINT#1, CHR$(27);CHR$(16);
```

Then follow the command with two codes which represent the number of dot columns. Take the number of dot columns (180 in our example) and divide it by 256. The quotient is the first code (known as d1) and the remainder is

the second code. First divide 180 by 256, like this:

```
    0   quotient (d1)
256)180
  -0    subtract
 180    remainder (d2)
```

Now take d1 and d2 and add them to your print statement. You'll get this command:

```
PRINT#1, CHR$(27);CHR$(16);CHR$(0);CHR$(180);"TEXT..."
```

Graphics

Function:	Code:
Start graphics	CHR$(8)
Normal density	CHR$(27);"P"
High density	CHR$(27);"Q"
Repeat graphics	CHR$(26);"n"

NOTE: n = a number between 0 and 255.
If n=0 the pattern is repeated 256 times.

This section reviews how the OKIDATA 120 prints graphic images like charts and pictures.

Printing graphics

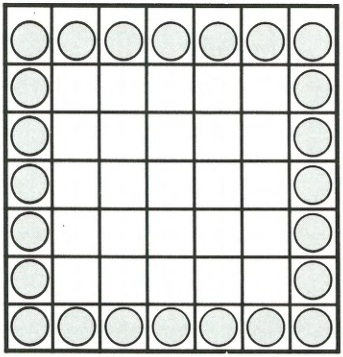
The OKIDATA 120's graphics capabilities let your print charts, graphs and pictures. The easiest way to create graphics is by using a graphics software package. With these packages, you usually create an image on your screen and then instruct your computer to send the image to your printer. Like a newspaper photograph, these images are composed of thousands of tiny dots. Your software package tells the OKIDATA 120 where to print each dot.

More advanced programmers might want to try writing programs that produce graphic images. This takes time, patience, and an understanding of how your printer functions.

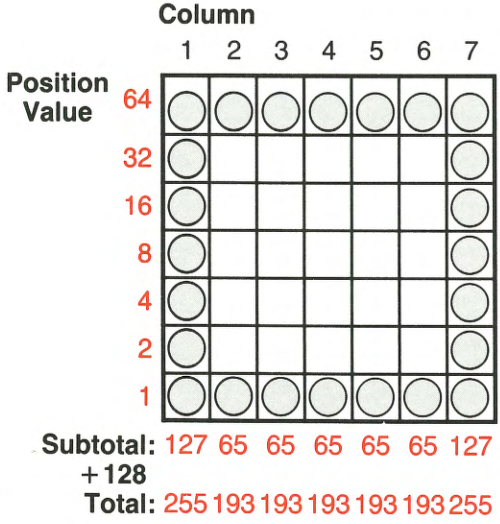
When the OKIDATA 120 prints standard text, it receives an ASCII code from your computer that is assigned to a particular character. CHR$(65), for example, represents the "A" character. But when you enter graphics mode, ASCII codes no longer stand for characters...each code now represents a unique pattern of dots in a single column, seven dots high. For example, the CHR$(65) code prints this dot pattern:

Mapping your image

To program graphics, you must first map your image as a series of dot columns. We'll use a square here as an example:



We've assigned values to each of the grid's seven rows. Whenever a dot appears in a row, add that value for a column total, like this:



Take each column total and add 128. You will use these totals as ASCII codes when you write your graphics program.

Writing the program

You can print your image in either normal density or high density. In normal density, each row of dots in your picture has a horizontal resolution of 60 Dots Per Inch (DPI) and a vertical resolution of 72 DPI. In high density, the vertical resolution stays the same, but each row of dots has a horizontal resolution of 120 DPI. The result? In high density, your image has a darker, denser look.

When you write your graphics program, you must first send a normal density—CHR$(27);"P" command or a high density—CHR$(27);"Q" command. Follow this with the "start graphics"—CHR$(8) command. Once the printer receives this command, any codes which follow are printed as graphic columns. You should follow the graphics command with the values you calculated for your graphic image. The graphics command stays on for only one print line, so if

you have more than one program line containing graphic data, each line should end with a semicolon.

Let's use the values we calculated for the square pattern to create a graphic image.

```
10  OPEN 1,4 :REM OPEN code
20  PRINT#1,CHR$(27);"P" :REM Normal density
25  PRINT#1,CHR$(8); :REM Start graphics
30  PRINT#1,CHR$(255);CHR$(193);
    CHR$(193);CHR$(193); :REM Graphic data
35  PRINT#1,CHR$(193);CHR$(193);
    CHR$(255);CHR$(15) :REM More data and
                        exit graphics
40  CLOSE1 :REM CLOSE code
```

And here's what you get:

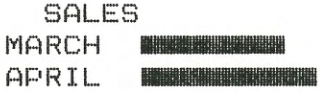
Repeating graphics

The repeat graphics command allows you to repeat a dot pattern across the page. You'll find this useful in creating decorative borders or bar charts. To repeat a column, use the CHR$(26);CHR$(n) command. The "n" represents the number of times (from 1 to 256) you want the column repeated. Follow this command with your graphics value.

Try this example:

```
10  OPEN 1,4  :REM OPEN code
20  PRINT#1," SALES "  :REM Chart title
30  PRINT#1,"MARCH";CHR$(8);CHR$(26);
    CHR$(45);CHR$(255);CHR$(15)
      :REM Bar chart
40  PRINT#1,"APRIL";CHR$(8);
    CHR$(26);CHR$(55);CHR$(255);
    CHR$(15)  :REM Bar chart
50  CLOSE1  :REM Close code
```

Here's the printout:



Miscellaneous

This section covers programming codes not explained in previous sections.

Function Cut Code

Function:	Code:
Set function cut (FCUT)	CHR$(34)

This command converts control codes into printable symbols. This feature is useful when troubleshooting your printer or programs. After you use the CHR$(34) command, all data, including function codes, will be printed out. You must enclose inside quotation marks all the data you want printed.

All non-printing codes will print out in reverse printing. Any non-printing codes with ASCII decimal values from 00 to 31 will be printed as ASCII values 64 to 95. Codes with ASCII decimal values from 128 to 159 will print as ASCII values 192 to 223.

Cancel Function

Function:	Code:
Cancel	CHR$(24)

The cancel command clears any printing features from the printer's memory. If you've set double-width, emphasized, elite printing with an indent and then want to cancel them

all, the CHR$(24) command will do it. This command returns you to these standard settings:

Feature:	Standard setting:
Character size	Pica (10 CPI)
Line spacing	6 Lines Per Inch (LPI)
Character set	Cursor Up mode
Paper sensor	ON
Auto-skip	OFF
Auto line feed	ON or OFF*
Graphics mode	Normal or High-density*
Page length	5.5, 8.5, 11 or 14 inches*
Language set	Slashed zero, unslashed zero, French-Canadian or Spanish*

*Determined by function switch settings.

NOTE: The cancel command won't clear the following functions: page length, top of page location or paper end sensor.

Secondary Address

Function:	Code:
Cursor Up mode (Upper case letters and graphics)	OPEN 1,4,0
Cursor Down mode (Upper and lower case letters)	OPEN 1,4,7
Reset printer	OPEN 1,4,10

On page 20 we explained how to use software commands to enter Cursor Up mode (capital letters and graphic symbols) or Cursor Down mode (upper and lower case letters). As an alternative to this method, you can use a secondary address number in your OPEN statement. If you want to enter Cursor Down mode, add a 7 to your OPEN statement, like this:

```
OPEN 1,4,7
```

NOTE: The first two numbers (1 and 4) serve other programming purposes (see page 20). The 7 is the optional secondary address number.

The reset mode works like the Cancel command described on page 38. It clears the printers memory and erases all previously-set printing features. To reset your printer, use the OPEN 1,4,10 command.

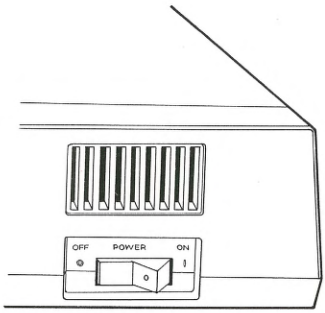
NOTE: Unlike CANCEL, this command resets secondary address, page length, top of page and the paper end sensor setting, returning them all to standard settings.

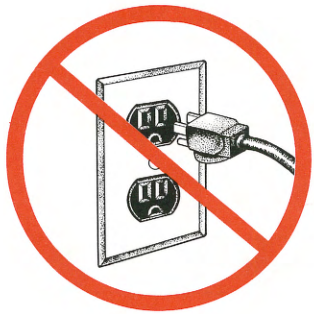
APPENDIX A: INTERNAL SWITCH SETTINGS

If you remove the small panel at the back of your printer, you'll find a set of switches numbered 1 to 8. By turning these switches ON or OFF, you can control features like foreign language character sets, page length and Commodore device numbers. After you set these switches, the printing features you selected will go into effect automatically whenever you turn on your printer.

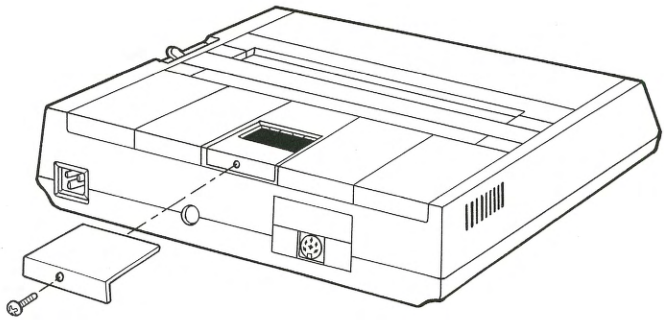
To set the switches:

1) Make sure the printer is OFF and unplugged.

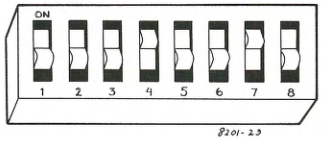




2) Take a phillips-head screwdriver and loosen the screw on the panel located at the back of your printer.



3) Use a fine-tipped tool, like a ballpoint pen, to slide the switches to one of the selections listed here.



Switches 1 and 2 allow you to select one of the printer's four language character sets described on page 29.

Language	Switch 1	Switch 2
Commodore ASCII (Slashed zero)	OFF	OFF
Commodore ASCII (Unslashed zero)	ON	OFF
French Canadian	OFF	ON
Spanish	ON	ON

Switches 3 and 4 set your printer for various page lengths:

Length	Switch 3	Switch 4
5.5 inches	OFF	OFF
8.5 inches	ON	OFF
11 inches	OFF	ON
14 inches	ON	ON

Switches 5 through 7 perform other functions. Switch 8 is not used; it should remain OFF.

Switch	ON Function	OFF Function	Notes
5	Auto LF	No Auto LF	Adds Linefeed after CR.
6	Device #4	Device #5	Sets printer device number. See page 20.
7	Normal	High density	Sets graphics density. See page 34.
8		Factory set	Not used.

APPENDIX B: INTERFACE SPECIFICATIONS

Your printer is sold with an interface cable that connects your printer to your computer. More technically-oriented owners, however, may wish to design their own cable for special needs. The information here will assist the experienced in identifying the printer's configuration and wiring requirements.

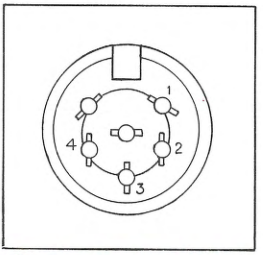
This printer requires a shielded serial interface cable with the following connectors:

Printer end: DIN 6-hole socket TCS 4460-01-1-11 or equivalent

Cable end: DIN 6-pin plug TCS 0566-01-0201 or equivalent

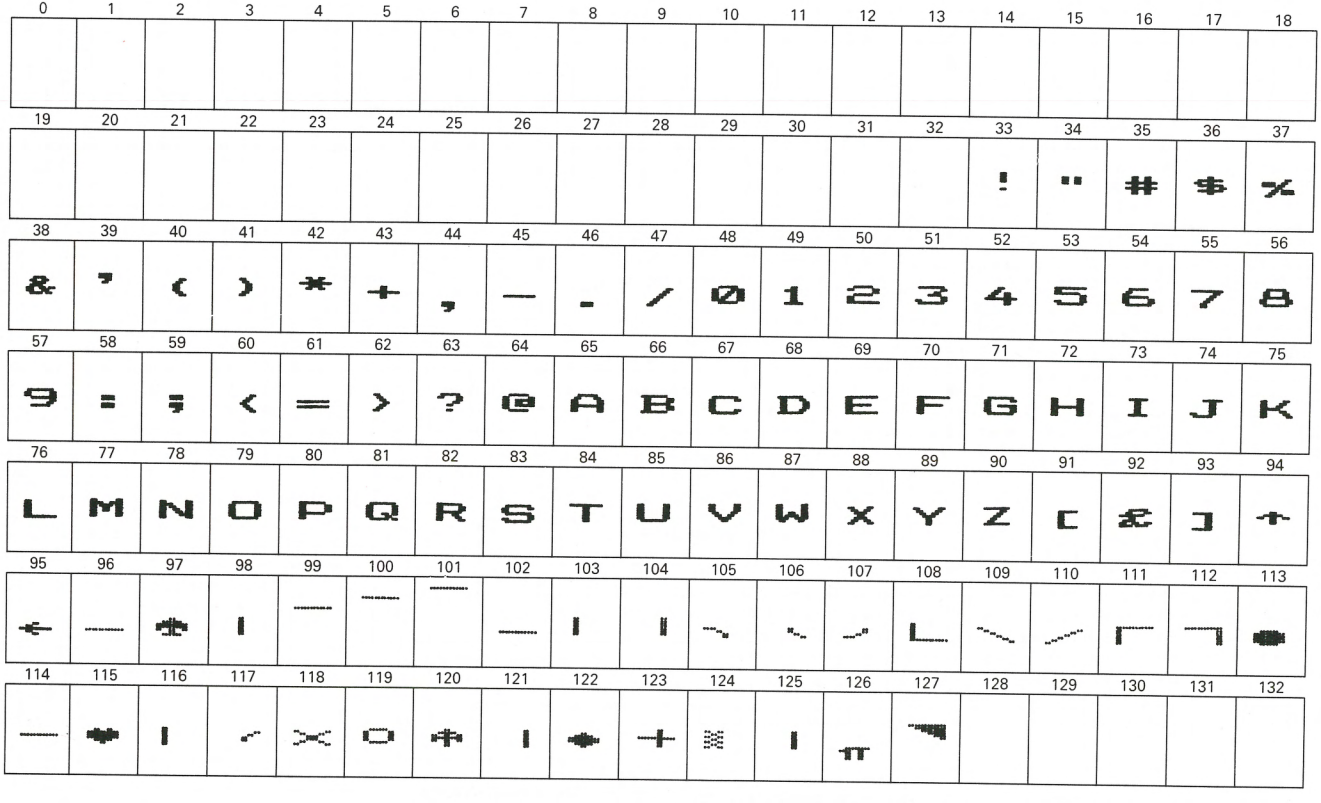
Signals for Serial Pin Assignments

Pin	Direction	Signal	Symbol	Description
1	From printer	Service request	$\overline{\text{SRQ}}$	Not used
2	—	Ground	GND	—
3	Both directions	Attention	ATN	Low: Attention frame High: Print data frame
4	Both directions	Clock	CLK	Data sample timing and data frame end signal
5	Both directions	Data	$\underline{\text{DATA}}$	Receive data and response signal
6	To printer	Reset	RESET	Reset signal to initialize printer

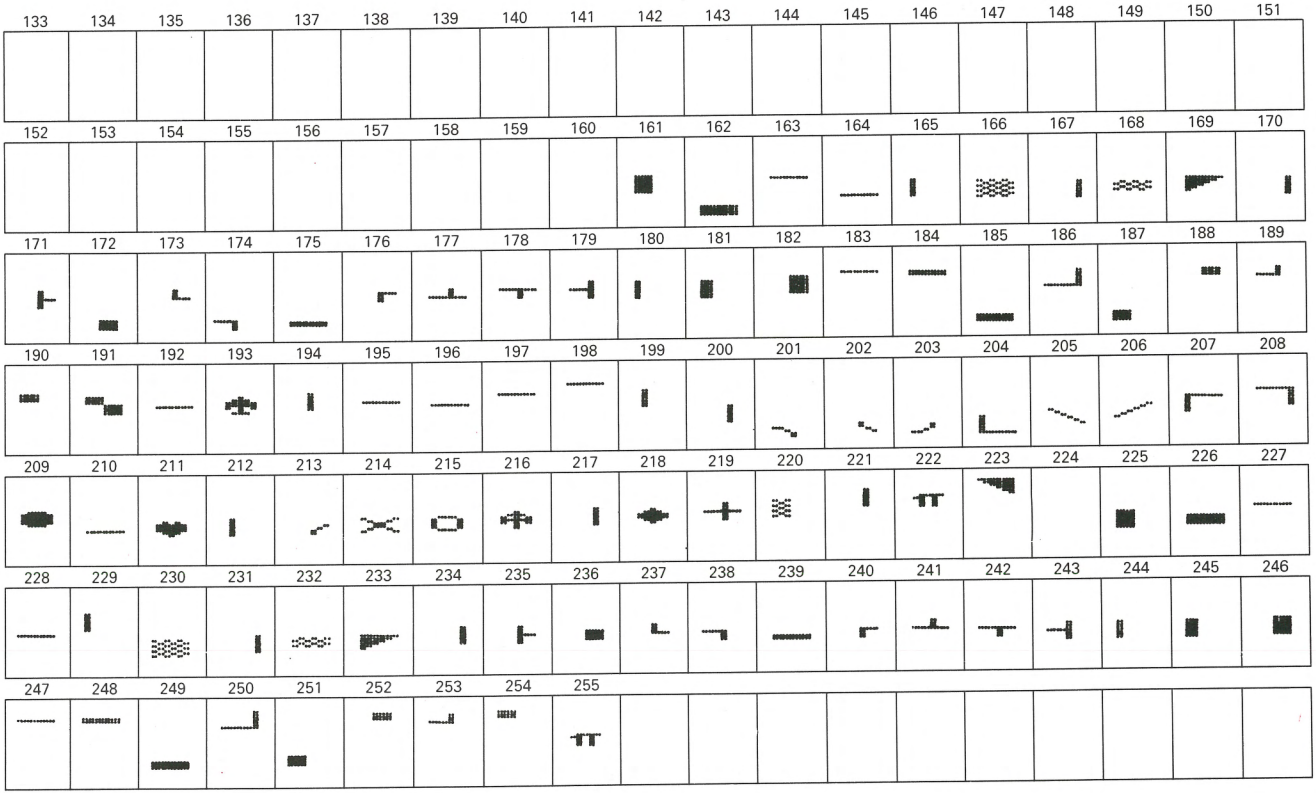


CONNECTOR APPEARANCE

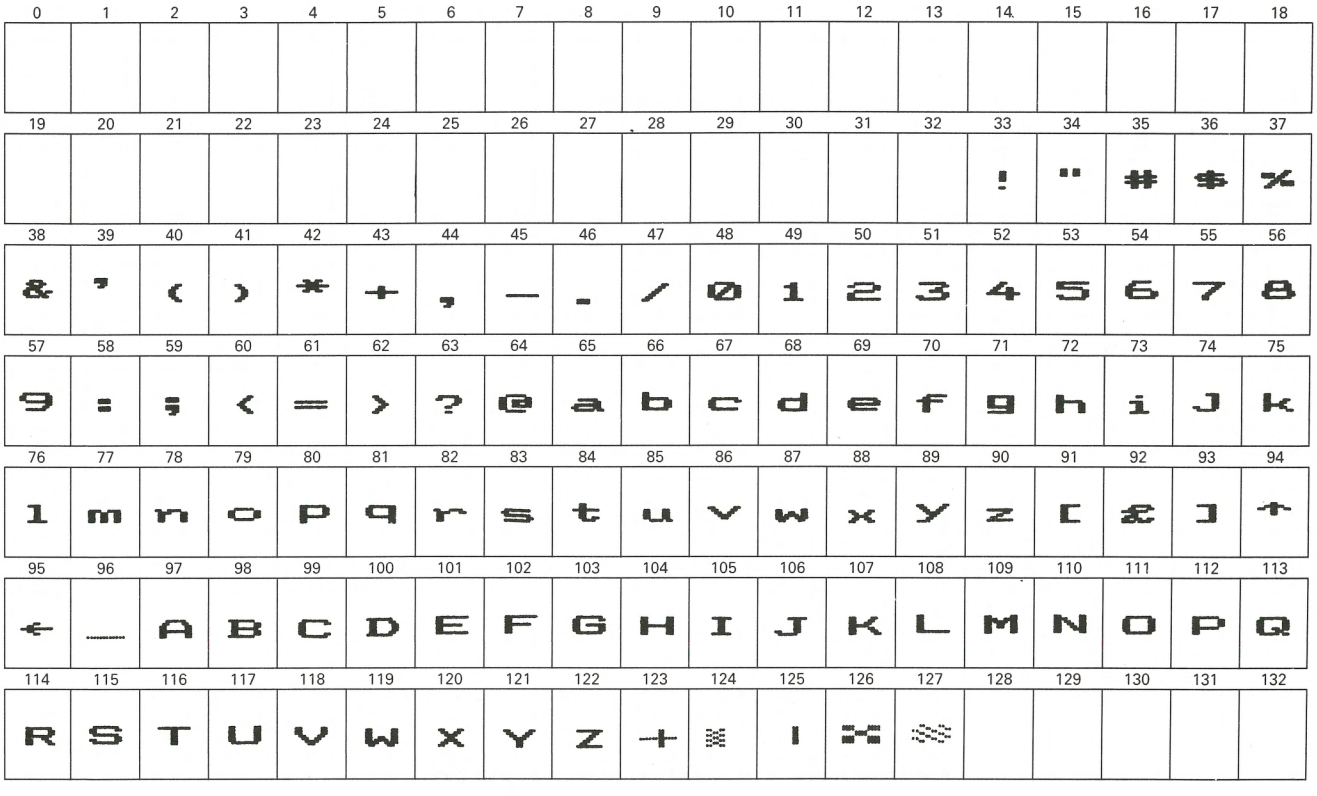
CURSOR UP MODE



CURSOR UP MODE (Continued)



CURSOR DOWN MODE



CURSOR DOWN MODE (Continued)

APPENDIX D: PROGRAMMER'S GUIDE

This chart summarizes the commands described in this handbook's programming section. It includes decimal, hexadecimal, and Commodore ASCII values for each command.

Function	Decimal	Hexadecimal	Commodore ASCII
CHARACTER SIZE Changes the size of printed characters (page 26)			
Pica (10 CPI)	15	0F	SI
Elite (12 CPI)	28	1C	FS
Fine (17.1 CPI)	29	1D	GS
DOUBLE WIDTH CHARACTERS Doubles the width of the current character size (page 26)			
Start double-width	14	0E	SO
Stop double-width	129	81	UNENHANCE
UNDERLINING Underlines all characters (page 27)			
Start underlining	27/67	1B/43	ESC C
Stop underlining	27/68	1B/44	ESC D
SUPER/SUBSCRIPTS Prints small characters above or below the printline (page 27)			
Start subscript	27/76	1B/4C	ESC L
Stop subscript	27/77	1B/4D	ESC M
Start superscript	27/74	1B/4A	ESC J
Stop superscript	27/75	1B/4B	ESC K
ENHANCED/EMPHASIZED Prints boldface-style characters (page 27)			
Start enhanced	27/72	1B/48	ESC H
Start emphasized	27/84	1B/54	ESC T
Stop enhanced/emphasized	27/73	1B/49	ESC I
CHARACTER SETS Selects Commodore or language character sets (page 28)			
Commodore modes:			
Cursor Up	145	91	CURSOR UP
Cursor Down	17	11	DC1
Language features:			
Slashed zero	27/33/64	1B/21/40	ESC ! @
Unslashed zero	27/33/65	1B/21/41	ESC ! A
French-Canadian	27/33/66	1B/21/42	ESC ! B
Spanish	27/33/67	1B/21/43	ESC ! C

Function	Decimal	Hexadecimal	Commodore ASCII
REVERSE PRINT Prints white letters on a black background (page 29)			
Start reverse print	18	12	DC2
Stop reverse print	146	92	RVS OFF
CARRIAGE RETURN (CR) Prints line of data with or without line feed (page 30)			
CR with line feed	13	0D	CR
CR without line feed	141	8D	CR w/o LF
LINE FEED (LF) Advances paper one line (page 30)			
Line feed	10	0A	LF
LINE SPACING Changes the number of lines per inch (page 30)			
6 LPI	27/54	1B/36	ESC 6
8 LPI	27/56	1B/38	ESC 8
Multiples of n/144" LF (n = 0 to 255)	27/10/n	1B/0A/n	ESC LF n
FORM FEED Advances to next page (page 31)			
FF	12	0C	FF
FORM LENGTH Sets form length by lines (page 31)			
Set form length	27/70/nn	1B/46/nn	ESC F nn
SKIP OVER PERFORATION Controls skip over perforation (page 31)			
Start auto-skip	27/65	1B/41	ESC A
Stop auto-skip	27/66	1B/42	ESC B
OVERRIDE PAPER-OUT SENSOR Controls sensor which detects end of paper (page 32)			
Paper sensor OFF	27/69/1	1B/45/01	ESC E 1
Paper sensor ON	27/69/0	1B/45/00	ESC E 0
PRINT START POSITION Starts printing at specific distance from left margin (page 32)			
Set by character column (c1 = tens digit c2 = ones digit)	27/16/c1/c2	1B/10/c1/c2	ESC POS cc
Set by dot	16/d1/d2	10/d1/d2	POS d1 d2
FUNCTION CODE CUT Converts control codes into printable characters (page 38)			
Set function code cut	34	22	FCUT

Function	Decimal	Hexadecimal	Commodore ASCII
CANCEL Resets printer to default settings (page 38)			
Cancel	24	18	CAN
GRAPHICS (page 34)			
Start graphics	8	08	BS
Normal density	27/80	1B/50	ESC P
Graphics density	27/81	1B/51	ESC Q
Repeat graphics	26/n	1A/n	SUB n

SPECIFICATIONS

I. PERFORMANCE

Print speed ..... 120 CPS
Print technique ..... Bidirectional/short line seeking

II. PRINTING

Dot matrix, standard characters ..... 9 × 9
Characters per line ..... 80 at 10 CPI
96 at 12 CPI
137 at 17.1 CPI

III. MEDIA

Number of sheets ..... 1 to 4
Maximum paper width ..... Roll paper: 8.5 inches
Pin feed: 10.5 inches
Tractor feed: 10.5 inches
Paper weight ..... 16 to 24 pounds
Paper path ..... bottom or top
Ribbon ..... cartridge load

IV. RELIABILITY

Mean time between failures ..... 4000 hours
Mean time to repair ..... 15 minutes
Printhead life ..... 200 million characters

V. ELECTRICAL CHARACTERISTICS

Voltage ..... 120V AC ±10 %

For Customer Service,
call 1-800-OKIDATA

(In New Jersey, call 609-235-2600
and ask for Customer Service)

Specifications subject to change without notice

FEDERAL COMMUNICATIONS COMMISSION

Radic Frequency Interference Statement Class B

WARNING: This equipment complies with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules. These specifications are designed to minimize radio frequency interference in a residential installation; however, there is no guarantee that radio or television interference will not occur in any particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on when the radio or television is on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient the radio or television receiving antenna.
- Relocate the printer with respect to the receiver.
- Move the printer away from the receiver.
- Plug the printer into a different outlet so that printer and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful:

"How to Identify and Resolve Radio-TV Interference Problems".

This booklet is available from the U.S. Government Printing Office, Washington, DC 20402 by ordering Stock Number 004-000-00345-4.

OKIDATA

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Printed in USA

NO POSTAGE
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BUSINESS REPLY MAIL
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OKIDATA®
532 Fellowship Road
Mt. Laurel, New Jersey 08054
Attn: Marketing Services Department

OKIDATA 120

58023902

CONGRATULATIONS!

Your new OKIDATA printer is a precision, quality product, which will give you years of reliable service. OKIDATA is pleased to add you to our growing list of customers and we are proud that you selected this OKIDATA product.

OKIDATA 120
WARRANTY REGISTRATION CARD

Fill out the information requested below and mail it within 15 days of purchasing your OKIDATA printer to register your printer.

Printer Serial No. _____

Model: OKIDATA 120

Your Name _____

Address _____

City/State _____ Zip _____

Your Company _____
(If for business use)

Co. Address _____

City/State _____ Zip _____

Date Purchased _____

Purchased From _____

Address _____

City/State _____ Zip _____

1. What type of business did you purchase your printer from?
   - 1-1 ___ Computer store
   - 1-2 ___ Department store
   - 1-3 ___ Mail order
   - 1-4 ___ Distributor
   - 1-5 ___ Other _____

2. Why did you purchase an OKIDATA printer?
   - 2-1 ___ Print Quality
   - 2-2 ___ Reliability
   - 2-3 ___ Versatility
   - 2-4 ___ 200 Million character Printhead
   - 2-5 ___ Speed
   - 2-6 ___ Price
   - 2-7 ___ Compatibility
   - 2-8 ___ Other _____

3. Where did you hear about OKIDATA printers?
   - 3-1 ___ Advertisement
   - 3-2 ___ Catalog or literature
   - 3-3 ___ Magazine article or review
   - 3-4 ___ Demonstration in store
   - 3-5 ___ Recommendation of a friend
   - 3-6 ___ Other _____

4. Where will the printer be used?
   - 4-1 ___ Professional use . . . office
   - 4-2 ___ Personal use . . . home
   - 4-3 ___ Educational purposes . . . school
   - 4-4 ___ Other _____

5. How will the printer be used?
   - 5-1 ___ General D.P. printing
   - 5-2 ___ Letters, Correspondence
   - 5-3 ___ Personal Accounting
   - 5-4 ___ Graphics

6. What computer are you using it with?
   - Make _____
   - Model _____
   - Date Purchased _____

7. How many ribbons do you plan to purchase in the next year? _____

8. Where would you purchase your ribbons?
   - 8-1 ___ Computer store
   - 8-2 ___ Department store
   - 8-3 ___ Mail order
   - 8-4 ___ Distributor
   - 8-5 ___ Office supply store
   - 8-6 ___ Other _____

9. Personal information (Optional)

   Age Group
   - 9-1 ___ 20 to 35
   - 9-2 ___ 36 to 45
   - 9-3 ___ 45 and over

   Sex
   - 9-4 ___ Male
   - 9-5 ___ Female

   Education
   - 9-6 ___ Advanced Degree
   - 9-7 ___ College
   - 9-8 ___ High School
   - 9-9 ___ Other _____

   Occupation
   - 9-10 ___ Engineer
   - 9-11 ___ Educator
   - 9-12 ___ Professional
   - 9-13 ___ Programmer
   - 9-14 ___ Business Owner
   - 9-15 ___ Student
   - 9-16 ___ Other _____

LIMITED WARRANTY

OKIDATA, Division of Oki America, Inc. (OKIDATA) warrants this OKIDATA 120 printer to be free from defect in material and workmanship and will remedy any such defect according to the terms of this *Limited Warranty.* This *Limited Warranty* does not extend to consumable items, including but not limited to ribbons, fuses, etc.

OKIDATA will repair (or at its option, replace) at no charge, any defective component(s) of the PRINTER for one (1) year from the date of purchase. This *Limited Warranty* extends to the original purchaser only.

To make request or claim for service under this *Limited Warranty*, the original purchaser must return the OKIDATA product, shipping prepaid, in the original shipping container or equivalent, to OKIDATA or an authorized OKIDATA service center and assume the risk of loss or damage in transit. A written receipt for the product, showing the date of purchase, dealer's name, and both the model and serial numbers of the OKIDATA product must accompany *any* request or claim for work to be performed under this *Limited Warranty.*

This *Limited Warranty* shall not apply if the product has been damaged due to abuse, misuse, misapplication, accident, or as a result of service or modification by any other than an authorized OKIDATA service center.

THERE ARE NO EXPRESS WARRANTIES OTHER THAN THOSE ON THE FACE HEREOF AND DESCRIBED ABOVE. NO WARRANTIES WHETHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, SHALL EXTEND BEYOND THE RESPECTIVE WARRANTY PERIOD DESCRIBED ABOVE OF ONE (1) YEAR. Some states do not allow limitations or how long an implied warranty lasts, so the above limitation may not apply to you.

OKIDATA SHALL NOT BE RESPONSIBLE OR LIABLE FOR ANY SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES OR LOSS ARISING FROM THE USE OF THIS PRODUCT. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above exclusion may not apply to you.

This *Limited Warranty* applies to OKIDATA 120 PRINTERS sold in the continental United States. Additional information on obtaining service under this *Limited Warranty* is available by contacting the OKIDATA dealer from whom the product was purchased, by contacting OKIDATA directly at 1-800-OKIDATA, or one of the service centers as listed below.

OKIDATA SERVICE CENTERS

East	Central	West
111 Gaither Drive Mt. Laurel, NJ 08054 Attn: Field Service Dept. (609) 235-2600	1155-A W. Dundee Road Arlington Heights, IL 60004 Attn: Field Service Dept. (312) 253-8055	843 Auburn Court Fremont, CA 94536 Attn: Field Service Dept. (415) 657-0600

This *Limited Warranty* applies to all OKIDATA 120 PRINTERS. However, the procedure for obtaining service may vary outside the continental United States. Contact your OKIDATA dealer for warranty service information.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.