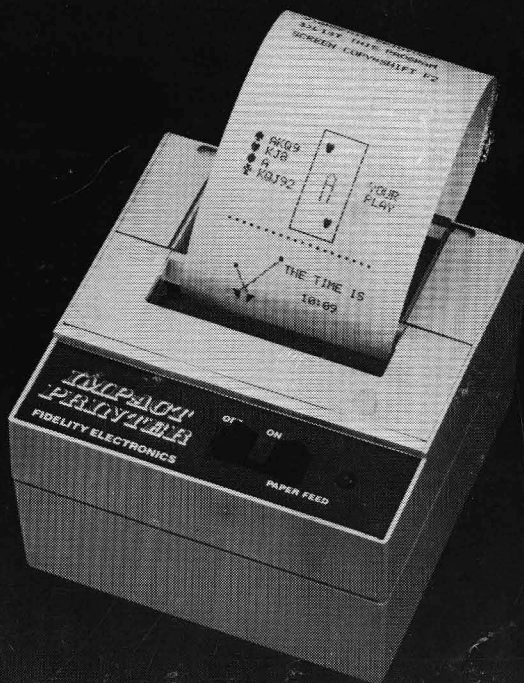


**OWNER'S MANUAL
INSTRUCTION BOOKLET**

IMPACT PRINTER

SELECTABLE 24, 32, or 40 COLUMN FORMAT



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OWNERS MANUAL FOR THE IMPACT PRINTER
by Fidelity Electronics, Ltd.
for use with the Commodore 64 and VIC 20 computer.

SECTION I

PREPARING TO USE YOUR FIDELITY PRINTER

1. Installation

Please follow the precautions listed below when setting up your printer. They are designed to help you keep your printer working at its best.

*Place your printer on a flat hard surface, like a tabletop.

*Keep your printer out of direct sunlight.

2. Installing the Cartridge Ribbon



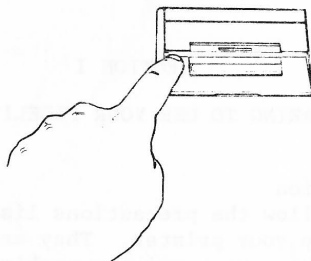
A cartridge ribbon is used in the Printer. When printing becomes faint or difficult to see, you should replace the cartridge.

NOTE: If the printer is used infrequently, the print impression sometimes becomes weak because the ribbon dries out. If the printed material is difficult to read and you suspect this is the cause of the problem, advance to a properly inked portion of the ribbon by pressing the POWER switch into the PAPER FEED position.

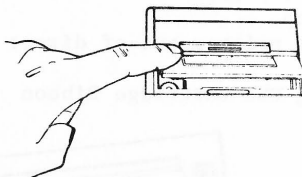
To install the cartridge:

- a. Press the POWER switch into the OFF position.
- b. Push down on the left side of print mechanism cover and remove cover:

Four small grooves are embossed on the printer cover. With the index finger of your left hand, push gently on these grooves (see figure 1).



The printer cover will tilt:



When the printer cover is tilted up to a near-vertical position, you may lift it completely off.

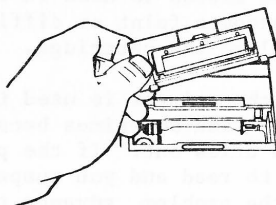


FIGURE 1. Removing The Printer Cover

- c. Push down on the right side of ribbon cartridge (marked "PUSH") and remove cartridge (see figure 2).

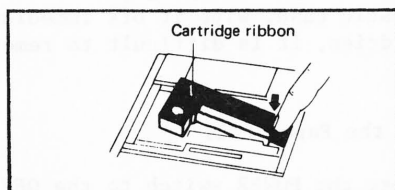


FIGURE 2. Removing Cartridge

- d. Install cartridge (see figure 3). Be sure the cartridge is inserted firmly to prevent weak or irregular printing. The cartridge must be properly seated and aligned for best printing.
- e. Turn the cartridge "knob" (marked by an arrow) clockwise to stretch the ribbon (see figure 4).

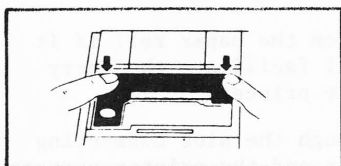


FIGURE 3

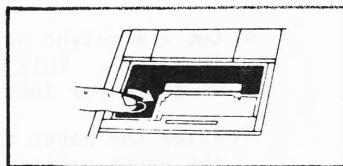
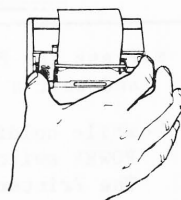


FIGURE 4

- f. Replace the cover.
- g. Replace the paper.

You may also insert the ribbon cartridge if paper is already in the printer.

Holding the ribbon as shown, slide it over the paper and into the printer compartment. Be sure the paper goes between the ribbon cartridge and the ink ribbon.

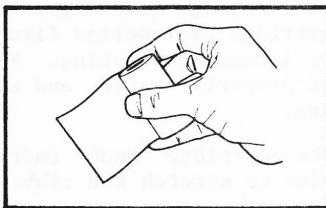


NOTE: If you get ribbon ink on the printer

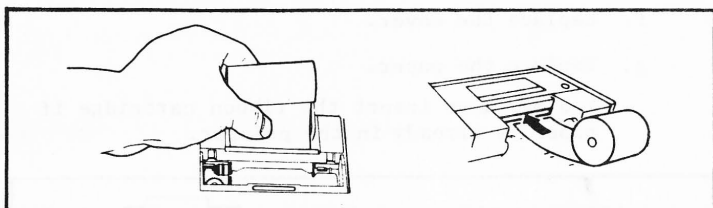
plastic case, wipe it off immediately. Once it dries, it is difficult to remove.

3. Inserting the Paper Roll

- a. Press the POWER switch to the OFF position.
- b. Unroll several inches of the paper:

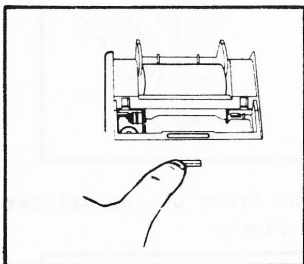


- c. Cut a straight edge on the paper roll if it is jagged. This will facilitate the entry of the paper into the printer.
- d. Slide the paper through the slot connecting the paper compartment and the printer compartment. You can slide it in about one-quarter inch before it stops:

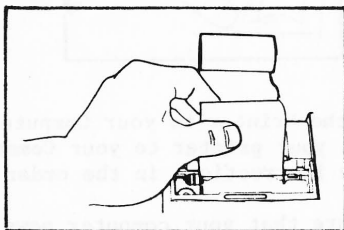


- e. Press the POWER switch to the ON position and wait a few seconds.
- f. While holding the paper in place, press the POWER switch to the PAPER FEED position. The Printer will activate, and a rubber roller will pull the paper into the printer compartment. Hold the switch in the PAPER FEED position until the paper emerges from

the top of the Printer mechanism. When an inch of paper has emerged, release the switch from the FEED position.



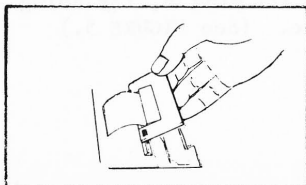
g. Now pull the paper through the printer, until several inches are exposed:



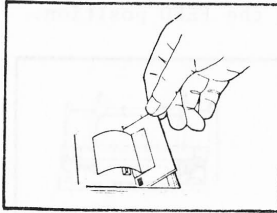
NOTE: To remove the paper from the Printer, cut the paper with a pair of scissors on the compartment side of the printer, then pull the paper forward through the print mechanism (POWER switch should be OFF). NEVER ATTEMPT TO PULL PAPER OUT OF THE PRINTER BACKWARDS OR FROM THE PAPER ROLL!

4. Replacing the printer cover

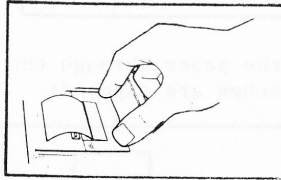
a. Slide the paper through the slot in the printer cover:



- b. Push the back of the printer cover down and into place:



- c. Press the front of the printer cover down to lock in place.



5. Connecting the Printer to your Computer

To connect your printer to your Commodore computer, follow the instructions in the order listed below.

- a. Make sure that your computer power is ON and that the Printer power is OFF.
- b. Plug the end of the Printer Cable into the Computer's Serial Port connector located in the back of your computer. This cable is "keyed" so that you cannot plug the cable in the wrong way. This means that the pins should be positioned so that a slight pressure will seat the cable properly. You should not have to force the pins in, for doing so could damage the cable. (See FIGURE 5.)

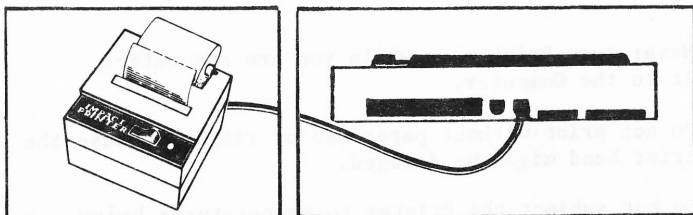


FIGURE 5.

- C. Now plug the printer's power cord into a standard AC wall outlet. DO NOT TURN THE PRINTER ON YET.

6. Performing the Printer Self-Test

- a. Assure ON-OFF switch into the FEED position.
- b. Plug in power source to printer.
- c. Depress ON-OFF switch until it reaches paper feed position.
- d. Hold switch in paper feed position until LED light goes on and printer starts to operate. Release switch.
- e. There are two ways to stop the printer.
 - 1) Turn ON-OFF switch to OFF position during printing operation. WAIT ABOUT 3 SECONDS and depress ON-OFF switch to ON position. Printer is now ready.
 - 2) Allow printing to continue until it stops automatically.

CAUTIONS

WAIT AT LEAST THREE SECONDS to turn on the power after it is turned OFF, otherwise the printer will not be initialized properly.

Never place the Printer where it is exposed to direct sunlight.

Never turn Printer on while you are connecting it to the Computer.

Do not print without paper and/or ribbon because the print head might be damaged.

Do not subject the Printer to temperatures below 40°F (5°C) or above 100°F (40°C) during operation. Avoid sudden, severe changes in temperature.

Regarding printing duty:

In graphic mode and reverse field printing, using patterns with too much dot density will wear out the print head faster. We recommend that you use patterns in which dot density is equal to that of ordinary alphanumerics. The continuous printing of high dot density patterns may adversely affect the longevity of the print head.

POWER UP PROCEDURE

With the POWER switch in the OFF position, the cable connected to the serial bus port of the VIC-20 or the Commodore 64 (directly or indirectly through other serial bus devices) and the Printer Power cord connected:

1. Power up other Serial Bus peripherals.
2. Power up VIC-20 or Commodore 64 and wait for READY on screen.
3. Push printer power switch to the center ON position. The LED should turn on and within 3 seconds "READY" should start to print on the roll paper. (Should the LED light not go on or "READY" not appear printed within 5 seconds, push power switch to OFF and wait 3 seconds, then repeat step 3.)
4. If during operation a DEVICE NOT PRESENT error is displayed on the screen with deference to the printer, then push the power switch to OFF for 3 seconds and go to step 3.)

SECTION II

USING YOUR FIDELITY PRINTER

1. Introduction

Having learned how to insert the ribbon cartridge and paper into your printer, how to connect the printer to the Commodore computer, and how to test your printer, you are now ready to use the Impact Printer. Your printer does a lot more than just print the information you send to it. It has its own internal microprocessor (computer) which permits it to be quite versatile in its operation. You will learn the special commands the printer understands in the last half of this section, but first you must become familiar with how your Commodore computer "talks" to other devices such as a printer.

Before you go any further in this manual, make sure you are able to do the following:

- a. Operate your Commodore computer.
- b. Write simple programs in BASIC.
- c. OPEN and CLOSE files.

If you are not familiar with any of the above procedures, study your computer's user manual for the information you need.

2. Special Printer - Associated BASIC language commands

The Open Command

This command creates a correspondence between a file number and a physical device. The file number may be any number from 1 to 255, as long as you keep the same number throughout the program. The device number refers to the device (disc drive, printer, etc.) to which you send the file. Normally, there is only one device number which is

referred to as the primary address. Some devices will accept additional numbers (separated by a comma) following the primary address.

The Impact Printer recognizes either 4 or 5 as its primary address. There are two additional numbers after the primary address that it recognizes, 0 and 7:

- 0 : Selects "cursor up" (upper case and graphic) mode.
- 7 : Selects "cursor down" (upper / lower case) mode.

NOTE: If neither 0 nor 7 is used in the OPEN statement, the printer assumes 0 upper case and graphic mode.

Example OPEN statements:

```
OPEN 4,4          (same as OPEN 4,4,0)
OPEN 36,5,7
OPEN 3,4,0
```

The CMD Command

The CMD command changes control from the computer TV screen to the printer. The file number used with this command must be the same as the one you chose for the OPEN command. If you attempt to use this command without having previously used the OPEN command, you will see the FILE NOT OPEN error message appear on your screen. The device given the CMD command is said to be "listening". That means that once you give the CMD command, your printer will print READY and it will be open and waiting for further commands. At this point, any PRINT or LIST command will go directly to the printer as output.

Example CMD statements:

```
CMD 4
CMD 36
CMD 3
```

The Print # Command

The Print # command works just like the basic command PRINT, except that it directs its output to devices other than the video screen. Please note that unlike the standard PRINT statement you cannot abbreviate with a "?". You must always type PRINT# in full, and without a space before the #. After the "#" you must place the device number corresponding to a previous OPEN statement and then a comma and finally the information you wish to send to the printer.

Example: Print #4, "HELLO"
Print #36, CHR\$ (152)

The Close Command

You should always CLOSE a file after you have printed from it. The reason is that you can only have a maximum of 10 files open at any one time. Therefore, if you make a habit of closing files when you have finished with them, you will always have the maximum number of files available.

NOTE: Since the CMD command does not close the line of communication to the printer, you must always follow a PRINT# command with the CLOSE command to properly close a file.

Example Close commands

CLOSE 4
CLOSE 36

Examples using all of the previously described commands

OPEN 4, 4
PRINT #4, "HELLO WORLD"
CLOSE 4

OPEN 36,5
CMD 36
LIST
PRINT #36: CLOSE 36

2. Printing in the Direct Mode

The DIRECT mode is a feature of the BASIC computer language which permits you to communicate with your printer by entering commands DIRECTLY from the keyboard.

The following example shows the use of the DIRECT mode. In the example, a one line BASIC program is stored in memory. A file is then OPENed for output to the printer address 5. The printer is told to "listen" with the CMD command. The file (a one line program in this case) is LISTED. The output channel is then properly closed using the PRINT# followed by the CLOSE command.

NOTE: When typing in this example (and all others) you must press RETURN at the end of each line.

<u>You Type:</u>	<u>The Screen Displays:</u>	<u>The Printer Prints:</u>
------------------	-----------------------------	----------------------------

10 PRINT"CHECK"	10 PRINT"CHECK"	
OPEN 4,5	OPEN 4,5	
	READY	
CMD 4	CMD 4	READY
LIST	LIST	10 PRINT"CHECK"
PRINT#4	PRINT#4	READY
CLOSE 4	CLOSE 4	
	READY,	

3. Printing Under Program Control

Now that you have seen how to control the printer directly from the keyboard, it's time to control the printer from within a BASIC program. The short BASIC example below would already be in the computer's memory. It could have been placed there from the keyboard, a cassette tape, or a floppy disk.

```
10 OPEN 4,5
20 CMD4
30 PRINT"PROGRAM CONTROL
   EXAMPLE"
40 LIST
```

The RUN command is given and the resulting printout is shown here:

PROGRAM CONTROL EXAMPLE

```
10 OPEN 4,5
20 CMD4
30 PRINT"PROGRAM CONTROL
   EXAMPLE"
40 LIST
```

REMEMBER THIS! When using the LIST command within a program execution, you must type the PRINT # command to close the channel. Then type the CLOSE command to close the file after you have finished running the file. Although this works, it is NOT good programming practice. It is suggested that you only use the CMD command in DIRECT mode.

4. Printing Modes and Control Codes

You can also use your printer and the PRINT#, CMD and PRINT commands in conjunction with CHR\$ codes to do the following:

DESCRIPTION	INPUT CODE
Line Feed Spacing.....	CHR\$(8)
Line Feed After Printing.....	CHR\$(10)
Carriage Return.....	CHR\$(13)
Enter Standard Character Mode.....	CHR\$(15)
Tab Setting the Print Head.....	CHR\$(16)
Enter Cursor Down Mode.....	CHR\$(17)
Start Reverse Field.....	CHR\$(18)
Back Space.....	CHR\$(20)
32 Column Plus Adjustment.....	CHR\$(129)
32 Column Minus Adjustment.....	CHR\$(130)
40 Column Plus Adjustment.....	CHR\$(131)
40 Column Minus Adjustment.....	CHR\$(132)
Shift Carriage Return.....	CHR\$(141)
Enter Cursor Up Mode.....	CHR\$(145)
Turn OFF Reverse Field.....	CHR\$(146)
DEFINE Custom Character.....	CHR\$(149)
Print Custom Character.....	CHR\$(150)
24 Column.....	CHR\$(151)
32 Column.....	CHR\$(152)
40 Column.....	CHR\$(153)
Bit Mapped Graphics.....	CHR\$(154)
Double Height.....	CHR\$(155)

4.1 CHR\$(8) Line Feed Spacing

Linefeeds are executed in accordance with the print mode in effect just prior to the execution of a PRINT command. This means that if a CHR\$(8) is sent anywhere on a print line, the printer will not put any space between that line and the next. If a CHR\$(8) is not on a print line, the normal space between lines will be printed.

```
10 OPEN#1,4:BS$=CHR$(8)
20 PRINT#11," "BS$
30 PRINT#11," | "BS$
40 PRINT#11," | "BS$
50 PRINT#11," | "BS$
60 PRINT#11," | "BS$
70 CLOSE#1
```

RUN:

4.2. CHR\$(10) and CHR\$(13)

Linefeed, which is CHR\$(10) is treated identically by the printer as carriage return, CHR\$(13). This means that either code forces an immediate printing of the printer's memory. If the printer receives more characters than it can print on a line, it will automatically print its memory and then clear it and await more information.

4.3. CHR\$(15) Enter Standard Character Mode

Upon receipt of this code, the printer will clear the effects of having received any previous CHR\$(8) or CHR\$(18) control codes.

4.4 CHR\$(16) Tab Setting The Print Head

With the CHR\$(16) code you can determine the print start position. This is done by assigning a 2-digit number following the CHR\$(16) (see the examples below).

Example 1:

```
10 OPEN4,4
20 PRINT#4,"0123456789";
30 PRINT#4,"012345678901
23"
40 PRINT#4
50 PRINT#4,CHR$(16)CHR$(
48)CHR$(52)"IMPACT";
60 PRINT#4,CHR$(16)CHR$(
49)CHR$(54)"PRINTER"
70 CLOSE4
```

RUN:

012345678901234567890123

IMPACT

PRINTER

Example 2:

```
10 OPEN4,4
20 PRINT#4,"0123456789";
30 PRINT#4,"012345678901
23"
40 PRINT#4
50 PRINT#4,CHR$(16)"04IM
PACT";
60 PRINT#4,CHR$(16)"16PR
INTER"
70 CLOSE4
```

RUN:

012345678901234567890123

IMPACT

PRINTER

4.5 CHR\$(17) Enter Cursor Down Mode

By using the CHR\$(17) code you have selected the Cursor Down character mode. This means that the printer will now print using its second character set. The second character set has lower case letters in addition to upper case letters. It also has a limited graphic character set. You may also select the upper/lower case character set by following your primary device address in the OPEN statement with a 7. If you are going to switch the printer to upper/lower case with the intention of leaving it in that mode, it would be easier to use this latter method of OPENing the device. If on the other hand the switching of character sets was to be temporary, then the CHR\$(17) method would be better.

Example 1:

```
10 OPEN4,4
20 PRINT#4,CHR$(17)"PERS
ONAL COMPUTER"
30 PRINT#4,CHR$(145)"PER
SONAL COMPUTER"
40 CLOSE4
```

RUN

personal computer
PERSONAL COMPUTER

```

RUN:
character set 2

```

00	@@	PP		rr	—	PP
!!	11	aa			BB	RR
22	bb	rr		rr	BB	RR
##	33	cc	==	rr	CC	SS
44	dd	tt		rr	CC	TT
\$\$	55	dd		rr	EE	UU
%%	66	ff		rr	FF	VV
&&	77	gg			GG	WW
<<	88	hh	==		HH	XX
>>	99	ii	///		II	JJ
**		jj	zz	\\	JJ	ZZ
++		kk	[[tt	KK	++
--		ll	mm	ll	LL	mm
==		nn	nn	rr	NN	==
??		oo	oo	rr	OO	??
..		pp	pp	rr	PP	..

(18) Start Reverse Field

By selecting the CHR\$(18) you have turned on Reverse Field printing mode. This prints white letters on a dark background. Do not print more than three reverse field lines. Also, do not print more than a few empty spaces in reverse field. If these precautions are not adhered to, the printer may become overloaded and stop printing.

一、關於我國經濟建設的方針
 二、關於我國經濟建設的步驟
 三、關於我國經濟建設的組織
 四、關於我國經濟建設的資金
 五、關於我國經濟建設的技術
 六、關於我國經濟建設的勞動力
 七、關於我國經濟建設的物資
 八、關於我國經濟建設的市場
 九、關於我國經濟建設的對外經濟關係
 十、關於我國經濟建設的總結

```
10 OPEN#9,4
20 PRINT#9,CHR$(18)" PER
SONAL COMPUTER"
30 PRINT#9,CHR$(18)" IMP
ACT PRINTER"
40 CMD9:LIST
```

NOTE: Use of this feature while printing in 32 or 40 column mode may produce distorted characters on that line.

4.7 CHR\$(20) Back Space

Upon receipt of this character, the printer erases the last previously received character. This is useful in correcting typing errors. The following simple typewriter program demonstrates this feature. Type in the program and then type RUN. The screen will clear. Now type something on the screen and make an error. Use the DELETE key to correct your error. Press RETURN and your corrected line will appear on the printer. If you type more characters than the printer can print on a line, the printer will automatically start printing. You must wait until the printer is finished before typing in more characters. If you wish to type in lower case, then switch your computer to that mode by holding the SHIFT key and pressing the Commodore key. To switch the printer, simply press (↓) cursor down.

MINI-TYPEWRITER PROGRAM

```
10 PRINT CHR$(147)
20 OPEN#4,4
30 GET X$
40 IF X$="" THEN 30
50 PRINTX$;
60 PRINT#4,X$;
70 GOTO 30
```

4.8 Setting or Changing Column Width

An interesting feature of the Impact Printer is its ability to change from 24 to 32 to 40 column printing. The denser the printing the poorer the quality of printing will be. If you want the highest quality printing, then you should leave the printer in 24 column mode.

The normal way of selecting the three different column widths is by sending:

```
CHR$(151) for 24 columns per line
CHR$(152) for 32 columns per line
CHR$(153) for 40 columns per line
```

Since the 32 and especially 40 column printing is so dense, these modes use the maximum capability of

the printer mechanism. Since this capability may vary from printer to printer, you may be able to improve your printers 32 or 40 column printing ability. This can be done by sending a different control code and comparing the printouts. Normally the recommended CHR\$(152) for 32 column and CHR\$(153) for 40 column will be the best.

The other alternate control codes are:

32 columns: CHR\$(129) or CHR\$(130)

40 columns: CHR\$(131) or CHR\$(132)

Example:

```
THIS IS 24 COLUMN PRINTING
THIS IS 32 COLUMN PRINTING - CHR$(152)
THIS IS 32 COLUMN PRINTING - CHR$(129)
THIS IS 32 COLUMN PRINTING - CHR$(130)
THIS IS 40 COLUMN PRINTING - CHR$(153)
THIS IS 40 COLUMN PRINTING - CHR$(131)
THIS IS 40 COLUMN PRINTING - CHR$(132)
THIS IS 24 COLUMN PRINTING
```

```
10 OPEN#4,4
20 PRINT#4,CHR$(151)"THIS IS 24
   COLUMN PRINTING"
30 PRINT#4,CHR$(152)"THIS IS 32
   COLUMN PRINTING - CHR$(152)"
40 PRINT#4,CHR$(129)"THIS IS 32
   COLUMN PRINTING - CHR$(129)"
50 PRINT#4,CHR$(130)"THIS IS 32
   COLUMN PRINTING - CHR$(130)"
60 PRINT#4,CHR$(153)"THIS IS 40
   COLUMN PRINTING - CHR$(153)"
70 PRINT#4,CHR$(131)"THIS IS 40
   COLUMN PRINTING - CHR$(131)"
80 PRINT#4,CHR$(132)"THIS IS 40
   COLUMN PRINTING - CHR$(132)"
90 PRINT#4,CHR$(151)"THIS IS 24
   COLUMN PRINTING"
100 PRINT#4,CHR$(152);
110 CMD4:LIST
```

4.9 CHR\$(145) Enter Cursor Up Mode

By using the CHR\$(145) code you have selected the CURSOR UP character mode. Like the standard character


```

40 PRINT#4,OFF$ " FIDELIT
Y "RVS$" ELECTRONICS "
50 PRINT#4,RVS$ " FIDELIT
Y "OFF$" ELECTRONICS "
60 CLOSE4

```

RUN

```

ELECTRONICS
FIDELIT
ELECTRONICS

```

4.11 CHR\$(149) Define Custom Character

By using CHR\$(149) you enter the Custom Character mode. This allows you to design and print your own 6 x 8 character by inputting data. A DATA statement is made of numbers that represent a row of dots which when READ all together, will make up your character. To design your character, follow the example below. You should notice that each number in the DATA statement corresponds to 1 row in your character. To design a character, follow these steps:

1. Get a separate piece of paper to design your character.
2. Number 8 consecutive rows like this:

```

1
2
4
8
16
32
64
128

```

3. Now design your character in dot form (see the example below).
4. Add together all the numbers from the column on the left, only wherever you have placed a dot in a row. In our example, the first column has 3 dots located in rows 4, 8, 16. Added together they equal 28.

5. Put your final total for each column into a data statement in column order.

1			●	●		
2		●			●	●
4	●				●	
8	●					
16	●				●	
32		●			●	●
64			●	●		
128						
	28	34	65	65	54	34

The DATA statement in your program will read:

DATA 28, 34, 65, 65, 54, 34

The next step is to tell the printer your newly designed character. To do this you must send a CHR\$(149) followed by the six numbers you computed above. Here is an example of how this can be done.

Example: (Type NEW before starting to type in example)

```

10 DATA 28,34,65,65,54,34
20 OPEN#4
30 PRINT#4,CHR$(149);
40 FOR I=1 TO 6
50 READ A
60 PRINT#4,CHR$(A);
70 NEXT
80 CLOSE#4

```

After typing RUN, your custom character will be stored in the Impact Printer's memory. It will retain this information until the printer is switched off or until you write over the data by defining a different character.

To print your newly designed character, simply send a CHR\$(150) to the printer.

4.12 CHR\$(150) Printing a Custom Character

Assuming you have followed the procedure for designing

a custom character and RUN the example in the previous section, you may print your custom character by sending CHR\$(150). You may repeatedly print this character as often as you want.

Example: (Type NEW before starting to type in example)

```
10 OPEN#4,4
20 FOR I=1 TO 3
30 PRINT#4,CHR$(150)" CO
MMODORE "CHR$(150)
40 NEXT
50 CLOSE#4
```

RUN

```
C COMODORE C
C COMODORE C
C COMODORE C
```

4.13 CHR\$(154) Bit Mapped Graphics

The mechanism used in the Impact Printer prints one line of dots across at a time. This means that when it prints one line of characters it has actually printed ten lines of dots where the first eight lines make up the character and the last two line are blank for the space between character lines. By using the CHR\$(154) control code, you can tell the printer which dots to print for one whole dot line. Since there are 144 dots per dot line, you must follow the CHR\$(154) control code with 144 bits of information. For every place there is a one in the 144 bit pattern you send, the printer will print a dot. Rather than receive one bit at a time the printer expects to receive the information eight bits at a time. This means that after receiving a CHR\$(154) the next eighteen 8 bit characters it receives will be printed as dots to form one dot line.

To figure out the dot pattern values to send after the CHR\$(154), you will need some grid paper. A large sheet with 144 grid boxes across would be convenient. If such a large sheet is not available, you could divide your pattern in half and work with 72 grid boxes across. Divide up your grid paper by drawing a heavy line down every 8 boxes across. Now fill in each box of the grid that you want to be printed. Now

do the following procedure to compute the eighteen values which describe your desired bit pattern.

Imagine placing the number sequence over each of the first eight grid boxes.

128	64	32	16	8	4	2	1
		●	●			●	

Now add together all the numbers above the boxes which are filled in or have a dot as in the example above. In our example, we would have $2 + 16 + 32$ which equals 50. 50 then would be the first entry of a data statement which would be followed by seventeen more numbers computed in the exact same manner as the example.

Once you have the eighteen values in a data statement, you need simply run a program which PRINTS a CHR\$(154) followed by the data value read from the data statement. Don't forget to end all of your Print statements with a semicolon. This will prevent carriage returns CHR\$(13) from being sent, which would become part of the eighteen data values for which the printer is waiting.

Example 1:

```
10 OPEN4,4
20 B=65
30 A$=CHR$(154)
40 FOR I=1 TO 18
50 A$=A$+CHR$(B)
60 NEXT
70 PRINT#4,A$;
80 B=B+B
90 IF B>255 THEN B=B-255
100 GOTO 30
```

RUN



```

10 OPEN 4,4
20 PRINT#4
30 FOR J=1 TO 13
40 A$=CHR$(154)
50 FOR I=1 TO 18
60 READ BT
70 A$=A$+CHR$(BT)
80 NEXT I
90 PRINT#4,A$;
100 NEXT J
110 PRINT#4
120 CLOSE4
1000 DATA 46,0,0,0,102,48,0,0,0,0,
16,1,128,0,0,0,0,0
1010 DATA 113,0,64,153,72,0,0,0,
0,16,2,64,0,0,2,0,0,0
1020 DATA 160,128,64,16,132,0,0,
0,0,16,2,64,0,0,2,0,0,0
1030 DATA 32,128,224,16,132,0,0,
0,0,16,1,136,0,0,2,2,0,0
1040 DATA 35,8,64,16,132,48,88,8,
8,48,16,0,249,1,130,194,0,8,16
1050 DATA 32,128,67,144,132,72,1,
00,100,72,112,0,137,194,67,34,1
92,20,40
1060 DATA 32,64,64,16,132,132,66
,66,72,144,1,9,36,34,19,34,34,6
8
1070 DATA 32,72,64,16,132,132,66
,66,73,16,10,47,36,34,18,34,32,
132
1080 DATA 48,72,66,16,132,132,22
8,228,49,18,7,253,36,39,38,37,3
6,69
1090 DATA 40,148,164,16,133,77,9
1,90,83,20,10,33,42,106,218,41,
82,38
1100 DATA 39,99,24,16,130,50,64,
65,140,232,17,198,17,146,2,16,1
4,24
1110 DATA 0,0,0,0,0,0,64,64,0,0,
0,0,0,2,0,0,0,0
1120 DATA 0,0,0,0,0,0,64,64,0,0,
0,0,0,2,0,0,0,0

```

Bit-Mapped Graphics

(VIC-20 only)

```

5 REM *** SIDE WINDER ***
10 OPEN#4
20 FOR J=0 TO 21
30 FOR M=0 TO 7
40 V=2*J*A$=CHR$(154)
50 FOR I=0 TO 17
60 X=0:Z=PEEK(7701-J*22*I)
70 FOR K=0 TO 7
80 IF (VANDPEEK(32775-K*8*Z))=0
    THEN 100
90 X=X+2*I
100 NEXT
110 A$=A$+CHR$(X)
120 NEXT
130 PRINT#4,A$;
140 NEXT M:NEXT
150 PRINT#4:CLOSE#4

```

```

OPEN#4 TO #21
FOR J=0 TO 21
    FOR M=0 TO CHR$(154)
        Y=2*I+M-I*7
        IF Z=PEEK(7701-J+2) THEN 100
        FOR K=0 TO 7
            IF VANDPEEK(32775-
                *Z)*2<K
                NEXT K
            X=X#+CHR$(X)
        NEXT M
        PRINT#4,X$;
    NEXT J
NEXT I
PRINT#4,CLOSE4
END
```

To print in the Double Height Line mode, send the CHR\$(155) control code at any point on a line.

Example:

```
10 OPEN4,4
20 PRINT#4,"    PRESENTING THE"
30 PRINT#4,CHR$(155)"    IMPACT
   PRINTER"
40 PRINT#4,"BY FIDELITY ELECTRON
   ICS"
50 CLOSE4
```

RUN

```
    PRESENTING THE
    IMPACT PRINTER
BY FIDELITY ELECTRONICS
```

5. Application Programs

Hard Copy of the Screen

The following sample program can be used to get a hard printed copy of a program you have on your screen. The Program is made to be used as a sub-routine. That means that when you use it, you must have a "GOSUB 60000" in your program where appropriate.

```
60000 REM - SCREEN COPY FOR VIC
20
60010 OPEN4,4
60020 CU$=CHR$(145):BS$=CHR$(8):
   CR$=CHR$(13):SI$=CHR$(15)
60030 RVS$=CHR$(18):OFF$=CHR$(14
   6)
60040 PRINT#4:G=PEEK(640)*256
60050 PRINT#4,CU$
60060 FORP=GT06+505
60065 REM - CHANGE ABOVE 505 TO
   999 FOR COMMODORE 64
60070 C=PEEK(P):C$=""
60080 IF(P-G)/22=INT((P-G)/22)TH
   ENPRINT#4,BS$+CR$+SI$;
60085 REM - CHANGE ABOVE 22'S TO
   40'S FOR COMMODORE 64
60090 IFC>128THENC=C-128:C$=RVS$
60100 IFC<320RC>95THENC=C+64:GOT
   06120
60110 IFC>63ANDC<96THENC=C+128
60120 C$=C$+CHR$(C)
60130 IFLEN(C$)>1THENC=C$+OFF$+
   CU$
60140 PRINT#4,C$;:NEXT
60150 PRINT#4:RETURN
```

This program is made for the CURSOR UP mode. If you wish to write the program in the CURSOR DOWN mode, you must change CU\$=CHR\$(145) to CU\$=CHR\$(17) in line 60020.

This program is also made for the VIC-20. If you wish to use this program for the Commodore 64, you should observe the changes noted in lines 60065 and 60085.

NOTE: This program can't print the characters following the reverse quote.

Note: VIC-20 and Commodore 64 are registered trademarks of Commodore Business Machines.

IMPORTANT NOTICE

This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient the receiving antenna

Relocate the computer with respect to the receiver

Move the computer away from the receiver

Plug the computer into a different outlet so that computer 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. Stock No. 001-000-00315-4.



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