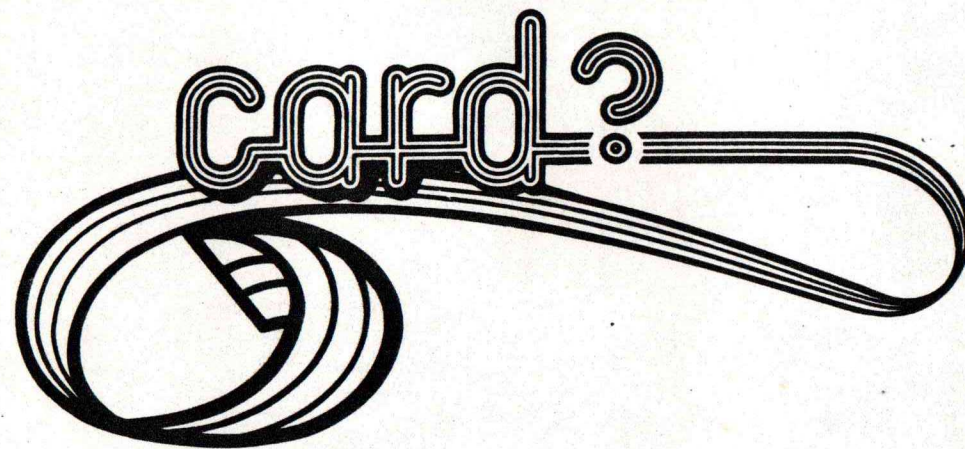


Instructions For



**Cardprint PS, B, S  
Printer Interface  
for the VIC-20™  
and C-64™ Computers**



**cardco, inc.**

**300 S. Topeka • Wichita, Ks 67202**

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# FCC NOTICE (U.S.A. only)

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 equipment with respect to the receiver
- Move the equipment away from the receiver.
- Plug the equipment into a different outlet so that the equipment and receiver are on different branch circuit

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 Communication 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. 004-000-00345-4.

CARDPRINT - INSTRUCTION MANUAL  
CARDCO, Inc. - (316) 267-6525

## GUARANTEE

For as long as this product is owned by its original owner, CARDCO, Inc. will repair or replace any defective parts or the entire unit if it should become inoperative due to a defect in manufacture or materials, providing the unit is returned to CARDCO, Inc. in undamaged condition with proof of purchase (purchase receipt).

This product was developed by:

CARDCO, Inc.  
300 S Topeka  
Wichita, Ks.  
67202

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First Printing - First Revision



INTRODUCTION  
\*\*\*\*\*

The "CARDPRINT" series of printer interfaces was designed to allow you to add a parallel or serial printer to your VIC-20 or C-64 computer. The design objective was to provide you with a system that would so closely duplicate the functions of the VIC printers that you would be able to run available software without any changes. To accomplish this task, and still allow you to make use of the special features available in today's high quality printers, required some special approaches to solving simple problems.

If you are planning to use this interface only to run pre-existing programs you should only have to read this booklet once over lightly. If, however, you plan to write your own programs or customize existing software to enable the use of special features of your printer this manual, along with the manual provided with your printer, should become your companion and best friend.

We have tried in this manual to document and fully explain each and every feature and function of our interface and how it will affect the operation of your system. We have provided examples and sample programs in an attempt to make each function understandable and useful to even a novice programmer.



THE THREE VERSIONS OF THE CARDPRINT  
INTERFACE COVERED IN THIS MANUAL

There are currently several CARDPRINT printer interfaces available, they are divided into two types. Type one features full Commodore emulation, including printing of Commodore custom graphics characters. This type of interface is available only for dot matrix printers that have hi-res graphics capabilities, has a retail price of around one hundred dollars and is sold under the CARDPRINT/+G model name. The second type of CARDPRINT interface (and the subject of this manual) is a less expensive unit that does not offer the Commodore graphics features of the CARDPRINT/+G series but allows you full use of the graphics capabilities and special features of your printer. This series of printer interfaces is intended for users of letter quality printers, and dot matrix printer owners that do not require Commodore graphics capabilities.

There are three printer interfaces in the CARDPRINT series covered in this manual, each offers a slightly different capability and each will require a slightly different set up procedure. Unless otherwise stated all of the information in this manual applies to all three interfaces in the series. Next is a description of the three models, their individual differences and their different set up procedures.

CARDPRINT/PS  
\*\*\*\*\*

The CARDPRINT/PS printer interface is designed to allow you to use your Commodore computer with either a parallel input or a serial input printer. The package the unit came in should show the PS part number designation as part of the "CARD?" logo. The PS interface differs from the other members of the CARDPRINT series in that it includes both the 25 pin connector used for serial operation and the 36 pin connector used for parallel operation. These connectors are mounted directly on the circuit board at opposite ends of the interface.

CARDPRINT/PS HOOK UP PROCEDURES

1. TURN OFF YOUR COMPUTER AND PRINTER
2. SET THE DIP SWITCHES ON THE CARDPRINT AS DESCRIBED IN THE APPENDIX OF THIS MANUAL UNDER DIP SWITCH SETTINGS.
3. INSERT THE FOUR PIN PLUG AT THE END OF THE ROUND GREY CABLE INTO THE SIX PIN PORT ON YOUR COMPUTER. (IF YOU ARE USING A DISK DRIVE YOU WILL HAVE TO PLUG THE FOUR PIN PLUG INTO THE SIX PIN PORT ON THE DISK DRIVE.)
4. INSERT THE APPROPRIATE PLUG ON THE INTERFACE INTO THE MATCHING PORT ON YOUR PRINTER.



5. PLUG THE CONNECTOR ON THE END OF THE THIN WIRE INTO THE CASSETTE PORT ON THE COMPUTER BEING SURE THAT THE CONNECTOR FACES DOWN, AND THE SMALL CIRCUIT BOARD IS ABOVE THE CONNECTOR. NOW, IF YOU ARE USING A CASSETTE, PLUG THE CASSETTE ONTO SMALL CIRCUIT BOARD AND IT WILL OPERATE NORMALLY.
6. TURN ON THE PRINTER AND THE COMPUTER IN THAT ORDER. (USUALLY TURN ON THE PRINTER FIRST WHEN USING THE "CARDPRINT").

7. NOW: YOU TYPE: OPEN 4,4 <RETURN>  
VIC SAYS: "READY"  
YOU TYPE: CMD4 <RETURN>

8. ONE OF TWO THINGS WILL HAPPEN:

\*\*A. YOUR PRINTER WILL RESPOND BY PRINTING 'READY'. IN THIS CASE YOU HAVE FINISHED THE HOOK UP AND YOU ARE READY TO GO ON TO THE NEXT SECTION.

\*\*B. IF YOUR SCREEN DISPLAYS A "DEVICE NOT PRESENT ERROR" OR THE PRINTER DOES NOT PRINT 'READY' SOMETHING IS WRONG. TURN YOUR PRINTER AND COMPUTER OFF AND REPEAT THE HOOK UP AGAIN, CAREFULLY.

IF ALL ELSE FAILS CONTACT YOUR  
DEALER, OR CALL US AT (316)  
267-6525 BETWEEN 9 AM & 5 PM.  
CST MONDAY THRU FRIDAY.

CARDPRINT/B  
\*\*\*\*\*

The CARDPRINT/B printer interface is designed to allow you to use your Commodore computer with any parallel input printer. The package the unit came in should show the B part number designation as part of the "CARD?" logo. The B interface differs from the other members of the CARDPRINT series in that it includes only the 36 pin connector used for parallel printer operation.

CARDPRINT/B HOOK UP PROCEDURES

1. TURN OFF YOUR COMPUTER AND PRINTER
2. SET THE DIP SWITCHES ON THE CARDPRINT AS DESCRIBED IN THE APPENDIX OF THIS MANUAL UNDER DIP SWITCH SETTINGS.
3. INSERT THE FOUR PIN PLUG AT THE END OF THE ROUND GREY CABLE INTO THE SIX PIN PORT ON YOUR COMPUTER. (IF YOU ARE USING A DISK DRIVE YOU WILL HAVE TO PLUG THE FOUR PIN PLUG INTO THE SIX PIN PORT ON THE DISK DRIVE.)
4. INSERT THE 36 PIN CONNECTOR ON THE INTERFACE INTO THE MATCHING PORT ON YOUR PRINTER.



5. PLUG THE CONNECTOR ON THE END OF THE THIN WIRE INTO THE CASSETTE PORT ON THE COMPUTER BEING SURE THAT THE CONNECTOR FACES DOWN, AND THE SMALL CIRCUIT BOARD IS ABOVE THE CONNECTOR. NOW, IF YOU ARE USING A CASSETTE, PLUG THE CASSETTE ONTO SMALL CIRCUIT BOARD AND IT WILL OPERATE NORMALLY.

6. TURN ON THE PRINTER AND THE COMPUTER IN THAT ORDER. (USUALLY TURN ON THE PRINTER FIRST WHEN USING THE "CARDPRINT").

7. NOW: YOU TYPE: OPEN 4,4 <RETURN>  
VIC SAYS: "READY"  
YOU TYPE: CMD4 <RETURN>

8. ONE OF TWO THINGS WILL HAPPEN:

\*\*A. YOUR PRINTER WILL RESPOND BY PRINTING 'READY'. IN THIS CASE YOU HAVE FINISHED THE HOOK UP AND YOU ARE READY TO GO ON TO THE NEXT SECTION.

\*\*B. IF YOUR SCREEN DISPLAYS A "DEVICE NOT PRESENT ERROR" OR THE PRINTER DOES NOT PRINT 'READY' SOMETHING IS WRONG. TURN YOUR PRINTER AND COMPUTER OFF AND REPEAT THE HOOK UP AGAIN, CAREFULLY.

IF ALL ELSE FAILS CONTACT YOUR  
DEALER, OR CALL US AT (316)  
267-6525 BETWEEN 9 AM & 5 PM.  
CST MONDAY THRU FRIDAY.

CARDPRINT/S  
\*\*\*\*\*

The CARDPRINT/S printer interface is designed to allow you to use your Commodore computer with a serial input printer. The package the unit came in should show the S part number designation as part of the "CARD?" logo. The PS interface differs from the other members of the CARDPRINT series in that it includes only the 25 pin connector used for serial operation.

CARDPRINT/S HOOK UP PROCEDURES

1. TURN OFF YOUR COMPUTER AND PRINTER
2. SET THE DIP SWITCHES ON THE CARDPRINT AS DESCRIBED IN THE APPENDIX OF THIS MANUAL UNDER DIP SWITCH SETTINGS.
3. INSERT THE FOUR PIN PLUG AT THE END OF THE ROUND GREY CABLE INTO THE SIX PIN PORT ON YOUR COMPUTER. (IF YOU ARE USING A DISK DRIVE YOU WILL HAVE TO PLUG THE FOUR PIN PLUG INTO THE SIX PIN PORT ON THE DISK DRIVE.)
4. INSERT THE 25 PIN CONNECTOR ON THE INTERFACE INTO THE MATCHING PORT ON YOUR PRINTER.



5. PLUG THE CONNECTOR ON THE END OF THE THIN WIRE INTO THE CASSETTE PORT ON THE COMPUTER BEING SURE THAT THE CONNECTOR FACES DOWN, AND THE SMALL CIRCUIT BOARD IS ABOVE THE CONNECTOR. NOW, IF YOU ARE USING A CASSETTE, PLUG THE CASSETTE ONTO SMALL CIRCUIT BOARD AND IT WILL OPERATE NORMALLY.
6. TURN ON THE PRINTER AND THE COMPUTER IN THAT ORDER. (USUALLY TURN ON THE PRINTER FIRST WHEN USING THE "CARDPRINT").
7. NOW:    YOU TYPE:            OPEN 4,4    <RETURN>  
          VIC SAYS:            "READY"  
          YOU TYPE:            CMD4        <RETURN>
8. ONE OF TWO THINGS WILL HAPPEN:  
  
\*\*A. YOUR PRINTER WILL RESPOND BY PRINTING 'READY'. IN THIS CASE YOU HAVE FINISHED THE HOOK UP AND YOU ARE READY TO GO ON TO THE NEXT SECTION.  
  
\*\*B. IF YOUR SCREEN DISPLAYS A "DEVICE NOT PRESENT ERROR" OR THE PRINTER DOES NOT PRINT 'READY' SOMETHING IS WRONG. TURN YOUR PRINTER AND COMPUTER OFF AND REPEAT THE HOOK UP AGAIN, CAREFULLY.

IF ALL ELSE FAILS CONTACT YOUR  
DEALER, OR CALL US AT (316)  
267-6525 BETWEEN 9 AM & 5 PM.  
CST MONDAY THRU FRIDAY.

#### RUNNING EXISTING PROGRAMS

Your interface was designed to allow you to run standard programs available for the VIC-20 and COMMODORE-64 without any changes. Most programs on most printers will operate normally. A few specialized programs might require some small changes in the dip switch settings (see appendix) or in the programs themselves, but after reading this manual you should be able to handle them. If you run into a severe problem, don't hesitate to call us. We want to get you on line!!!

#### WRITING YOUR OWN PROGRAMS

The rest of this manual is going to be devoted to explaining how to write and/or edit your own programs in order to make the best use of every part of your system. We will split this into three parts. In the first part we will tell you about your computer's command format. In the second we will deal with the "CARDPRINT"'s commands. And, in the third part we will relate all of this to your printer's abilities.

To make the most of this educational manual, we strongly suggest that you try the examples and see how they react on your printer. Some printers have features that others don't, but all the features of any printer can be accessed from a VIC-20 or a C-64 using the "CARDPRINT" interface.



### BUT HOW DO I MAKE IT PRINT?

If you have made it this far, you deserve a pat on the back for picking a system that works and getting it up and running. Now type in and run this sample program:

```
10  X = 32:OPEN4,4:CMD4
20  PRINT CHR$(X);:X = X+1
30  IF X = 127 THEN X = 160
40  IF X < 256 THEN GOTO 20
```

You have just printed the standard character set that comes with your printer, (There may be several alternate sets and we will describe how to access these later.) You may have noted that we did not use any characters less than 32 or between 128 and 160, this is because they are reserved for special printer functions. (See appendix: SPECIAL PRINTER CODES) For example try this:

```
OPEN4,4:CMD4:PRINTCHR$(12) <RETURN>
PRINT#4:CLOSE4
```

If you just lost a sheet of paper then your printer (most do) honors CHR\$(12) as an automatic form feed to get to the top of the next page without your having to figure out where it is. This form of telling the printer what to do is accomplished by simply 'printing' a command code CHR\$. These codes are contained in the instructions that came with your printer. I would suggest at this time that you get to know them because these codes are the keys that will allow you to unlock all the special features contained in that printer of yours.

### COMMODORE COMMAND FORMAT

Commodore designed some really outstanding features into your computer but made a few normally easy things hard to do in the process. Getting the printer to print on paper what you print on the screen is not as easy as it should be, but with a little patience it can be mastered.

Your computer calls everything connected to it a device, and each device has a number so the computer knows what type of accessory it is talking to. It sends information to different types of devices in different codes.

PRINTERS HAVE DEVICE NUMBER OF 4, 5, 6 OR 7

To talk to a printer, you must open a channel. (kind of like the President of the United States opening a channel of communication to the Russians.) This can be done either in the direct mode as a statement, or it can be done within a program as a program line. But it must be done or you will not be able to communicate with the printer.

One thing you must be careful of is that a channel can be opened only once. You can use it all you want while it is open; but if you try to open an already opened channel you will get a FILE OPEN ERROR. So it is good practice to close each channel as soon as you are done with it.



The format for opening a channel is:

OPEN(file number),(device number),(command)

The format for closing a channel is:

CLOSE(file number)

The "FILE NUMBER" can be any number that you choose to call that file. This number must be between 1 & 255. This is the number you will use whenever you want to communicate with your printer. This is also the number you must use to close the FILE (close the channel of communication). Additionally, any file number of 128 or greater will cause the printer to add a line feed <CHR\$(10)> after each carriage return <CHR\$(13)> causing some printers to double space and not permitting the use of some special printer functions that may be available with your printer.

The "DEVICE NUMBER" is simply the number of your printer as determined by the "CARDPRINT" interface. It is set at the factory to device 4, as this is the accepted standard. The device number can be changed to device 5 if desired so as to allow the use of two printers at the same time. For example, with a dot matrix printer as device #4 and a daisy wheel type printer as device #5, you would be prepared to print reports and correspondence from the same program without any re-wiring or changing around of the printers. (See appendix: DIP SWITCH SETTINGS)

The "SECONDARY ADDRESS" or command number is the third and last number in the command. It may be omitted, and in that case, a secondary address of 0 will be inserted automatically by the computer. The secondary address is used by the computer to send information to the printer; or in the case of our product, to the microprocessor in the interface box. A complete listing of these commands and examples of how to use them starts on page # 17.

So, the command to open communications with your printer is:

OPEN fn,dn,sa

The word OPEN followed by:

fn = The FILE NUMBER (0 to 255) and a comma  
dn = The DEVICE NUMBER (4 or 5) and a comma  
sa = An optional SECONDARY ADDRESS (0 to 28)

And the command to end the conversation would be:

CLOSE fn

The word CLOSE followed by:

fn = The FILE NUMBER (as in open statement)



NOW THAT YOU CAN TALK TO THE PRINTER  
-----

Now that we have an open file that we can use to tell the printer what to do, you have to make a choice between two formats to use to get the printer to listen to you.

CHOICE # 1:

CMD#  
\*\*\*\*

This format is generally the easiest to use to get the printer to print something. In this mode, everything that would normally be sent to the screen is sent to the printer. This is usually a very easy mode to use because by now you are probably quite use to printing things to the screen and most of the same rules apply to printing things to the printer.

Let's try a simple sample. Enter and RUN:

```
10 OPEN4,4:CMD4:A$=""
20 PRINT A$;"THIS IS A TEST"
30 A$=A$+"      (17 spaces)  ":A=A+1
40 IF A<4 THEN 20
50 PRINT#4:CLOSE4:END
```

I told you it was a simple sample, but it should give you an example of how to set up a program to print to the screen using the CMD statement.

Remember that in order to get back to printing to the screen you must redirect the information by closing the file, or opening a channel to the screen. Adding to the program to allow printing to the screen would result in the following:

```
10 OPEN4,4:CMD4
20 PRINT"TEST":I=I+1:IFI=5THEN40
30 GOTO 20
40 OPEN3,3:CMD3:CLOSE4:PRINT"DONE":
   CLOSE3:I=0:GOTO10
```

OR LINE 40 COULD READ

```
40 PRINT#4 : CLOSE4:PRINT"DONE":
   I=0:GOTO10
```

As we stated earlier most of the print statements that you use to print to the screen also will print to the printer. However, there are some statements that just won't work no matter how hard you try. These statements are covered in the addendum of this book starting at page # A5.



CHOICE # 2:

PRINT#  
\*\*\*\*\*

Printing using the "PRINT#" statement is similar to the CMD format except that you must use the "PRINT#" statement before every item you want to print. The "PRINT#" statement must be followed by the file number of an open file and a comma.

PRINT#(file number),

Again, let's try a sample program:

```
10 OPEN4,4
20 PRINT#4,A
30 PRINTA
40 A=A+1:IFA=5THEN50
50 GOTO20
60 CLOSE4:END
```

Notice that using this format it is easier to print to both the screen and the printer. The disk drive can also be easily accessed using this format. But be sure to keep track of what files you have open and where you are sending the information.

As before, remember it is a good idea to close each file as soon as you are done using it. The "PRINT#" function has some strange properties just like the "CMD" function and these are covered in the same section as above starting on page # A5.

CARDPRINT OPEN COMMANDS  
\*\*\*\*\*

This refers to the secondary address as used in each open statement (See SECONDARY ADDRESS).

| SECONDARY ADDRESS    | FUNCTION  |
|----------------------|---|
| Ø (or null)          | normal printing mode<br>upper case only with line feed  |
| 1                    | normal printing mode<br>upper case only no line feed  |
| 4                    | TRANSPARENT MODE, with line feed  |
| 5                    | TRANSPARENT MODE, no line feed  |
| 7                    | normal printing mode<br>upper/lower case with line feed   |
| 8                    | normal printing mode<br>upper/lower case no line feed   |
| 20+ any of the above | lock mode, locks in the command given. (ie. OPEN x,4,25 locks in the TRANSPARENT MODE without line feed.) |



AUTO LINE FEED  
\*\*\*\*\*

The CARDPRINT provides two methods for selection of the automatic line feed function. One method is a hardware switch on the CARDPRINT circuit board. The other method is through a software switch that is sent with the secondary command in the OPEN statement used when you open a file to the printer.

Refer to the diagram of the switch layout in the appendix of this manual to locate the appropriate switch to control the automatic line feed function. When this switch is in the on position it overrides the software automatic linefeed functions and provides a permanent LINE FEED OFF condition. In this position the interface will never send an automatic line feed to the printer. This switch position should be used with printers that add their own line feed after every line is printed (i.e. Smith Carona TP-1). It may also be desirable to use this switch position with some software programs. Especially those written to run on the Commodore 1525/1525e printers.

When this switch is off (the normally recommended position) the interface will check the status of the software switches and allow these switches to control the automatic line feed function. The operation of these software switches is described in the next few paragraphs.

Software automatic line feed is an option available in most print modes and we will cover it only once because it will apply to all modes in the same way.

Most printers come from the factory set to print each line of characters when given the command from the computer to do so. This command is CHR\$(13), after this command the printer returns to the start of the line to print more data. It will not advance to the start of the next line unless told to do so. To find out if your printer falls into this category, please consult your printer's instruction manual.

There is usually a method provided with most printers to add the necessary command data to automatically go on to the next line, but this method may require disassembling your printer, or at least turning the printer off and switching a switch. Aside from being time consuming this method usually cannot be accomplished from within a program.

There are many benefits of being able to return the printer to the beginning of the same line, but printing the command to advance the paper (the command by the way is CHR\$(10)) after each line can be time and memory consuming. Also the printers made by Commodore do line feed automatically, so to use programs written for these printers an auto line feed function is necessary.



Fear not brave computerist, CARDCO, Inc., to the rescue. Within the command format of the CARDPRINT interface you may switch between several modes all of which offer the option of either automatically adding a line feed command 'CHR\$(10)' at the end of each line, or not adding it. This option may be selected at any time from within your programs so you can enjoy the best of both worlds.

First, let's find out if your printer has its line feed function on or off. Try this sample program:

```
10 OPEN4,4,1:CMD4
20 PRINT"MY PRINTER WILL NOT
   PRINT ON THE SAME LINE TWICE."
30 PRINTTAB(16)"XXX"
40 PRINT#4,:CLOSE4:END
```

If your printer X'ed out the word "NOT" then it will allow a return without a line feed. If not, you may want to refer to your printer's instruction manual to see if there is a switch you can use to select this option, because this is the most flexible way to set up your printer.

So, in conclusion of this section, remember that the auto line feed function simply adds a line feed to each line. You choose this option in an "OPEN" statement. Refer to the SECONDARY ADDRESS chart, to see which SECONDARY ADDRESS you need to use.

NORMAL PRINTING MODE  
\*\*\*\*\*

This is the mode of operation that you will use most of the time. This mode automatically changes Commodore's unusual ASCII to the standard ASCII format which is understood by normal printers. The ASCII conversion chart in the appendix will show you exactly what characters are converted to what if you need to know what is happening, but it all takes place automatically and you needn't know what's going on to make use of this function. What you DO need to know is that there are four options available in this mode. They are:

1. OPEN x,4 - This option sets the printer to print in the upper case only mode with a line feed added as we talked about in the last section. (OPEN X,4,0 may also be used.)
2. OPEN x,4,1 - This is the same as the above mode except that the line feed function is not implemented.
3. OPEN x,4,7 - This option sets the printer in the upper/lower case mode and adds a line feed as before.
4. OPEN x,4,8 - This is the same as above except this option is without the line feed function implemented.

NOTE: x is any file number (1 to 127)



Additionally, there are four other important statements that apply to this mode. You will have to be aware of these character conversions if you plan to write your own programs. If you are using commercially written programs however, these instructions will do their job without your even knowing they are there.

The first character change you should know about is CHR\$(17). This character is produced by the cursor down key, and it will show up in a listing on your screen as a reversed Q. When you send this character to the printer it will shift you into the upper/lower case print mode without having to close and reopen the file. And, it has no affect on the line feed function, if it was on it'll stay on and visa-versa.

The second change is to CHR\$(145). This is the cursor up key, and it does the opposite of the cursor down key - it shifts you into the upper case only mode.

Changes three and four involve the control codes sent to the printer to shift out of the expanded print mode and to shift into the condensed print mode. If your printer has these functions, then these codes will be important to you.

A brief explanation of how the Commodore printers use these codes will be helpful in understanding what we change and why. The reason we change these codes around is simply so that you can run existing programs written for your computer with the Commodore printer without any modifications. It does, however, require you to remember what changes to make when you are writing your own programs.

The Commodore printer is set into the expanded print mode (double size characters) by sending CHR\$(14) to the printer. It stays in that mode until you send it a CHR\$(15). Also, the Commodore printer has no provisions for condensed print (small characters) at all so there are no control codes to access this function.

On the other hand your printer (this applies to Star Micronics, Epson and many others) probably will print only one line in the expanded print mode and then shift back to the normal print size automatically so you will have to send another CHR\$(14) to print the next line in the expanded print mode. If you want to go back to normal size print in the middle of a line the normal Commodore command of CHR\$(15) would send you to a combination of expanded and condensed print because most printers use CHR\$(15) to shift into the condensed print mode. So we change CHR\$(15) to CHR\$(20) which is the code most printers use to shift back to normal size characters.



But that leaves us with the problem of what to send to the printer to get into the condensed print mode. If we send a CHR\$(15) the CARDPRINT changes it to a CHR\$(20) so that won't work. But, if we changed CHR\$(15) to CHR\$(20) it would make sense to change CHR\$(20) to CHR\$(15) so that's what we did. By the way, CHR\$(18) is the code to revert from condensed mode to normal mode and it is not changed in any way.

SPECIAL NOTE TO C-ITOH/PROWRITER USERS:

Your printer does not need the CHR\$(15) and CHR\$(20) exchanged because it uses the same codes as the Commodore printer. For this application we have provided a switch on the circuit board of the CARDPRINT (see the appendix for the switch location) that defeats this feature. With this switch in the on position (Prowriter option) the 15/20 swap is not done, if the switch is off (normal position) the swap will be done.

So, remember, CHR\$(17) shifts the printer into the upper/lower case mode; CHR\$(145) shifts the printer into the upper case/graphics mode; and CHR\$(15) is swapped with CHR\$(20). The 15/20 swap can be defeated with a switch located on the circuit board. And all of these things happen in the NORMAL PRINTING mode ONLY, they are defeated in the TRANSPARENT MODE.

Try this program to see what your printer can do. Most printers honor all of these codes. If yours doesn't it will probably just ignore the code and go on.

```
10 OPEN 4,4 : CMD4
20 PRINT"THIS IS NORMAL UPPER CASE."
30 PRINT"THIS IS "CHR$(17)"LOWER
   "CHR$(145) " AND UPPER CASE"
40 PRINT"THESE ARE";
50 PRINTCHR$(14)" EXPANDED";
60 PRINTCHR$(15)" NORMAL";
70 PRINTCHR$(14)CHR$(20)
   "EXPANDED/CONDENSED";
80 PRINTERCHR$(15)" AND CONDENSED";
90 PRINTCHR$(18)" CHARACTERS !"
100 PRINT#4,:CLOSE4:END
```

OKIDATA PRINTERS OWNERS: You must substitute the codes as listed in your manual in place of the codes shown in the above program.



# SPECIAL LISTING CODES

\*\*\*\*\*

The LISTING MODE is the mode you will want to use to list programs from your computer to the printer. A listing of a Commodore program usually contains some strange code symbols referring to functions such as color changes and cursor movements. These codes may mean other things to your printer however. For example if an Epson MX-80 printer was trying to list a program containing the home cursor symbol CHR\$(19), it would stop dead because to the Epson CHR\$(19) means stop printing until you are told to start again. So unless we make some changes I'm sure you would see how we could wind up with some strange looking program listings and unhappy programmers.

So, in the SPECIAL LISTING CODES we have not only prevented disastrous listings, we made them easier to read. Instead of symbolic representation with reversed hearts, arrows and other wierd graphics symbols, we substituted normal characters enclosed in brackets which are much more understandable in a listing.

# LISTING CODE ABBREVIATIONS

| CHARACTER STRING SENT | LISTING SYMBOL | SYMBOL DEFINITION           |
|-----------------------|----------------|-----------------------------|
| CHRS(1)               | "(\$1)"        | UNKNOWN CHARACTER VALUE     |
| CHRS(2)               | "(\$2)"        | UNKNOWN CHARACTER VALUE     |
| CHRS(3)               | "(\$3)"        | UNKNOWN CHARACTER VALUE     |
| CHRS(4)               | "(\$4)"        | UNKNOWN CHARACTER VALUE     |
| CHRS(5)               | "(\$5)"        | WHITE                       |
| CHRS(6)               | "(\$6)"        | UNKNOWN CHARACTER VALUE     |
| CHRS(7)               | "(\$7)"        | UNKNOWN CHARACTER VALUE     |
| CHRS(8)               | "(\$8)"        | DISABLE SHIFT/COMMODORE KEY |
| CHRS(9)               | "(\$9)"        | ENABLE SHIFT/COMMODORE KEY  |
| CHRS(10)              | "(\$10)"       | UNKNOWN CHARACTER VALUE     |
| CHRS(11)              | "(\$11)"       | UNKNOWN CHARACTER VALUE     |
| CHRS(12)              | "(\$12)"       | SHIFT TO LOWER CASE         |
| CHRS(13)              | "(\$13)"       | UNKNOWN CHARACTER VALUE     |
| CHRS(14)              | "(\$14)"       | UNKNOWN CHARACTER VALUE     |
| CHRS(15)              | "(\$15)"       | UNKNOWN CHARACTER VALUE     |
| CHRS(16)              | "(\$16)"       | UNKNOWN CHARACTER VALUE     |
| CHRS(17)              | "(\$17)"       | CURSOR DOWN                 |
| CHRS(18)              | "(\$18)"       | REVERSE ON                  |
| CHRS(19)              | "(\$19)"       | HOME CURSOR                 |
| CHRS(20)              | "(\$20)"       | DELETE                      |
| CHRS(21)              | "(\$21)"       | UNKNOWN CHARACTER VALUE     |
| CHRS(22)              | "(\$22)"       | UNKNOWN CHARACTER VALUE     |
| CHRS(23)              | "(\$23)"       | UNKNOWN CHARACTER VALUE     |
| CHRS(24)              | "(\$24)"       | UNKNOWN CHARACTER VALUE     |
| CHRS(25)              | "(\$25)"       | UNKNOWN CHARACTER VALUE     |
| CHRS(26)              | "(\$26)"       | UNKNOWN CHARACTER VALUE     |
| CHRS(27)              | "(\$27)"       | UNKNOWN CHARACTER VALUE     |
| CHRS(28)              | "(\$28)"       | RED                         |
| CHRS(29)              | "(\$29)"       | CURSOR RIGHT                |
| CHRS(30)              | "(\$30)"       | GREEN                       |
| CHRS(31)              | "(\$31)"       | BLUE                        |
| CHRS(128)             | "(\$128)"      | UNKNOWN CHARACTER VALUE     |
| CHRS(129)             | "(\$129)"      | ORANGE                      |
| CHRS(130)             | "(\$130)"      | UNKNOWN CHARACTER VALUE     |
| CHRS(131)             | "(\$131)"      | UNKNOWN CHARACTER VALUE     |
| CHRS(132)             | "(\$132)"      | UNKNOWN CHARACTER VALUE     |
| CHRS(133)             | "(\$133)"      | F1 FUNCTION KEY             |
| CHRS(134)             | "(\$134)"      | F3 FUNCTION KEY             |
| CHRS(135)             | "(\$135)"      | F5 FUNCTION KEY             |
| CHRS(136)             | "(\$136)"      | F7 FUNCTION KEY             |
| CHRS(137)             | "(\$137)"      | F2 FUNCTION KEY             |
| CHRS(138)             | "(\$138)"      | F4 FUNCTION KEY             |
| CHRS(139)             | "(\$139)"      | F6 FUNCTION KEY             |
| CHRS(140)             | "(\$140)"      | F8 FUNCTION KEY             |
| CHRS(141)             | "(\$141)"      | SHIFTED RETURN              |
| CHRS(142)             | "(\$142)"      | SHIFT TO UPPER CASE         |
| CHRS(143)             | "(\$143)"      | UNKNOWN CHARACTER VALUE     |
| CHRS(144)             | "(\$144)"      | BLACK                       |
| CHRS(145)             | "(\$145)"      | CURSOR UP                   |
| CHRS(146)             | "(\$146)"      | REVERSE OFF                 |
| CHRS(147)             | "(\$147)"      | SCREEN CLEAR / HOME CURSOR  |
| CHRS(148)             | "(\$148)"      | INSERT                      |
| CHRS(149)             | "(\$149)"      | BROWN                       |
| CHRS(150)             | "(\$150)"      | LIGHT RED                   |
| CHRS(151)             | "(\$151)"      | GREY 1                      |
| CHRS(152)             | "(\$152)"      | GREY 2                      |
| CHRS(153)             | "(\$153)"      | LIGHT GREEN                 |
| CHRS(154)             | "(\$154)"      | LIGHT BLUE                  |
| CHRS(155)             | "(\$155)"      | GREY 3                      |
| CHRS(156)             | "(\$156)"      | PURPLE                      |
| CHRS(157)             | "(\$157)"      | CURSOR LEFT                 |
| CHRS(158)             | "(\$158)"      | YELLOW                      |
| CHRS(159)             | "(\$159)"      | CYAN                        |
| CHRS(160)             | "(\$160)"      | SHIFTED SPACE               |



By using these codes it should be easier to decipher the sometimes cryptic Commodore program listings. The SPECIAL LISTING CODES will be used whenever you list a program:

To list a program use the following format:

```
OPEN x,4,s:CMD4:LIST    <RETURN>
PRINT#4:CLOSE4          <RETURN>
```

x is any file number from 1 to 127  
s is any of the secondary commands desired as listed in the section on OPEN statements and SECONDARY COMMANDS.

REMEMBER: THE GRAPHICS CHARACTERS PRINTED BY ANY PRINTER WILL BE THOSE CHARACTERS IN THE PRINTER'S MEMORY AND THOSE CHARACTERS MAY NOT BE THE SAME AS THOSE IN THE COMPUTER> SO UNLESS YOUR PRINTER HAS A SPECIAL COMMODORE GRAPHICS SET OR A PROGRAMABLE CHARACTER SET, OR DOT ADDRESSABLE GRAPHICS, THERE IS NO WAY IT CAN PRINT COMMODORE'S GRAPHIC CHARACTER SET.

If you need to list or print the COMMODORE graphics characters we would suggest that you purchase a copy of CARDCO's Printer Utility Programs (tape \$19.95 or disk \$24.95) or Super Printer Utility (C-64 disk only \$39.95) from your dealer. This program will allow Epson, Star and Prowriter printers to print Commodore graphics. The Programs also includes a full function machine language screen dump programs and a banner headline maker.

TRANSPARENT MODE  
\*\*\*\*\*

In this mode you have the ability to pass any character string to the printer unchanged. This mode is primarily intended for access to advanced graphics features available on some printers and for use in conjunction with word processors and other programs that have the provisions to allow the use of non-Commodore printers. In this mode whatever the computer sends, the printer receives, exactly as it was sent.

You do have the option of line feed in this mode if you should desire it. The commands to access this mode are:

```
OPEN x,4,4    TRANSPARENT MODE
               with line feed.
```

```
OPEN x,4,5    TRANSPARENT MODE
               no line feed.
```

We have also provided a switch on the circuit board that will place the interface into the TRANSPARENT MODE. This switch may be used together with the switch that controls the auto line feed function to accomplish the same results as if you would have used the open statements as listed above. The difference when you use the switches is that the software switches provided by the open commands are overridden and any commands that are used by the program you are running will be ignored.



QUOTE MODE OPERATION  
\*\*\*\*\*

There is one other feature implemented in your new CARDPRINT that you should be aware of. This feature is the QUOTE MODE. It is used primarily in program listings.

If you look at a typical program listing you will see that whenever a cursor control code (cursor up, for example) is listed it is always part of a group of characters enclosed in quotation marks. When you are listing a program the quotation marks tell the CARDPRINT that the group of characters enclosed is a string to be printed during the operation of a program. And the interface should list them as such and include the special listing codes as they are needed.

It is possible to fool the program into thinking it is listing a program during the running of a program by sending a CHR\$(34) to the printer as part of a print statement. This will cause any control codes to be converted to special listing codes. This can be good or bad depending on your intentions. So be careful when you are printing using CHR\$(34) and quotation marks.

This can be a bothersome situation especially when sending dot addressable graphics to the printer. When sending graphics to the printer we highly recommend using the secondary address commands of ,4 or ,5 to enable the TRANSPARENT MODE. When the interface is in the TRANSPARENT MODE the QUOTE MODE will be disabled.

LOCK MODE  
\*\*\*\*\*

The LOCK MODE is provided to allow you to override the secondary addresses in the open commands given within commercial programs, because unless you are a master programmer you will not be able to change them. For example if you have a word processor that sends a line feed automatically, but the word processor allows no provision to change the secondary address to ,8 within the open command. This means that both the program and the interface will be generating a line feed which will cause your text to be double spaced.

LOCK MODE will solve this problem by allowing you to lock the secondary address of ,8 in the interface before you load your word processor. After the LOCK MODE has been turned on all future secondary addresses will be ignored. This allows you to make the interface do what you want it to do, not what the program tells it to do.

The LOCK MODE is turned on by adding twenty (20) to any valid secondary address (ie. 0, 1, 4, 5, 7, 8) and then sending it to the printer as part of a valid open command. Then you MUST print something to actually lock the secondary address in. For example:

```
OPEN4,4,24: PRINT#4,"LOCK": CLOSE4 <RETURN>
```

This sequence will LOCK the interface in the TRANSPARENT MODE with line feed.



You can change the secondary address by sending another LOCK MODE secondary address sequence as above. But you can only turn off the lock mode by turning off power to your interface. This happens when you turn off your computer, or when you unplug the connector that is plugged into the cassette port.

The End.

That's should be all you need to know to use your interface, we have included more examples and some additional technical information in the appendix. If you need additional information please read the appendix before you call.

SPECIAL PRINTER CODES  
\*\*\*\*\*

We have found that most printer instruction manuals leave something to be desired in the area of informing the user about the use of special printer functions. For general use these guide lines should be of some help. (Please refer to your manual)

FUNCTION CODES.

These codes are always less than 32 (decimal) or between 128 and 160. These codes are usually listed as something like:

|    |        |       |                        |
|----|--------|-------|------------------------|
| SO | 14/142 | 0E/8E | Double Wide Characters |
|----|--------|-------|------------------------|

This translates as:

|    |  |
|----|--|
| SO | This is the name they give the function for an a abbreviation. |
|----|--|

|        |   |
|--------|---|
| 14/142 | This is the number (or numbers) that must be sent to the printer to enable this function. If two numbers are given you may send either of these numbers. This number must be sent as a character string (ie. CHR\$(14)) |
|--------|---|

|       |  |
|-------|--|
| 0E/8E | This is the hexadecimal value of the above number. |
|-------|--|

|    |  |
|----|--|
| -- | This should explain what this function does. |
|----|--|



THE ESCAPE CODE and SPECIAL FUNCTION CODES  
\*\*\*\*\*

THE ESCAPE CODE (IMPORTANT)

If your printer has any special codes that it honors other than the function codes which were covered above they will always be used in conjunction with this code. This code tells your printer that you are sending it a special code and that the printer is to act on this code and not treat it as a normal character and print it. This code is called the ESCAPE CODE. It is always sent to the printer as CHR\$(27). Whenever you see ESC or ESCAPE that means send CHR\$(27) and follow it with another code.

SPECIAL FUNCTION CODES.  
\*\*\*\*\*

These are the special function codes that your printer allows. These codes are always preceded by the escape code which is always sent as CHR\$(27). Because these codes usually are assigned the same values as the upper case alphabet you must be careful when sending them "THROUGH" our interface because in some modes the interface changes these values. These codes are usually listed in your printer manual in a cryptic format. We will try to explain how to use these codes.

The codes are usually shown like this;

ESC E 69 45 emphasize print

This translates to:

ESC E Send the printer the escape code  
CHR\$(27) and then send it an E.

69 The decimal value of "E" which  
can be sent to the printer as  
CHR\$(69).

45 The hexadecimal value of "E".

--- This should be an explanation of  
the special function that is done  
when this command is executed.

When sending these codes to the printer  
try to use this format:

PRINT#4,CHR\$(27)"E"

The "E" must be upper case, if you are  
printing in the upper/lower case mode.

If you are using a word processor that does  
not allow you to send letter codes to the  
printer, and requires only numbers you can  
send the correct number by adding 128 to the  
number shown in your printer manual if the  
letter is supposed to be an upper case  
character.



Some control codes require more than one character after the ESCAPE CODE for example:

ESC Q n 81 n 51 n Set Right Margin.

In this example the printer "sees" this as:

CHR\$(27)"Q"CHR\$(70)

\*\* OR \*\*

CHR\$(27) - Ah Ha, This is an escape code, so I should not print the next character, because the next character will be an instruction for me.

"Q" This instruction tells me to set the right hand margin. But I need to wait for the next character to tell me where to set the margin.

CHR\$(70) This tells me that the right margin is to be set to the 70th position. And that is all the information I need so I can go back into my normal operation and put the next character on the paper.

With a little practice and reading your printer's instructions you should be able to make it do all of its tricks for you.

COMMANDS THAT DON'T WORK  
????????????????????????

As we mentioned in the text of this manual, there are several abnormalities in the Commodore computers that affect printing functions. We will cover those that we know about and if you find any more please let us know so we can add them to updates of this manual for future Commodore owners.

#1.

The first oddity is the format that must be used to close a file from the CMD# mode. It seems that the only statement that will work consistently is:

PRINT#x:CLOSEx

Where "x" is the file number is to be closed.

We have no idea why Commodore made this necessary, but a simple CLOSEx statement doesn't work from the CMD mode unless it is preceded by a PRINT#x: statement.



#2

A pair of functions that don't work right are the TAB and SPC functions. If you try to put this into a program:

```
PRINT#4,TAB(20) or PRINT#4,SPC(20)
```

you will get a syntax error. This is a bug in the Commodore computer because that should be a legal statement. THE ONLY WAY THIS STATEMENT WILL WORK IS:

```
PRINT#4,""TAB(20) or PRINT#4,""SPC(20)
```

This allows the SPC function to work, but the TAB function doesn't do a true tab.

There are three solutions to this problem and some will work with some printers while another may be required for your printer. Experimentation will provide the best solution for your system, so we will give you several options.

1. If your printer requires the line feed option then this is the easiest solution for you. To do tab functions; close the file you are using; reopen it without the line feed function and then print each item to be tabbed as a separate print statement. But, be sure to remember to print CHR\$(10) to advance the paper to the next line after the last item you want printed on each line. Try this:

SAMPLE TAB PROGRAM # 1  
\*\*\*\*\*

```
10 OPEN 4,4: FOR I = 1 to 4
20 PRINT#4,"THIS IS LINE #"I:NEXT I
30 CLOSE4:OPEN4,4,1
40 FOR I = 1 TO 4
50 REM SEVEN TABS AT 10, 20, 30...
60 PRINT#4, ""SPC(10)I*10
70 PRINT#4, ""SPC(20)I*20
80 PRINT#4, ""SPC(30)I*30
90 PRINT#4, ""SPC(40)I*40
100 PRINT#4, ""SPC(50)I*50
110 PRINT#4, ""SPC(60)I*60
120 PRINT#4, ""SPC(70)I*70
130 PRINT#4,CHR$(10)
140 NEXT I : CLOSE4:END
```

\*\* This will work with most printers.



2. If that doesn't work on your printer printer then try looking in your printer manual to see if the printer itself has the ability to provide the tab function. In the Star GEMINI 10 the tabs are preset to every tenth position and accessed by printing CHR\$(9). But you can set your own if you like. The code to set the tabs is CHR\$(27)CHR\$(68) followed by your desired tab locations given as CHR\$(x) as many times as you need tabs, and then ended with CHR\$(0). This tells the printer there are no more tabs and to return to normal printing. In the Epson printers tabbing is the same as the Star. Except that if you don't have GRAFTRAX you may have to add 128 to some of the numbers. Without GRAFTRAX, in the Epson MX-80 the horizontal tabs are preset to every eighth position and are accessed by printing CHR\$(137). But you can set your own. The code to set the tabs is CHR\$(27)CHR\$(68) followed by your desired tab locations given as CHR\$(x+128) as many times as you need tabs, and then ended with CHR\$(128). This tells the printer there are no more tabs, and to return to normal printing.

The Okidata Microline 82 & 83 series printers do not allow for horizontal tab, but the Microline 84,92 and 93 do. These are implemented as above with CHR\$(9), but are set with CHR\$(27) CHR(9) then your tabs as three digit numbers IE. "002" or "002,020,042"

3. As a last resort you can construct your own tab function by printing everything as a string and tabbing from the end of the last item printed the desired distance minus the length of the string just printed. This is a last resort but will always work.

Here is a sample of how to do it:

In this sample we will print a mixture of strings and numbers and tab for even spacing. Note that the numbers must be converted to string format for this to work unless the numbers are all the same length. If you use for next loops for your printing this is not as difficult as it would seem. And if you take the time to use this method it is fool proof and will work on any printer with any program.



PROGRAM EXAMPLE TO DO TABBING # 2  
\*\*\*\*\*

```
10 OPEN4,4
20 FOR I = 0 TO 10
30 READ A$,B$
40 A=A+I*I
50 B=B+I*B
60 REM FOUR TABS AT 10,30,50,70
70 PRINT#4,""SPC(10)A$;
80 PRINT#4,""SPC(20-LEN(A$))A;
90 PRINT#4,""SPC(20-LEN(STR$(A)))B$;
100 PRINT#4,""SPC(20-LEN(B$))B
110 NEXTI:END
120 DATA THE,NEW,CARDPRINT,INTERFACE
130 DATA E.J.LIPPERT,PRES,CARDCO,INC.
140 DATA BRECK RICKETTS,VP,CARDCO,INC.
150 DATA 300 S TOPEKA,WICHITA,KS,67202
160 DATA AREA,(316),PHONE,267-6525
```

WORD PROCESSORS  
\*\*\*\*\*

Some word processors offer additional features and special codes when you specify that you are using a NON-Commodore printer. Since the CARDPRINT simulates a Commodore printer in normal print modes it will cause a conflict if you take this option. So to allow you to take advantage of special word processor functions you should use the following open command sequence before calling up your word processor:

```
OPEN4,4,25:PRINT#4,CHR$(8);:CLOSE4 <RETURN>
```

Setting the switch on the circuit board as described in the section on switches will also lock in this mode.

This will lock the interface in the non-Commodore mode and allow the word processor to control all ASCII conversion and line feed functions. You may now specify the type of printer you have when the word processor prompts you for this information.

Be aware that once you are locked in a mode the only way to unlock the CARDPRINT is to reset the interface. The easiest way to do that is to unplug the power line that goes to the cassette port and then plug it in again.



CARDPRINT ASCII CHANGES  
\*\*\*\*\*

Normal printing mode  
UPPER CASE ONLY

=====

CHR\$(15) BECOMES CHR\$(20) \*  
CHR\$(17) CHANGES TO UPPER/LOWER CASE  
CHR\$(20) BECOMES CHR\$(15) \*

ALL OTHER CHARACTER STRINGS ARE SENT  
UNCHANGED.

=====

Normal printing mode.  
UPPER/LOWER CASE

=====

CHR\$(15) BECOMES CHR\$(20) \*  
CHR\$(20) BECOMES CHR\$(15) \*  
CHR\$(65) TO CHR\$(90) HAVE 32 ADDED TO THEM  
CHR\$(145) CHANGES TO UPPER CASE ONLY MODE  
CHR\$(192) TO CHR\$(218) HAVE 128 SUBTRACTED  
FROM THEIR VALUE

ALL OTHER CHARACTER STRINGS ARE PASSED  
UNCHANGED

=====

\* This is an optional feature that can be  
changed (See DIP SWITCH SELECTIONS)

QUICK SCREEN DUMP WITH NO GRAPHICS  
\*\*\*\*\*ICS  
\*\*\*

This screen dump can be used in any basic program to copy the contents of the screen to any printer. It would work fine to copy a screen of numbers from a check book or the instructions from a game or some other program.

To use this program simply put the statement "GOSUB 63999" in the program at the point (or points) at which you wish to dump the screen to the printer, and then add this to the program:

```

63000  GET A$ : IF A$ = "" THEN GOTO 63000
63010  IF A$ <> CHR$(133) THEN RETURN
63020  OPEN 4,4,4
63030  CG = PEEK (36869)
63040  SC = 4*(PEEK(36866)AND128)+
        64*(PEEK(36869)AND128)+
63050  FOR I0 = 0 TO 505
63060  C0 = PEEK(SC+I0)
63070  IF(CG = 240) OR (CG=242) THEN
        GOSUB 63300
63080  IF (CG = 242) OR (CG=244) THEN
        GOSUB 63200
63090  PRINT#4,CHR$(A0);:L0 = L0 +1
    
```



VIC-20 HIGH RESOLUTION SCREEN DUMP  
\*\*\*\*\*

```
63100  IF L0=22 THEN PRINT#4," ":L0=0
63110  NEXT I0:CLOSE4:RETURN
63200  IF C0 < 27 THEN A0=C0+96:RETURN
63210  IF C0 < 32 THEN A0=C0+64:RETURN
63220  IF C0 < 91 THEN A0=C0:RETURN
63230  A0=32:RETURN
63300  IF C0 < 32 THEN A0=C0+64:RETURN
63310  IF C0 < 64 THEN A0=C0:RETURN
63320  A0=32:RETURN
63999  GOTO63000
```

o change this program to run on the C-64:

```
63030  CG = PEEK(53272)
63040  SC = 1024
63050  FOR I0 = 0 TO 999
63070  IF CG = 21 THEN GOSUB 63300
63080  IF CG = 23 THEN GOSUB 63200
63100  IF L0=40 THEN PRINT#4," ":L0=0
```

When the program comes to the "GOSUB 63999" it will stop. It will wait for a key to be pressed, pressing function key "F1" will cause the screen dump subroutine to run, pressing any other key will allow the program to continue as if nothing happened.

This is a very unusual screen dump. It may give you a new perspective on how your printer sees your Commodore computer. To use this screen dump just insert "GOSUB 63999", or "GOSUB 62999" for a reversed image, where ever you want a snapshot of your screen. This is in basic so it is somewhat slow but it'll get the job done. An examination of this program will probably teach you a few things about programming.

PROGRAM BY: E.J. LIPPERT II

```
62999  RV=1
63000  C0=PEEK(36869)
63010  SC=4*(PEEK(36866)AND128)
        +64*(PEEK(36869)AND112)
63020  IF C0 > 239 THEN C0=C0-240:
        GOTO63040
63030  C0=C0-192
63040  IF C0 < 3 THEN CG = 32768+
        (C0* 1024): GOTO 63060
63050  IF C0 > 11 THEN CG = 4096+
        ((C0-12)* 1024): GOTO 63060
63060  OPEN4,4,5: PRINT#4,CHR$(10)
        CHR$(10)
```



```

63070 PRINT#4,CHR$(27)CHR$(64)
63080 PRINT#4,CHR$(27)CHR$(51)
      CHR$(16)" "
63090 FOR I1 = 0 TO 21
63100 PRINT#4,"          "CHR$(27)
      CHR$(76)CHR$(112)CHR$(1);
63110 FOR I2 = 0 TO 22
63120 C1 = PEEK(SC+(22*(22-I2))+I1)
63130 FOR I3 = 0 TO 7
63140 C2 = PEEK(CG+(C1*8)+(7-I3)):
      IF RV=1 THEN C2 = 255 - C2
63150 PRINT#4,CHR$(C2)CHR$(C2);
63160 NEXT I3
63170 PRINT#4,CHR$(10)
63180 NEXT I2 : PRINT#4,CHR$(10)
63190 NEXT I1
63200 PRINT#4,CHR$(10)
63210 PRINT#4,CHR$(27)CHR$(64)
63220 CLOSE4 : RETURN
63999 GOTO 63000

```

\*\*\* SPECIAL NOTE: On some Epson and Star printers the CHR\$(16) in line 63080 might need to be changed to allow the best line spacing. Possible values would be from CHR\$(6) to CHR\$(24)

This version was written for the STAR MICRONICS - GEMINI 10/15 & EPSON FX & MX-80/100 printers with graftrax. To modify it for the Prowriter or C ITOH 8510 you will have to change these lines to read:

```

63070 DELETE THIS LINE
63080 PRINT#4,CHR$(27)CHR$(84)"16"
63090 FOR I1=21 TO 0 STEP -1
63100 PRINT#4,          "CHR$(27)
      CHR$(83)"0368";
63110 FOR I2=22 TO 0 STEP -1
63130 FOR I3=7 TO 0 STEP -1
63200 DELETE THIS LINE

```

And that should have you running on your printer.

THIS PROGRAM WILL NOT RUN ON AN OKIDATA PRINTER EVEN WITH OKIGRAPH. Due to its ability to accept only 7 bit graphics codes the changes required would be to extensive to be included in this manual.



Adding these lines will allow you to fill up a screen with text or graphics, and then press the 'f-1' key to print the screen or press the 'f-2' key (shifted 'f-1' key) to print a reversed image on the screen.

```
10 PRINT"<CH>"
20 GET A$: IF A$ = "" THEN 20
30 IF A$ = CHR$(133) THEN GOSUB 63999
40 IF A$ = CHR$(134) THEN GOSUB 62999
50 PRINT A$;:GOTO 20
```

You can also use this routine as a gosub routine in a basic program using the VIC computer's high-res screen graphics capabilities. This will allow you to create a screen in high-res graphics and then print that screen to the printer in high-res mode.

CARDPRINT PIN OUT DIAGRAM  
\*\*\*\*\*

This is a standard Centronics type parallel pin out.

| Pin # | Function                          |
|-------|-----------------------------------|
| ===== | =====                             |
| 1     | data strobe (data ready to print) |
| 2     | 8 bit ASCII - data bit 0          |
| 3     | 8 bit ASCII - data bit 1          |
| 4     | 8 bit ASCII - data bit 2          |
| 5     | 8 bit ASCII - data bit 3          |
| 6     | 8 bit ASCII - data bit 4          |
| 7     | 8 bit ASCII - data bit 5          |
| 8     | 8 bit ASCII - data bit 6          |
| 9     | 8 bit ASCII - data bit 7          |
| 10    | not used                          |
| 11    | busy line (printer busy)          |
| 12-13 | grounded                          |
| 14    | n/c                               |
| 15-17 | grounded                          |
| 18    | n/c                               |
| 19-30 | ground returns                    |
| 31    | prime output (printer reset)      |
| 32    | not used                          |



DIP SWITCH SELECTION  
\*\*\*\*\*

The CARDPRINT has six switches exposed through its plastic case. These switches are clearly marked with the numbers 1 through 6 and the on position is marked as well. The switches would normally be set as shown below for normal operations:

When used with parallel input printers:

CARDPRINT/PS  
\*\*\*\*\*

SW1 - OFF  
SW2 - OFF  
SW3 - OFF  
SW4 - OFF  
SW5 - OFF  
SW6 - OFF

CARDPRINT/B  
\*\*\*\*\*

SW1 - OFF  
SW2 - OFF  
SW3 - OFF  
SW4 - OFF  
SW5 - OFF  
SW6 - OFF

When used with RS-232 serial input printers:

CARDPRINT/PS  
\*\*\*\*\*

SW1 - OFF  
SW2 - OFF  
SW3 - OFF  
SW4 - OFF  
SW5 - OFF  
SW6 - ON

CARDPRINT/S  
\*\*\*\*\*

SW1 - OFF  
SW2 - OFF  
SW3 - OFF  
SW4 - OFF  
SW5 - OFF  
SW6 - ON

see next page for function of each switch.

The following is a listing of the functions of each of the six switches.

SW1: Device number selection.

(See pages 11 & 12)

-ON Printer is assigned device #5.

-OFF Printer is assigned device #4.

SW2: ASCII correction selection.

(See pages 17, 21, 22, 29 & 30)

-ON Defeats software selection of ASCII conversion and locks in the TRANS-PARENT MODE.

-OFF Allows software selection of ASCII conversion.

SW3: Auto line feed selection.

(See pages 17 thru 20)

-ON Passes CHR\$(15) and CHR\$(20) with no changes made.

-OFF Swaps (or exchanges) CHR\$(15) and CHR\$(20).

SW4: 15/20 Swap selection.

(See pages 23 & 24)

-ON Defeats auto line feed functions.

-OFF Allows software selection of auto line feed functions.

SW5: Baud rate selection.

(Used with /S and /PS models ONLY.)

(Used when in the serial mode only.)

(See page A22)

-ON Selects 1200 baud data transfer.

-OFF Selects 300 baud data transfer.

SW6: Serial/parallel selection.

(Optional with /PS model ONLY.)

(See page A22)

-ON Selects serial printer option.

-OFF Selects parallel printer option.



RS-232 SERIAL PRINTER OPERATIONS  
\*\*\*\*\*

The CARDPRINT /S and /PS interfaces will work with most RS-232 serial input printers. When using serial printers refer to the instruction manual provided with your printer and be sure that the printer is set to the following communication format:

BAUD RATE: Either 1200 or 300 baud. This is an optional setting as determined by dip switch SW5 as discussed on the previous page. Generally, the higher speed will provide the fastest data transfer, but the slower speed will provide better reliability.

PARITY: Set parity to NONE

STOP BITS: Set the number of stop bits received to two(2).

7/8 BIT: Set bits per word to eight (8).

BE SURE THAT CARDPRINT DIP SWITCH SW6 IS ON!

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This entire manual was composed using the **WRITE NOW!** word processor. This high performance word processor is available from your local CARDCO dealer. **WRITE NOW!** is provided on instant loading and reliable cartridges for both the VIC-20 (\$39.95) and the Commodore 64 (\$49.95).

Because the **WRITE NOW!** word processor was designed by the same people that designed your CARDPRINT printer interface, you can be assured that all of the advanced features of your printer and interface will be fully available for your use.

Additional features of **WRITE NOW!** are:

- 80 column output to the screen (C-64 ONLY)
- Full header and footer capability
- Cut & Paste buffer
- Full block functions.
- FORMAT, LOAD, SAVE, SCRATCH & RENAME disk files from within the program
- Full search and search/replace functions
- Prints text directly from disk files
- Full formatting commands
- Single key non-destructive disk directory
- Four HELP screens available (C-64 ONLY)
- Prints up to 99 copies of each document
- Prints complete or partial documents
- User defined tab stops
- Page numbers can be located anywhere
- Page number in standard or Roman numerals
- Wait for keyboard input anywhere in text
- Optional conditional page command available
- Keyboard overlay included
- C-64 version fully links with other NOW! series programs



**NOW!** Series programs for the Commodore 64  
(Each **NOW!** series program is \$39.95 on disk)

**SPELL NOW!/64** is a full featured spelling checker with a 34,000 word dictionary and as many personalized dictionaries as you wish to create. **SPELL NOW!/64** allows you to change words, view them in context, add them to a dictionary or mark them to be reviewed at a later time with **WRITE NOW!/64**.

**MAIL NOW!/64** is a full function mailing list program that allows you to generate customized mailing labels and create files that can be used by the **WRITE NOW!/64** word processor to send personalized form letters.

**FILE NOW!/64** is a very easy to use data base program and not confusing to entry level users. The program has user defined fields and features an attractive index card format. Special files can be created that will allow data to be included in documents and reports written with **WRITE NOW!/64**.

**GRAPH NOW!/64** is a graphics and chart designer that creates all kinds of business charts for you and allows you to create custom designed graphics. The charts and graphics can then be used with **WRITE NOW!/64** and your dot matrix printer to include this information right in the text of your documents. (Includes **PAINT NOW!/64**)

**CALC NOW!/64** is a very powerful full featured spread sheet program that can provide data for integration within documents created with **WRITE NOW!/64**. **CALC NOW!/64** is only \$39.95!