

**Instruction Manual**  
**DELUXE RS232 INTERFACE**  
**for Commodore Computers**  
**INSTRUCTION REVISION 4.0**

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## SECTION 1 - BASIC INFORMATION

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### WHAT IS RS232?

RS232 is a word which refers to a certain standard way by which signals are sent. It is the "RS232" standard. RS232 compatible accessories usually have an oblong 25 pin computer connection. A Hayes modem or a Sears 600 typewriter are examples of RS232 compatible accessories. Sometimes you will also see the word RS232C. This is RS232 also.

### WHAT IS AN RS232 INTERFACE?

An "interface" is an adaptor which allows you to connect two devices which are not normally directly compatible with each other. The Deluxe RS232 Interface is an interface which lets you use standard RS232C compatible accessories with your Commodore computer. Commodore computers do have an "RS232" type port (means connection), but the signals which go out there are not actual RS232C signals and are not compatible with real RS232 accessories. Using our Deluxe RS232 Interface, you make your computer compatible with virtually any standard RS232C accessory.

### WHAT TYPE OF COMPUTERS IS IT COMPATIBLE WITH?

The Deluxe RS232 Interface works correctly with the VIC-20, C64, C128, SX64, and Plus4 computers. The Plus4 computer works a little differently than these other computers. If you have a Plus4, be sure to carefully read the section later on about setting the Baud rates.

## **WHAT ACCESSORIES IS IT COMPATIBLE WITH?**

The Deluxe RS232 Interface makes your computer compatible with all standard RS232 accessories. It is compatible with all types of 300, 1200, and 2400 Baud RS232 modems. It will also allow connection with all other standard RS232 accessories such as Robots, Eprom Programmers, and RS232 Printers.

The Deluxe RS232 Interface will allow you to connect and use a standard RS232 printer. However, the USER I/O port of your Commodore is not the standard printer connection on your computer. Virtually no wordprocessing software on the market is designed to allow you to hook your printer up to your Commodore USER I/O. Although you can hook up and use your printer with the Deluxe RS232 Interface, you will be limited to printing out program listings and writing your own programs. Omnitronix has designed a different interface specifically intended to allow you to use your RS232 Printer with your Commodore for full compatibility. The Serial Printer Interface connects to your Commodore serial bus, giving you greater compatibility with all software. The Serial Printer Interface has many advanced features, and it has a suggested list price of \$79.95. Call us for a dealer in your area.

The RS232 Interface allows you to make the correct physical connection between your computer and these accessories. The Deluxe RS232 Interface has been designed fully in accordance with the standard established by Commodore for this type of interface. Our instructions here give you the information you need to connect your printer or modem from your computer. If you have any questions about your particular modem or printer or software program, you should contact the manufacturer of that particular item.

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## SECTION 2 -CONNECTIONS AND SETTINGS

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### CONNECTING THE DELUXE RS232 INTERFACE TO YOUR COMPUTER

The Deluxe RS232 Interface connects to the computer USER I/O port. See your computer Users Manual to find where this is on your particular computer. It plugs in so that the writing on its front cover is right side up, NOT UPSIDE DOWN. If you connect the Deluxe RS232 Interface upside down, we cannot be held responsible for damage done to your computer. It will at least blow your computer fuse. When plugging the Deluxe RS232 Interface into your computer, you should strive to push it straight onto the connection, not wiggling it side to side. This avoids the possibility of a short circuit.

Once you have the Deluxe RS232 Interface plugged onto your computer, you need to plug it into your modem or printer. It should be fairly obvious where on your modem or printer to plug the cable. If the connector is wrong, doesn't fit, or is the wrong gender, you may have the wrong type of interface, or you may need to go to your local computer store and buy a gender adaptor. Once you have the Deluxe RS232 Interface plugged into the computer and your accessory, you are almost ready to use it.

## WHICH SWITCH SETTINGS TO USE

Looking at the connector on the Deluxe RS232 Interface cable, you will see that it is a 25 pin connector, but with only 10 pins being used. These 10 connections are all the signals any standard RS232 equipment needs to use. However, actually getting your equipment connected is complicated by the fact that some accessories require certain signals to come out on one pin, and other types of accessories require the same signal to go on a different pin.

The Deluxe RS232 Interface solves this problem with two switches in its cover which allow you to switch the signal lines for these two different types of accessories. These two different types of accessories can be mainly divided down into two categories, modems and printers. There is a more technical name for these categories. Modems are called Data Communication Equipment (DCE) and printers are called Data Terminal Equipment (DTE). There are other accessories besides modems which are DCE and other accessories besides printers which are DTE, but modems and printers are the main two, and so to keep it simple we have labeled both switches PRINTER and MODEM. If you have a modem or other DCE equipment, set the two switches on MODEM. If you have a printer or other DTE equipment, set the switches on PRINTER. Previous versions of our interface had a third switch which had a totally different function. This switch has been replaced by some cut and jump pads on the main PC Board. See the later section on this titled CUT AND JUMP PADS. Also, the exact changes made by the two switches is described in the section titled TECHNICAL.

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## SECTION 3 - USING THE DELUXE RS232 INTERFACE

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### WHAT DO YOU HAVE TO DO?

Hooking up and using RS232 equipment is not difficult, if you have a basic understanding of what has to be done. There are several steps which you will have to do. These are:

- 1) Hook the interface to the computer
- 2) Hook the interface to the other accessory
- 3) Set the two switches on the interface
- 4) Find out the settings of the accessory  
(see next section)
- 5) Set your Commodore program to those settings
- 6) Then you are ready to go!

These are the simple basic steps which need to be done to make your RS232 equipment work. However, sometimes it can be more difficult than it sounds, particularly if you don't understand how to do steps 4 and 5. Before you read the later sections on these settings, read this next section for a basic introduction to what these settings are.

### WHAT SETTINGS NEED TO BE SET?

Step #4 is go find out the settings of your accessory. The most important setting you need to determine is the "baud rate" of your accessory. Baud rate is the speed at which the information goes over the wire. If you send a signal to your accessory at a different speed than your accessory is set to receive at, you will have garbled information, or possibly no information will get through. A

modem is usually 300 baud or 1200 baud. On other accessories, you will have to look it up in its manual. There should be a specific section in your manual that describes this setting. If you can choose your own setting, we recommend 1200 baud.

There are several other settings you will need to find out about. The "parity" selection is difficult to easily explain, but you don't have to know what it means, only how it is set. Parity settings are usually Even, Odd, or None. This should also be described in your manual. If you can choose your own setting, we recommend None.

"Word length" sets whether there are 7 or 8 bits in the byte. Again, you don't necessarily have to understand what that means, only what selection is used. If you can choose your own setting, we recommend setting for an 8 bit word.

"Stop bits" refer to how much space is between each byte of data transmitted. This is almost always set to 1.

These are the main settings which need to be set correctly in order to get your accessory to get the correct data. Once you have found out what settings your accessory is set to, you need to accomplish step #5.

Setting the Commodore computer for these same settings may requires a bit more work figuring it out. If you have a modem communications program, it should have an easy to follow selection or choosing these settings. If you are writing your own program, or listing out a program on your printer, you will have to learn bit about programming. This information is covered in



your Commodore Programmers Reference Guide, and in the next two sections of this instruction manual. If you understand how to set your computer for the necessary settings, you should have no problem getting most any accessory to work.

## **WORD PROCESSING WITH THE DELUXE RS232 INTERFACE**

Word processing programs are designed to work with a computer printer. You write your letter and then you print it out. Normally, a standard Commodore type printer plugs into the same place your disk drive does, and your word processing program sends its print data out on that connection. This is not the connection the Deluxe RS232 Interface plugs into, and this causes most all standard software to be incompatible with your RS232 printer. The only two programs we know of that work with the USER I/O port are PaperClip by Batteries Included and EasyScript by Commodore. For any other software, we recommend the use of our Serial Printer Interface. It connects to the serial bus for maximum compatibility. It has many advanced features. This is available from your local dealer or direct from Omnitronix. Its suggested list price is \$79.95.

## **COMPUTER RS232 PROGRAMMING**

To operate your printer or modem, you will have to use some sort of commands, or a software program. Below is an example of a BASIC TERMINAL PROGRAM which will allow you to use your 300 baud modem. If you have a Plus4 use the first line 10, all others use the second line 10.

## Basic Terminal Program

```
10 OPEN2,2,3,CHR$(54)+CHR$(101):REM Plus4
10 OPEN2,2,3,CHR$(38)+CHR$(96):REM others
20 C$=CHR$(147):K$=CHR$(20):J$=CHR$(187)
30 CR$=CHR$(13):PRINTCHR$(14)+CHR$(8)
40 PRINTC$;"LOADING DATA....."
50 REM
60 REM SET UP COMMODORE ASCII TO
70 REM STANDARD ASCII CONVERSION TABLES
90 DIMR%(255),T%(255):T%(13)=13
100 T%(20)=8:T%(160)=32:T%(133)=3
110 T%(134)=19:T%(135)=17:T%(136)=16
120 FORZ=32TO64:T%(Z)=Z:NEXTZ
130 FORZ=65TO90:Y=Z+32:T%(Z)=Y:NEXTZ
140 FORZ=193TO218:Y=Z-128:T%(Z)=Y:NEXTZ
150 FORZ=0TO255:Y=T%(Z):IFY<>0THENR%(Y)=Z
160 NEXTZ
180 REM MAIN PROGRAM LOOP
200 PRINTC$;"TERMINAL MODE"+CR$+J$;
210 GET#2,A$:IFA$=""THEN240
220 A=R%(ASC(A$))
230 PRINTK$+CHR$(A)+J$;;GOTO210
240 GETA$:IFA$=""THEN210
250 PRINT#2,CHR$(T%(ASC(A$)));;GOTO210
```

The above program is set for 300 baud, 7 bit word, even parity. If the system you want to communicate to is set differently than this, you will get some garbage characters printing on your screen. This program is tested and there are no errors or typos in it. It must be typed in exactly as above without any additions such as added spaces, in order to ensure it works correctly. If you get any errors, check your typing. The Commodore BASIC language is too slow for this program to run faster than 300 baud. If you want more features than this program gives, or if you need a 1200 baud terminal program, we recommend BOBS TERM, one of the most popular and complete terminal programs on the market. We sell these programs direct from Omnitronix, Inc. BOBS TERM 64 sells for \$49.95 and BOBS TERM 128 sells for \$79.95. Call us for details or information.

## ----- SECTION 4 - PROGRAMMING INFORMATION -----

If you look at the BASIC Terminal Program, you will see three different types of commands involved in sending and receiving RS232 data. These commands can be used with either a modem or any other type or RS232 programming. These three commands are OPEN, PRINT#, and GET#.

The OPEN command below is the same one used in the BASIC Terminal program. This command opens a channel to the RS232 port. The command is used to set the Logical File number of that channel (by which the channel is later referred to), and it also tells the computer what baud rate and other settings your computer should send and receive data at.

The Logical File number is the first 2 after the word OPEN. You will notice that the later PRINT and GET commands also use #2. That is what the Logical File number is used for. The second 2 in the OPEN command is the Device number designating the USER I/O port. The USER I/O port is device #2. The third number has no function when addressing the USER I/O port, but some number has to be there for the command to work.

The baud rates, etc. are set through the two CHR\$ numbers in the command. In the above program, the command is:

**OPEN2,2,3,CHR\$(38)+CHR\$(96)**

The first of these numbers is called the CONTROL REGISTER. The second number is called the COMMAND REGISTER. In the above OPEN

statement, the CHR\$(38)+CHR\$(96) sets the computer for 300 Baud, 7 Bit word, Even Parity, 1 Stop bit, 3 Line Handshake. If you changed the number 38 to the number 40, this would change the setting from 300 baud to 1200 baud. How to determine exactly what the correct numbers are for your particular modem or printer is covered in the next section. For now, you should just be familiar with the OPEN command.

In the BASIC terminal program, you will also see two other commands, PRINT#2 and GET#2. These two commands allow you to send and receive data on the RS232 port. The GET#2 command only gets one character at a time. The PRINT#2 command will allow you to send one or more characters at a time.  
Example:

```
GET#2,A$  
PRINT#2,"PRINT THESE WORDS"  
PRINT#2,A$
```

Using these two commands, you can program just about anything you need using the RS232 port. However, there are two other commands you can use. One is INPUT#2,A\$. This is not a good command to use, because it must be terminated by a carriage return and it will stay locked up at this command until it gets one. The only way to get out of it then is to reset your computer.

The other command you can use is the CMD command. This is how you would list a program out to your printer. When this command is executed, it causes all the data which would normally have been printed on the screen to go out to the printer instead. This is how you would use this command:

**OPEN 2,2,3,CHR\$(38)+CHR\$(96) <RETURN>**

**CMD <RETURN>**

**LIST <RETURN>**

(your program now lists out to the printer)

**PRINT#2 <RETURN>**

**CLOSE2 <RETURN>**

In the above example, when it says <RETURN> you press your return key. The method assumes you have a BASIC program in memory at the time you do these commands. The CHR\$(38) and CHR\$(96) in the first line are just examples. You would need to use the correct numbers for your particular setting. Read the next section to find out what you should use.

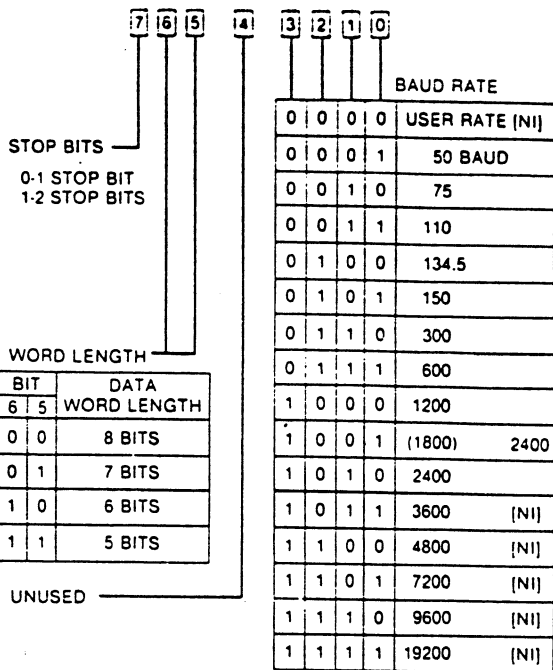
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## **SECTION 5 - BAUD RATE AND OTHER SETTINGS**

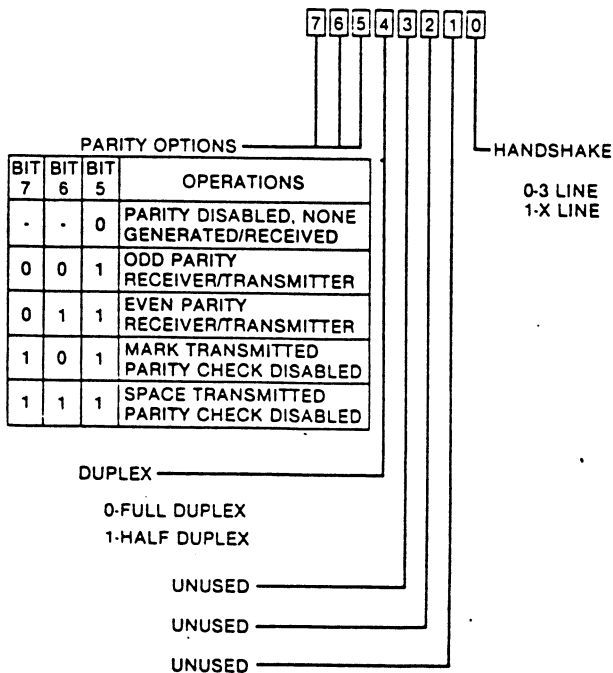
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### **THE CONTROL AND COMMAND REGISTERS**

Your computer and modem or printer must be set for the same settings so that they will understand each other's signals. If you are using a professionally written program, in some instances it will directly ask you, "WHAT IS THE BAUD RATE?", and so on. Some other programs will have to set these various settings by entering in two control numbers, which are the Control Register and Command Register that we mentioned in the previous section. If you need to figure out what the correct numbers are for your Control and Command Registers, use the following charts. The first chart is for the Control Register and the second chart is for the Command Register. Two sets of charts are given. The first set of charts apply to the C64, C128, VIC-20, and SX64. The second set of charts apply to the Plus4 only.



## Commodore CONTROL REGISTER CHART



## Commodore COMMAND REGISTER CHART

## CONTROL REGISTER

The Control Register is used to select the desired mode for the 6551. The word length, number of stop bits, and clock controls are all determined by the Control Register, which is depicted in Figure 1.

### STOP BITS

0 = 1 Stop Bit  
1 = 2 Stop Bits  
1 Stop Bit if Word Length = 8 Bits and Parity = 1  
1 1/2 Stop Bits if Word Length = 5 Bits and no Parity

### WORD LENGTH

BIT	DATA WORD LENGTH
6 5	
0 0	8
0 1	*
1 0	6
1 1	5

### RECEIVER CLOCK SOURCE

0 = External Receiver Clock  
1 = Baud Rate Generator

\*This allows for 9-bit transmission (8 data bits plus parity)

### CONTROL REGISTER

7	6	5	4	3	2	1	0
---	---	---	---	---	---	---	---

### BAUD RATE GENERATOR

0	0	0	0	15x EXTERNAL CLOCK
0	0	0	1	50 BAUD
0	0	1	0	75
0	0	1	1	109.92
0	1	0	0	134.58
0	1	0	1	150
0	1	1	0	300
0	1	1	1	600
1	0	0	0	1200
1	0	0	1	1800
1	0	1	0	2400
1	0	1	1	3600
1	1	0	0	4800
1	1	0	1	7200
1	1	1	0	9600
1	1	1	1	19200

### HARDWARE RESET PROGRAM RESET

7	6	5	4	3	2	1	0
0	0	0	0	0	0	0	0
—	—	—	—	—	—	—	—

## Plus4 CONTROL REGISTER CHART

### COMMAND REGISTER

7	6	5	4	3	2	1	0
---	---	---	---	---	---	---	---

### PARITY CHECK CONTROLS

BIT	OPERATION
7 6 5	
— — 0	Parity Disabled—No Parity Bit Generated—No Parity Bit Received
0 0 1	Odd Parity Receiver and Transmitter
0 1 1	Even Parity Receiver and Transmitter
1 0 1	Mark Parity Bit Transmitted Parity Check Disabled
1 1 1	Space Parity Bit Transmitted Parity Check Disabled

### NORMAL ECHO MODE FOR RECEIVER

0 = Normal  
1 = Echo (Bits 2 and 3 must be 0)

### DATA TERMINAL READY

0 = Disable Receiver and All Interrupts (DTR high)  
1 = Enable Receiver and All Interrupts (DTR low)

### RECEIVER INTERRUPT ENABLE

0 = IRQ Interrupt Enabled from Bit 3 of Status Register  
1 = IRQ Interrupt Disabled

### TRANSMITTER CONTROLS

BIT	TRANSMIT INTERRUPT	RTS LEVEL	TRANSMITTER
3 2			
0 0	Disabled	High	Off
0 1	Enabled	Low	On
1 0	Disabled	Low	On
1 1	Disabled	Low	Transmit BRK

### HARDWARE RESET PROGRAM RESET

7	6	5	4	3	2	1	0
0	0	0	0	0	0	0	0
—	—	—	0	0	0	0	0

\*These bits must be set to the given values.

## Plus4 COMMAND REGISTER CHART

These charts show the different options one can choose to set the computer RS232 port to. In choosing which settings to use, the determining factor is, "What is the printer or accessory set to?". The whole action here is to get them so they agree. Therefore it is vital to read your printer booklet and find out what settings your printer is set to.

The charts are shown connected to a row of eight boxes, numbered 7 thru 0. This box is supposed to represent the eight bits of the byte character which makes up the Control or Command Register. The 7 box is referred to as "Bit 7", the 0 box is referred to as "Bit 0", and so on. In order to figure out what numbers you should use, just follow these steps:

First, decide what settings you want to use. For example, you may want to set the computer for 300 baud, 8 bit word, 1 stop bit, No Parity. If you look at the charts, you see that this can actually be put together as a series of ones and zeros. For the above settings, you would get a pattern of:

**CONTROL REGISTER**

0 0 1 0 0 1 1 0

+

**COMMAND REGISTER**

0 1 1 0 0 0 0 0

If you look at the chart you can see that this is the way it works out. There are other settings not yet mentioned which have been set to zero. For now you have the two bytes above. Those are binary numbers. Each column has its own distinct value.



## Value Chart

BIT 0 = 1  
BIT 1 = 2  
BIT 2 = 4  
BIT 3 = 8  
BIT 4 = 16  
BIT 5 = 32  
BIT 6 = 64  
BIT 7 = 128

If a particular bit is set to 1, that is worth its value according to the above Value chart. If a bit is 0 it has no value. If bit 4 is set to 1, it is equal to 16. If bit 2 is set to 1, it is equal to 4. Once you have established which bits should be set, just add them up according to this rule.

0 0 1 0 0 1 1 0  
0+ 0+32+ 0+ 0+ 4+ 2+ 0 = 38

0 1 1 0 0 0 0 0  
0+64+32+ 0+ 0+ 0+ 0+ 0 = 96

You can see this equals a Control Register of 38 and a Command Register of 96.

There are a few other things to know. When using a modem, bit 0 of the Command Register should always be off (0). When using a printer, bit 0 of the Command Register should usually be on (1). This bit sets the "handshaking" between the computer and printer, so that the computer does not overflow the printer with data. Your modem does not need handshaking. You also usually don't care which way the "duplex" is set. On the Plus4 charts, you need to set the Control Register RECEIVER CLOCK SOURCE to 1. On the Plus4 you need to set the Command Register bit0 to 1, bit1 to 1, bit2 to 1, bit3 to 0, and bit4 to 0. This should then cover any of the other settings you may have questions on.

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## SECTION 6 - HOW TO TEST YOUR MODEM OR PRINTER

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Once you have hooked everything up and have determined all the correct settings, you will want to test your modem or printer. If you are using a modem, the best way to test it is by using the BASIC Terminal program. You run this program, and it comes up and says **TERMINAL MODE**. At this point, anything you type gets sent out to the modem and any incoming characters from the modem get printed on the screen. If you are using a Hayes type Smartmodem, you will see the RD and SD lights on the front of the modem flash each time you press a key. When using a Smartmodem and sending out AT type commands, you should send Upper Case "AT" commands, not lowercase "at" commands.

If you are using a printer, before you try to run a professional software program, it is best to make your printer work directly from BASIC. Below is an example of how you could do this:

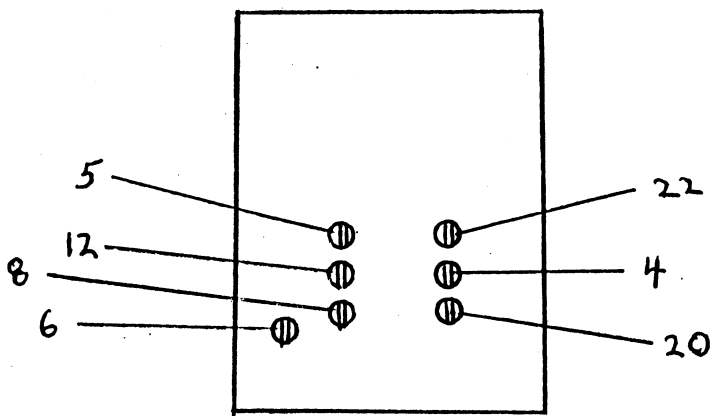
```
10 OPEN2,2,3,CHR$(38)+CHR$(97)
12 PRINT#2,"PRINT THIS OUT"
```

These commands will print those words on your printer. Notice that in the above open command, the number 97 is used, instead of the previous 96. This is because the Command Register Bit 0 handshaking bit is usually set to 1 when using a printer, in order to enable handshaking. If you have any difficulties trying to get your printer to work, try setting the Command Register Bit 0 to 0. The above 38 and 97 are only examples, and you should determine the correct numbers for your particular printer.

## SECTION 7 - MORE TECHNICAL INFORMATION

### CUT AND JUMP PADS

Previous versions of the Deluxe RS232 Interface have had one or more switches which allowed you to invert the polarity of the various control lines. These lines are 4, 5, 6, 8, 12, 20, and 22. Since our interface has been designed according to Commodore's established standard, change on these control lines is rarely necessary. However, with the past switch, if you wanted to change one line, you had to change them all. This often caused problems. This switch has been replaced by a set of cut and jump pads on the main PC Board of the RS232 Interface. As seen in the chart below, each of the control lines has a cut and jump pad. If you want to invert the polarity of any line, cut the trace that goes between the middle and the right pad, and then connect with a solder blob the middle and the left pad. This will invert the polarity of that line. To change the line back, remove the blob on the left pad and reconnect the middle and right pads.



## HOW TO DIRECTLY READ/WRITE THE RS232 BITS

From BASIC or machine language, you can directly read the incoming RS232 lines, and you can directly manipulate the outgoing RS232 lines. This description covers the C64 and C128 computers. Other computers will have different requirements.

There is a byte in memory at decimal address 56577 which represents the RS232 lines.

BIT	VALUE	NAME	I/O	TYPE
0	1	RXD	INPUT	-----
1	2	RTS	-----	OUTPUT
2	4	DTR	-----	OUTPUT
3	8	RI	INPUT	-----
4	16	CD	INPUT	-----
5	32	HI SPEED	INPUT	-----
6	64	CTS	INPUT	-----
7	128	DSR	INPUT	-----

This byte contains eight bits which represent the above eight lines on the RS232 port. If the line is an input, you can determine if it is high or low by peeking the bit value of that byte. For example, if you wanted to check to see if you had a Carrier Detect, you would use the command:

**A=PEEK(56577)AND16**

If carrier detect was present, A should equal 16. If carrier detect was absent, A should equal 0.

If a bit is an output, you can actually toggle that bit high and low by doing a logical AND and logical OR with the byte. For example, to make the RTS line go high and low, you would use the following commands:

**POKE56577,PEEK(56577)OR2 (go hi)**  
**POKE56577,PEEK(56577)AND253 (go lo)**

Using this method, you can do some manipulation of these lines. Although the Commodore USER I/O port can be set so that any of the lines are inputs or outputs, the Deluxe RS232 Interface is set for the above input/output pattern, and cannot be changed.

## **TRANSFERRING BASIC PROGRAMS**

The following program is a tricky little routine to allow you to transfer a BASIC program from another computer to your Commodore computer over an RS232 line. What this program does is take the incoming character from the RS232 line, and it prints them on your screen and then enters them with a forced carriage return, just as if you were typing them in directly. In order to use this routine, the other computer would have to send out the actual complete lines of BASIC program, just as if you were typing it in.

```
0 OPEN2,2,3,CHR$(38)+CHR$(96):PRINTCHR$(147);
1 GET#2,A$:IFVAL(A$)=0THEN1
2 PRINTA$;
3 GET#2,A$:PRINTA$;:IFA$<>CHR$(13)THEN3
4 PRINT:PRINT"POKE152,1:GOTO6"
5 POKE631,19:POKE632,13:POKE633,13:
  POKE634,13:POKE635,13:POKE198,5:END
6 PRINTCHR$(147);:GOTO3
```

The above BASIC program should be typed in without any changes. Realize that the line between line 5 and 6 is a continuation of line 5, and it just wraps around because of the short page. When you are ready to transfer your BASIC program, run this program. As the BASIC program comes across, this routine will print it on the screen and then enter it into the computer, just as though you had pressed

the return key. It will tack the transferred program onto the end of the program above. Once the transfer is complete, just delete the first 7 lines and then save your newly transferred program. The program being transferred must start above line 6 so that it doesn't erase the transfer program.

## TECHNICAL DATA

The Deluxe RS232 Interface has several switches which allow you to change which pins certain signals will be sent on. This is because a modem needs to have certain signals go into it in different places than a printer does. The charts below show the different "pinouts" for the MODEM and PRINTER settings.

### PIN FUNCTION - WHEN SET ON MODEM

2	Transmit Data	(to modem)
3	Receive Data	(from modem)
4	Request to Send	(to modem)
5	Clear to Send	(from modem)
6	Data Set Ready	(from modem)
7	Signal Ground	
8	Carrier Detect	(from modem)
12	Hi Speed Indicator	(from modem)
20	Data Terminal Ready	(to modem)
22	Ring Indicator	(from modem)

### PIN FUNCTION - WHEN SET ON PRINTER

2	Receive Data	(from printer)
3	Transmit Data	(to printer)
4	Request to Send	(from printer - (DCD))
5	Clear to Send	(to printer - (DTR))
6	Data Set Ready	(to printer - (DTR))
7	Signal Ground	
8	Carrier Detect	(to printer - (RTS))
12	Hi Speed Indicator	(not used)
20	Data Term Ready	(from printer (CTS/DSR))
22	Ring Indicator	(not used)

These charts will show you which signals are at which pins when you have the switches set for a modem or printer. The PRINTER charts gives the name of the signal, shows whether the computer is sending that signal to the printer or vice versa, and it also has some comments like (DCD).

The two switches on the front cover of the Deluxe RS232 Interface make these changes from MODEM to PRINTER. More specifically, the left hand switch swaps pins 2/3 and pins 4/8. The right hand switch swaps pins 6/20 and 5/20.

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### SECTION 8 - HOW TO RETURN A PACKAGE TO US

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In the event that you need to return the Deluxe RS232 Interface to Omnitronix for any reason, you must call us and get a Return Authorization Number. Your Return Authorization Number should then be clearly marked on the outside of the package you return as RA# \_\_\_\_\_. Any package returned to us should have a letter or note enclosed inside the package describing why the package has been returned, and a xerox copy of your purchase invoice. Write your Return Authorization Number in your letter also. Returns for repair should have a complete description of how the interface was acting defectively and all steps that were tried to get it to work correctly.

Any returns to us for refund should include a copy of the original receipt. No COD returns will be accepted. All packages should be addressed to our new address at:

**Omnitronix, Inc.**  
**760 Harrison St**  
**Seattle WA 98109**  
**(206) 624-4985**

