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EDITORIAL COMMENT

Our Index this month looks skimpy, but each of the articles in this issue are quite long and we have devoted as much space as possible to the Open Forum in an effort to get somewhat caught up. Not everyone's letter or answer is there yet, but we will get to them as quick as we can. Your patience is greatly appreciated.

Our Mouse House contest deadline of January 15, so we could award some happy mouse user with a hundred dollars, has come and gone. We did not receive one entry! Some lucky soul could have sent us his entry with only one program named that he was using his mouse with and been one hundred dollars richer today. Was it because our contest was too early after bringing out the mouse program? Or was it because we ran it through the holiday period and everyone was too busy?

There are now plenty of users who have added a mouse to their Model 4 and we

thought that by now we would have heard from some of them. But we haven't, so our only conclusion is that everyone thought there were others who would send their entries in with a larger list than they could produce. Whatever the reason was, if we hear from you that you would like to have more time in learning how to apply your mouse, we will run the contest again.

NEW PRODUCTS

This issue announces another two new program packages by David Goben. One package Hi-Res Utilities Package has many new features that were never available for use with the high resolution boards. They are compatible with either the Micro-Labs or Radio Shack high resolution boards. They support almost any printer you can think of, Radio Shack DMPs, third party dot matrix printers that have Epson and IBM modes. They will even support laser and inkjet printers including the HP laserjet and Deskjet.

The second package of programs is a collection of PostMaster Utilities which will allow you to create your own icon libraries for PostMaster. The one unique feature of the Make Icon program is its windows which can be moved across the screen with a high resolution picture on it and capture just what is inside the window frame. This feature is not available in any other icon building package. For more details see our display add section.

And if you don't have a PostMaster program yet, its time you got one. They are still available from David P. Miller, PO Box 704, Okmulgee, OK 74447 for the still low price of \$40 and are fully supported by the author.

February
1992

PROGRAMMING TUTOR Part 37

by Chris Fara (Microdex Corp)

Programming style

According to Webster, a "style" is a "manner of expressing thought in language, especially a manner characteristic of an individual", etc. It also is an "overall excellence, skill or grace in performance". What does that have to do with programming? For one thing, computer programming is precisely "expressing thought in language", be it assembly, BASIC, or any other. Cultivating a consistent style also tends to make the programming work easier, and the results more acceptable. There is, of course, programming and programming. Often we need only a quick and dirty utility for our own use. So we just hack away at the keyboard, get the results, and don't worry about excellence. But any program intended for continuous use will benefit from a moment of "thought to be expressed in the language". By definition everybody's style will be different, so today I'd like to share some bits of "philosophy" from personal experiences.

The tools

Faced with a programming job of any consequence, I begin by thinking what "tools" will be needed. It's much like getting all the screwdrivers and wrenches lined up for a repair job. In our case the "tools" are procedures that will be needed in the program. For instance if it's likely that the program will do comparisons of "strings" (lines of text) then a comparison routine is a tool. So we'd ponder whether the comparison should be "case sensitive" or not (should "Chris" and "CHRIS" and "chris" be treated as equal or not)? Will all strings have the same length? Is it likely that a "null string" may come up (word without any characters; it happens more often than you think)? This phase of programming is most conveniently carried out in the bathroom. My favorite time is during the morning shave. In this respect some people are more fortunate than others. For example my daughter seems to have all the makings of a great programmer: she already spends about 45 minutes in front of the bathroom mirror every morning.

Often this mental exercise brings up a fuzzy

memory of having written a similar routine for some other program, or having seen something like that in a magazine. In that case I don't hesitate a moment and freely plagiarize my own or somebody else's previous ideas. Otherwise, once I have mentally scanned all likely applications of my tool, I write the routine on a piece of paper in what the computer jargon calls "pseudo-code" which really means: in plain English. It's like a cooking recipe and looks maybe like this....

Get the length of first string.
Get the length of the second.
Take the shorter one.
Is it a "null string"?
If so then the other is "greater".
Otherwise.....

And so on. The pseudo-code goes into a manila folder, and after several visits to the bathroom the outline of the tools is more or less ready.

When the time comes to produce the actual code, I personally like to write all my "tools" as subroutines. In assembly language they are CALLED, in BASIC we GOSUB, but it's the same idea. Much ink has flown in arguments over the respective merits of subroutines versus "in-line" programming (the GOTO or Jump variety). It is true that the subroutine approach adds a bit of overhead to the program. But the benefits by far outweigh this objection. One practical advantage is that the programming process can be carried out on and off, as the time and workload permits. Each procedure can be written independently from the rest of the program, and even teamwork is possible this way. Another benefit is a better organization of the program, which in turn facilitates changes. Not the least relevant is the ability to plagiarize old work. In fact I keep some of my favorite subroutines in "common" disk files, both assembly and BASIC. Sometimes I even get smart (happens less often than you think) and I'll merge those files into a current program. The thing may need some changes here and there, but usually the bulk of the old work can be reused. Initially I may end up with more routines than I'll really need, but I tend to keep them in the listing almost until the end of the program development process. It's like keeping that extra pair of pliers ready just in case they might be needed. Later on, when the program structure is near completion, the unused routines can be

simply deleted. And that's another advantage of the subroutine approach. Since each is called and returns independently of all other segments of a program, each can be deleted or added anywhere in the listing without affecting the rest of the work.

Borderlines

No, I am not talking about the PostMaster. One of the most common reasons for "bugs" in any program is the lack of provision for "borderline conditions". It's hard to believe, but even some of the most famous commercial programs have suffered from this oversight. A basic example is any input routine. One generally can expect that something will be typed in response to an input prompt. After all, why use a program if we have nothing to use it for? Yet a provision must be made for the case when the user has nothing to say. There are essentially 6 conditions to be examined in any routine....

1. The "not enough" case: for example when a routine normally expects positive numbers but a negative value creeps in.
2. The "minimum" case: eg. "null" string.
3. The "just about right" case.
4. The "maximum" case: eg. when a "change sign" routine gets an integer -32768 but the max possible positive value is +32767.
5. The "too much" case: how to stop the user from typing a book into a routine designed to handle a 3x5 card.
6. The "wrong" case: for example when a routine designed to process numbers encounters alpha characters. Not every routine will be sensitive to all those conditions, but I found it a cheap insurance to mentally scan all six possibilities. And if any of them could lead to a crash then a provision must be made to divert the program flow to a known safe point.

Leaving the party

Not every party turns out to be as fun as advertised and so it's not a bad idea to have a plan for a graceful exit in case things get boring or sour. In assembly programs one very useful plan is to store the stack pointer as it exists at some known safe point in the program flow.....

LD (LABEL),SP

This comes in handy when we are somewhere deep in "nested" subroutines (one calling another) or have PUSHed all kinds

of values onto the stack, but suddenly need to "abort" everything, for instance after a disk failure. Rather than plodding through a series of POPs and RETurns (and usually miscounting them), restore the original stack.....

LD SP,(LABEL)

and jump to the point in the program where the stack pointer was originally stored. This guarantees that the stack will be cleared and will not cause any problems later on, such as overflowing or RETurning to some forgotten address. Or worse yet, to an address which really was not an address but some numbers PUSHed onto the stack.

Close the door

The civilized way to leave a house is to close the door on exit. The same applies to programs. BASIC is pretty tolerant and usually the only important requirement is to CLOSE open files. But if any values have been POKEd into system memory, then the original contents should be restored before exit. The good manners are even more critical in assembly language because there we have more dangerous means to modify DOS and system memory. A well-behaved program is like a house with an entry hallway: when we arrive, we leave our dripping overcoats there, and collect them before exit. In a program there should be an entry section where all modifications of the system are made (break status, scroll protection, routing, and such). All original values should be stored in a neutral memory area that will not be affected by the program operations. Just before exit collect the original values and put them back where they came from.

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A VISIT WITH DAVID GOBEN

by David Goben

When it rains, it pours. Just as I was running out of ideas for column material, a fresh tidal wave of creativity sweeps over me. Now I just about don't know where to start. For example, while working (playing) with my Epson printer, I discovered not only how to print self-created near letter quality characters super fast, but I discovered how to print graphics in such high density that it rivals laser printer quality. I never thought I would see picture perfect graphics printed out on a dot matrix printer. Well, this technology will soon be shared with you in these pages, as well as commercially available applications which take advantage of it.

Powerful mouse applications are also being designed which will debut in 1992 and 1993. As time permits for development, these applications will cover new relational data base systems, a super word processing system, desktop publishing, spreadsheets and more. Other authors are also hard at work on many secret projects. One of them is even catering to the recreational side of computing, and is developing a truly incredible mouse-oriented hi-res game I am dying to play. A machine language mouse-oriented drawing program for hi-res is also currently being developed. There are -many- other products, software and hardware, which are in the developmental and conceptualization stages which I am sworn to secrecy on, and I believe they will totally revitalize our computers. My advice is: if you think your computer is on its last leg and you are thinking about going to MS-DOS simply because you need a competitive or even a functional computer -- please just hold on a little longer. My prediction is that 1992 will herald the evolution of our computers from a larvae to a butterfly. I don't think I'm exaggerating.

1992 will also introduce my brother, Robert (Bob) Goben. He is to hardware what I am to software. Between us, we could be dangerous. Back from an extended, all-expense paid trip to Europe and Iraq, Bob is now state-side and dying to exercise his hardware genius. Maybe I'm prejudice in calling him a genius because he's one of my best friends and my brother. But actually I think it's because his last name is Goben

(yuk-yuk). We had this running joke with our Dad about 'Goben-Perfect' products; a play off of Herter's-Perfect ammunition and outdoor supplies. Hopefully you will soon see what kind of 'Goben-Perfect' hardware/software combination products can come when he and I put our heads together. Of course, at the same time, sometimes when I think of my brother, about the times that we had shared in the past, it makes me want to just pick up the phone... and bounce it off his head.

CHEAP PHOTOCOPIER

Aside from using the TRSCAN program with my Chinon DeskScan 2000 full-page scanner, I can use it as a simple photocopier by attaching the parallel interface connector on the scanner to my Epson printer (this can also be done with the DeskScan 3000). I then set dip switch settings as follows:

SWITCH #1

- 1: any (don't care)
- 2: any
- 3: ON (use markers)
- 4: OFF
- 5: OFF (9 - pin)
- 6: OFF (EPSON printer)
- 7: ON (parallel interface)
- 8: OFF

Set Switch # 2's positions 1 and 2 to the resolution you desire. Interestingly, I've found better results by keeping positions 3 and 4 of Switch # 2 in the OFF position, thus selecting positive imaging and character mode gray scaling. Selecting the graphics mode tends to wash an image out. Finally, you may wish to set position 5 of Switch #1 to ON if you have a 24 pin printer, and position 6 to ON if you have an NEC compatible printer. The thing that burns me with Tandy about the NEC mode is that Tandy copied much of its graphics format (but not all of it) for their DMP mode printers. Of course they changed it just enough so that DMP users cannot use this mode. Thanks a lot.

Figure #1 is a sample printed out at a resolution on the Chinon set at 100 (Switch # 2 positions 1 & 2 set to ON). A resolution of 150 or 120 is closer to the images original size (130 may have been ideal, but not supported). 120 makes the copied image slightly smaller, and 150 makes the copied image slightly larger (100 makes an image

only about 2/3 the original size) Remember that the image in Figure #1 may have lost a little detail between its original printout and its final printout in this magazine.

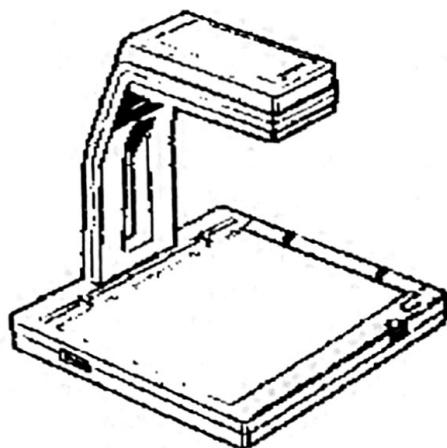


FIGURE #1

By the way, the output images in all modes on the Chinon will be printed with a graphics resolution of 120 x 144 DPI (dots per inch), which is the near-letter-quality resolution.

PRINTER DUMP (Round 2)

Since I am focusing on the Epson printers this month, I thought I might point out a nice feature in this printer for checking codes sent to the printer. In my last column I described how to route printer codes to a disk file to be examined by a zap utility, to see if the codes expected to be sent to a printer which you may not have are in fact the codes which were sent (this application is handy for writing printer drivers for printers you do not have readily available, but know its command protocol).

Another method is to use the Data Dump Mode available on most recent Epson dot-matrix printers (many other printers also have such a feature, such as my ALPS LPX600 laser printer). You should consult your manual for this feature. For example, on my Epson Apex80 printer (also called the Epson Action printer APEX80), you activate the Data dump mode by holding the FORM FEED and LINE FEED front panel buttons down when turning the printer on. On this printer, the words "Data Dump Mode" are

printed, and the paper advances a couple of lines.

When you send data to the printer, it prints the information in a 3-field format. The first, left-most field displays a reference 4-digit line number in hexadecimal format. The 2nd, middle field displays 16 bytes in 2-digit hex format, each 2-character group being separated by a space. Each group represents the code for 1 byte. The last, 3rd field displays the printable rendition of the codes. Codes having a value of less than a space (0-31: a "control" code) are printed as a period character).

The great thing about this mode is that you can set up an application program for a totally different printer, and quickly examine what codes are sent to it, versus what you think should be sent to it. This way you can debug code for a printer you do not even have. As may be obvious, this has application only to those who have the experience and knowledge and need to access such information.

DOING IT WITH EPSON GRAPHICS

I told you last month that I may have put my foot in it when I shared info on DMP graphics. Now Epson users want the low-down on their printers. Remember, those of you who have DMP printers which are switchable to IBM mode; you can follow along, as the IBM mode is Epson compatible.

Epson graphics allow much higher resolution than most DMP printers, but at a cost of a more involved process of sending graphics data to the printer. Of course this higher degree of involvement can also result in super-fast printing, if done correctly. In this column I will be discussing the 9-pin Epson compatible printers. 24-pin printers will be left for the future (except where applicable in this column) if there is enough interest.

Most Epson printers have more features than you can shake a stick at, but the beauty in them is that they are compatible -- a trait common to the Japanese infatuation with standardization -- a trait the US is now only waking up to in the computer industry (Japan actually has 2 standards: Epson and NEC). Because of this standardization, we can be using different printers, but still communicate with our printers in the same fashion. Most Epson-compatible printers are

backward compatible with older Epson-compatible printers. Unlike the days when it took dozens of dot-matrix printer drivers to support an equal number of dot-matrix printers using an application program, chances are you can use a printer driver written for one Epson printer on that and future Epson printers. For example, my FX-80 SuperSCRIPSIT printer driver, and the DTMTRX printer driver (for older Epson printers which do not support reverse linefeeds), covers -all- Epson dot matrix printers released in the last several years. The only time you may want a newer driver is when you want to support features not previously available.

With most Epson printers you can usually select numerous international characters sets (normally between 10 and 15). You can also usually select between various print modes and types, such as pica, elite, condensed, emphasized, double-strike, double-wide, italic, underline, draft, NLQ Roman (Near Letter Quality) and NLQ Sans Serif. Often other NLQ modes are available, especially with the newer 24-pin printers.

All Epson compatible printers (except for perhaps the first models of the very early 80's), support 8-pin graphics, meaning that you can print 8 dot high columns in one shot. Many also support 9-pin graphics, where you can print 9 dot high columns. Obviously 24-pin printers can support 24 dot high columns. For the time being I will stick with 8-pin graphics.

8-pin graphic codes can send a graphics code in one byte. A byte contains 8 bits, each of which is assigned to a pin on the printer's head. Unlike DMPs, the Epson mode assigns the higher values to the higher pins, and the lower values to the lower pins:

PIN#	BIT#	VALUE
8	7	128
7	6	64
6	5	32
5	4	16
4	3	8
3	2	4
2	1	2
1	0	1

Using this chart, we can design a vertical column by adding the values for the pins

we want to fire together, to compute our graphics code. For example, if were wanted to send a graphic code which would print with just pins 1, 2, 7, and 8, we would refer to the chart and see that these pins have values of 1, 2, 64, and 128, respectively. Added together results in a graphics code of 195.

For our purposes, and to make this month's column less of a novel, I will discuss the most common Epson graphics modes: 60 DPI (Dots Per Inch), 120 DPI, and 240 DPI. There are usually other modes, such as 80 DPI (CRT I), 72 DPI (Plotter), and 90 DPI (CRT II). The 72 DPI mode deserves special mention because in this mode you can print data in a 1:1 aspect ratio, meaning that 1 dot-space horizontally is equal in length to 1 dot-space vertically. This mode has great potential for those who want to develop printer plotter type support without going out and buying a plotter.

Like the DMP printers, each dot on the printer head is located 1/72 inch from each other vertically. This does not mean that we are stuck with printing with a vertical density of 72 DPI. Using some tricky techniques, though not recommended to the beginner, we can print graphics with vertical densities of 72, 144, and 216 DPI. Of course all other densities between 1 and 216 are also possible, but may require even trickier programming magic.

60 DPI is called single-density. This is the same density available on a DMP in its 10 CPI (Characters Per Inch) mode. 120 DPI is called double-density (kind of an obvious name). 240 DPI is called quadruple-density (again obvious).

8-pin graphics have a fairly standard way of being initialized. Unlike the DMP printers which set a graphics mode and let you go to town sending as many graphics codes as you care to choose without counting them, Epson printer require that you tell the printer how many graphics code are going to be sent when you send the graphics mode selection code. Actually, this is not all that complex. What happens is the graphics mode is selected with the number of codes to send in that mode. And once the codes are sent, the printer returns to the text mode. This is handy in a screen-print application when you may have to mix text

with graphics. Here you can print the text data normally, and print each graphics character individually. Program listing 1 is a Model 4 screen printing routine which can be added to your low-resolution graphics programs, which prints on an Epson printer. It even supports the "crushed" pixels common to the Model 4 screen. Refer to its comments at the beginning to see how to use it.

Selecting 8-pin Epson graphics follows this formula:

ESC mode n1 n2

ESC is the ESCAPE code 27 decimal. "mode" is "K" for 60 DPI, "L" for 120 DPI, and "Z" for 240 DPI. "n1" and "n2" are the count of graphics codes to send, which are sent in the "Intel" 16-bit format, which states that the lower byte of the value precedes the higher byte value. What this means is that "n2" is the count divided by 256, and "n1" is the remainder.

Suppose we wanted to send two horizontal bars 300 dots long in the single-density mode. A sample BASIC program line could be:

```
10 LPRINT CHR$(27)"K" CHR$(300 AND  
255); CHR$(300\256);
```

on one line, of course. Model I/III users will need to change the last command to CHR\$(FIX(300/256));. Remember the final semicolon (;) so that a return code is not sent to the printer. By the way, the integer divide "\\" code is generated on the Model 4 by holding the CLEAR key down and pressing the "/" key (Model I/III do not support integer division).

The above math can be simplified by using the following BASIC commands (remember to assign line numbers as appropriate for your application if you include these lines in a program):

```
10 V = 300  
20 N1 = V and 255  
30 N2 = (V - N1)/256  
40 LPRINT CHR$(27)"K" CHR$(N1);  
CHR$(N2);
```

Note the line wrap on line 40.

The next step is to send the graphics code. If we use the graphics code developed earlier in this column, 195, we could send these codes using one of many possible ways. For example:

```
50 FOR X=1 to V  
60 LPRINT CHR$(195);  
70 NEXT X  
80 LPRINT
```

The final LPRINT sends a carriage return code to the printer so that the line will be printed out.

Notice the two lines. See how each one is made up of 2 vertically printed dots? You may also like to experiment by changing the "K" in line 40 to "L" for 120 DPI, and "Z" for 240 DPI, or with changing the 195 value to another.

Setting up vertical DPI is the next hurdle. If we were to use the standard vertical spacing of the printer, which is 6 lines per inch, we will find that the rows of graphics are not adjacent to each other, but are separated by a small space. Why? Because unlike the DMP which automatically enters the vertical 7/72 DPI mode while in its 7-pin graphics mode, the Epsons do not. Considering that the standard vertical graphics resolution is 72 DPI, and there are 6 text lines to an inch, 72/6 equals 12 dots per column. This causes a 4 dot (12 - 8) margin between graphics rows. Since we are printer 8 pins graphics, it would be desirable to print rows with a spacing of 8 DPI (8/72) rather than 12 DPI (12/72). We can do this by issuing the command LPRINT CHR\$(27)"1" CHR\$(8); before printing any graphics (By the way, the quoted character is the number ONE). This way we can print graphics which occupy more than 8 vertical dots as a single joined graphic. Obviously, to print 8-pin graphics which are greater than 8 dots high will require more than one row of 8 dots apiece.

NLQ MODE

Most Epson printers allow you to construct your own Near Letter Quality characters. You do this by using a grid template which is usually 18 dots high and 12 dots wide. Each vertical column of 18 dots must be supported by 3 separate bytes. The first 2 are a full 8-bits long, providing 16 pins (8 x 2) and the last byte provides the last 2 dots.

Just like with the graphics mode, each byte has a top pin value of 128, and a bottom pin value of 1. Also, the 3rd byte, at least on 9-pin printers, uses only the top 2 pins, providing a values of 128 for the top pin, and 64 for the one below it. No other bits on this 3rd byte are supported, except on 24-pin printers ($8 \times 3 = 24$).

The best way to visualize this is to draw a 12×18 grid on a piece of paper, or a piece of grid paper. Further divide it by drawing a line between the 8th and 9th row, and the 16th and 17th rows. Now you should see the demarcation of the 3 bytes which must be assigned for each vertical column. It might be nice to enhance this grid by writing the column numbers 1 to 12, left to right along the top (I use 12 because it is the usual width of the NLQ character set). You may also want to assign the pin values on the left for each byte (128 down to 1 for the first and second byte, and 128 and 64 for the 3rd).

Now would be a good time to make copies of this grid for future use.

Using the "standard" procedure for defining a NLQ character requires several steps. The first is to be sure to be in the NLQ mode. This is accomplished with the command:

```
LPRINT CHR$(27)"x1";
```

That is a lowercase "x" and the number ONE. You must then download the printer's ROM into the printer's RAM area. This is accomplished with:

```
LPRINT CHR$(27)":"STRINGS$(3,0);
```

The next step is to select the user-defined set:

```
LPRINT CHR$(27)%"CHR$(1);
```

The next step is to specify the range of characters to replace. These are restricted to a range of 58 to 63 decimal (characters ":" through "?"). If you have a 24-pin printer, most of these allow you to redefine codes from 0 to 127. If you wanted to redefine the "<" character, you would specify the range from "<" to "<":

```
LPRINT CHR$(27)"&"CHR$(0)"<<;
```

You must then tell the printer some specifics about the character: the dot width of space before the character, the dot width of the character, and the dot width of the space after the character. These are represented by 3 consecutive bytes. The leading and trailing values are required if your Epson printer supports proportional justification. On my printer the proportional mode is not supported, so I will use a null value for the leading and trailing dot widths, and a value of 12 to specify the dot-width of the character. This is accomplished with:

```
LPRINT CHR$(0);CHR$(12);CHR$(0);
```

Since we are only redefining one character, we can simply send one dot width command. Were we to be defining more than one character, we would send out the above line for as many characters as we were redefining.

Finally, we send the character data in blocks of 36 bytes apiece (12 groups of 3 bytes) for each new character. Since we are only defining one character, we could use the following code:

```
FOR X=1 TO 36  
READ C  
LPRINT CHR$(C);  
NEXT X
```

It is assumed that the 36 bytes are stored in DATA statements somewhere in the program. More on this later.

Finally, we get to do the best part: PRINT IT! Since we have selected the "<" to be replaced by our new character, every time we send the character "<" to the printer, our new character will instead be printed. To see a practical example of this (if you have an Epson or compatible which supports all the commands listed in this section), type in and RUN Program Listing 2. This will redefine the "<" character to an Up Arrow character. When you examine the program, remember that each consecutive 3 characters represents one vertical column.

Contrary to what my Epson manual states, you can specify characters greater than, or less than 12 dots wide. Also, the programmer for the examples in the manual must have been drinking, because the examples do not

work without some serious debugging. Also, 24-pin Epson printer owners (and those with 24-pin Epson modes, such as the Okidata series) can use the lower 6 bits of each 3rd byte to define characters 24 dots high. They can also use program listing 2 on their printers unchanged because it is backward compatible to them.

CONCLUSION

In my next column, I'll show you techniques for taking advantage of high density 120 x 144, 240 x 144, and 240 x 216 dot matrix printing, and give you a preview of some printouts from my revised, soon to be released hi-res screen printer. If room permits, I'll also show laser printer users how incredibly easy it is to print boxes, and even fill them in with gray-scale shading or patterns. So until then, HAPPY COMPUTING!

-David Goben

LOOKING OVER ALLWRITE

by Ronald Garbin

Allwrite is a very powerful word processor. It has extremely capable handling of printing and printers, and the user finds editing easy and fast. Within reason, you can do almost anything you please. Sometimes this takes thought, and it may be worth while to describe here some capabilities of Allwrite which may not be obvious. Also, I want to mention a few simple patches which increase the program's performance. Everything that follows refers to Allwrite Version 1.13 running on the Model 4.

VARIABLES FOR FORMATTING

A major strength of Allwrite is the use allowed of variables, numeric or string. The Program provides the user a choice of 100 variables. These are designated as @@0, @@1, . . . @@99. The first variable (@@0) is special: you assign it a value by responding to a prompt. The other variables you can change throughout the text, in several ways.

A variable becomes numeric by receiving an integer value, e.g. ;se7=2. Thereafter you refer to it as @@7. Allwrite users know that a simple but powerful arithmetic emerges by

combining commands such as ;IF, GO, LB, AR, etc. Many of you may not know that you can set variables equal to text formatting commands and, by "printing" the variables, invoke those formatting commands.

For example, put in your document the statement

```
;se7=;in+5;ll-5
```

This defines the variable as a character string. It prints literally as a string whenever the expression @@7 occurs in the text, except when @@7 appears at the left margin, immediately following a text line end (carriage return or ENTER). Then Allwrite's text formatter processes @@7 as a format statement. Subsequent text will print with left margin shifted rightward by 5 tenths of an inch (.5") and the print line length will shorten by the same.

Suppose you wanted also to change the print pitch of the subsequent text. Then you would have defined ;se7=;in+5;ll-5;pi5, where ;pi5 specifies the new pitch. You can change the line spacing (;ls) and/or the line feed value (;li) in the same way.

Complicated format statements can become quite concise, thanks to this use of variables. They can be employed over and over again. So you can change print format values, globally and systematically, by a set command at the start of the file or merely as a run-time option. Throughout the text there may occur pitch commands to print special characters, italics, or other typefaces, always followed by a return to a "base" pitch ;pi0. Then you can change the base pitch overall just by a set command such as ;se5;pi16.

Consider also the ;GO command. Allwrite allows conditional jumps ahead to a label specified by the ;LB command. You might have defined an integer variable @@4. When its value equals 1, you might want Allwrite to skip ahead through the text until it finds a label specified by ;LB LABEL1. One way to do this is to insert the lines:

```
;IF @@4=1  
;GO LABEL1
```

Better yet, you could write simply the one

line ;GO LABEL@@4. This carries the added advantage of allowing jumps to other labels LABEL2, LABEL3, . . . if you define them, and if @@4 takes on the appropriate values.

KEYBOARD CLICK

The substitution feature is not the only overlooked aspect of Allwrite. There exists also an undocumented BREAK key command in the editor. Press <BREAK> and type the word click or its first two characters. Press <ENTER>. This command sequence toggles the keyboard click on or off.

NAMED SOFT POINTS

It might be worth mentioning here the use of soft keys to define and use named points. Allwrite lets you name up to 26 points by pressing the sequence of keys (on the Model 4) of <CLEAR>, <,> followed by any letter from A to Z. Say you press the letter "A." Then Allwrite stores the current cursor position as the named point A. Thereafter, you can always return to that text position by typing the sequence <CLEAR>,<,>,<A>. The return occurs with lightning speed. Now you can simplify the naming process by defining soft key combinations such as <CLEAR>,<2> to name a point A, and <CLEAR>,<3> to return to that point. I find this a much better use of soft keys than the defaults of inserting ;pa and ;ce, respectively. If, like me, you can touch-type, ;pa and ;ce are already easy to type. But soft keys used to name and reach a point open a world of added convenience.

Suppose you want to copy or move selected single lines from one part of your text to another. You can do this with great speed by placing the cursor on the line and pressing <CLEAR><C> to copy the line, or <CLEAR><M> to move it, and then going to a previously named destination point with <CLEAR><3> followed by <CLEAR><H> for "here." You can even return to the vicinity where you started by having named there a point "B." Or you could just do a search to an appropriate target string. Allwrite has the very useful attribute of allowing searches, or continued searches, even while the editor is in block mode. You still have at your disposal the simple key combination <CLEAR><F> to carry the cursor to a point in the text previously defined by a search string.

FORMATTING TABLES OF CONTENTS
Some simple patches exist to Allwrite which augment its formatting powers. Run

PATCH ALF/CMD (D4F,41=00 00 00
00:F4F,41=2B 36 20 3C)

This permits the Table of Contents routine to accept format commands on the fly. It becomes possible, for instance, for you to have your table of contents printed in columns, without direct editing. In the text you insert ;TC;pi5;cb2;cm just like the usual table of contents entry; only this one will change the print pitch and cause subsequent printing in two columns. The format line ;pi5;cb2;cm will appear in the generated table of contents file, with the indicated result. The comment command ;cm disables the tab character and page number that occur in each table of contents entry. You don't want those. They would ruin the format statement and lead to a format error.

One word of warning: Allwrite (patched or not) uses in the table of contents file the tab character that was in force at the first occurrence of the ;TC. You should make sure that any tab character you use in your subsequent ;TC commands matches this first occurrence (e.g. ;TC;tb > 25,+8 works only if > is your tab character throughout).

RELATIVE PITCHES

The following patches apply to any Version 1.13 of Allwrite for the Model 4, but it has special value for those of you who, like me, use an Hewlett-Packard, or HP compatible, laser printer.

PATCH ALF/CMD (D70,5A="See our manual.":F70,5A="PLEASE CHECK OUR")
PATCH ALF/CMD (D70,6A=00 FD 36 FF 02
2A BC 94:F70,6A=" MANUAL ")
PATCH ALF/CMD (D70,72=22 F2 A7 CD D0
57 22 BC 94 C9 0C:F70,72="FOR DETAILS")
PATCH ALF/CMD (D35,14=07 CD AB
94:F35,14=01 CD D0 57)

These changes cause Allwrite to accept what I call relative pitch commands. A format expression like ;pi+3 assumes a meaning not provided by the original program; namely, add 3 to the current pitch number, whatever it is. The patches let you add to, or subtract from, a given pitch any value that won't take the result outside the range 0-63, since Allwrite doesn't recognize pitches outside

that range; e.g., something like ;pi73 is not permitted. Of course your printer will respond sensibly to any pitch selection, only if it has access to an actual font corresponding to the new pitch. For more information on that, see your Prosoft LaserJet package documentation or, better, the Allwrite Model 4 Laser Utility Pack by Lee Rice and Gary Shanafelt, which is available from Computer News 80.

Suppose throughout a document you employ a base font specified by ;pi27. Let the associated bold and italic fonts be given by ;pi28 and ;pi29, respectively. If you later decide on a base font of a larger point size, or a different type face, then you will have to change not only ;pi27 everywhere, but also ;pi28 and ;pi29. This often will be easy--but not if your entire document is so long that it spans many linked Allwrite files. Then it is much simpler and tidier for you to specify ;pi27 at the start of your document, or on the option line at print time, and invoke bold with ;pi+1 and italics with ;pi+2, returning to the normal base font with ;pi-1 and ;pi-2, respectively.

Of course you previously must have grouped your LaserJet fonts to have pitch numbers in the suitable order.

If you want your LaserJet to print subscripts, these will look better in a point size smaller than the body text. You might print the chemical formula for water with:

```
;co on;se7=;pi-3  
;se8=;pi+3
```

```
...  
H  
@@7  
@-2@+  
@@8  
O
```

This assumes that ;pi-3 selects the font of next smaller point size. You can use @@7 and @@8 again and again without worrying whether your initial pitch changes.

PITCH RECOVERY

Font flexibility becomes still greater by exploiting further patches:

```
PATCH ALF/CMD (D00,04=FE 40 C2 52 5C  
2A 23 26 22 21:F00,04="COPYRIGHT ")
```

```
PATCH ALF/CMD (D00,0E=26 22 BC 94 C3  
44 5A 30 ED E5:F00,0E="(c) 1984, ")  
PATCH ALF/CMD (D00,18=2A 21 26 22 23  
26 E1 22 21 26:F00,18="THE TESLER")  
PATCH ALF/CMD (D00,22=C3 54 5A 00 00  
00 00:F00,22=" SOFTWA")  
PATCH ALF/CMD (D35,12=12:F35,12=15)  
PATCH ALF/CMD (D35,1C=08:F35,1C=0B)  
PATCH ALF/CMD (D35,25=C3 11  
26:F35,25=D2 52 5C)
```

Once you make these changes, Allwrite will recognize the format statement ;PI64. This doesn't introduce an additional font with pitch number 64; rather, it calls back the font previous to the current font.

So if your text starts by printing a base font given by ;pi27, and at some point the text switches to italics via ;pi29 or ;pi+2, then the occurrence of the statement ;pi64 causes printing to resume in the original base font. Both ;pi27, and ;pi-2 achieve the same result. But suppose you want to print a particular special character, perhaps the 91st in a font of pitch number 5. Then define in your document:

```
;se7=;pi5;sy91;pi64
```

Whenever in your text you later insert @@7 (on a separate screen line), Allwrite will print the desired character in pitch 5 and return to the previous font, whatever it was. Of course the connect (;co) must be on, as always for a mid-line pitch change.

If you want to print a blank space to precede the special character, define:

```
;se7=;sy32;pi5;sy91;pi64
```

With the ;pi64 command you can even define certain variables more or less permanently as special characters in a designated file. By imbedding such a file in your text, or in your printer default file, you can have those characters always conveniently defined and ready to print, independently of externally specified pitches.

OTHER REMARKS

Finally, let me mention two further tricks and a remedy for a bug in Allwrite. All three pertain to using a LaserJet printer.

Allwrite lets you use headers and footers,

called top and bottom titles, respectively. For once, though, the program is less versatile than some other word processors. Prosoft warns that Allwrite won't permit mixing LaserJet fonts on a single title line. But you can partially overcome this difficulty.

Suppose you want your LaserJet to print a single bottom title line consisting of a centered page number in a font given by ;pi30, flanked flush left and flush right by the words "Allwrite" and "Tricks," respectively, but you want to print these words in a font given by ;pi29. To do so, define two bottom title lines.

```
;pi30  
;bt 1//-$-/  
;pi29  
;bt 2/@+@+Allwrite//Tricks@-@-/  
;pi30
```

The second title line effectively will shift up and print on a level with the page number.

Another trick is putting in your printer default file the long-edge offset command

```
;sy @27,38,108,45,49,53,53,85
```

This will compensate for the LaserJet normally starting all its printing from about 1/6" in from the left margin of the paper (printing zone). The compensation ensures that ;lm10 gives you a 1-inch left margin, ;lm20 gives you a 2-inch left margin, and so forth.

Lastly, I come to a bug in Allwrite. Allwrite should let you choose line spacing (;ls) greater than 2. You certainly would want this choice in preparing, say, overhead slides in a large font. I found, though, that with line spacing greater than 2, Allwrite loses track of page lengths and page breaks. The first overhead prints properly, but subsequent ones become impossible: each succeeding overhead prints increasingly lower on the page and lines run over to subsequent pages.

The problem seems to result from the LaserJet's high resolution. To correct the problem, patch the printer driver:

PATCH HPLASER/TAB (D00,1C=F0 00:F00,1C=D0 02)

So far the patch has worked for me, up to line spacings equal to 6, certainly adequate for 30-point fonts.

CONCLUSION

Model 4 users enjoy a fortunate position. Programs like Allwrite don't grow on trees. Compared to such recent word processors as WordPerfect 5.1, Allwrite is simple and easy to use, and I find it has all or most features I need. Allwrite doesn't show you on screen exactly what you will print, but you do see on screen your text in readable form--unlike those more WYSIWYGed word processors which crop off the ends of lines at the left edge of the display. To read them you are compelled to scroll right to left, line by line.

Allwrite deserves use, and Model 4 owners have the machines to do just that. I hope you find these suggestions helpful. Good luck!

-Ronald Garbin

(*Editors Note*) The Allwrite program by Prosoft is no longer available or supported by the Prosoft company. Prosoft as a company is also no longer in business. The above article clearly demonstrates the willingness of users who own original TRS80 programs to support them for others who also use the same program. Also please remember that even though a company is no longer in business, it does not mean that their software becomes public domain. It is still a copyrighted program and belongs to the company or authors of the program. To obtain a legal copy of Allwrite, it must be the original program disk and manual and the former owner can retain no copies for his use.

That aside, we wish to thank Ronald Garbin for his efforts on Allwrite and hope to hear more from him. -CN80



THE NEWCOMERS CORNER

For Novices, Beginners, and First Time TRS-80 Users. Part 7

In our opening article for the Newcomers Corner (Vol. 4 No. 5, pg. 16) we told you that there were eight Command Words that you needed to become familiar with which are used from DOS Ready to get the most out of your computing. They were:

FORMAT (see Vol. 4 No. 6, pg. 17)
DIRectory (see Vol. 4 No. 7, pg. 14)
LIST (see Vol. 4 No. 8, pg. 17)
COPY (see Vol. 4 No. 9, pg. 12)
BACKUP (see Vol. 4 No. 10, pg. 11)
BASIC -LOAD-SAVE (Vol. 4 No. 11, pg. 10)
QUESTIONS ON DISK DRIVES (Vol. 4 No. 12, pg. 13)
QUESTIONS ABOUT THE 4P (Vol. 5 No. 1, pg. 12)

In part one through six we covered the few computer command terms that you need to know to operate your TRS-80 computer with some comfort. In part 7 we took the opportunity to answer many of the questions we have been asked by new owners about floppy disk drives and floppy disks. In our last issue we covered some of the questions received by the Model 4P owners.

Some readers failed to read the opening statement in our last Newcomers Corner, where we stated that the answers in this column only related to computers as they were originally sold, without third party additions, or personal modification by those hackers who love to tinker with any system.

So, for those of you who missed it we will repeat it here.

"Please keep in mind that our discussions are about the Model 4 computer [and other computers] just as it was manufactured, and just as in many of our answers in the Open Forum we give answers that refer to the plain "vanilla" computer as it was originally purchased. We could go into all the "third party modifications" that were or are available, but our intent here is to discuss what can be added to your computer without extensive internal modification.

Super hackers will be writing in [and did] telling us how we can do this or do that,

and we gave the wrong answer when we say no it can't be done. But how many users have the time or experience to take the cover off their computer and start waving the soldering iron around? We are aware of many of the products that can be adapted to these computers and have published many articles about specific items like the SmartWatch, which we now stock by the way. (\$29.95 + \$3 S&H) Or about the many memory ad-ins, ad-ins should be the proper term and less confusing than "ad-ons". (End of quote from last months column.)

One answer that we gave to a question about the 4P in last month's issue did, through our fault, give the impression that you could not use a A-B switch with the internal modem that Tandy sold to install in the 4P. In this case the question was not fully explained. The reader wanted to use the modem outside the model 4P, like you would any external modem. Thus the answer, "No, the internal modem is wired into the computer internally and the RS232 connector is separately wired." What should have been explained is that the POWER to run this slide-in modem is provided by connectors inside the computer, and therefore you would need a separate source for power if you were going to use the modem externally.

We were well aware that if you leave the modem in the computer that you can reroute the cable going to the RS232 connector to an A-B switch by adding a Male to Female 25 pin serial cable, between that cable and the A-B switch. You then need an additional Male to Male 25 pin Serial cable to run from the A-B switch back to the RS232 connector on the computer. Total cost for the cables, about \$30. We have provided this setup for several people in the past who had special applications, but it is not the way to go, in our opinion, because you are still operating with only a 300 Baud modem. 2400 baud modems are now available in the 70 to 80 dollar range and will capture and send data eight times faster, saving those long distance phone bills and cutting down the time you have to spend waiting for a large program to be downloaded. The faster external modem seems to be the wiser investment, to us at least.

Sorry for any confusion we may have caused.

While on the subject of modems and for those who are not familiar with the term BAUD. "A baud is a unit that measures the speed with which information is transferred." The higher the baud rate the faster you can send and receive information over the phone lines.

Some of the modems now on the market will receive fax messages and some of modems will send and receive fax messages. TRS-80 users do not have any programs (Yet, but we are working on it.) to take advantage of this new technology. The connection here is, that with a send fax you could use a scanner connected to your Model 4 to send a fax through your Model 4 and out through your modem to anyone who had a fax machine. You would also be able to receive a fax and send it through your Model 4 to a printer. How nice it would be to be able to have all this without having to spend seven hundred dollars or more for a stand alone fax machine.

Again for those of you who are unfamiliar with the term FAX; "A fax machine or facsimile machine, transmits copies of paper documents over telephone lines by converting the appearance of the document into electronic signals."

Definitions quoted from the Dictionary of Computer Terms, Barron's Business Guides Series.

One other benefit of having a send/receive modem connected to your model 4, would be that you would not have to settle for the thermal print paper that is used by the lower priced fax machines. You would have dry bond paper fax copies and much better looking copies. There are dry bond paper fax machines on the market, but because they uses the same system that most copiers use they are still very high priced. If you have a business and live in the fast lane you might want to consider this approach for the future.

But, for us here at CN80, we are quite content to receive your letters through the mail. And we don't need anything delivered so fast from our suppliers that we would have to send them a paper purchase order in two minutes over the phone. Life in the slow lane is really much simpler - isn't it?

MINIMUM SYSTEM DISKS

Some time ago in Volume 2, number 4, page 3, we wrote in CN80 about how to make a minimum systems disk and with the many new users coming on stream, we thought it would be a good idea to repeat it here.

MINIMUM SYSTEM DISKS - What are they?
And why do we see so much reference to minimum systems being applied to file manipulation?

Well first, we have to remember that all Radio Shack commercial application programs such as SuperScripsit, VisiCalc, and others, you use only one disk right out of the package in drive zero to turn on (boot up) the program and make it operate. This is a disk that has a COMBINATION of the DISK OPERATING SYSTEM program files, usually ending with the file extension of /SYS, combined with the APPLICATION program files, usually ending with the file extension /CMD.

Whereas your LS/TRSDOS system and basic interpreter disk has the DISK OPERATING SYSTEM files, and the DISK BASIC files that are used by the computer to read and understand. What you write in the basic language which we understand, but the computer does not, without first having someone (in this case the basic interpreter files) translate the words we use to a language the computer understands. A further description of this is not necessary for us to go into here. Just so we understand that the computer does not speak english in Basic, and has to have someone/or something translate it into computereez.

Now back to the Minimum System Disk. If you have ever tried to use your Scripsit or some other Radio Shack program disk to call up BASIC, you have found that it is not there. It was left off the disk so that Radio Shack had room to put the application program you were using on the disk.

So a disk like program XXX. Version X.X made by Radio Shack, and one which you can put straight into drive zero and turn on the computer, or hit reset, will boot up and run without any further manipulation for disks - has on it only the system files that it needs to run the disk drives at the commands of the application program. IT IS

A MINIMUM SYSTEM DISK. Bet you didn't know that you already had quite a few minimum systems disks in your library of programs.

Also on this commercial package, if Radio Shack had room they would include UTILITY PROGRAMS, like BACKUP, so you could immediately make copies of your new program, (backup that brand new program disk) without having to know anything about the System/Basic Interpreter Disk, and how to do a backup with that disk in Zero, and have to put your source disk and destination disk in and out of drive one.

Does that make sense? How many of us got started with our computers with just one program that we purchased to do just one thing. Maybe it was a program like pfs:file that we purchased to keep track of our phone numbers and household items, or a word processor like Scripsit to write our letters and school reports. Or maybe we bought a computer and a word processing program for the office, and we wrote letters on it for years, with out knowing that it was a program on a minimum system disk. That disk and manual that was packed in the box with the computer was lost in the back closet or completely lost.

The whole point here being that when we come across a nice public domain application program, we can do one of two things. We only have two drives to work with, remember. We can place the System/Basic Interpreter disk in drive zero, and the public domain program disk in drive one and let the program run for us, by calling it up at DOS ready. But supposing you have a program that wants to store data to a disk, but not to its own disk. Being a bad neighbor it doesn't want anyone else living on its block (disk) except the systems family. It will talk to the data family but won't allow it to live on the same block (disk), and we only have two blocks in our town. What we need to do is place the system files that we need and the application program files on the same disk. These files are the nice neighbors that will get along on one block, and leave the other block completely empty for the data group of the family.

Having only two blocks in our town (two

disk drives) it is easy to create a minimum system disk. What we need to have on this disk are only the system files that are required to run the program.

First make a backup copy of your System/Basic Interpreter disk. Which is the DOS that you want to use with the program. LS/TRSDOS 6.3 or TRSDOS 1.3, the procedure is the same.

After making this extra work copy of your DOS system disk put the source copy of your system disk away. This we hope is not your Original System Disk, but a previously backed up working copy too.

Take the copy of the System disk you just created and place it in drive zero without a read/write tab on it, hit RESET. Print your directory to your printer so you can watch what you are doing by crossing off the files you take off this disk from the hard copy of the directory. To do this type:

DIR :0 (SYS,INV,PRT)

Once you have printed your hard copy of the disk's directory, you can proceed to remove the files that you do not need.

Type: PURGE :0 (SYS,INV)

This will call up all the files one at a time on your system disk in drive zero. Answer the prompt Y for yes, N for no after each file.

Remove all the files that do not have the extension /SYS, EXCEPT "BACKUP/CMD", this file you will need later on to load the application programs.

You can remove the BACKUP/CMD file. But then you would have to place your full system disk back into drive Zero to backup your application files to your new minimum system disk using only drive one. This means pulling the source and destination disk in and out of drive one to do your copying of the application files onto the minimum system disk. If you have the room, do it the easy way by leaving the BACKUP/CMD file on the minimum system disk. If you have room you might want to leave the FORMAT/CMD and others for convenience. But for maximum space all /CMD files have to be purged. You could do

all this in one pass, but it is better to make two passes to eliminate errors and be less confusing.

When all the files except the ones with the /SYS are removed then type at DOS ready:

DIR : 0 (SYS,INV,PRT)

again, print out a new list of what is left on the disk. And again after you have the print out type:

PURGE : 0 (SYS,INV)

And remove the system files that you do not need.

You can remove SYSS/SYS
SYS9/SYS
SYS13/SYS

For Model III users the word ALL can be used to replace (SYS, INV).

For model 4 users using later versions of the DOS 6, you can use I,S,P single letters for Sys, Inv, and Prt.

A full explanation of the use of these /SYS files are given in Mod 4 by Chris, Vol 1 No.2 page 13 of CN80, and your RS Disk operating manual.

After stripping your system disk down to a minimum of what is needed you should have enough room for the program files to move in on the block (disk).

To do this you play Mayflower Van service and place your program disk in drive one with your (now) minimum system disk remaining in drive zero, type at DOS ready:

Backup :1 :0 (NEW)

This will copy all the visible program files down from drive one to drive zero.

Now you have a COMBINATION application program of your choice and a minimum system disk all on the same block (disk), which will work just the same as the ones made by Radio Shack when they sent out program disks that required no other disks to operate them.

A new single sided double density 40 track

LS-DOS 6.3 system/basic interpreter disk has only 3K of free space out of 180K. The maximum space left on minimum system disk to receive program files from other disks with BACKUP/CMD removed should be 124.5K. When the BACKUP/CMD is left on a minimum system disk the free space should be 116.5K, more than enough room for the average Model III or 4 program.

An additional suggestion, which has been gained through experience over the past couple years is: create a master minimum system disk and keep it in your library of work disks. Then when you need a new minimum system disk, make a backup copy of it to place your new files on. This saves going through the procedure of making a minimum system disk each time you need one.

REMINDERS

DATA LOST

Someone recently sent us an article on a disk with no hard copy enclosed and with no label on the disk. Some how this phantom disk got mixed into the blank disk stack and formatted. All we know now is who it was from, but have no idea what was on the disk.

When sending us material, please label your disk and include a printout of what is on the disk.

If the last four digits on your mailing label are 92/02, then this is your last issue. Time to get your renewal in the mail.

Moving?

Remember to send us your new address.

If you have been receiving your copy of CN80 for years at the same address and you start missing copies, report it to your Postmaster. Chances are your route carrier isn't delivering it because it is marked Bulk Mail. The imprint on our mailing block guarantees delivery or return to us as per US postal regulations, it should not be destroyed as other bulk mail can be.

OPEN FORUM

Q: I just received my copy of SCRIPT and I was checking out the disk when I noticed that I get an undefined line number in line 120 on the MODSCRIPT/BAS program. Is there any way that I can get a copy of the listing to add what is missing? I did put a write protect tape on the disk when I got it. Please let me know what I have to do about correcting this problem.

-W.F. Absecon, NJ

A: Line 120 calls a subroutine at line 580 which prompts for a Y/N answer. Check to see what line is referenced in your copy. It should be 580. Next check the listing and see if line 580 exists. If not, then perhaps you have a bad copy on disk.

Q: I have a 128K Model 4P on which I use LDOS 5.3.0 and LS-DOS 6.3.1. The only value that I have been able to extract from the additional 64K is that of installing a MEMDISK. Does anyone out there have any other uses for the additional memory? Does anyone know how to spool the printer output, from BASIC programs, to the additional memory?

-D.M. Hamburg, NY

A: There is a SPOOL command in LS-DOS 6.3.x which allows you to specify an extended memory bank for printer spooling. DoubleDuty uses extended memory, as does Busy-Calc, BCX, PRO-WHAM, Scripsit PRO, Model 4 VISICALC, Multiplan, LeSCRIPT, and many others. In fact, many of the new utilities being written, such as FBACKUP and FASTBACK, use extended memory. Since the upgrade cost is so cheap, extended memory will be required for many future projects in development.

Q: I am writing to enquire about "Symphony 90". I have received from SYDTRUG in Sydney, to which I belong, a copy of pages 6-10 from your newsletter, I presume, Vol. 4 No. 4, but I am not sure if this particular programme is what I am looking for. Perhaps you can help me?

I have a TRS80 Model 4 with 3 double sided drives connected to an Epson MX80. I am

not particularly interested in playing music back through my computer, rather I am more interested in the edit features. I have seen on Apples and Tandy 1000s programmes that enable the user to enter musical notes from the keyboard direct onto staves on the screen and then to edit that score to raise or lower the pitch or key, then finally to print out the edited manuscript. I am wondering then, if "Symphony 90" will do this function, or if you have anything that will.

-K.L.L. Victoria, Australia

A: No, "Symphony 90" is for the composition and playing of audible music. Scoring as you require is possible, but it is not in demand. In this case a hobbyist who wishes to construct such a program would be needed, as currently the general market cannot justify the money needed to develop and market such a product. Sorry.

Q: I have been using ORCHESTRA-90 for several years. I have several questions about ORCHESTRA 90 vs. SYMPHONY 90.

As I understand it, PLAYER is necessary to play ORCHESTRA and SYMPHONY files. Does it have any advantages over ORCHESTRA 90? Does it allow accented notes or crescendos and decrescendos without a series of voice changes with different volume settings?

Does the COMPOSER include the PLAYER functions? Does the COMPOSER have any features over ORCHESTRA 90 besides a better editing feature? Even though we are still limited to 5 simultaneous voices, does it allow the use of more than 5 voices (not simultaneous)? Does it reduce aliasing (distortion)?

If I transcribe a copyrighted piece of music to SYMPHONY 90, can it be added to our SYMPHONY files of the File Cabinet? If the copyrighted piece was modified by adding additional voices (a trio that has been made into a quintet), can it be added?
-R.L.H. Albion, NY

A: The advantages of SYMPHONY 90's PLAY/CMD program over ORCHESTRA 90 are obvious to anyone who simply wants to play music and not fiddle with an Editor. Also, used in conjunction with the included

SYMFKEY/CMD program and the many menu files available, selecting compositions is a breeze. Accented notes are allowed, and crescendos can be emulated, just like on ORCH 90.

The COMPOSER features the play functions in that it can load, compose and play one or more music files at a time. The ability to play music from within the editor is crucial to a composer.

Adding more than 5 voices would produce an intolerable amount of "aliasing" which turns good music into garbled noise. Were everyone's systems speeded up to 6+MHz, we could add another voice or two. The downside of this is that more buffer space would be required for each additional voice.

Copyrighted material cannot be copied outright. However, if you take a work that has been released to the public domain (being PD does not remove copyright ownership), you can modify or re-release it, as long as the original author allows it, and is given original credit, except in cases where the original author is still supporting the item.

LTR: Thank you for your continued devotion to maintaining an active TRS80 market. I have purchased many products from CN80 and its many advertisers.

I would like to know if VDT glare / E-Field radiation screens are available that will fit either internal or external for TRS Model 4 computers? My original source is now out of business.

Second, I would like to suggest a proposal for a project to rewrite BASIC/CMD in an abridged form. Is it possible to create a shortened version increasing available memory for basic to utilize? Can this be done by eliminating the editing features etc that are not necessary to run previously debugged Basic programs?

-M.R.C. Berkeley, CA

A: These screens are no longer available, and good riddance. Contrary to popular belief, the only radiation our CRT's emit are rays of visible light; that's how we see what is on the screen. I don't know where

these rumors got started, but it's gotten totally out of hand.

As far as anti-glare, good screens can be obtained at Radio Shack, and adapted to your system.

Q: I'm having trouble getting the mouse to do anything at all. I have correctly installed it several different ways on two different machines but don't get any response from either of the two games DO INVADE, or DO WORMS. The programs install fine, the games come up and you can play them with the arrow keys on keyboard, but the mouse acts as if it's dead. I have a Model 4 and a 4P and the only mouse response I get from either machine is on the 4P. When I run the test program and move the mouse in any direction the letters on the screen go down and left until they leave the screen, then nothing. Do you think it's possible both my RS232's are bad or could it be the connection that converts 9 pin to 25 pin? The extender cable I only use on the Model 4. It is entirely possible that I am doing something wrong, but I think maybe the mouse could be bad. Think about it and let me know what to try.

-D.J.F. Dallas, TX

A: Sounds like you have a 2-button mouse. In this case you'll have to modify the JCL files so that the first line reads MOUSE(B2) instead of simply MOUSE.

From your description, a 2-button mouse will always track down and left if the driver is set up for the 3-button mode.

LTR: CN80 & it's readers-

First of all, I'm happy to say that I've been an CN80 subscriber since Volume 1, Number 8, and I have never been able to just read sections of it and put it down. If you've helped your other readers as much as you have helped me, then you're doing one hell of a job! Keep up the good work, as long your publication and help stays alive then the TRS-80 will as well.

Anyway, this letter will most likely sound like a 3 year old asking a bunch of questions to his parent. Although I have a few things that I'd like to tell everyone about. The enclosed check is for the Mouse+ combination package and the 64K memory upgrade for my Gate Array model 4.

I've used a TRS-80 model 4 with 2-single sided 180K disk drives, 64K of memory and a cassette port in the back for about 9 years. During this time I've written several programs in Basic (I've tried Assembly, but I still can't get a grasp on it, even after following Chris Fara's articles.) One of the programs is a Bulletin Board System that I have finally finished (simply because I don't have any more room on 2 180K disks).

Some readers may be able to help me figure out the answers to the following questions:

The Mouse+ driver program and mouse uses the RS232 serial port, right? Well, I was wondering if there was any way to have two or more serial ports on a model 4 and in LS-DOS call the devices *CL, *CL1, *CL2... That way communications packages, and for an example, my bulletin board system could utilize the operations of a mouse. Or, people like me could have a multi-line BBS.

Speaking of ports, is there any program that allows the use of the TRS-80's cassette port besides TAPE100/CMD which only reads Model 100 tapes? I have several model 3 programs on cassette and would like to convert them to Model 4 Ascii files.

Another problem I've run into with the bbs program I wrote is detecting carrier loss. There was an article that David M. Roberts wrote in Micro 80 (April 1987, page 74) called "Supercharge Your BBS." He wrote a driver program to control the RS232 device with features like Lower/Uppercase conversion, CR/LF conversion and several other useful features for a bbs, one of them being carrier detection/loss of carrier. I wrote to him because I did not have an assembler at the time and he sent me his new version. The driver itself takes up a lot of memory and requires COM/DVR to be resident. Now, my BBS is actually several files that are just CHAINED to each other in basic, but 64K isn't all that much. Is there an easier way to have ^S/^Q pause, carrier

detection, CR/LF conversion, Output to modem on/off, and still be able to use the SETCOM command directly from basic like the driver does? I would like the computer to execute a certain program when carrier is lost. I'm happy with the bbs driver I have, but would like to know if there is any other way to do the same thing without using a lot of memory. On this disk are the files BBS/ASM, BBS/DVR & INFO which is the source code, the assembled version, and a file that Mr. Roberts wrote concerning the driver. I'm not sure if the bbs driver program is shareware, PD, or otherwise.

One other problem with the bbs is that I don't know how to handle file uploading/downloading. Right now all the bbs does is E-Mail, Message Bases, a database for textfiles from games or just information anyone may be interested in, user survey section, on-line games, and a few other things not normally found on a bbs.

I have a membership with Compuserve [73677,633] and have tried continuously to download files using COMM/CMD (I don't have any other Communications programs, except for Mterm which is useless to me). I've been trying to download Fastterm V13 from the TRS80PRO forum and have had no luck whatsoever. Text files are no problem to download, but programs like FASTTERM/ASC & ARC/CMD in library 3 have never been able to be downloaded. Is there another way that I could get Fastterm? I don't know if it's in the File Cabinet or not, but I'd really like to have a terminal program that supports VT-100, and some of the more popular download protocols. It also has to support a error correction modem that uses CTS & RTS.

Last question, I had a Non-Gate Array Model 4 before it got zapped (smoke and everything). I have a Graphyx Solution hi-res board that is still functional on a Non-Gate array computer. Is there anyway or anyone that I could swap this board for a gate array board?

Few other things. In my experimenting with bbs programs I stumbled on the following command that works in BASIC V01.01.02:

OPEN"O",1,"*CL"

which opens the RS232 device and assigns it

as an output file to buffer #1. This way you can send information directly to your modem, serial printer, and any other serial device. I read through the instruction manual, and there isn't any documentation about opening devices. This command can be used for any device, *PR, *DO (there really isn't a point to opening up *DO), *KI, etc...

The only thing I noticed about that command is that when opening a device, say *CL, as in input file,

OPEN"I",1,"*CL"

when you issue an input command like LINE INPUT#1,K\$ and send something from the device to the computer, it "freezes" and waits to receive something as if nothing was sent from the device. I tried the EOF(x) command as you would for a file, and it acts as if it was checking an opened file. When information is being sent from the device, it responds negative, when there is no information being sent, it responds positive. LOC(x) and LOF(x) cannot be used when opening a device. Does anyone know how to input using this command?

If you decide to print this letter, you may use my address and telephone number as well. If anyone is interested in the bbs program I wrote, I'd be happy to answer questions. I'm thinking of releasing it as shareware as soon as it's all finished. Presently I'm working on a networking program to work somewhat like the Atari ST's FoReM ST Fnet world does.

I hope that you can find room somewhere to print this letter I would really appreciate it. Thanks in advance.

Shane DeRidder
17154 Louis Ave.
South Holland, IL. 60473
(708)-333-4003

A: For more serial ports use an A-B-C-D serial RS232 switch. You won't have to have software control.

A: In your January issue, E. F. of Dallas, TX has a couple of questions that I think I can clear up.

The first deals with the full use of his 15

meg. hard drive. Although E. F. doesn't say what driver he is using, I suspect it's TRSHD6/DCT supplied with all the R/S drives. There is also a JCL to initialize a 5 meg. drive in the package. That JCL is answering the CYL question with 153. Another reason is that even if he isn't using the JCL, TRSHD6 defaults the CYL count to 153. You'll have to answer the CYL question with 306.

The second question relates to a QUICKEN like program for the Model 4. I don't know of any as comprehensive as QUICKEN but I co-authored one called CHECK4 that is in the File Cabinet Library. (Disk Volume Number M4BUS27) It did all that I needed for tax tracking of checks.

The last question related to PROFILE4+. Again, E. F. wasn't too specific on just what kind of printouts he wanted for the *entries of the day* but I think he is trying to get screen prints. I go on with that presumption. The solution to his problem is to include the *Date of Last Update* to his record. It should be in the KEY segment with a length of 8. It'll display the date in YY/MM/DD format. The screen field indicator is "@". After that he can select records by the scan field method, selecting the *Date of Last Update*. When the first one comes up on the screen, press the SPACE bar to select MASS Operations. Select HARDCOPY and all the records selected will be screen printed.

I hope this'll help E. F.
-D. K. Amherst, OH

LTR: In all the months that I've read the very worthy issues of CN80, I don't recall a single mention of the NETWORK3. However, the small parochial high school where I have been introducing computers and teaching computer applications has been the beneficiary of nearly 60 Model IIIs and 4s, three Network3 units, a 5 meg hard drive, coils of cables. All of this has been donated free-of charge by schools which have adopted MS-DOS or MacIntosh systems. It was ours for the hauling away! But, sad to say, very little Network3 software.

In this rural South Jersey school of some 300 students and 23 teachers, we have just

about every make and model that Tandy manufactured during the 80's. And we are all going through the throes of technological re-structuring that others experienced a decade ago. As a retired Tandy/Radio Shack computer trainer and systems engineer I have been able to install two Network3 units in a converted classroom furnished with some very fine carrels crafted by one of our own carpenters. We can service 25 students.

We are sorely in need of any information leading to the following:

[1.] NETWORK3 Technical Reference Manual: which contains procedures of installing PASCAL on a hard drive, and other programming information.

[2.] A list of network-able software: some of these programs are listed in the Network3 Student Manual of which we have one copy. Are there more?

[3.] A copy (one each) of the two Personal Computer Applications Student Manuals (Part I & Part II) catalog #26-2591. Or even the Teacher's Manual.

[4.] One power supply for our back-up Network3 box.

Any information or assistance that may be offered by other computer teachers/coordinators in similar circumstances past or present, will be warmly welcome by the students and faculty of St. James High School.

Please contact:

Mr. Les Schnierer
Saint James High School
350 Georgetown Road
Carneys Point, NJ 08069

Thank you!

things, it would depend a great deal on the its price.

I am looking for something to keep track of my video tapes (I've got @ 300). I tried a book inventory program, but it was too limited, it would only print alphabetical. I need a program that would allow me to print and arrange both alphabetical and by a numbering system. Anything on the market that you know about or any suggestions?

-G. C. Palo Alto, CA

A: There are many data base programs that could do the job, but the simplest and easiest to set up any record file is pfs:File. Unfortunately pfs:File has been off the market for some years. A few original copies of this program do come available from personal collections that are sold.

pfs:FILE is a flat-file data base system where you create any set up you want, much like having preprinted index cards where you fill in the lines (called fields) with any information you want. The fields are given titles or field titles to identify what information is placed in the field. You can then sort the printout many different ways, alphabetical or numerical, or by any field of information. The search and find is most useful in this data base, as you can search by any field of information to find an individual card of information.

When we say easy, we mean it. This program allows you to set up a new set of file layouts in less than 10 minutes, and change it any time you want.

pfs:FILE also has a companion program called pfs:REPORT, which reads any data base file you have and places it in columnar printouts. You can also add columns with math functions installed which will create columns in the printout using the information in the data file.

CN80 has made several efforts to purchase the rights to reproduce these two programs with no luck. Our only option is to convince one of the programmers out there to create a similar program.

You may also find that the CD Catalog program that is on our latest disk series useful. (Disk Series # 15).

Q: First of all: Thanks for your support of the Model 4s. Having four machines going at work and at home (1 being a BBS) I can appreciate your magazine.

I'm looking for a calendar program. I am in need of a full sheet monthly calendar. I've looked in the "File Cabinet" catalog, unless I've overlooked something, does anyone know of a calendar program?

I'm using an Okidata 93 or DWP210 printer.
-D. T. Mantua, OH

A: There are several calendar programs in the File Cabinet Collection, plus the the calendar program on our Disk Series #15. There is a monthly calendar program included in David Goben's Model 4 System Utilities Package which calls up a calendar to the screen with today's date marked.

To really know which calendar program to recommend we do need to know more about your planned application.

Check out the File Cabinet Model 4 Catalog Volumes M4BUS12, M4BUS15, M4BUS18 which have about 40 calendar programs, and M4BUS24 has a calendar drawing program.

Program Listing Number One by David Goben

```
1 'EPSON SCREEN DUMP FOR MODEL 4
2 'David Goben. Adapted from D.B.Heckenlively Model III version
3 'Incorporate following line into your program.
4 CLEAR,-3073
5 'Merge this program with your graphics program, and execute a
6 'screen dump by a GOSUB 65000
64999 'skip if already initialized
65000 IF XXXX THEN 65130 ELSE XXXX=1
65010 'initialize graphics array
65020 DIM XX1(64),XX2(64),XX3(64),XX4(64)
65030 FOR XX5=1 TO 16:READ XXX,XXY
65040 XX1(XX5)=XXX:XX1(XX5+16)=XXX:XX1(XX5+32)=XXX:XX1(XX5+48)=XXX
65050 XX2(XX5)=XXY:XX2(XX5+16)=XXY:XX2(XX5+32)=XXY:XX2(XX5+48)=XXY
65060 NEXT XX5
65070 DATA 0,0,240,0,0,240,240,240,15,0,255,0,15,240,255,240
65080 DATA 0,15,240,15,0,255,240,255,15,15,255,15,15,255,255,255
65090 FOR XX5=17 TO 32:XX3(XX5)=192:NEXT XX5
65100 FOR XX5=33 TO 48:XX4(XX5)=192:NEXT XX5
```

Cont'd on next page.

LTR: Recently I bought a revised version of Arthur Hurlburt's genealogy program. I had a problem entering recent dates to the program. The new version did not correct the problem either.

Mr. Hurlburt was kind enough to send me the modification to his program to cause it to accept current dates.

Maybe you can give the answer to other people who may be having the same problem.

Mr. Hurlburt writes, "the best solution is to remove or bypass these edit checks and rely on the user to assure accuracy. To eliminate the problem edit the following program lines to read as shown below, then SAVE the modified programs."

ADDNAMES program

```
2310 IF Z=7 THEN RETURN
2410 RETURN
```

EDIT program

```
2220 IF Z=7 THEN RETURN
3210 IF Z=5 THEN RETURN
4020 RETURN
```

-H. H. Buffalo, NY

Our thanks to H. H. for sharing this information with our readers. -CN80

```
65110 FOR XX5=49 TO 64:XX3(XX5)=192:XX4(XX5)=192:NEXT XX5
65120 'ACTUAL SCREEN DUMP ROUTINE
65130 XX7=PEEK(120)AND 254:POKE 120,XX7:OUT &H84,XX7 'select screen
65140 LPRINT CHR$(18);CHR$(27)"U";CHR$(1);
65150 FOR XX5=0 TO 1919 STEP 80:LPRINT CHR$(27)"A"CHR$(8);
65159 'read a video row byte
65160 FOR XX6=0 TO 79:XX7=PEEK(XX6+XX5+&HF800)
65170 IF XX7<32 THEN XX7=32 'convert control codes to a space
65179 'put normal characters
65180 IF XX7<128 OR XX7>191 THEN LPRINT CHR$(XX7)::GOTO 65220
65189 'set up for display of graphics chars
65190 LPRINT CHR$(27)"L"CHR$(12);CHR$(0);
65199 'do 1st half of line
65200 XX7=XX7-127:LPRINT STRING$(6,XX1(XX7));STRING$(6,XX2(XX7));
65219 'set up for second half
65220 NEXT XX6:LPRINT:LPRINT CHR$(27)"A"CHR$(2);
65229 'pick up row byte again
65230 FOR XX6=0 TO 79:XX7=PEEK(XX6+XX5+&HF800)
65240 IF XX7<128 OR XX7>191 THEN LPRINT" ";:GOTO 65280
65250 LPRINT CHR$(27)"L"CHR$(12);CHR$(0);
65260 XX7=XX7-127:LPRINT STRING$(6,XX3(XX7));STRING$(6,XX4(XX7));
65279 'finish line:do next:done
65280 NEXT XX6:LPRINT:NEXT XX5:LPRINT CHR$(27)@"
65289 'disable screen and exit
65290 XX7=PEEK(120) OR 1:POKE 120,XX7:OUT &H84,XX7:RETURN
```

» Program Listing Number Two by David Goben

```
10 LPRINT CHR$(27)"x1";
20 LPRINT CHR$(27)":"STRING$(3,0);
30 LPRINT CHR$(27)%"CHR$(1);
40 LPRINT CHR$(27)""CHR$(0)"<<";
50 LPRINT CHR$(0);CHR$(12);CHR$(0);
60 FOR X=1 TO 36
70 READ C:LPRINT CHR$(C);
80 NEXT X
90 LPRINT"Your character in PICA: < < <"
100 LPRINT"In Double-wide Emphasized PICA: ";
110 LPRINT CHR$(27)!"CHR$(32+8)"< < <
120 LPRINT CHR$(27)!"CHR$(0);
130 DATA 4,0,0,8,0,0,16,0,0,32,0,0
140 DATA 64,0,0,255,255,192,64,0,0,32,0,0
150 DATA 16,0,0,8,0,0,4,0,0,0,0,0
```



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Dot-matrix printers supported: AMT Office Printer, Anadex DP-9625B, DP-9000A, DP-9500A, DP-9001A, DP-9501A, Apple Dot Matrix Printer, ImageWriter, ImageWriter II, Base 2, BMC MicroGraphic, Cannon PJ-1080, Centronics 150-3, 352 and 739, C. Itoh 8510 Prowriter, 8600B, 8610 BPI, CTI CT-80, Data General 4434, DataProducts SPG8054, SPG8070, 8010, DataSouth DS-180, Diablo P11, C-150 Inkjet, DEC LASO, all Epson and compatibles, Facit 4510, Genicom Gemini 10X/10XP/C/15X, Hewlett Packard Thinkjet, CuleJet and HP82905, IBM Graphics printer and compatibles, QuietWriter, Proprietary, IDS Prism 80/132 (with Dot Plot), 445, 560, MicroPrism, JDL 750, 750C, Legend 880/1360, Mannesmann Tally Spirit and MT85/86/160, MPI (Sprinter, Printmate 99 and 150), NEC 8023AC, P560, P565, P660, P665, P760, P765, Okidata 82/83 (with Okigraph or PC-Write), 84, 92, 93, 192, 193, 292 and 293, Panasonic 1091, Radio Shack DMP Models 100, 110, 120, 200, 400, 420, 500, 2100 & CGP-224, Tandy DMP-130, TI 850, 855, Toshiba 24 pin printer.

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REMBRANDT is the only graphic software you'll ever need for your Model 4 computer. A Hi-Res board not required — it works with the graphics capabilities built into every Model 4, 4P or 4D.

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MONTEZUMA MICRO SYSTEM PROGRAMMER'S GUIDE \$14.00 plus \$2.00 S/H

Monte's WINDOW \$14.00 plus \$2.00 S/H
Monte's Window is a "desktop" utility that installs in the extra 64k RAM bank and has a drop down menu that provides you with a Notepad on the screen, or a calendar window for any month from 1700 to 2200, it also provides a four function Calculator, Window and the Index File that is a collection of miniature index cards. The number of index cards is limited only by the size of your disk storage area and subject line and eight lines for text, plus a search command.

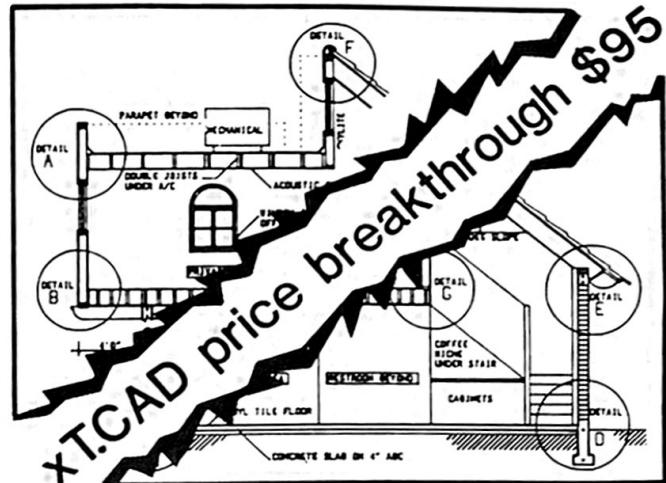
Monte's MENU \$14.00 plus \$2.00 S/H
Monte's Menu requires 128k and installs in Montezuma Micro's CP/M to replace the >A prompt and when run displays all the .COM and .SUB files in the current drive. To run one of the application programs on file just move the cursor over it and push enter. A real point & shoot call up of programs without typing the command lines required by DOS.

Monte's TOOLKIT \$14.00 plus \$2.00 S/H
Monte's Toolkit is a collection of software "tools" that enhance your use of MM-CP/M. Utility programs that allow you to transfer files from TRSDOS 1.3 or 6.x and MS/PC-DOS to or from one format to another. FREEFORM lets you format and copy TRSDOS or IBM disks. FILEFIX which massages files to accommodate the different requirements of the various operating systems. AUTO lets you execute several commands from the same command line. SYS2M copies CP/M over to drive M if you have 128k. WSPR is a WordStar set of printer control codes which allow you to print boldface, underline and other features using codes which you enter for your printer.

Monte's HARDBACK \$14.00 plus \$2.00 S/H
Monte's Hardback is a utility for backing up your hard drive under CP/M and has the ability to restore single files from a backup set.

Monte's BASCOM \$14.00 plus \$2.00 S/H
Monte's Bascom is a conversion utility that applies a number of patches to TRSDOS BASIC 01.01.00 so that it runs under CP/M MBASIC. That means that all the BASIC programs written for MBASIC under CP/M will run without change. TRSDOS BASIC requires some changes.

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Model 4 4p 4d or MSDOS \$95 \$145.00

xT.CAD BILL of Materials by Microdex. Software utilizes text labels from xT.CAD drawings to automatically generate invoices, parts requests, shipping lists, etc. Includes a mini-editor for customizing line printer output.

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CASH PROFESSIONAL by Microdex. Bookkeeping software with automatic double-entry ledger distribution in user-definable accounts. Reports by period, account, project, etc. Ideal for small business, professional or personal accounts.

Model 4 4p 4d or MSDOS \$45.00

S/XT software by Microdex. Enables disk directory review and special character printing from within standard Scripsit.

Model III or 4 4p 4d \$15.00

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Model III/4 TRS-80 Program Packages by David Goben

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DAVID'S MODEL III LDOS FILE UTILITIES

Like above, but for LDOS 5.x. Contains eight utilities (SAVBAS not needed). Priced as above.

DAVID'S MODEL 4 SYSTEM UTILITIES

For TRSDOS/LS-DOS 6.x. 16 powerful system support utilities to streamline system maintenance. XMEMDISK: the most powerful memdisk program going. XDRIVE: allows 1 drive to emulate 2. ONEPASS: the most powerful single-pass disk duplicator yet. VERDISK: verify the integrity of your disks. PRINT: control your printer from the DOS command level. Plus many more. \$16 + \$3 S&H.

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T62DOSXT

Extends the dating capabilities on TRSDOS 6.2.x DOS disks to Dec 31, 1999 with full compatibility with older, pre 6.3 DOS dating formats, as well as the newer dating format for LS-DOS 6.3. Includes many optional system patches, plus numerous useful utilities. \$18 + \$3 S&H.

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Model III/4 TRS-80 Word Processing by David Goben

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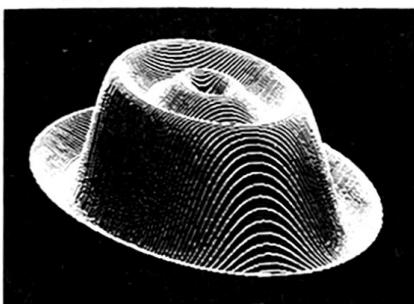
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Superior Hardware. The Grafx Solution provides 153,600 pixel elements which are arranged in a 640×240 or on the Model III a 512×192 matrix. Hundreds of new business, personal, engineering, and educational applications are now possible. The hi-res display can be shown on top of the standard display containing text, special characters, and block graphics. This simplifies program debugging, text labeling, and upgrading current programs to use graphics. The Grafx Solution fits completely within any tape or disk based Model 4, 4D, 4P, or III. Installation is easy with the plug-in, clip-on Grafx Solution board.

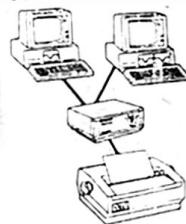
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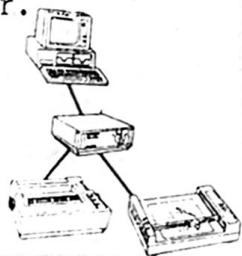


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Symphony 90

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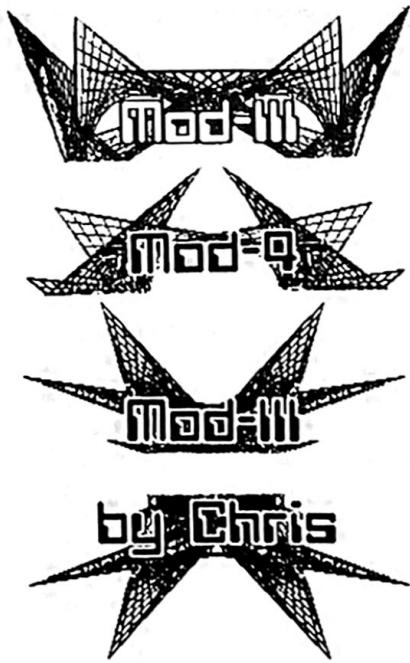
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The hardware interface¹ is required to utilize the Symphony 90 Music Systems. The interface (either the new Symphony 90 interface or the original ORC-90 interface) plugs into the 50 pin connector on the bottom of your computer. Patch cords plug into the interface and your stereo or speakers. The system requires that you use the stereo amplifier or your speaker amplifier. If you have a hard drive and want to connect both your hard drive and the Symphony 90 interface, CN80 can supply you with an adapter cable which enables a hard drive and the interface to be connected at the same time. If you have an existing ORC-90 collection of music files, Symphony 90 will play them also.



Books by Christopher Fara

MOD-4 by CHRIS for TRS/LS-DOS 6.3, 232 pages each \$24.95
MOD-III by CHRIS for LDOS 5.3, 234 pages any two \$39.95
MOD-III by CHRIS for TRSDOS 1.3, 210 pages any three \$59.95

Complete Owner's Manuals for Models 4/4P/4D and Model III, fully updated for all current DOS versions. These beautifully designed books replace obsolete and confusing Tandy and LDOS manuals and addenda. Mod-III editions combine both the "Basic Operations" and "Disk System" manuals in one book. Mod-4 edition has chapters on DOS SuperVisor Calls, previously not accessible without a separate "technical" manual. And no more fumbling between pages: each subject is contained under a logical, bold heading on one page or on pages facing each other, with plenty of blank spaces for notes.

Written in plain English, the manuals are better organized, with more and better examples for the use of DOS, JCL and BASIC; include chapters with examples on interfacing of DOS and BASIC with assembly language; describe in detail popular ROM, RAM and DOS subroutines; and provide lots of useful extra information never before published in the Model III and Model 4 manuals.

"... no matter how long one is using a system, there will be times to look up the manual ... nothing easier than looking into Chris' comprehensive, beautifully arranged and printed treatise ... the organization is exceptional good ..." (review by Henry H. Herrdegen)

"... excellent alternative ... not only does it offer information I have not been able to find in the regular BASIC manuals, it explains in better detail what some of the more arcane commands are good for, or not good for ... here is a manual where you can find it all ..." (review by Henry A. Blumenthal)



JCL by CHRIS 30 pages \$7.95

Job Control Language for Mod-III LDOS and Mod-4 TRS/LS-DOS doesn't have to be so confusing as the 'official' manuals made it. This remarkable, well-organized booklet includes step-by-step explanation how to design, build, DO and compile JCL files, plus a description of other JCL features, and a reference section with examples. We've got rid of the jargon and JCL turns out to be simple, easy, useful and fun.

"... the investment for this instruction booklet was small compared to the welcome education on the expanded use of my computer ... thanks to Chris and his way of explaining things in a simple and logical fashion ..." (Ray Stanley)



Z-80 TUTOR I Introduction, 39 pages \$9.95
Z-80 TUTOR II Toolbox, 33 pages \$9.95
Z-80 TUTOR III Applications, 37 pages \$9.95
Z-80 TUTOR X Reference, 63 pages \$12.95

Assembly language tutorials, developed from Chris' popular essays in *Computer News 80*. The series takes the reader from a fresh look at the assembly basics, through useful programming tools, to complete applications such as disk file handling and BCD math. Includes over 80 practical subroutines, many not published before, for all kinds of typical programming chores. Volume X is a detailed cross-referenced description of all Z-80 instructions, timing, registers, and flags.

"... highly readable ... I realized how much I had been missing in Edtasm manual ..." (review by Jane A. Layman)

"... somehow Chris Fara manages to bring the subject down to earth ... explains simply and effectively ... in clear, concise and, most importantly, in plain and easy to understand English. Now, that's impressive ..." (Lance Wolstrup)

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Three Button Mouse

and adapter for RS-232 connection.
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Extender Cable for Model 4 with
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Use an AB switch to connect both Mouse and Modem

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64K 120ns 128 refresh cycl. chips \$ 2.75 ea.

16 Chips are required for use with Anitek Speed Up Kits.

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PAL CHIP - needed to upgrade Non-Gate Array Model 4s
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TYPITALL Word Processor with Spelling Checker \$ 79.95

Optional spelling checker has 29,500 word dictionary -- verify a 3,500 word document in less than two minutes.

SYSTEM DIAGNOSTIC \$ 69.95

Complete tests for every component of your TRS-80 Model 1, 3, or 4 (separate versions for each model). ROM:checksum test. RAM:three tests. Video Display: character, video RAM, signal. Keyboard: every key contact tested. Line printer: character tests. Disk Drives: disk controller, drive select, track seek, read sectors, formatting, read/write/verify data with or without erasing, disk drive timer, disk head cleaner. Single/double density, single sided or double sided drives from 1 to 99 tracks. RS-232-C Interface: connector fault, data transmission, framing, data loop, baud rate generator. - Specify version when ordering.

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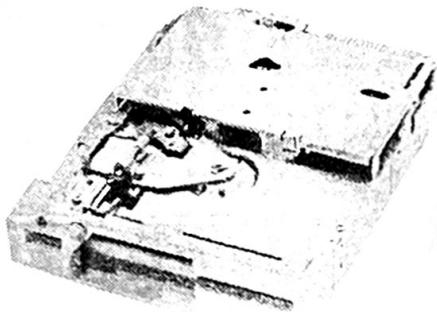
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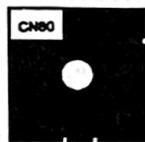
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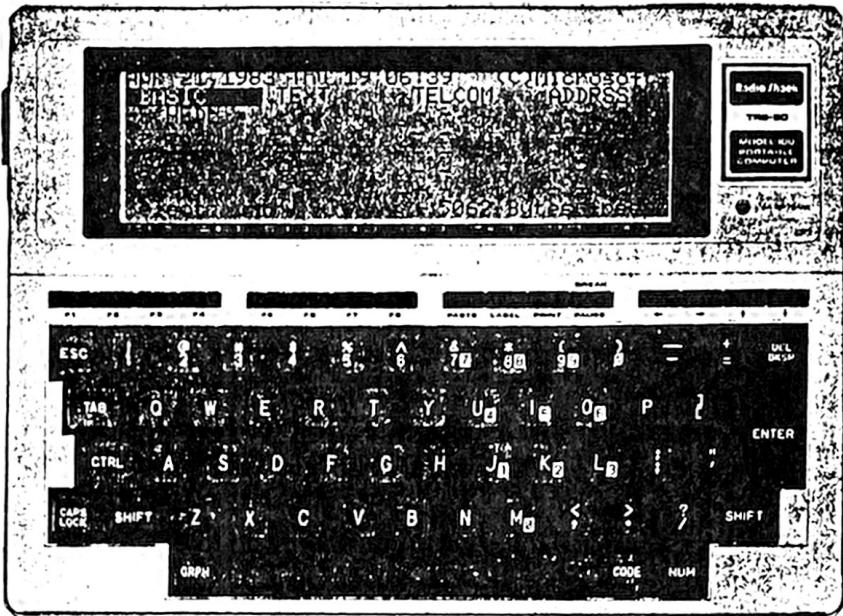
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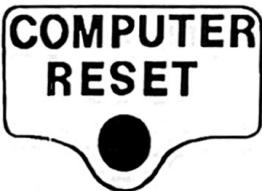
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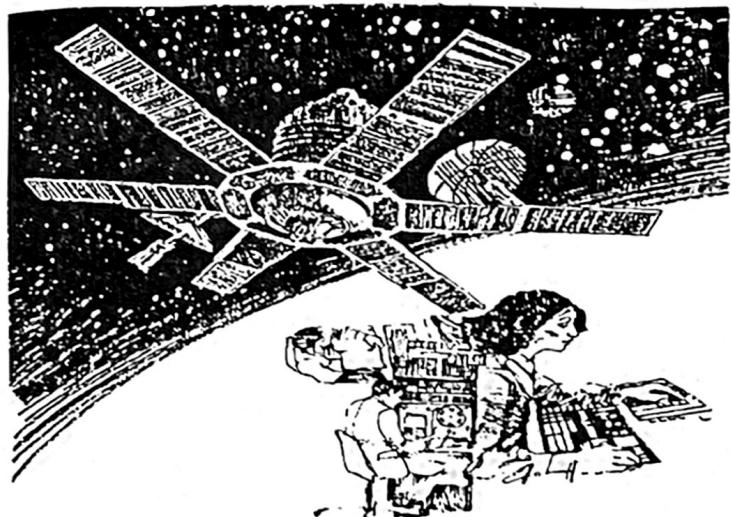
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NO I'M NOT going MS-DOS. Just seeking a home for my M3 books & mags. 80-Micro mag collection 92 issues (missing #1, 2, 4, 6), the great IJG TRS-80 books, RS TRS-80 Graphics; few issues of Basic Computing & Computer User. Large SASE for list. Dick Burwell, RR 2 Box 1341, New Ipswich, NH 03071. (603)878-3277

HELP: I need the Owners' Manual for Tandy BPS 400, R/S #26-1189 (a 400 watts UPS). DISK only for MULTIPLEX on Models II/12, R/S #26-4580. Contact R.Yves Breton, P.O. Box 95, Stn Place d'Armes, Montreal, Que, Canada H2Y 3E9

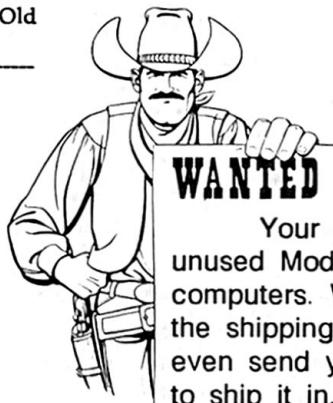
WANTED: "Alpha Products" A-Bus smart stepper controller board (SC-149) & Motherboard (MB-120). Also wanted Radio Shack plotter (FP 215). S.B.W., PO Box 1233, Blythe, CA 92226

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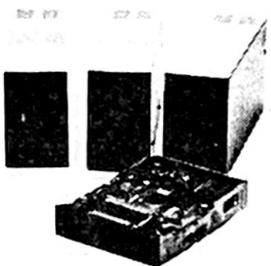
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Vol. 5 #2	February - 1992	Jan. 13	Jan. 28
Vol. 5 #3	March	Feb. 10	Feb. 25
Vol. 5 #4	April	Mar. 16	Mar. 31
Vol. 5 #5	May	Apr. 13	Apr. 28
Vol. 5 #6	June	May 11	May 26
Vol. 5 #7	July	June 15	June 30
Vol. 5 #8	August	July 13	July 28
Vol. 5 #9	September	Aug. 10	Aug. 25
Vol. 5 #10	October	Sep. 14	Sep. 29
Vol. 5 #11	November	Oct. 12	Oct. 27
Vol. 5 #12	December	Nov. 16	Nov. 30
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