

Soft Horizons[®]

MAGAZINE

October/November 1985
Volume 2
Number 3

The Magazine for Tandy[®] computer users

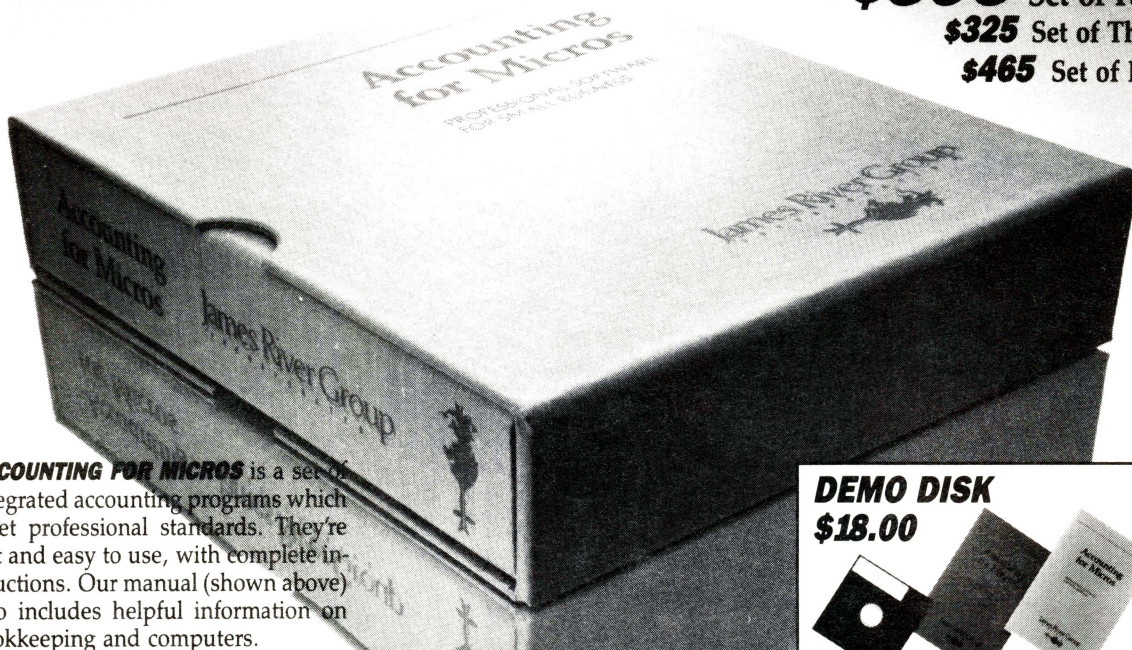


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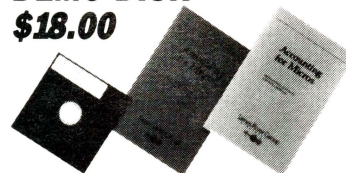
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MAGAZINE

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SOFT HORIZONS MAGAZINE supports the Tandy 1000, 1200, and 2000 computers by exchanging information and ideas among users of these machines. The magazine is published bi-monthly by Soft Horizons, RD 1 Box 432, State Highway 83, Cape May Court House, NJ 08210.

AUTHORS are welcome to submit unsolicited manuscripts and programs.

SUBSCRIPTION rates for the paper edition are \$20 a year (\$30 outside continental United States). The text of each issue is available on our BBS. Subscription rate is \$10 a year to the electronic edition. The BBS number is 817-551-6793. Visitors are welcome on the board.

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Does anyone know the name of the Gnome in King's Quest? If you do, please tell us before we loose our minds! It isn't necessary to know his name in order to solve the game, but it is the only thing left we haven't figured out.

We wish to thank artist Leslie Fontana of the Noyes Art Museum for contributing her talents to this issue.

This little magazine is slowly growing, and we now distribute over 1,000 copies of each issue nationally. We ask readers to patronize our advertisers who are helping to support this magazine project. Their confidence is deeply appreciated.

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This magazine is for you, the Tandy computer owner. Your continued interest will help fellow Tandy owners everywhere get support for their machine. A hearty thanks to all our subscribers! *Dan*

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JOHN B. HARRELL,III

8^\$#@*! -- OR WHAT HAPPENED TO MY PROGRAM?

There has been many a time when I have lost programs -- I either did not save it to the disk prior to exiting BASIC or something that I did caused the computer to hang up and forced a reset. This is a very likely event if you happen to be absent-minded (as I am) and don't frequently save your updated programs, etc., to the disk. Even the most prudent programmer has had this little event happen now and then -- but this consolation still does not make you feel any smarter.

DON'T WORRY! It's still there -- in the memory of the computer. Now, the trick is to be able to reclaim the program data. What I am about to delve into is not really difficult, but you must understand some of the fundamental concepts used by the computer and the interpreter.

For example, there are two different problems that may be solved using this approach: first, exiting without saving the program, and, secondly, accidentally erasing a program using NEW prior to storing it. You may also reclaim a program stored using Microsoft's "protected" format. Refer to the diagram and notes contained in Figure 1 for a description of how BASIC stores program lines on the T2K.

In the case of exiting without saving your program, the memory of the computer should look just like it does in Figure 2. The only difference between this and a program erased using the NEW command is the first statement pointer. BASIC sets this pointer to 00 00H to reflect a "null" link or an empty program, but leaves the remainder of the program intact! This is the secret of reclaiming the program.

Under MS-DOS 02.11.02 and BASIC 01.03.00, the BASIC interpreter always begins storing program bytes 9870H bytes from the start of the segment that you see displayed when you enter DEBUG. Remember that the 80186 processor requires a 20 bit address composed of a 16 bit segment shifted left 4 bits which is then added to a 16 bit displacement.

If you feel that your version of BASIC is different and this address offset does not match my example, you can find the starting displacement easily. Enter BASIC and store one REMark line with some easily identifiable text and then exit using the SYSTEM command. Enter DEBUG and use the search command as follows (if you are not sure of the proper syntax, refer to the DOS reference manual):

S 0 FFFE <text bytes>

where the <text bytes> are the hexadecimal

bytes representing the text of the remark. Use enough to uniquely identify the text in memory. Search will display the address of all matched detected within the range specified in the form SEGMENT:DISP (segment & displacement).

The displacement of 9870H bytes is adequate to locate the program text in memory but it does not correlate with the pointers used by the BASIC interpreter (see Figure 1) and will not aid in restoring the program text. Therefore, we will convert this displacement into an equivalent segment and displacement address which does correspond to these statement pointers.

Careful examination of the memory configuration illustrated in Figure 1 requires the first byte of the first line to begin at segment displacement 0A70H. The difference between 9870H and 0A70H is 8E00H. If you take 8E00H and divide by 16 (or shift right by 4), the result is 08E0H. This indicates that the segment used to point to the BASIC program must be 08E0H greater than the displayed segment value which is contained in the DS register.

Now refer to Figure 2 and I will try to ease the confusion that this last bit of chatter must have created. The numbers in parentheses refer to the applicable step number in Figure 2.

After entering DEBUG (1), use the display command (2) to display the current value of the DS segment register and memory at DS:0100H. In my example, the DS register contains 0DD1H. Use the arithmetic command (3) to add 08E0H to the value displayed before. This command will give you the result of the addition and the subtraction of these two numbers, respectively. We are interested in the addition result (16B1H).

Next, store the value obtained from (3) into the DS segment register (4,5). Then display the start of the BASIC program (6) at the new segment address plus offset 0A70H. Note that I have indicated the first pointer address and the first end of statement indicator. If the program was erased using the NEW command, you will see 00H 00H in these first two bytes (DS:0A70H). You will have to find the first end of statement 00H byte and store the address of the byte just past it in this pointer location. Don't forget that the T2K stores addresses in the conventional Intel format of LSB, MSB just like the Z-80.

There is one additional element that must be stored prior to writing the text. A binary compressed format file has a header byte of FFH, a "protected" BASIC file has a header byte of FEH, and a "BLOAD" format file has a header byte of FDH. Since the program in memory is compressed binary, we must so indicate this fact with the modify memory

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command (7). This stores the proper header byte (compressed binary file) just prior to the beginning of the program.

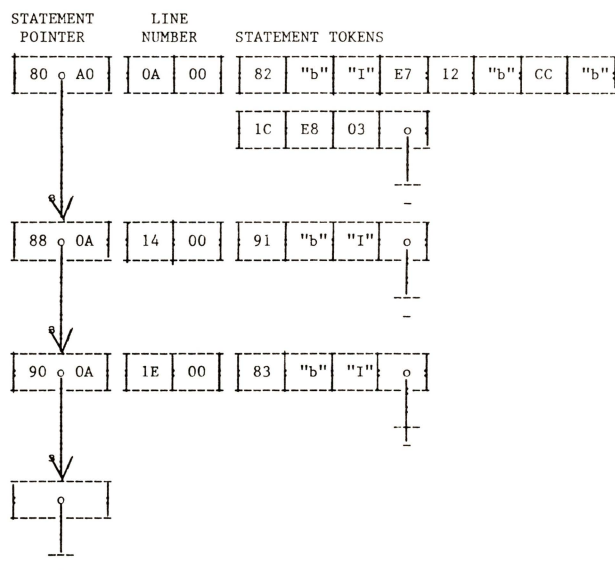
The last task is to determine the amount of memory to dump to the file. We know that the program file now begins at 0A6FH (header byte). Examine Figure 1 again and you will note that all BASIC binary files end with 00H as the terminator of the last line and a null pointer of 00 00H (or three consecutive bytes of 00 00 00H). Using the search command (8), locate the end of the BASIC program. I have limited the search boundary in Figure 2 because I knew the relative size of the program in memory. It may be necessary to use a larger number in the search command if your program is larger. A word of caution, however, is appropriate. The first triple set of 00H bytes is the one you are looking for -- if you have searched lots of memory, you may find every instance of this triple and the original value will scroll off the screen top.

Use the display command (9) to display

SIMPLE BASIC PROGRAM

```
10 FOR I=1 TO 1000
20 PRINT I
30 NEXT I
```

INTERNAL TOKENIZED REPRESENTATION



Each BASIC program line has a two byte pointer to the next line, a two byte binary line number, and is physically terminated by a null (00H) byte. The last line of the BASIC program points to two null bytes.

In the tokens above, character data (byte value less than 128) is represented in "" and tokens are represented by actual byte values. The "b" representation refers to a blank character (20H). In the diagram above, null bytes (00H) are represented by a "ground" terminal.

FIGURE 1

the area around the triple 00H bytes. The displacement of the byte after the last 00H is the number we want (0D1CH in this case). Again using the arithmetic command, calculate the number of bytes to store, this time keeping the difference of the starting and ending displacements (02ADH).

DEBUG conveniently will store this information to the disk if you provide the proper information. Set the CX register to the number of bytes to write (11, 12) and establish the file name for the information to be stored in (13). Then use the write command (14) to save your restored program to the disk beginning at the segment:displacement specified. Once this is completed, exit (15) and re-enter BASIC and reload the program from the file RESTORED.BAS.

This technique should work for most any BASIC program. I have encountered some problems with large programs (about 32K or so). In the middle of the listing, you may well note some really strange looking text. If so, you have encountered the mysterious DEBUG monster that likes to use part of your workspace for a stack area.

He only does this on disk read/write operations (which is what we just did). You can overcome this problem by using the DEBUG move command to move the program text block identified from DS:0A6FH to the ending address identified in step (9) to some other area of memory out of the way. I typically move my text up to the segment beginning at 3000H. This allows you about

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61K of memory before you start to interfere with the monochrome video memory area.

Insert the move operation into the procedure outlined in Figure 2 between steps (13) and (14). After completing the move operation, all you must then do is to replace the write operation in step (14) with the following command: **w 3000:0** and press the ENTER key.

SEQUENCE OF OPERATIONS FOR RESTORING A BASIC PROGRAM USING DEBUG

```
1. A%debug
2. -d
   ODD1:0100 7C A0 2E 04 50 8B 1E 66 04-E8 BB 0C 2C EB B1 58 A2 2 ..P.....6)t.h
   ODD1:0110 C4 0C 2C 53 8B 1E 66 04-E8 BB 0C 2C EB B1 58 A2 D.,S.,f,h;.,k1X"
   ODD1:0120 1A 05 58 0A C0 74 51 A2-2E 04 BB 00 00 03 DC E8 ..X.@tQ";...3h
   ODD1:0130 EB 7B BB 08 00 03 DC 8B-E3 5A B3 03 FE C3 4A 8B k%;...3.c23."CJ.
   ODD1:0140 F2 8A 04 0A C0 79 02 EB-F3 4A 4A 4A A0 2E 04 02 r...@y.ksJJJ ...
   ODD1:0150 C3 8A E8 A0 1A 05 8A C8-02 C5 3C 64 72 03 E9 4B C.h ...H.E$dr.iK
   ODD1:0160 DF 50 8A C3 E5 00 BB 1C-05 03 D9 8A C8 E8 E0 00 P.C5;...Y.Hh+.
   ODD1:0170 B9 1E 2F 51 51 E9 E3 E0-8B 1E 88 04 E8 EB DD 53 9./QQic+...hk]S
3. -h Odd1 08e0
   16B1 04F1
4. -r ds
   DS ODD1
5. :16b1
6. -d 0a70
   16B1:0A70 84 0A 0A 00 AD 20 41 EA-5A 3A 20 86 20 4B 24 28 ....- AjZ: . K$(
   16B1:0A80 0F 0C 29 00 98 0A 14 00-4B 24 28 12 29 20 E7 20 ..)....K$(.) g
   16B1:0A90 22 4C 49 53 54 20 22 00-B1 0A 1E 00 4B 24 28 13 "LIST ".1...K$(.
   16B1:0AA0 29 20 E7 20 22 52 55 4E-22 E9 FF 96 28 0F 0D 29 ) g "RUN"i..(..)
   16B1:0AB0 00 CB 0A 28 00 4B 24 28-14 29 20 E7 20 22 4C 4F .K.(.K$(.) g "LO
   16B1:0AC0 41 44 22 E9 FF 96 28 0F-22 29 00 E5 0A 32 00 4B AD"i..(..).e.2.K
   16B1:0AD0 24 28 15 29 20 E7 20 22-53 41 56 45 22 E9 FF 96 $(.) g "SAVE"i..
   16B1:0AE0 28 0F 22 29 00 FA 0A 3C-00 4B 24 28 16 29 20 E7 (..).$.$.K$(.) g
7. -e 0a6f
   16B1:0A6F 00 ff
8. -s 0a70 1000 0 0 0
   16B1:0D19
9. -d 0d10
   16B1:0D10 22 01 95 20 A7 20 89 20-0E 00 00 00 3A 0D 2C 01 "... '.....:..
   16B1:0D20 BA 20 22 52 22 2C 12 2C-22 41 3A 42 41 53 49 43 : "R",,"A:BASIC
   16B1:0D30 2E 45 58 45 22 2C 1C 00-01 00 59 0D 36 01 FE 82 .EXE",....Y.6."
   16B1:0D40 20 12 2C 20 0F 80 20 41-53 20 52 31 24 2C 20 0F ., .. AS R1$, .
   16B1:0D50 80 20 41 53 20 52 32 24-00 65 0D 40 01 FE 89 20 . AS R2$e.@."
   16B1:0D60 12 2C 0F CA 00 82 0D 4A-01 52 32 30 32 2E 31 24 .,J...J.R202.1$
   16B1:0D70 E7 52 31 24 3A 20 52 32-30 32 2E 32 24 E7 52 32 gR1$: R202.2$gR2
   16B1:0D80 24 00 AD 0D 54 01 5A 41-24 E7 52 32 30 32 2E 31 $.-.Z.A$gR202.1
10. -h 0d1c 0a6f
   178B 02AD
11. -r cx
   CX 0000
12. :02ad
13. -n restored.bas
14. -w ds:0a6f
   Writing 02AD bytes
15. -q
   A%
```

FIGURE 2

BASIC SORTING

{ A continuing series on BASIC sorting techniques. Reprinted from "BASIC PROGRAMMING Using Structured Modules" by permission of Holt, Rinehard, and Winston Publishers. }

THE SHELL SORT

By Jon Barron, Eastern College

This sorting method is named after its creator D.L. Shell. It is similar to the bubble sort, except the exchanges take place over greater "distances" which turns out to

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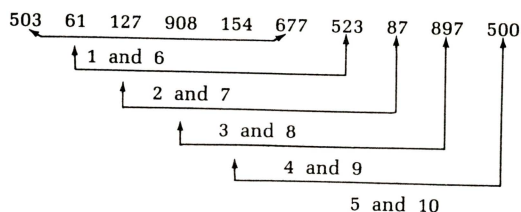
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be more efficient. The distance or gap between items will be denoted by G and starts out as $\text{INT}(N/2)$ (N = the number of numbers) for the first pass. G is divided by 2 for each pass until it is eventually reduced to 1. When $G=1$, i.e., during the last pass over the array, the program is the same as the bubble sort.

Let's illustrate for our sample of 10 numbers:

503 61 127 908 154 677 523 87 897 500

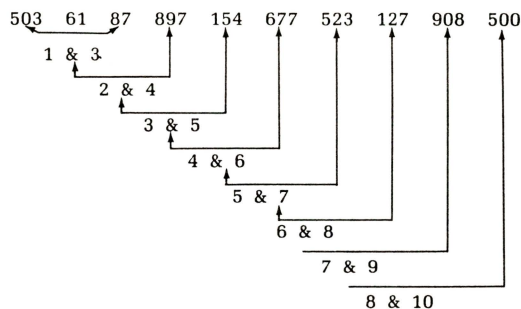
For the first pass through the array, $G=\text{INT}(10/2)=5$. Thus, we compare the 1st and the 6th numbers, the 2nd and 7th numbers, etc. When a given pair are out of order, they are switched.



1 and 6 are in the correct order; so are 2 and 7. However, 3 and 8 and 4 and 9 are out of order. Therefore, they are exchanged giving us the following arrangement:

503 61 87 897 154 677 523 127 908 500

Now, we cut the gap in half to $G=\text{INT}(5/2)=2$. Thus, on the second pass, the computer compares 1 and 3, 2 and 4, 3 and 5, etc. and exchanges those which are not in the correct order.



The exchanges yield

87 61 154 677 530 127 523 500 908 897

For the last pass through the array, $G=1$ which results in

61 87 127 154 500 503 523 677 897 908

Now, we are ready to write the module. Let's start with the pseudocode:

SHELL SORT:

Initialize distance variable G at N (# of numbers)

Compute G by dividing by 2

IF G is not less than one

THEN (gap \geq one)

Initialize switch indicator S

FOR each array number from one TO total minus G

IF array number > array number at distance G

THEN

Exchange these array numbers

Set exchange indicator S at 1

ELSE

NEXT array number

IF switch indicator not zero

THEN

GOTO initialize switch indicator and execute switching loop again

ELSE

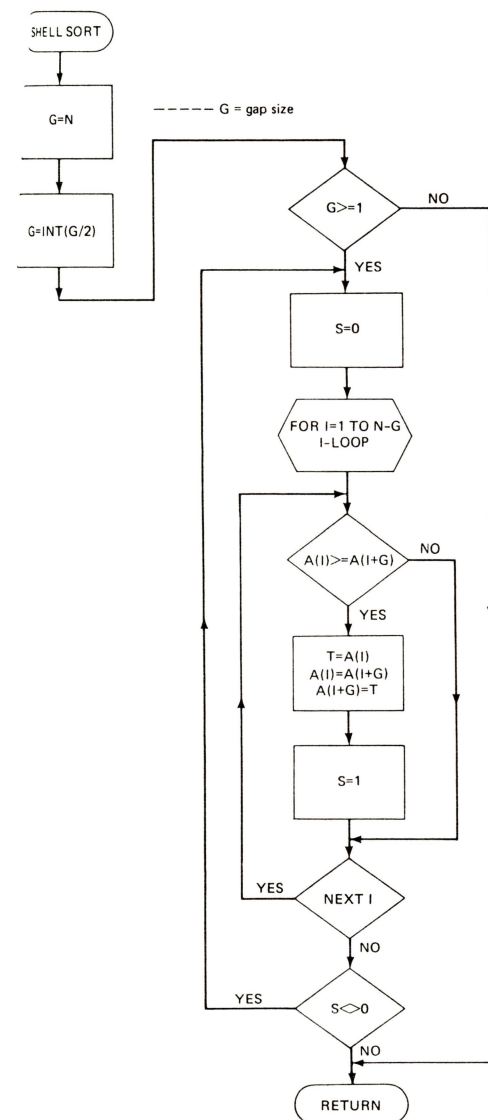


Figure 10.3 A flowchart for SHELL sort.

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80-MICRO summed it up; "The value of this program far exceeds its price...
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SuperCROSS/XT+ will allow you to COPY files back and forth between different operating systems. Up to 170 of them - including PC/MS-DOS 1.x,2.x/3.x (single or double-sided), CP/M+, or CP/M 2.2 on your TRS-80™ Model 4/4P, III, or I/DD. You can do this with your existing hardware and SuperCROSS/XT, eliminating modems, cables, and terminal program transfers. SuperCROSS/XT runs as a /CMD file under your TRS-80 operating system. Data files, spreadsheet files, and text files can also be usefully moved between machines, like years of Visicalc™ files, business letters, legal drafts, or medical records, for example. Scripsit & SuperSCRIPSIT files may be successfully transferred and re-used by saving in ASCII first.

Comments and letters on-file from users are unusually enthusiastic about this product. **It WILL do what you think it will do, it's easy, and it WORKS GREAT!** User-oriented features in SuperCROSS/XT include "tagging" files for multiple COPY's or KILL's to eliminate many unnecessary keystrokes!

Some unsolicited customer comments from returned registration cards...

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"Really works well." - RK, Monmouth OR
"Works! Rejoice! I can now talk to PC's!" - CN, Sanatoga PA
"I love SuperCross! I love PowerSoft!!!" - TAC, Gadsden AL
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"LOVE IT!" - Col. CDL, APO San Francisco CA
"Doc is straightforward & understandable. Solves my problem." - DG, C.Chase, MD
"Top Notch! Works for me." - DB, Lancaster PA
"Great product as usual." - CL, Laurel MD
"Will save 100's of hours! It'll protect my 4P from obsolescence"-RJ, Denver CO
"Outstanding!" - GA, Hawthorne CA
"Program works very well. I like it!" - MDM, Rochester, NY
"Superb. Easy to understand documentation." - RES, St. Louis, MO

CNVBASIC/CMD, available seperately, "preps" your BASIC programs before sending over with SuperCROSS/XT. It will make most of the syntax and spacing changes required for converting Model I/III BASIC programs for use on MS-BASIC, CP/M BASIC, or Model 4 BASIC. Complex or commercial business packages written in BASIC probably will not convert 100% over by our or any other BASIC translator. So why put the bulk of your money into a BASIC translator when what you REALLY need is a great disk format FILE-TRANSFER utility? DATA is what most of you will need to be transferring.

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SuperCross/XT is also available from Express-Order-Software at all Radio Shack™ Computer Centers or any other Radio Shack™ store - as well as from us or any of our dealers.


```

300 REM SHELL SORT:
302 REM INITIALIZE GAP
304 G=N
306 REM COMPUTE GAP
308 G=INT(G/2)
310 IF G>=1 THEN 312 ELSE 344
312 REM THEN (GAP >=1)
314 REM INITIALIZE SWITCH INDICATOR
316 S=0
318 FOR I=1 TO N-G
320 IF A(I)>A(I+G) THEN 322 ELSE 332
322 REM THEN (SWITCH REQUIRED)
324 T=A(I)
326 A(I)=A(I+G)
328 A(I+G)=T
330 S=1
332 REM ELSE (NO SWITCH REQUIRED)
332 NEXT I
334 IF S<>0 THEN 336 ELSE 340
336 REM THEN (SWITCH HAS OCCURRED)
338 GOTO 316
340 REM ELSE (NO SWITCH HAS OCCURRED)
342 GOTO 308
344 REM ELSE (GAP <1)
346 RETURN

```

SOFTWARE REVIEWS

A REVIEW OF MS-WORD AND WORD PERFECT

Microsoft® Word

The basic text for Soft Horizons Magazine is created on a Tandy 1000. Since this machine comes with DeskMate, we instantly had a word processor at our disposal upon purchasing the machine. The last few issues of the magazine were created with Deskmate's text editor. Well, the DeskMate word processor is ok for getting a quick letter out. But it has some serious drawbacks, mainly in its lack of advanced features. We make many requirements of a word processor to produce the magazine, one of which is being able to access the special characters such as | * © and the like as well as boldface, underline, and centering on our Daisy Wheel II. DeskMate is easy to learn to use and we still use it occasionally to whip out a quick letter. But for the magazine, we needed to look further.

We played a little with Microsoft's MS-Word. We have talked with several people who have used WORD and they arrived at the same conclusion we did: WORD has all the features a human being could want, but some of its features are difficult to learn to use. We have always held "ease of learning" and "ease of use" as an important criteria in software evaluation.

In the first chapter in the owner's manual, "Learning Word", everything looks

rose. An excellent tutorial is given, walking the reader through the various processes of insertion, deletion, justification, and the like. You are taught to save and load text. Other parts of the manual, unfortunately, are not always clear. At times it is disjointed and confusing. For example, one of the things we needed to learn was how to get Daisy to print the trade mark symbol. We thought it must be easy to do, its just that we couldn't locate the place in the manual where it tells how to do it. We eventually stumbled on it...a brief single paragraph with no heading which said in effect to hold down the <ALT> key while typing the character code on the keypad. Yes, this works, but the writers should not have hidden that sentence in the bowels of the manual with no heading. Furthermore, emphasis should have been placed on the word "keypad". After failing an attempt at hitting <ALT> and the ASCII code 169 on the keyboard, we put the <NUM LOCK> on and tried <ALT> 169 from the keypad, and it worked fine. Little things like this make learning a new system less enjoyable and more time consuming.

Basic operation is logical and after a few sessions and some study of the manual, you can become comfortable at the console. Many command options are constantly shown on the bottom of the screen, although you still must know much more than is shown for daily operation. Also along the bottom is a status line keeping you up to date on all the latest news.

So, let's look at some of WORD's big features. First, it supports that new computer fad called "windows". Windows, it seems to us, are not super useful when working on a single document. But WORD does allow you to open more than one document at a time and view each through a window. There are times when that is quite useful. You can copy or move text from one document to the other.

A "Mouse" can be used with WORD. Although we didn't try one, we would imagine that a Mouse may not be very advantageous, especially to a person who knows how to type and can enter commands pretty rapidly. Operating a Mouse also takes up valuable desktop area which we cannot spare.

We find one of this word processor's neatest features is the on-screen displaying of formatted characters. When you underline something, or put it in bold face, italics, superscript, subscript, or even double underline, you actually see it on the screen. This does help keep the screen less cluttered from weird symbols such as those used by other word processors. This is one of WORD's best attributes.

WORD is setup to handle the latest

technology in printers. It was designed to take full advantage of daisy wheel, dot matrix, and laser printers.

An Undo command lets you reverse your last edit action and restores it to the way it was before you made the change.

The cursor does not blink, and occasionally we found it became camouflaged among the text if we turned away to answer the phone.

Weighing in at \$375, we find MS-WORD to be a very capable program, yet one some people may find tough to learn. It's not a program for the average word processing application.

A new book is available to help the struggling person who is trying to learn MS-WORD. Called, "The WORD Book", by David Bolocan, it provides an in-depth insight into WORD's innovative features. It is a systematic, yet simple approach to mastering Microsoft's WORD. It can be ordered through Soft Horizons Magazine. Include \$16.45 plus \$3.00 shipping/handling. Order No. 1958, 240 pages, 170 illustrations, 7" by 10" paperback format.

WordPerfect 4.0

SSI Software

Word Perfect, for the Tandy 1000, 1200, and 2000, provides a friendly environment to work in. Word Perfect has all the features anyone could want, and should handle most any task you can dream up.

Version 4.0 offers some new improved features over 3.0. One of those neat features is a single keystroke to make the machine fetch the current date for you and insert it at the current cursor location in your document. This is especially handy when you write a lot of letters. Of course, this assumes that you took the time to properly answer the DATE prompt on boot up!

Block manipulations are simple and quick. A block is now highlighted with inverse video. The ability to get a DIRectory while still working on a document is especially welcomed.

The 4.0 manual provides a better tutorial than the earlier release. The terms used are easy to understand. For example, the old name was "align" and the new name is "tab align". The old name was "file management" and the new name is "list files". Clearly you can see the names better describe their functions.

Other improvements include faster document switching, 80,000 word speller (compared to 30,000 originally), and improved foot noting.

Almost everything is done with function keys. A plastic template sits above the top row of function keys on the keyboard. Each key can perform up to four different tasks. The action it takes depends on whether you simply hit the function key, <SHIFT> and the function key, <CTRL> and the function key, or <ALT> function key. It may appear a little awkward at first, but you become proficient at it quickly. The latest version also color codes the template, blue meaning <ALT> and the function key, red meaning <CTRL> and the key, and so on. It's nice having the template in front of you for easy glancing when you are looking to do a specific thing. Functions are very logical and the on-screen menus are so well done that you seldom have to refer to the owner's manual.

Word Perfect is from Satellite Software International, (SSI). It requires 192K of RAM and sells for \$495.

SSI's support is great. We called them with a few questions and they were kind enough to tell us to call back on their toll free number which we appreciated since it was a super long distance call. They were friendly, knowledgeable, and very helpful. If tech support after the sale is important to you, you got it with SSI. Be sure to have your license number handy when you call.

WP comes with several diskettes which include the speller and convert programs to adopt Wordstar files. The diskettes are not copy protected.

Word Perfect is fast, and you can get up and running fast too thanks to the improved manual.

While letters in bold face type do appear as brighter letters on the screen, underlined words are not underlined. They are, however, marked by inverse video. On the Tandy 1000 version we tested, the color of the inverse video was selectable. If Tandy 1000 users boot up with the color turned on (by entering MODE CO at the A> prompt or from an autoexec.bat file), underlined words will appear green. We like word processors that use the same key for a function, and simply require hitting that key to toggle the effect on or off. WP does for bold and underline.

Many safeguards are built in to prevent you from overwriting files already on diskette.

There is only one very minor error we found. We really had to dig to find it, since Word Perfect is, as its name implies, just about perfect. If a special printer character code, such as ® or © is embedded in a line, and you justify the text, the line on which it appears may stick out of the right margin. In other words, printable printer codes are not calculated in the justification

process. But you would not expect it to be anyway, since a printer code may not be a printable character. It may be a 1/2 line space advance or something of that nature which would not take up any room on the line. Well, we said it was hardly worth mentioning!

The text of this issue of Soft Horizons (not including the large headers) was created entirely by using Word Perfect.

Learning any new program always takes a lot of use before you become completely

proficient and comfortable with it. After only a short time, we feel right at home with WP.

As you have gathered, we like Word Perfect!

An independent organization of Word Perfect owners, called the SSI User Support Group, produces a newsletter, The Word-Perfectionist. Membership includes 12 issues a year for \$36. Contact: SSI User Support Group, P.O. Box 1577, Baltimore, MD 21203.

COVER STORY

Children's Programs For The Tandy 1000

{ Cover: Seven year old Trisha Keen testing games on the Tandy 1000. }

KING'S QUEST. If you used to play the old Scott Adams' Adventure game series on the Model I/III, this one's for you. With full color high resolution graphics, a new dimension of adventure game playing is entered (there were no graphics in the original days, only text).

Similar to other adventure games, you control Sir Graham and walk him around the kingdom looking for treasures.

Even the youngest child will enjoy making Sir Graham journey through the various screens. The game is much easier to play with the optional joystick than with the arrow keys on the keyboard.

Those who have dabbled with Scott Adams' games will be a little disappointed in the actual communication intelligence of King's Quest. While the graphics are incredible and control of Sir Graham is excellent, the artificial intelligence part of the game is not as sophisticated as the "text only" adventure games. Those games accepted a much wider range of English statements.

While small children will enjoy the game, finding the various treasures and needed tools is difficult for those under, say, about 7 or 8 years old. But given some assistance by an adult, they can discover many things on their own. (Adults may need help too! Some things are hard to find!)

The game is also educational in that many commands must be typed on the keyboard. For example, when you jump in the water you must type "swim" or you will drown and end the game. It is a great spelling teacher for children.

\$49.95 is a lot to shell out for a game, but this one is worth it. We don't like the

fact that it is backup protected and you cannot make even one safety backup for your archives. However, the utility COPY II PC, which was reviewed in the August/September '85 issue of Soft Horizons, will allow you to make archival backups.

MICRO ILLUSTRATOR. With a joystick, you can "Etch-A-Sketch" your way to pictorial fame. This program can be used by 6 and 7 year olds with just a little instruction. It will keep them occupied for hours. At only \$29.95, you get a lot of drawing power, including instant circles, disks, mirror images, block moves (copy), and spray painting. Micro Illustrator is to drawing like word processing is to writing.

PIPES. You are a plumber who must buy pipes from a pipe shop and hook up the houses in a town to the water supply. We don't recommend it for children under about 7 years old unless guided by an adult. It is a little hard and does not have the dynamic pace of action games to hold their attention. Pipes is \$29.95 and does make the child think logically regarding angles and shapes.

DEMON ATTACK. Similar to Demon Attack for the Atari (like "Space Invaders"), even the very youngest of kids can shoot up the flying bat-like demons with the joystick. The game is a little boring for adults, but the graphics are very good and kids really enjoy it. \$29.95.

STATES. The previous programs we talked about are available at Tandy Computer Centers. States, by Art Thompson, is from IBM. We tried it on the Tandy 1000 and it works fine.

States drills you on many aspects of the United States. You can play several versions of it. Small children can play a version that makes the machine test you on the name of each state. A map of the US is drawn and the state in question is colored in. More advanced options allow you to be tested on any of several topics: capitals, abbreviations, even the number of people per square mile. Even adults will have fun guessing answers on the state comparison quiz. A good program. You will enjoy it.

VIEW FROM THE BEACH



By Tim Cwik

{ A continuing tutorial on the C language }

In the last column, we learned that C is a block structured language that is used for a wide variety of programming tasks. Each C program is made up on one or more functions and each program has a function called main. We also saw an example of a C function called printf that is used to do output to a terminal.

This time we will look at more examples of printf and see how variables are specified in C.

The basic purpose of any computer program is to manipulate data. From game programs using joysticks to payroll programs using information from timecards, programs store and use data to produce output. In C, variables are specified before they are used. Variable definition takes the form:

```
typename variable_name;
```

for instance;

```
char xref;
int point1;
```

The basic data types in C are:

char	single character
int	integer
long int	extended precision integer
short int	reduced precision integer
float	floating point
double	extended precision floating pt
unsigned char	non-negative character
unsigned int	non-negative integer

Not all data types are supported by all compilers, but most have char, int, short, long, and unsigned. Check your compiler manual for specifics. Unless you are dealing with direct control of hardware and need to read and write at specific memory locations or ports, the internal representation of each data type is not important. On

microcomputers, chars occupy 8 bits and ints have 16 bits. Long ints are no shorter than ints and short ints are no longer than ints. It is possible (but not likely) to have int, long int and short int all the same size.

Well written programs should not depend on things like the number of bits in an int. This type of dependency can cause problems when the program is moved to another machine.

Variable names in C may be longer (and thus more explanatory) than the one or two letter names allowed in BASIC and other languages. Exactly how many characters are allowed in a name depends on the individual compiler used, but 31 is not uncommon. For portability reasons, the first six characters of names should be unique. Most compilers allow long names, but only use the first six characters to determine if names are different. Thus xposition and yposition are better choices the positionx and positiony.

Let's look now at a program that does some very simple arithmetic as an example of using variables in C.

```
/* printf the square of a number */
#include "stdio.h"
main()
{
    int i;
    int j;

    i = 2; /* number to be squared */
    j = i * i;
    printf("The square of %d is %d\n", i, j);
}
```

This program has several new ideas. First, comments in C are enclosed in /* ... */. In our program, the lines "printf the square of a number" and "number to be squared" are comments and are ignored by the compiler. We include them as notes to ourselves or to anyone who comes along and needs to understand or modify our program.

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Next, we define two variables, i and j to be integers. This could also be done with the line

```
int i, j;
```

The next two lines show some of the arithmetic uses of C. The line

```
i=2;
```

stores the value two in the variable i. The asterisk (*) indicates multiplication. The statement

```
j = i * i;
```

multiplies i times itself and stores the result in j.

The printf also shows some new features. From the last column we remember that printf is a function used to print on a terminal or screen. A function may have arguments, data that it uses to do something with. The arguments to a function are enclosed in the parenthesis after the function name. If a function has more than one argument, they are separated by commas. Our printf function has three arguments:

```
"the square of %d is %d\n"
```

```
i
```

```
j
```

The first (and possibly only) argument to printf is the format string. It must be enclosed in double quotation marks and describes how the other arguments are to be printed. Almost everything in the format string is printed exactly as it appears.

This is what happened last time when the format string was "Hello\n". The "\n", you will remember, tells printf to print a carriage return and line feed. The new special symbol this time (%d) tells printf to print the next argument from the argument list as a decimal integer. Items are used from the argument list for each type code in the format string. The first %d will be used to print i, the second %d to print j. There are other type codes that can be used:

```
%u  unsigned int
%o  int in octal (base 8) format
%x  int in hexadecimal (base 16) format
%f  float or double
%e  float in exponential format
%c  char
%s  string
```

Our program as it stands is not very useful. Everyone knows the answer to two times two and even if you did not, using the computer is a lot of work to answer such a simple question. In the next column, we will look at how to construct our own functions to make the program more useful.

{ Tim Cwik is a professional programmer. He is on the American National Standards Committee to propose standars for the C language. Questions regarding C or UNIX can be sent to Tim c/o Soft Horizons Magazine. }

"View By The Beach" is Copyright © 1985 Tim Cwik.

PQfEDIT

PQfEDIT is a user-friendly full-screen editor program enabling you to edit a (ASCII) text file in a page rather than line-by-line format. It is a low-cost, faster, and simpler-to-use alternative to the EDLIN line editor.

PQfEDIT is designed for the IBM® Personal Computers series, the Tandy® 2000 computer, and IBM compatibles running the Disk Operating System (MS-DOS) and with a 25-line by 80-column display. The program is compatible with any release of DOS (1.0 to 3.x).

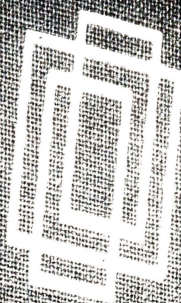
Text is edited in a window of 23 lines by 75 or 80 characters. Editing features available include cursor positioning, character insert delete and replace, horizontal and vertical page scrolling, and commands such as delete, add, copy and move lines, join and split lines, locate and replace strings, and get and put lines to disk. The program can also accept embedded printer-formatting control codes.

With the minimum recommended system memory of 128K, PQfEDIT can work with a single file size up to approximately 63000 characters. This file size is reduced for systems with less memory and for the 128K PCjr. Systems with more memory will enable you to work with multiple files at the same time. Files may contain up to 9999 lines with up to 253 characters per line; however, the actual number of accommodated lines is a function of available memory and individual line lengths.

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C Compiler

LETTERS TO THE EDITOR

{ Edited versions of letters we have received. }

LETTER: Do you have any information on an XMODEM for the Tandy 2000? I need something to download non-ASCII files.

Ed Congleton, New Canaan, CT

EDITOR: John B. Harrell, III reports using COMM2000 by Micro Systems Software (address below). John also tells us, "Teleterm from Telexpress in New Jersey supports this in addition to supporting different terminal setups. I believe that Softterm 2000 also supports the various transfers. Softterm 2000 is available through the local Radio Shack Computer Centers as a Radio Shack Product. Teleterm is available through Express Order Software as third-party software."

LETTER: Do you know if anyone is marketing BBS software for the Tandy 2000?

EDITOR: Try Micro Systems Software, Inc., 5846 Funston Street, Hollywood, FL 33023.

LETTER: I am using MS-WORD and the CGP-220 printer. I want to be able to pick various colors to highlight various text. Can you help?

[Sorry, we forgot the name of the person who left that question on our BBS last month.]

EDITOR: Again we bugged John Harrell, since he has used MS-WORD. His findings: "While the documentation that comes with MS-WORD is not incorrect, it is also not the easiest to understand either. Setting up the MS-WORD for the CGP-220 is a simple matter of using the CONVPRD utility and MS-WORD itself. While you could build a CGP220.PRД file from scratch, it is easier to use another as a prototype. I recommend using the TTY.PRД file that comes on your distribution disk. Using the CONVPRD utility (you can read about this in the MS-WORD reference manual on page 280 of Appendix A), convert this file to a DOC file so that MS-WORD can read and edit it. Once you have converted the file, load it with WORD and print it out so you will have a ready reference for the remainder of this discussion. Also, see the example printer definition located to the rear of this appendix.

"Page 281 describes the format of the resultant text file and this is where you must make changes to use it with the CGP-220. Now, turn to page 284 for the font

descriptions. This is the part of MS-WORD's printer definition files that we will use to select the various colors on the CGP-220.

"Each color should be set as a separate font description. This is the part of the listing that you just printed located between the first {} pair beginning with {F} and ending with }F. After specifying the first three items, each of the next group of enteries specifies a character size for that color. (I am not that familiar the CGP-220).

"The first mod statement is the printer code sequence that selects the color desired (for example, mod:0 "[X^A" sets my Okidata printer into the correspondence mode for 10 cpi). The second "mod" code is used to turn off the font selection only if a special code is required to stop it. This is described in detail on pages 284 and 285 of appendix A.

"Give each font name for each color a descriptive name so that you will easily understand what you are selecting from within WORD. When you have completed this for each additional feature, read through the last section of the appendix beginning on page 293 and select those special printer features that the CGP-220 is capable of (underlining, bold, etc.).

"Follow the table carefully and add these features to the printer definition file. You are now done and ready to test it out. Transfer Save the modified file under an acceptable name (CGP220.DOC, maybe) and exit WORD. Next, run CONVPRD and convert the File back to a "PRД" file. When you are ready to print with it, make sure the printer is ready and select this file from the "print" menu in WORD -- WORD will remember this selection for you in the future."

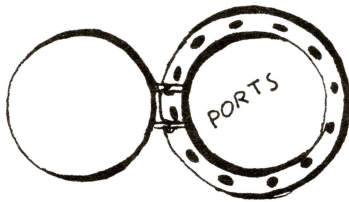
LETTER: Please renew my subscription to Soft Horizons. Your publication, along with PCS-21 (CompuServe) is the only decent resource for Tandy 2000 owners. Someone asked about Disk Utility Programs. Try Super Zap 2000, from Blue Cat Inc., 730 E. Katella Avenue, Orange, CA 92667 is excellent (order through R/S EOS). Along with the other good service you provide, a complete listing of IBM software that will work on the T2K would be marvelous.

Tom Walker, Denver, Colorado

LETTER: Enclosed is \$20 for renewal to your magazine. I am having a problem. When I LPRINT from BASIC or LLIST a program on my Epson LQ1500 printer, as soon as the print buffer fills up (after 25 or 30 lines), it starts loosing characters. It never happens when I PRINT from MS-DOS or from my word processor. Epson says Tandy BASIC probably doesn't use all 3 of thier "handshaking" lines (strobe, busy, and acknowledge).

Jacob Goodman, New York, New York

EDITOR: BASIC on the Tandy 1000 does have some idiosyncracies like giving an "out of paper" error if you try to LPRINT over 80 characters. This is solved by typing WIDTH LPRINT 255. Keep LPRINT statements short. If you need to list a program, you can always (inconveniently) save it in ASCII and print it from DOS using COPY or OPEN. For example, COPY FILENAME.BAS LPT1 should send a disk file to the printer connected to LPT1 connector, as will the statement COPY FILENAME.BAS PRN. Compatibility is, unfortunately, a never ending story. Naturally, Tandy doesn't know anything about Epson and vice versa, so it is hard to get a fix for such a thing from either manufacturer. There is just too much stuff on the market for any manufacturer to fully test all compatible devices. Any readers have another suggestion?



Many readers have been asking for back issues of Soft Horizons, but all back issues are out of print. Over the past year we have listed some ports on the Tandy 2000. For the benefit of those who do not have access to our back issues, we assembled all the port locations published into the list below.

out 408 Values 0 to 15 for background color.

out 410 Letter text color.

out 256,98 Dullest screen brightness.

out 256,100 Next level of brightness.

out 256,104 Brighter.

out 256,106 Brighter yet.

out 256,110 Brightest level.

```
Rainbow effect: 10 FOR A=1 TO 248
                  20 OUT 400,A
                  30 FOR X=1 TO 5:NEXT
                  40 NEXT
                  50 RUN
```

Copyright Basics

If you write computer programs, you may be interested in copyrighting your programs. You can get a free publication from the government explaining copyright registration for computer programs. Write to the Copyright Office, Library of Congress, Washington, D.C. 20559. Ask for Circular Oct/Nov '85 Soft Horizons

R61. Basically, this circular tells you what to send, what is and is not covered by copyright, and deposit requirements.

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- ___ "Mastering The Tandy 2000" from TAB Books, Inc. A guide to programming the Tandy 2000. \$10.95 + \$3 shipping/handling, paperback, 128 pages.
___ "Assembly Language Programming For The Model 16" from TAB Books, Inc. A beginners guide to assembly language programming on the Radio Shack Model 16 computer. \$9.95 + \$3 shipping/handling, paperback, 196 pages.

SOFTWARE ORDERS

- ___ "Convert 2000". A Tandy 2000 utility program which aids in converting Model I/II/III/4 BASIC programs to operate in the Tandy 2000 environment. Non-protected diskette. \$49.95 + \$3 shipping/handling.
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