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- Sailing Adventures in LOGO

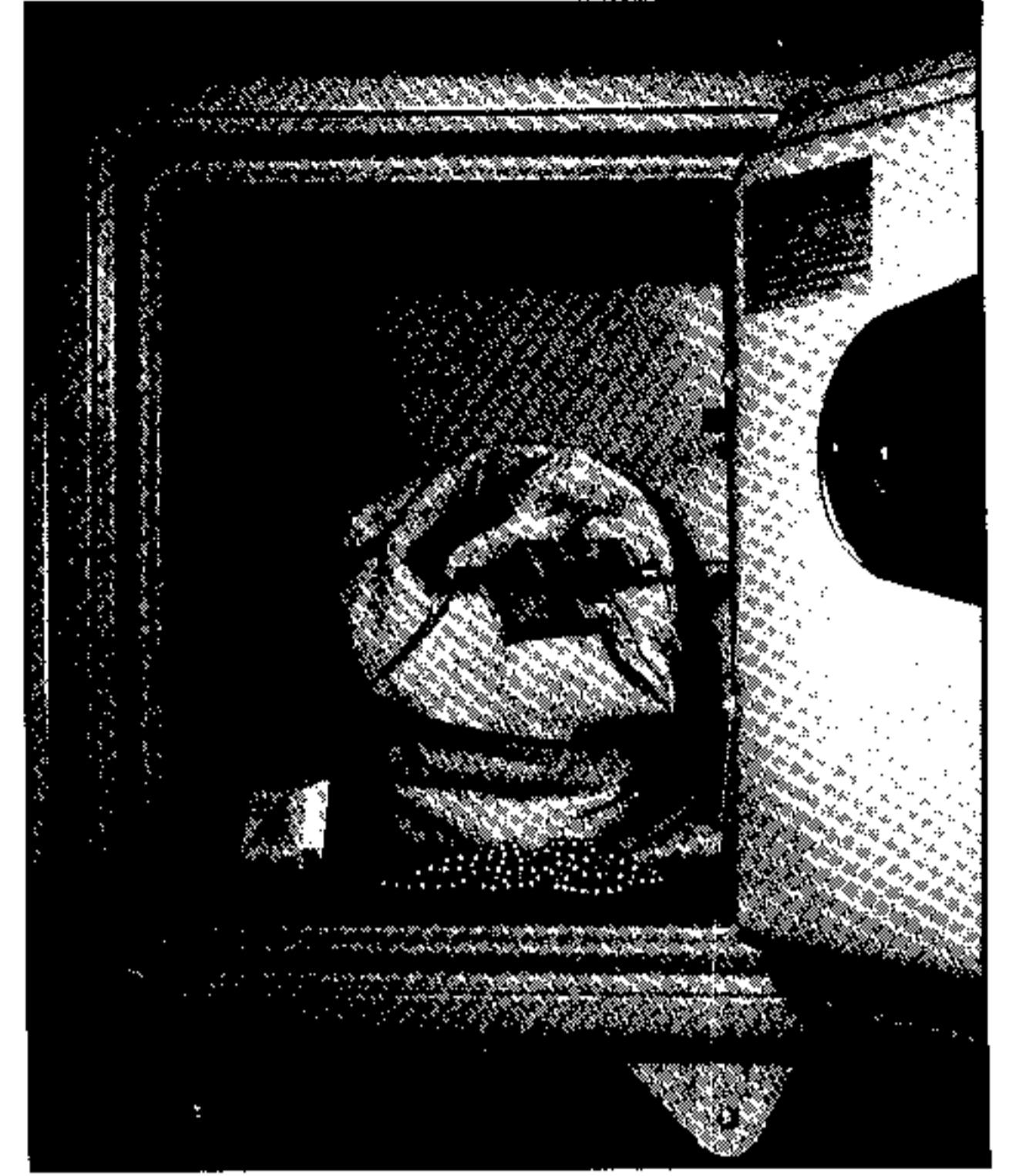
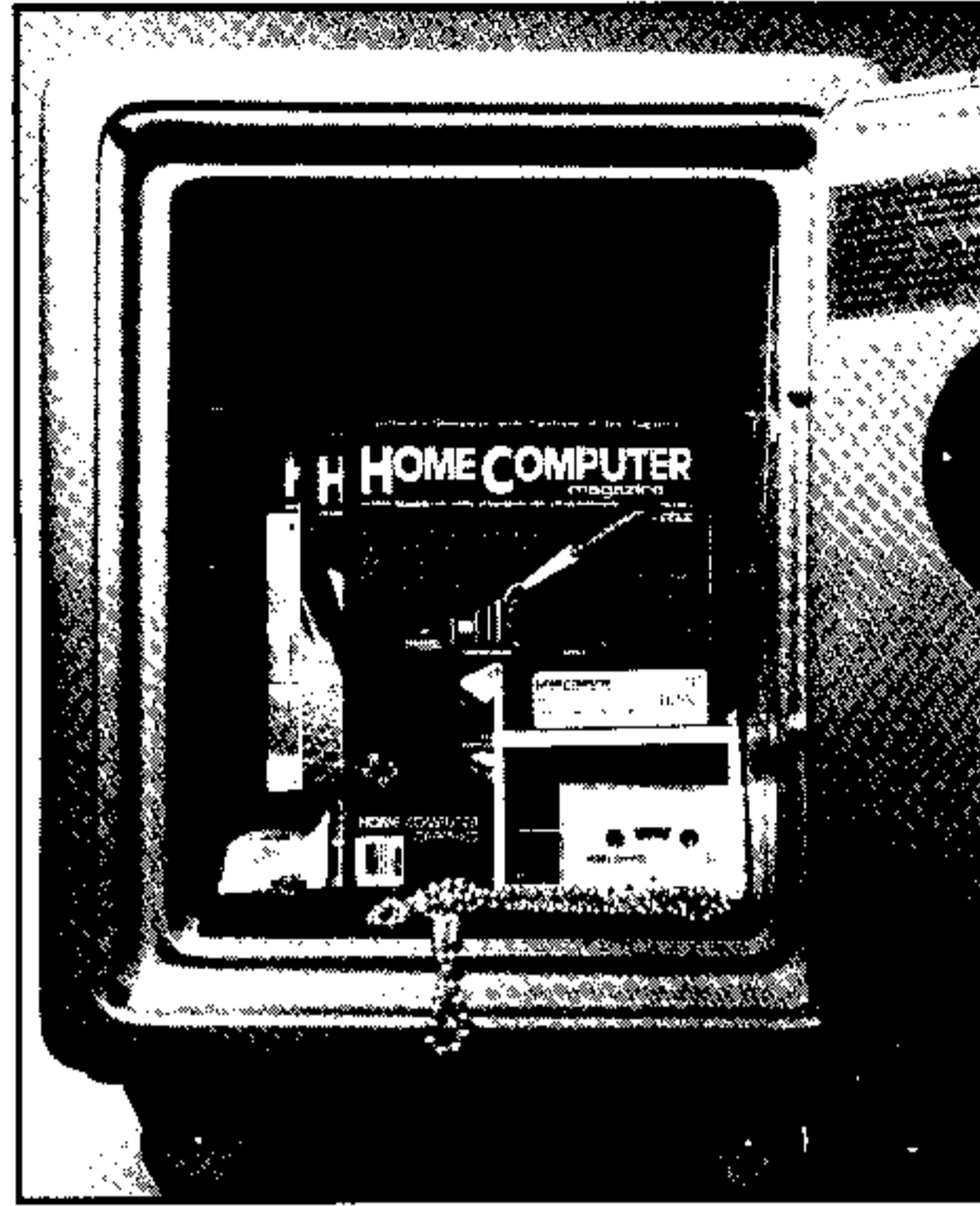
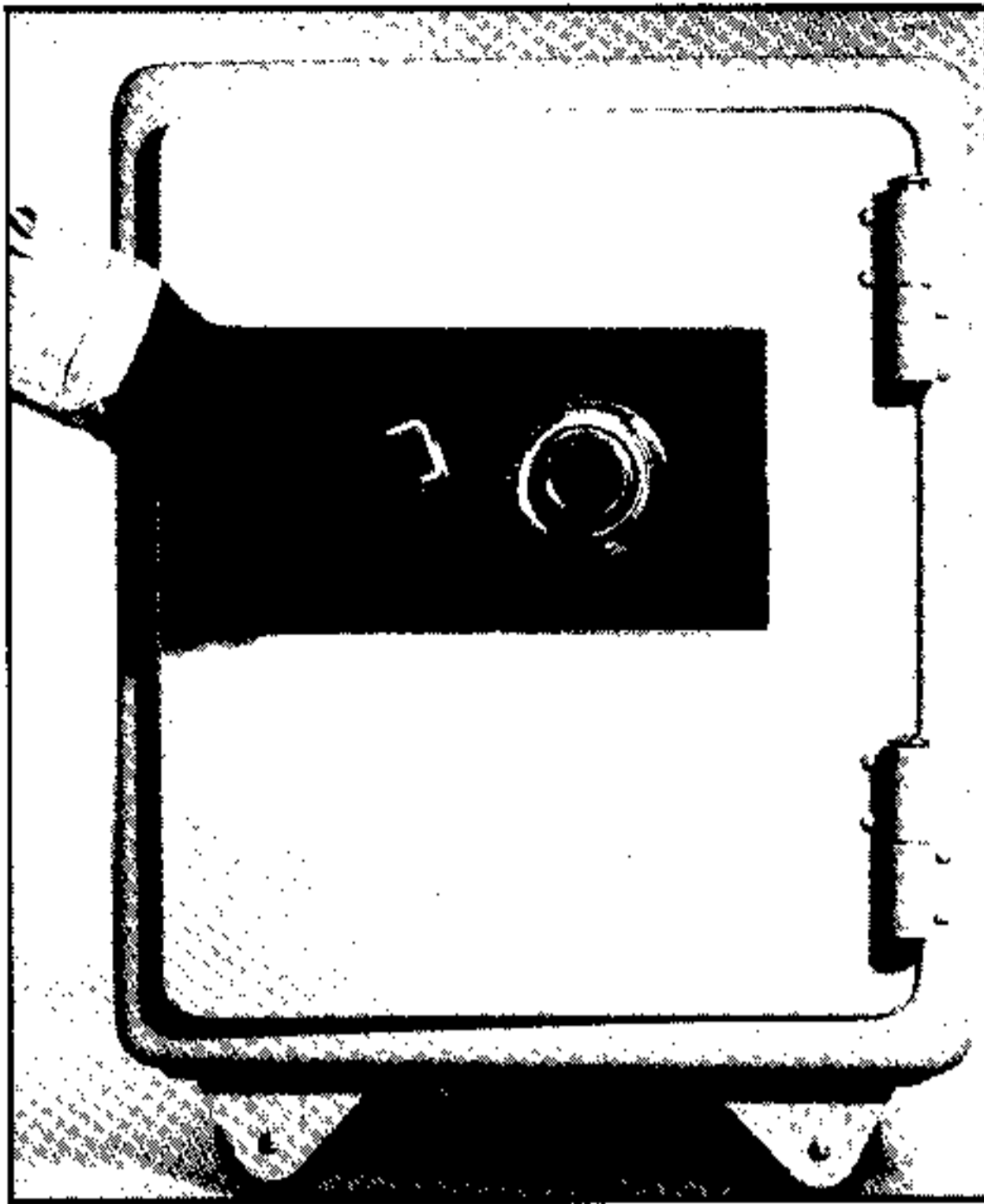
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- ★ Ham Radio Interfacing

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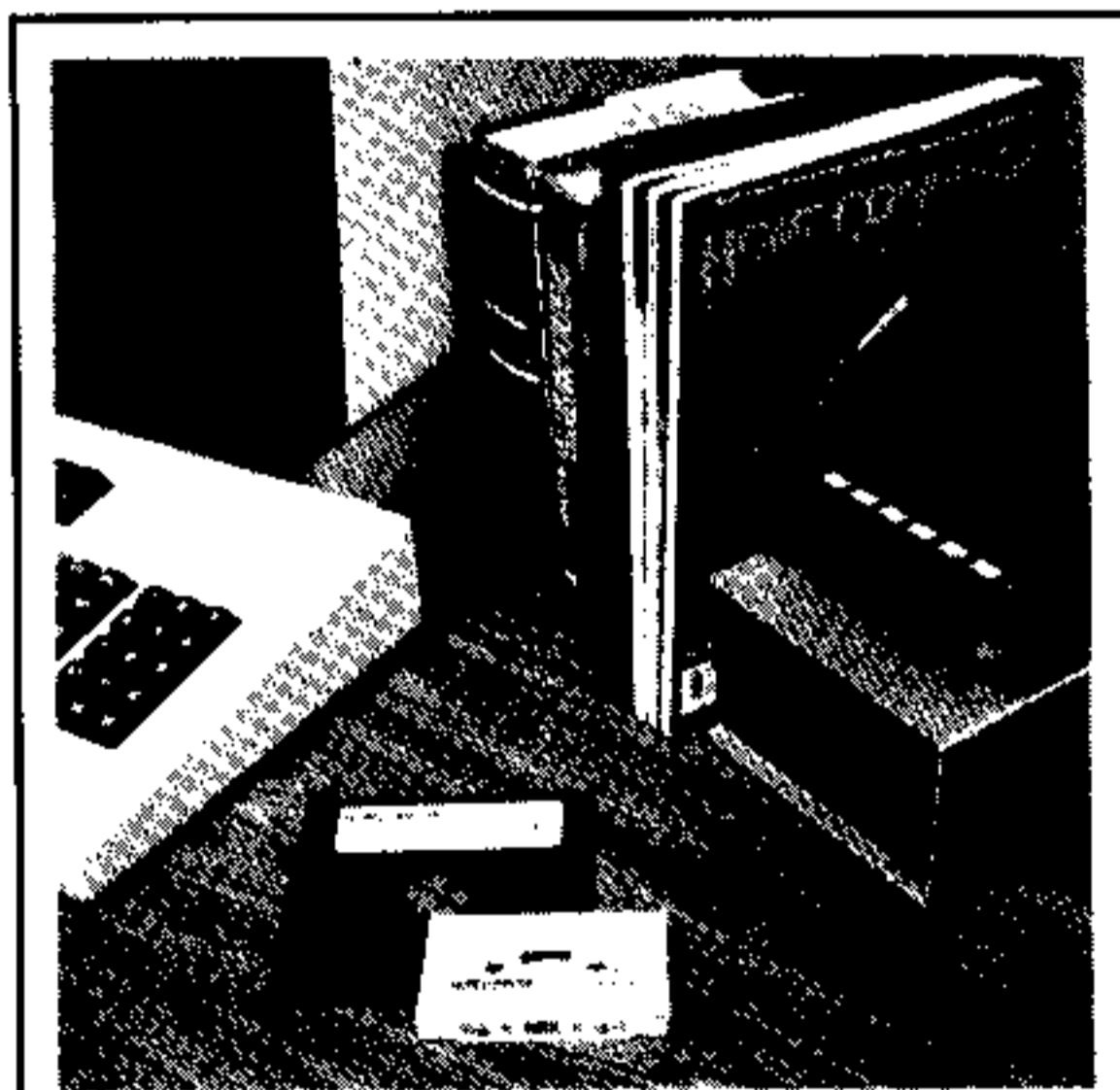
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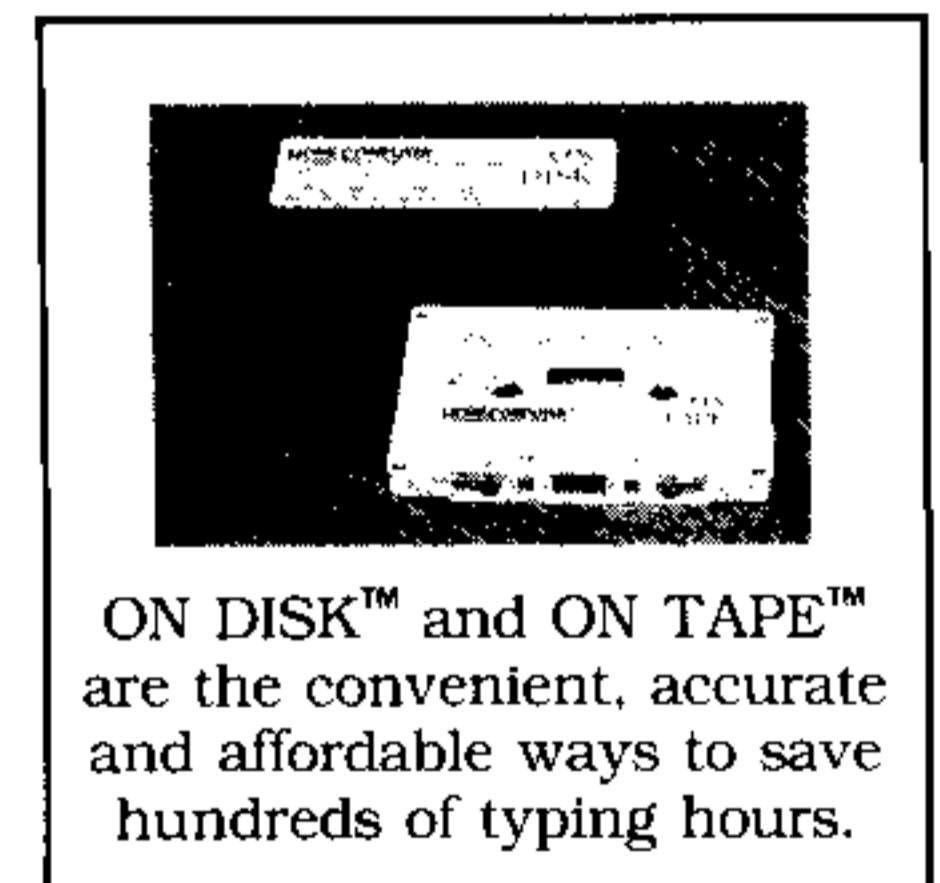
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In each issue we strive for a perfect balance of productivity, entertainment, education, utilities, and computer literacy—serving the needs of novice and pro alike. Every issue is a full-course meal, with a smorgasboard of tasty dishes for all palates. Whereas other computer magazines may dish out lumps of "editorial indigestion," we serve up a satisfying blend—one digestible byte at a time.

—Welcome to Our World of Home Computing

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Production Manager Norman Winney, Jr.
Creative Director Gei-Lei Gom
Photography
Nelson Stevens, K.D. Wainsworth
Production Assistant Rachel Knight
Customer Service Tel. (503) 341-1029
Dealer Sales & Distribution Tel. (503) 341-1036
Ken Reiling
Main Switchboard Tel. (503) 485-8796



Outside HCM

Food for Thought! It's in our magazine—and it's in our software. Even the simplest interaction with a computer involves thinking, however random—or organized—that process may be. Yet you might say that when it comes to software, you are what you boot. At *Home Computer Magazine*, we try to serve a balanced, healthy meal every issue—so that you can leave the table with your thought processes functioning even more vigorously than before. With such hearty fare to power your thinking, you may even grow to reach the stars . . .

Inside HCM

Think about it! Intelligence accumulates; it's additive. As humans evolve, they not only add to their collective *knowledge*, but they also develop new ways to solve problems—thus adding to their collective *intelligence*. Computers are but one hallmark of this process; though for our time, they may be the most important. They extend our powers of thought by doing some of our more mundane thinking for us, giving us the time to concentrate on other, more creative matters. They may also make us *better* thinkers, by teaching us to *organize* our thoughts.

Inside this issue of *Home Computer Magazine*, you will find a particularly powerful piece of mind-stretching software in *The Organizer*, a program that combines word-processing abilities with a built-in outline structure. Whether you are planning a project, drawing up a contract, or writing a term paper, you can place your ideas in this template and create a formidable game-plan—or even finished documents.

In future issues, we will continue to add even more useful features to this program in a similar way to what we have done with this issue's print option for *Quiz Construction Set* (originally published last issue). This versatile add-on allows teachers and others to hand out their quizzes on paper. We then follow through with a *Quiz-Print Tutorial: Accessing and Formatting Printer Output*. This article will not only provide you with more insight into the operation of *Quiz-Print*, but it also fosters a general understanding of how your computer can command a printer to produce a hard copy of virtually any document in its memory or storage media.

Don't forget to take the time to relax with a few of our thought-provoking

games—such challenges as *Orbital Defender*, a space-age thriller that will make you think *fast*; and *Electronic Backgammon*, a modernized classic in which you'll have to think *hard* to beat your cybernetic opponent. And to further mix thought with pleasure, the fast-paced *Kors-Elf* game will initiate young and old alike to learning quick and accurate typing on the keyboard.

A lot of thought also goes into our product reviews. Check out our evaluation of two fascinating educational programs, *Rocky's Boots* and *Robot Odyssey I*—a pair of trend-setting games that will surely make anyone think. Then take a look with us at two other packages designed to cool troubled thoughts: *Relax* and *Calmpute*, activities that "stress" biofeedback training in the home.

Along the way, we also review some hot new games: *Breaksteet*, a refreshing break from gang violence; and *King of the Castle*, an assembly-language arcade adventure.

Some interesting hardware items help to firm-up our review section. We examine several products that link your computer to the fascinating world of ham radio communications and international wire services. We also focus our sights on a state-of-the-art laser-jet printer.

This issue premieres two new mini-features to complement *Simon Sez* for the C-64, and *Razzle Dazzle* for the 99/4A. We're proud to present *Apple Seedlings* and *IBMpressions*.

After all this, we hope you still feel adventurous enough to venture further into part 2 of our tutorial series, *Build a LOGO Adventure*. Or, if sprites are your cup of tea, try your hand at *LOGO Sailing* to regain America's Cup. Now that's something to think about!

Until next time, have fun reading, learning, and RUNing HCM

Don Williams

By Gary M. Kaplan
Publisher & Editor-in-Chief

*"... Tramiel has caught a touch of 'Iacocca Fever'
... trying to resurrect Atari while
taking aim at 'The Big 3'..."*

January's Consumer Electronics Show (CES) in Las Vegas was indeed large—with more than 100,000 attendees. It was also largely boring: Timex and Mattel are no longer players in the game. Apple and IBM did not exhibit. Texas Instruments—without a home computer line—was a skeleton of its former self. The Microsoft-sponsored MSX presence was of yawning excitement and minimal impact. And Coleco's pre-show exit from the home computer business transformed their large CES floor area into a virtual ghost town.

Stand-alone video game hardware and software is definitely *out* this year. In the past, this product category dominated the shows. Former video superstars Activision and Imagic were at the show, but had metamorphosed into smaller, "respectable-looking" home computer software houses.

Judging from CES activity, it appears that educational software has finally caught up with and overtaken entertainment software as a category. CBS and Spinnaker virtually slugged it out in their large adjoining floor areas at the show. The message was clear that Spinnaker will not have an easy time keeping its early lead in the face of the CBS conglomerate's supposed \$40 million media onslaught scheduled for 1985.

Productivity software also made a much stronger showing this time around, but the "new" category that made the most impact was music—both peripherals and software. 1985 will undoubtedly be the Year of Music in the home computer world, with increasing numbers of C-64's being purchased as music system *components* rather than as stand-alone *computers*. And if Atari actually delivers its new music machines (mentioned below), the growth of this product category should escalate well into 1986.

The *real* gambling in town didn't take place in the casinos. The millions of chips being wagered were of the silicon variety—with Commodore pitted against Jack Tramiel's new Atari Corporation. Apple and IBM were clearly in the Commodore crew's sights as they uncovered and aimed their two new "big guns": the Commodore LCD portable, and the Commodore 128 Personal Computer. Designed to sell for about \$500, the LCD is a souped-up (with 8 ROM-resident application programs) Commodore Plus 4, with an 80-character by 16-line LCD viewing screen, and a built-in 300-baud modem.

The Commodore 128 is really three machines in one—with three separate microprocessors and operating systems. First, there is a C-64 compatibility mode with all of the critical chips present, so the large library of C-64 software can run unchanged. There's also an enhanced 128K mode to take advantage of the larger memory and higher-resolution (up to 640 x 200) video circuitry,



through a much richer BASIC (version 7.0) and a machine language facilitated by a resident monitor. In 128K mode, the machine utilizes a faster microprocessor (the 8502), and sports 80-column capability with 16 colors.

The third operating mode is CP/M 3.0, running under a Z80A microprocessor (at 4 Mhz). Perfect Software has ported their productivity series to this machine's CP/M environment. Commodore was also actively hyping its Arktronics connection with Jane 2.0—an integrated, icon-laden software package first introduced in the Apple world. Although Commodore's much-talked-about 16-bit Amiga machine wasn't introduced at this show, the firm is apparently counting on the Perfect/Jane products to carry its C-128 into the low-end business world until the more powerful machine is ready.

The 92-key Commodore 128 is slated to sell for about \$300 (sans disk drive) and is said to be expandable to 512K of memory with a RAM disk option. Peripherals announced include a mouse, 300/1200 baud modems, and a "high-speed" double-sided/single-density disk drive (with 350K storage capacity in C-128 mode, 140K in C-64 mode, and up to 410K in CP/M formats).

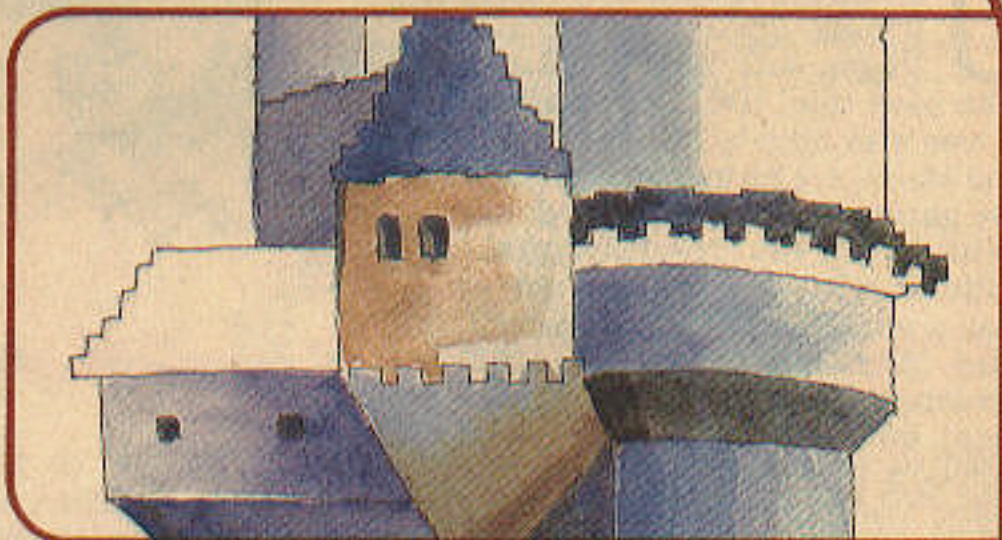
Atari announced two new hardware lines at the show. At the low end is the XE series of 8-bit machines (with 6502C microprocessors). A 64K version with 256 colors (and 320 x 192 resolution) will sell for approximately \$120. For \$150, there's a music version with 8 voices; \$200 gets you an expanded-memory machine with 128K; and \$400 buys a 64K portable with built-in 5-inch monitor and 3-1/2 inch disk drive.

Atari's second new line is its ST series of 16-bit machines (with the 68000 microprocessor). The ST sports Digital Research's GEM operating system—a Macintosh-lookalike desktop environment, complete with mouse and icons. The 128K version (sans disk drive) of Tramiel's ST "Jackintosh" will sell for about \$400; a 256K version will be available for \$500; and a 512K version for \$600. Each ST machine is capable of displaying 512 colors, a 640 x 400 pixel resolution in monochrome mode, and contains a built-in MIDI interface to provide digital control of musical instruments. A 3-1/2 inch disk drive and a color monitor will be sold for about \$200 each. The new Atari crew was also boasting of a forthcoming 15-megabyte hard disk drive to sell for \$400!

It's clear Mr. Tramiel has caught a touch of "Iacocca Fever." In trying to resurrect the new Atari Corporation, he is squarely taking aim at "The Big 3" with a full, aggressively-priced product line that—if delivered as promised—could set off a price/performance war of mammoth proportions.

HOME COMPUTER™

magazine



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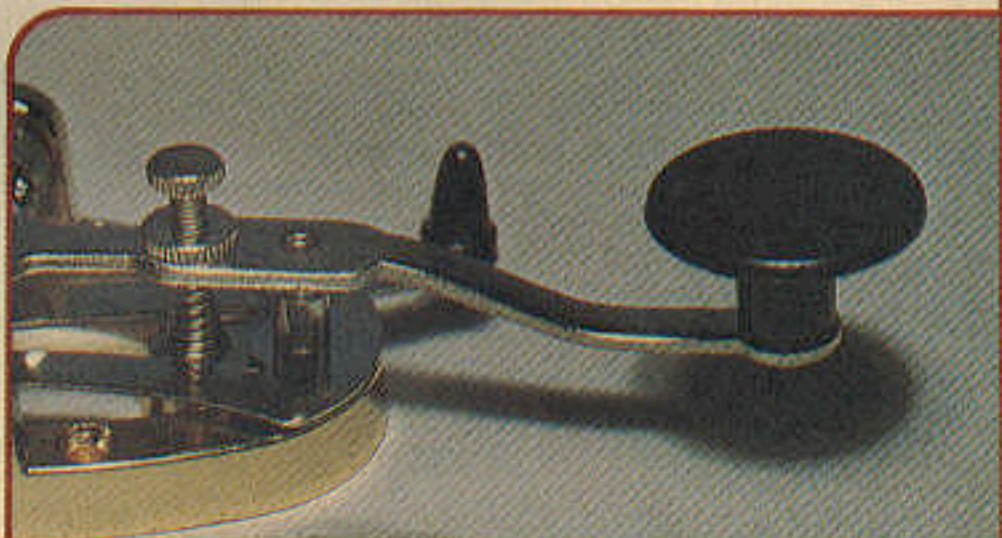
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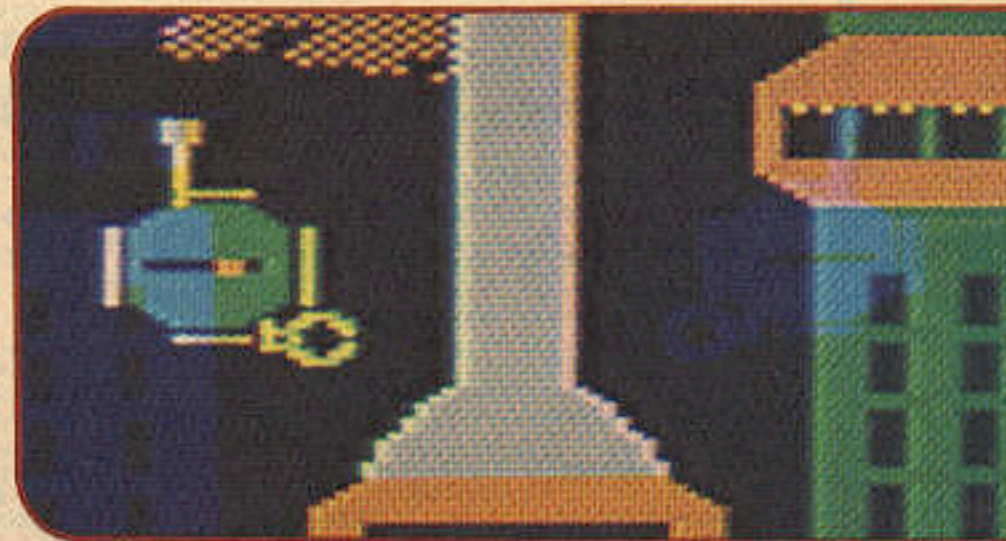


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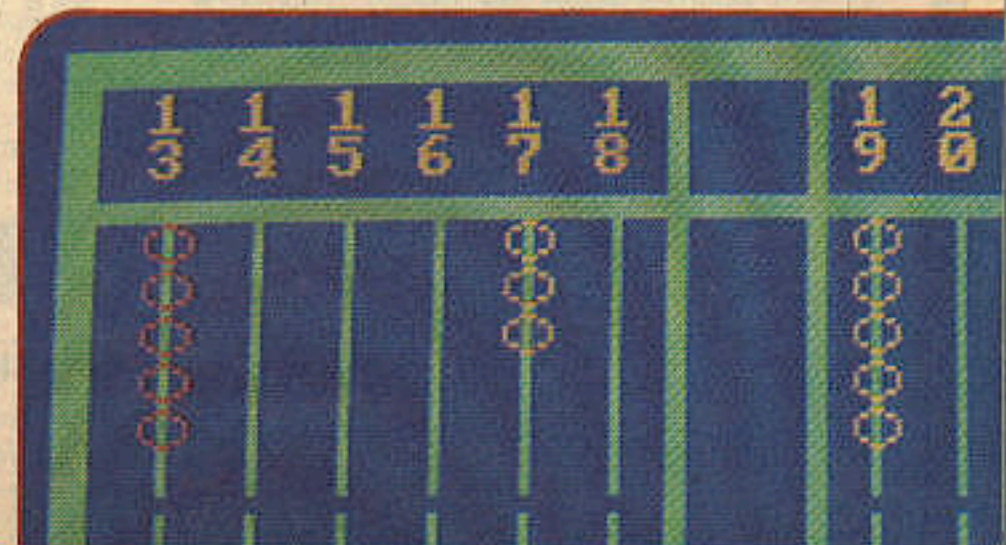
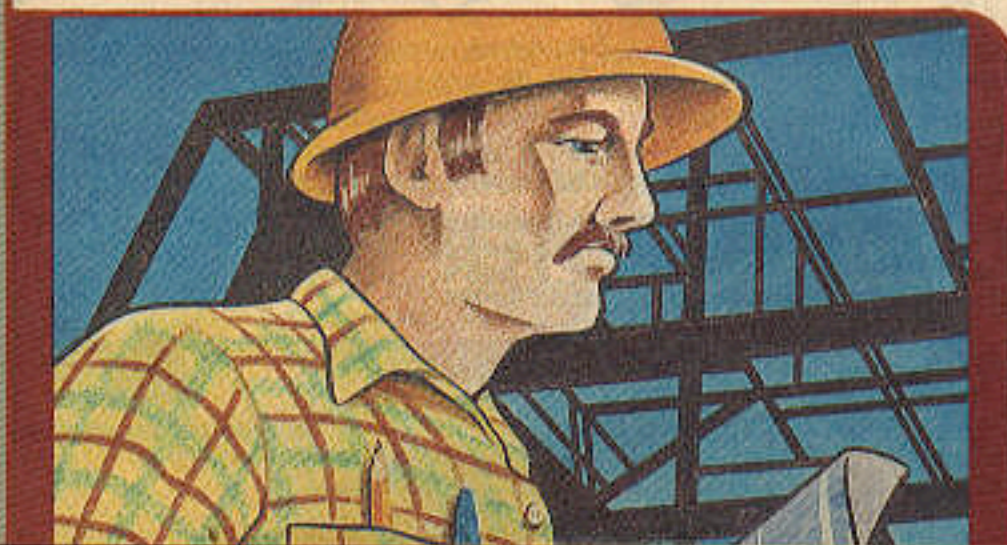
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HISTORICAL NOTE
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Keeping Your Head Clean

Dear Sir:

I read several months ago that one manufacturer of disk head-cleaning kits had a program that caused the disk head to stay in contact with the disk cleaning pad for 30 seconds, but I was not able to find one of the kits. Since then I have been trying to figure out a program that accomplished this and believe that the following program does just that.

```
10 ON ERROR 30
20 RUN "DSK1.LOAD"
30 ON ERROR 40
40 RETURN
```

This program will run the disk drive for 30 seconds, although the head may not be in contact with the cleaning pad for that long. I hope this information may be of some use. I like your new format. Keep up the good work.

Steve Lisonbee
Orem, UT 84057

There are many ways, Steve, to get the disk to turn for 30 seconds while cleaning the heads. Probably the simplest way is to try to load something from that particular drive and count the number of seconds that the drive turns, subtract that from 30, and repeat the load procedure until you have actually reached the 30 seconds. It is easy to tell when the head is in contact with the cleaning disk because you will hear a definite rasping sound as the rough surface passes over the disk head. We have noted that in cases where a disk drive is used extensively and is not cleaned regularly, the disk drive cleaning kit must be used much longer than just 30 seconds to remove the deposits from the head. This seems to be a trial and error situation. If your drive is actually producing errors, then we suggest that you run the head cleaner for 30 seconds, and see whether the errors have gone away. If not, run it for another 30 seconds and repeat this until the errors have cleared up. If after a collective period of five minutes the errors persist, have the drive checked by a service center.

Companion Review Reviewed

Dear Sir:

I would certainly like to commend you upon several aspects of the Companion word processor review. I was indeed pleased to see Companion so favorably reviewed in the August [Vol. 4, No. 3] issue of *Home Computer Magazine* and I congratulate the reviewer on accurately portraying the philosophy of Companion's design.

However, I would certainly have preferred that she do a more careful reading of the documentation before launching into the review. For example, Companion does have a "handy reference card." It happens to be two of the four sample text files included on the Companion diskette. We felt that this was the best possible way to provide such reference material, because the user may easily reproduce it in unlimited quantities and also edit it to personal preference.

Regarding the operation of the [FCTN][3] key, it is clearly stated both in the manual and

in the reference sheets that its purpose is to toggle the visibility of the typed spaces. It is, of course, its own "oops" key.

It was with some disappointment that we saw TI-Writer called the "de facto standard" [word processor in the 99/4A community], and it came as quite a shock to see TI described as "generous" in the middle of a review of Companion. I will leave it to your readers to decide whether this editorial comment was either appropriate or accurate.

Allan Swett
Intelpro
Brossard, Quebec, Canada

Thank you for your comments, Allan. We still feel, however, that the review was accurate and a fair assessment of your product's strengths and weaknesses. As for our statement that "TI has generously provided the 'hooks' for third-party add-on products," we feel that it was both appropriate and prescient. See our review of a third-party spelling checker for TI-Writer in Vol. 4, No. 5.

Word From the Board Room

Dear Sir:

I recently purchased a copy of the Vol. 4, No. 3 issue of *Home Computer Magazine* and was very impressed. I think the editorial style is easy to read, but unlike many other magazines of its kind, it wasn't filled with "computer fluff." As the in-house list manager for Boardroom Reports, I get to see a lot of computer magazines (since most of the "non-technical" ones use our lists) and yours is among the best.

Brian Kurtz
Board Room Reports
New York, NY 10036

It is nice to get an expert opinion, Brian. Thank you for taking time to write.

Innovation Is Not Without Problems

Dear Sir:

I would first of all like to compliment you on *HCM*. I have an Apple IIc and a TI-99/4A and *HCM* is unique in the usefulness of the material you present. I especially appreciate the availability of low-cost software in the form of your ON DISK and ON TAPE service. I also appreciate some of the innovative approaches you take to marketing, formatting, and editorial.

However, I have a concern. I have received issues at a slower rate than one per month since subscribing to *HCM*. While I can appreciate the chaos and re-planning that was undoubtedly necessitated by Texas Instruments' discontinuation of the 99/4A last year, and delays in publishing due to some of the revisions of policy you have recently undertaken, I would hope that your issues can be regularly counted on in the future.

Fred K. Rehl
Sedalia, OH 43151

As announced in our last issue, Fred, you can count on HCM being published ten times each calendar year—with approximately 5 to

6 weeks between issues. Both existing and new subscriptions are being fulfilled on an issue basis (instead of by months) so that everyone will receive the correct number of issues they are entitled to. This reduction to a more realistic frequency was necessitated by the comprehensive software content of each HCM issue.

Where Did All the Memory Go, Junior?

Dear Sir:

I recently acquired the IBM Writing Assistant word processor for my IBM PCjr. While it works fine, I find that I can only store about 1600 words in the "working copy" before the program memory is full. This is only about 12K bytes of RAM. I've got 128K RAM installed in my Junior, so I expected to be able to write a much larger document. What do you think?

James McCloskey
Reidsville, NC 27320

The IBM Writing Assistant word processor is a very large program, James. It was originally designed to run on the IBM PC with a minimum of 256K of RAM. In that configuration, it allows space for about 140K of storage for the "working copy." If you need more space to work with larger documents, you have two options: (1) select a word processor that takes up less space and memory, or (2) buy a memory expansion unit (from IBM or third-party firms such as Tecmar, Legacy, Microsoft, etc.) that will be compatible with the IBM Writing Assistant package.

Junior's Math & Memory Questions

Dear Sir:

I have two questions about the IBM PCjr. My first question has to do with mathematical accuracy. After reading *Microcomputer Accuracy* (Vol. 4, No. 1) I decided to try a few of the tests mentioned in the article. All but one yielded the right results. I typed in:

```
10 A# = 4*ATN(1)
20 PRINT A#
```

The answer I got was 3.141592979431152, nowhere near pi after the seventh digit. Amazed at how far off it was, I tried:

```
10 A# = 4*ATN(1.000000000)
20 PRINT A#
```

This yielded the correct answer of 3.141592653589793. Why does it do this? Does this mean if I want accuracy past seven digits I must put zeros at the end of each operation?

My last question is about additional memory. In your review of Tecmar's jr Captain you state that "Unfortunately, the additional memory doesn't mean a PC application that was memory-bound on the Junior will now work just fine." This is a seeming contradiction to what is said in "Home Computer Product News," which says, "The IBM PCjr 128KB Memory Expansion Attachment adds 131,072 characters of user memory to a PCjr, and can be used to run thousands of IBM PC programs." Which is correct?

Thank you for your time.

Sean Hillyard
Oakhurst, CA 93644

Continued

There's a paradoxical situation concerning memory expansion for the Junior: The Tecmar Junior Captain came with software that did not allow the use of the memory expansion with larger PC packages that needed contiguous memory space (it may have been corrected in a later version of Tecmar's software, but we're not aware of it). The IBM PCjr 128K byte memory expansion comes with software to configure the Junior so that it looks like an IBM PC with contiguous memory, thus allowing most PC programs to operate correctly.

Your discovery about accuracy, Sean, boils down to the election of "double precision." Unless you specifically declare double precision numbers—which you did in the second case—your Junior will default to single precision. An easier way to declare double precision in your formula would be:

```
A# = 4*ATN(1D0)
```

HCM Helps Make Buy Decision

Dear Sir:

I have enjoyed your magazine immensely since it was 99'er *Home Computer*. It was a great magazine then and is an even better magazine now. I have been craving more computing power and better software lately. I think that (from your informative coverage of the IBM, Commodore, Apple, and TI machines) a Commodore 64 would fill the slot nicely. It is a good machine at a good price. I was wondering if another Commodore, the Plus/4, is compatible with the C-64. And thanks again for the best computer magazine on the market.

Ashley Jacobs
Caracas, Venezuela

At the present, Ashley, the Commodore Plus/4 is not software compatible with the C-64. There were rumors circulating, however, that Commodore would soon introduce an add-on to make the two machines compatible. In light of the just-announced C-128 machine that is C-64 compatible (see *On Screen* in this issue), it doesn't appear to be likely. We're glad that you find *Home Computer Magazine* to be beneficial in aiding you to make a wise purchasing decision.

TI Game Cartridge Trick

Dear Sir:

I found a trick for most of the games made by Texas Instruments for the 99/4A. This trick allows one to change the starting level. To do this, simply select the game (after inserting the cartridge) and when the title screen of the game appears, quickly type (holding down the shift key) 838. I know this works on the games Moonmine, Alpiner, Munchman, Hopper, and Munchmobile, but those are only the ones I know of, so try and see what other games this works for.

David L. Whitlock
Houston, TX

You're right, David. This trick seems to work on most of the TI game cartridges (the ones actually produced by Texas Instruments). This trick can be used to change the level of difficulty and some other conditions of a game at the very

beginning. This is ideal for advanced players who wish to skip over the simple lower levels of an arcade game. It is also useful to those less skilled who have never been able to reach the upper levels of these arcade games, and want to satisfy their curiosity.

Texas Decisions Italian-Style

Dear Sir:

About a year ago (when I bought my TI-99/4A) I was greatly surprised at seeing how many peripherals and accessories this computer can have. But just out of production, my hopes to have these peripherals soon vanished, and I haven't made up my mind yet whether to buy another computer or not. That is the reason why I ask you if in America someone is still selling the Extended BASIC module, the Editor/Assembler module, etc. at possibly a reasonable price, in case you have an address.

Principally, I'm not asking you where to buy my accessories, but if it is worthwhile. I would not spend my money on a computer which has no possibility to evolve.

Add the probability that I can't have my computer repaired if it breaks because there are no TI assistance centers in my city. Draw your conclusions and write them (and the addresses) to me.

I wait hopefully for your answer.

Pietro Parrotta
Palermo, Italy

Pietro, it is difficult to say what you should do because you are located in Italy. Peripherals and software such as Extended BASIC, etc. are available in the United States as is support from the TI service centers. There are (or were) two TI facilities in Italy—at Aversa and Reiti. TI-99/4A computers bound for Europe used to go to Reiti for final assembly, so personnel at that facility may be able to guide you in your repair concerns. If you haven't already made a large investment in TI peripherals and software, we suggest you seriously consider purchasing one of the other computer systems we cover in this magazine.

Printer Switched to IBM Confirmation

Dear Sir:

I have been reading 99'er a long time and was pleased in its change of format to HCM after I purchased an IBM PC portable. I would like to know if you could help me in properly using my Axiom GP-100 TI II (which you reviewed in HCM Vol. 4, No. 4) with my IBM. I had no problems using it with my TI. I purchased a parallel interface cable for my IBM and got the printer to work, but when using Wordstar I cannot set line spacing, even with the [Ctrl] KS command, although the dot commands work in setting page length. Also, is there any software that will allow my printer to perform graphic screen dumps (the [PrtSc] key doesn't work), or is there any IBM software that will give this printer any new fonts. I would greatly appreciate your assistance.

Sam Ousta
St. Petersburg, FL 33715

Your information concerning the compatibility and incompatibility of the Axiom and

IBM machines is interesting, Sam. That particular Axiom version was produced for the TI-99/4A only, and the compatibility you've noticed stems from similar methods of handling the text of both IBM and TI printer routines. However, many differences exist—line spacing and dot-addressable graphics are just two of these. The Axiom's line spacing cannot be modified through software as it can with many IBM-compatible printers, which explains your Wordstar problem. The [PrtSc] function, which is accessible through the GRAPHICS command in DOS (see this issue's IBM "Home Computer Tech Note" for details), is not compatible with the unique graphic methods used by the Axiom. You can access these unique graphic commands (as detailed on pages 24-26 of the Axiom User Guide) from Microsoft BASIC, however, if you use the LPRINT command in place of the OPEN #1:"Axiom" and PRINT #1 in TI BASIC. Here's a one-line IBM program that does the same thing as the demo program on page 25 of the Axiom manual:

```
100 LPRINT CHR$(8):FOR I=1 TO 4:  
LPRINT CHR$(129); CHR$(137);  
CHR$(145); CHR$(161); CHR$(255):  
NEXT I: LPRINT CHR$(15)
```

We hope this gives you some insight into how you might make the most of using the Axiom printer with your IBM PC portable.

A Worm in Apple 3-D Graphics?

Dear Sir:

I know the frustration that B. Matthies spoke of in her letter to you (Vol. 4, No. 4) concerning the 3-D graphics program. I experienced some of the same problems that she outlined. However, I solved the load problem by first making a DOS 3.3 copy of all related 3-D programs and then loading the HELLO program onto the disk. My major frustration was in not being able to reload a saved, newly-created 3-D object. After reviewing the Applesoft 3-D program several times and experimenting with changes, I finally changed "size" in lines 1140-1160 to a value of 100. Also, I deleted the "%" symbol in lines 1760, 1770, and 1920. The program now runs smoothly and it is quite enjoyable to manipulate the axial rotation of various objects.

The latest format of HCM (Vol. 4, No. 4) arrived today and it appears that you may have finally found the magazine style and format that you have been searching for. HCM readers should be pleased with the quality of the magazine.

Paul E. Pennebaker
Slidell, LA 70461

You've done the right thing, Paul, moving the 3-D Graphics system to its own disk—it will give you plenty of room on the disk to save objects. The problem you describe is one that only readers who typed in the program (rather than loaded it from ON DISK) might have experienced. Chances are you didn't notice that not only do you add the listing on the right side of page 41 from *Home Computer Magazine*, Vol. 4, No. 2, to the listing from Vol. 4, No. 1, but you also must change line 770 of that listing. The line should read:

770 ON OBJ GOSUB 1190,1320,1480,1900:
REINITIALIZE ARRAY

When this change is made, using integer arrays (the %) in lines 1760, 1770, and 1920, these lines are all correct as printed. Because the SIZE variable is set to 100 in line 1130, your change of that variable in other parts of the program appears to be unnecessary.

IBM Library Software Needed

Dear Sir:

I currently administer a small law library for the Federal Energy Regulatory Commission in Washington, DC. Several of the library's manual filing and tracking systems appear to be candidates for automation.

The library will soon acquire an IBM Personal Computer. My hope is that I can locate software that will permit me to store and track data relevant to interlibrary loans, congressional legislation, and depository materials.

In my opinion, an inventory control program of some type would probably provide the capabilities needed, particularly one designed for library applications.

If you have any suggestions regarding where I might obtain software suitable for the applications I described above, I would appreciate receiving them.

Barbara Giersch
Washington, DC 20426

We are aware of several software packages for the PC, Barbara, that specifically reference (no pun intended) maintaining library files. These include: MDSIII (Micro Data Base, Inc.), The Data Factory (Micro Lab), Fasfile (Gryphon Systems), and Citation (Eagle Enterprises). For an overview of these (and other) packages, we suggest that your consult two directories: IBM Personal Computer & XT Software Guide (from MicroInformation Publishing, 15420 Eagle Creek, Prior Lake, MN 55372), and PC Clearinghouse Software Directory (from PC Clearinghouse, 11781 Lee Jackson Hwy, Fairfax, VA 22033).

PCjr Serial Port—Not For Printers

Dear Sir:

This letter was written on a PCjr using PC-Write and printed on a TI-99/4 Impact Printer. The printer is hooked up to the extended model PCjr serial (S) jack using the 1 through 8 and 20 leads. Pins 2 and 3 are reversed between the two units. This only works for OPEN #n and PRINT #n output. PRN from DOS, LLIST from BASIC and LPT1: just hang the system, as does an attempt to use PR from PC-Write.

How about a "how to do it" article on this? It should include enough data to set up all functions to work correctly. Perhaps a new ROM would be needed in the printer.

Ed Quenzer
Eastham, MA 02642

One of the problems, Ed, with using the serial port on the IBM systems is that the printer is expected—by both the operating system and Microsoft BASIC—to be connected at the parallel port which, of course, happens to be

an extra-cost item. We are looking into this problem and should have your request for a how-to-do-it article filled in a forthcoming issue. One way to solve the problem for now is to spend the money for the PCjr parallel interface and parallel interface cable, remove the serial interface card from the TI-99/4 impact printer, and connect everything together.

Making C-64 Listings Easier to Read

Dear Sir:

Typewritten letters are not the only things which are easier to read when double-spaced. Program listings are easier to read too if they are double-spaced. I thought that your readers might like to know one way that this can be done.

I have a Commodore 64 and Mannesmann Talley MT160L printer with a CARD/PRINT interface. The interface provides several alternative "modes" for printing out a listing, depending on the "secondary address" given in the OPEN statement. For instance, using a secondary address of 2 in OPEN 4,4,2:CMD4:LIST puts the printer and interface in a mode which prints out a program in upper case only and provides a "line feed." A line feed makes the printer advance the paper by one line with each carriage return (each time a new line is started). The statement OPEN 4,4,6:CMD4:LIST will result in the program being listed in upper and lower case, with a line feed. If the printer has also been set up to provide a line feed with each carriage return, then either of these listing modes will give double-spaced listings. A double-spaced listing is easier to read and provides space for inserting notes when editing a program.

For my combination of printer and interface, and perhaps for others, there is an additional advantage. The CARD/PRINT interface translates any control characters to readable abbreviations in the printer version of the listing. This can result in some program lines ending up with over 80 characters. For some reason, with single-spaced listings, this interferes with the line-feed, and overprinting of the preceding line results. Double-spacing prevents this overprinting.

Although I am not familiar with other interfaces, I would guess that they must provide various modes much like the CARD/PRINT interface. Most, if not all, printers enable the user to turn on or off their line-feed function. So, I am reasonably sure that most readers would be able to use this technique to obtain double-spaced listings.

Jack Ryan
El Dorado, AR 71730

Those are some good ideas, Jack, that we're sure quite a few Commodore users will appreciate. Thanks.

Junior Group Likes HCM

Dear Sir:

By the time you are able to publish news about the Las Vegas IBM PCjr Users Group, we will have quite a large group. As a sub-group of a PC club, we were dissatisfied enough to

start from scratch, so that all users of the PCjr could be fairly represented.

Since I purchased my first 99/4A in October, 1982, I have depended on your magazine as my major source of computing information. Now that Ziff-Davis and Compute! have stopped publishing PCjr-specific magazines (really stupid), I depend on you for the most complete coverage of the PCjr. You have an objectivity that is missing in other magazines and it allows me to place the PCjr in perspective with the rest of the market. Your ON DISK option is unrivaled, your "Tech Notes" are always used, and your method of identifying each computer to related articles and reviews beats any multi-computer magazine I've read. You have good program listings, and "Industry Watch" holds my interest because of past TI mishaps. I think it is very important for me to tell every member of the PCjr group about *Home Computer Magazine* for their own good.

I would like to ask you to include as much PCjr-related advertising in future issues of *Home Computer Digest* [our sister publication, mailed free to subscribers of this magazine] as you can. With the recent changes in PCjr-specific magazines, I feel that many mail-order suppliers of PCjr products will be looking for a good publication to advertise in.

I would like to tell you that your first issue of *Home Computer Magazine* was a major force of motivation that resulted in my purchase of an IBM PCjr.

Danny Duran
Las Vegas, NV 89115

Danny, it's great to hear from a PCjr users group. Most of the IBM groups that we have heard from have been primarily PC-only in interest. How many other PCjr-specific groups are forming out there? Let us know. Write in to the Group Grapevine editor and tell us about your activities and how we can better serve you.

C-64 Reset Button Problem

Dear Sir:

I have recently installed the reset switch that you featured in your C-64 "Tech Note" (Vol. 4, No. 4). I still have yet to figure out how it can save a program. If I load a program by POKEing (44,64) it will stay in memory, but there is no way to transfer it back to (44,8) to RUN it.

I have a Commodore 64. Could you please give me some advice on this?

Thank you.
S. Schoenfeldt
East Long Meadow, MA 01028

Note: See answer after the following question.

Another C-64 Button Reset

Dear Sir:

Last week I turned bold and decided to install a reset switch in my C-64. I am referring to the article in your magazine (*HCM* Vol. 4, No. 4, page 81).

I have had previous kit-building experience and I used my mini-soldering iron. I was told

Continued

to add (by a friend) a 50-100 ohm 1/4 watt resistor on one leg, which I did. It does reset the machine—back to the logo and all memory is lost! LIST and RUN are both dead. I tried it without the 68 ohm resistor and RAM was also wiped out.

I used the Simon's Basic cartridge then. I hit the reset, then the logo for Simon. I typed OLD and <RETURN> then LISTed it and it came back.

Can this be done without Simon's Basic? I would like to reset and RUN and/or LIST but . . .

Chet Mentz
Beverly Hills, FL 32665

The purpose of the referred-to "Tech Note" was to totally reset the computer (including all BASIC pointers), thus saving wear and tear on the system. We never intended that this modification be taken as a "super" [RUN-STOP][RESTORE]. We're sorry for the misunderstanding. Further software is necessary to restore any of the pointers. If any readers have a simple method, please write us.

Bermuda Race Lost to IBM World

Dear Sir:

Thank you for sending us a copy of *Home Computer Magazine* containing the review of our Bermuda Race program. There is one correction I wish to make. The IBM version will not be marketed.

We are grateful for the exposure you have given our product. Good luck with your new "no advertising" policy. While I read many magazines specifically for the advertising, I go to the editorials and reviews for "the facts."

Thanks again.

Dave Stitt
Howard W. Sams & Co., Inc.
Indianapolis, IN 46206

Thanks for the update, Dave.

User Functions—No Thanks

Dear Sir:

The article entitled, "Programming: The Name of the Game" that appeared in the Vol. 4, No. 3 issue of *HCM* suggested the DEF program statement to define frequently-used functions in one's game program. However, I think it should be pointed out that functions defined in this manner take almost twice as long to be executed as do the formulae themselves. Consider the following demonstration for the TI-99/4A:

```
100 CALL CLEAR
110 DEF YY = 1 + 2 + 3 + 4
120 FOR A = 1 TO 32
130 CALL HCHAR(YY,A,42)
140 NEXT A
150 CALL CLEAR
160 FOR A = 1 TO 32
170 CALL HCHAR(1 + 2 + 3 + 4,A,42)
180 NEXT A
```

As you can see, since line 130 uses the pre-defined function, the first loop is executed much more slowly than the loop using just the same formula.

I'm not trying to suggest that the use of pre-defined functions be abolished, but only that in situations where speed is important should their use be avoided. I hope that this information has been helpful and that it will help to solve some programming headaches.

Richard Solomon
Freehold, NJ 07728

You are absolutely right, Richard. The use of user-defined functions will indeed slow the execution of the TI BASIC programs. User-defined functions should not be used in time-critical loops or often-used subroutines that may affect the "playability" of the game.

Country Club on Cassette

Dear Sir:

First, let me congratulate you on your new format without outside advertising. As a former advertiser in *Home Computer Magazine*, I was skeptical, but after seeing the first issue in the new format, I am convinced *HCM* is setting new standards in computer journalism.

I was also impressed with the thoroughness of Tom Green's review of *Country Club* in Vol. 4, No. 4. He obviously spent a great deal of time examining the package. There was, however, one inaccurate point in the otherwise-exceptional review. The review indicated that memory expansion is needed to run *Country Club*. This is true only in the disk version. Making the game compatible with an unexpanded system was our major goal in development. I would appreciate it if you could mention this in a future issue of *HCM*.

As a TI owner expanding into the Apple and IBM markets, I want to commend you for the unequalled quality and depth of your magazine. I look forward to the next issue.

Michael A. Kidd
User-Happy Simulations
Barrington, IL 60010

Thank you for your comments, Michael. And for readers who wish to purchase Country Club on cassette for the 99/4A, we understand that the suggested retail price is \$19.95.

Back Issues Appreciated

Dear Sir:

I have just finished reading all the back issues of 99'er *Home Computer Magazine* I recently bought. Even though I had purchased the *Best of 99'er* several months earlier, I found that the additional back issues were packed with still more valuable information, and recommend to owners of the TI-99/4 and TI-99/4A to buy the back issues if they haven't already done so.

A problem I have come up against is in Microsoft's Multiplan. I have not found a way to handle dates in the formulas using MM/DD/YY format. The only reference to this that I could find was the VALUE(T) function, but I haven't had any success subtracting a date in one month from another to get a value to use in other formulas, such as in cost/day calculations.

Also, it would be very handy if at the end of the year you would publish a pull-out index

of past articles and programs categorized by subject matter.

Donald P. Mefford
Peebles, OH 45660

Yes, Donald, we're working on the index. We appreciate your comments about the older 99'er back issues, and have taken it one step farther. Readers are now able to purchase not only the back issues of the magazine, but also the software contained in each issue recorded on either a cassette tape or a floppy disk.

Unfortunately, Don, there is no simple way in Multiplan to handle the date calculations you mentioned. In fact, manipulating dates to attain cost/day statistics is tricky in any computer language. The VALUE(T) function only works on strictly numeric strings, and the slashes in MM/DD/YY format will cause problems. If you remove the slashes and rearrange the date in a YYMMDD format, you might be able to use the MODULA function to create functions to get the information you desire, but it won't be simple in any case. If any of our readers have any algorithms for these sorts of manipulations (whether in Multiplan or BASIC) please let us know.

Decided to Buy Apple Clone

Dear Sir:

First of all, after complaining about delays of receiving *HCM* on a not-so-regular basis, I'm pleased to report all seems well now.

I'm extremely pleased with the magazine as it's the only one I know of that deals in all formats.

I should mention that I started off buying 99'er when I got my TI machine about a year-and-a-half ago. Just recently, I upgraded my computer system when I became concerned about getting accessories. A friend of mine recently bought an IBM PC and so had no further need for his Apple clone—namely a Zeus 2001 system.

My system now includes two ATI drives, the Zeus computer, CP/M, Z-80, and an 80-column card, as well as a Gemini 10X printer and Arcomp amber monitor (far superior to green and more legible).

I am currently in the process of keying in programs from *HCM* since you changed from 99'er *HCM* to *HCM*. By the time I'm finished, I should have a good backlog of programs.

I hope your standards continue, as to date they are excellent. As well, I'd be interested in hearing from other Zeus owners and in particular, those who have Apples and Apple clones overseas, on how they use their systems or run their clubs.

Keep up the good work and delivery, and you'll have an *HCM* subscriber forever.

Philip Elliott
Kincardine, Ontario, Canada

*If your machine is a true clone, Philip, it should be able to read the Apple DOS 3.3 and Apple ProDOS disk formats that all Apple II Family programs in *HCM* run under. Here at "Programming Central" we're very much interested in hearing about how our programs are*

being used on both Apple and IBM clones and we'd appreciate it if our readers would keep us closely informed.

Stuck in Pyramids of Doom

Dear Sir:

My family and I are being driven crazy by Pyramids of Doom. This an Adventure program and we are stuck in the middle of it. If any of your readers have completed this game, can they give us some assistance?

I am very much impressed with your magazine—keep it up!

Peter J. Stephens
Port Jefferson, NY 11777

We don't think anybody has ever returned from the Pyramids of Doom. Wait—one fellow did come back, but he never stopped babbling that "dead mummies don't wear plaid!" We think that may be an important clue . . .

TI Disk Manager II Sought

Dear Sir:

After reading the article "2 for TI" in Vol. 4, No. 4, I have been trying to locate a Disk Manager II—with no luck. Can you suggest a purchasing source?

James A. Canter
Englewood, OH 45322

James, we suggest you check all the mail-order sources in our companion publication, *Home Computer Digest* [mailed free to our subscribers]. You might also check with an active TI user group in your area, such as: *Cin-Day Users Group, Box 519, West Chester, OH 45069*

Stadium Jumping With the IIc

Dear Sir:

A while ago I purchased a copy of the Vol. 4, No. 4 issue of *Home Computer Magazine*. It was the first that I had seen. It seemed to be what I have been looking for, so I sent in a subscription order.

I typed in a number of the short program listings in this issue for the Apple II family and found that they ran beautifully on my IIc. That gave me the incentive for trying the "Stadium Jumping" program, but when I tried to run it on the IIc, it wouldn't run. I got a "Syntax error in 220." Although I have checked my listing with your published listing many times, I can find no error.

I had a program on disk that would not run properly on my IIc but ran with no difficulty on a friend's IIe.

In the future, would it be possible to provide listings for ProDOS or at least the changes required for ProDOS operation? I understand that most of the newer Apple computers now use ProDOS, and I'm sure that you would make a lot of us very happy.

This also prompts me to wonder if the programs that you have ON DISK are fully compatible for the IIc. If so, I am sure that I will purchase some of them, but I hesitate until I know.

One final note: I believe that there is a typo in your "Stadium Jumping" listing for the

Apple II in line 740. I believe that a comma is missing in the entry shown as 2626, the next to the last data entry for that line. I may be mistaken because my attempts at running the program have not gotten that far.

John H. Lincoln
Seattle, WA 98117

John, all of our software is presently set up for ProDOS for the Apple machines and the ON DISK media is definitely compatible with the Apple IIc. We began that with Vol. 4, No. 3, and as of Vol. 4, No. 4 all ON DISK media comes with an Apple-licensed ProDOS package—including startup and formatting capabilities. You will find that all ON DISK products work on the Apple IIc. The listing of "Stadium Jumping" is correct as published, and the problem you refer to is either a typing error in line 220 or in one of the DATA statements containing the machine language routines referenced by that line (lines 250-330). The DATA statement in line 740 is correct as published.

TI Schematics Desired

Dear Sir:

I would like to know where I can get the electrical diagrams for the TI-99/4A. If any of your readers know this, I would like to hear from them.

Thank you for a fine magazine.

Reynaldo Rivera
San Juan, Puerto Rico 00926

The easiest way to get the technical information that you are looking for is from a local TI user group. Currently, however, we know of none that are still active in Puerto Rico. The closest group listed is the Miami 99/4A Users Group, ATTN: G. Guibor, P. O. Box 650955, Dept. MUG, Miami, Florida 33265-0955, (305) 522-1984. If any readers know of an active users group in Puerto Rico, please let us know. If the "group grapevine" can't get you the diagrams you need, we suggest that you write us again with a more specific schematic-related question(s) that we will try to answer for you.

Answer to LOGO Word List Question

Dear Sir:

In the Vol. 4, No. 3 issue of *HCM*, Gene Thomas asked for a LOGO procedure to insert a word at a specified point in a list. A short routine to do this follows:

```
TO PUTWORD :WORD :LIST :POS
TEST :POS > 0
IFF STOP
MAKE "POS :POS - 1
MAKE "F [ ]
REPEAT :POS [MAKE "F SENTENCE :F
FIRST :LIST MAKE "LIST BUTFIRST
:LIST ]
MAKE "F SENTENCE :F :WORD
MAKE "F SENTENCE :F :LIST
MAKE "LIST :F
OUTPUT :LIST
END
```

In this routine, "WORD is the word you wish inserted, :LIST is the list you want the word

inserted into, and :POS is the position you want the word to take in the list. If a value of zero is entered for the position, the routine will not do anything at all. Also, if a position is greater than that of the last word in the list specified, the new word becomes the last one in the list (e.g., PUTWORD "A [Z X C] 9 yields a computer response of [Z X C A]).

Anyway, thanks for a terrific magazine. You can count on my subscription as long as you're in business.

Loring Rose
Pantego, NC 27860

Thanks, Loring. Now we know how to put a word in edgewise, or at the front, or at the back, or . . .

A Vote of Confidence

Dear Sir:

I just renewed my subscription to *Home Computer Magazine* for two years. I was going to mail the renewal and enclose this letter, but instead telephoned the renewal to your toll free number.

At first when I heard the magazine would no longer be for the TI-99/4A exclusively, I was disturbed and disappointed.

The reason I'm writing is to tell you how pleased I am with *Home Computer Magazine* in its new format and especially the separate advertising supplement [*Home Computer Digest*]. I'd be willing to bet other magazines will follow your leadership. Very innovative, practical, and courageous.

Best wishes for continued success and growing circulation numbers.

Robert H. Howry
Los Angeles, CA 90025

Thank you for your comments, Robert. We're able to make this new format "work" because of the many tens of thousands of understanding subscribers like you.

HCM

Special Announcement:

Home Computer Magazine is looking for "One-Liners."

If you have written a 1-line program in any language that is available on the computers we cover, send it in addressed to *Letters to the Editor*. It may win a \$50 prize! By press-time, we had not yet received enough worthy candidates for publication in *this* issue, so keep those entries coming. On page 34 of our last issue, Vol. 4, No. 5, we published the top 4 entries—one for each brand of machine—and awarded \$50 to the best one-liner of the four. It can happen to you, too!

THE ORGANIZER

Program by William K. Balthrop
and the HCM Staff

with text by Wayne Koberstein
HCM Staff

Too many thoughts to keep in mind? This program will not only store your thoughts for you—but will keep them organized as well!

I've just got to get organized! How many times have you said that to yourself? Each time you take on a new project or tackle a new assignment, it's a whole new ballgame, with a new set of rules and contrary elements that seem to defy organization. You know that if you just stopped and planned it all out, the actual job would be so much easier—but at the start, it seems less trouble to jump right in and wing it than to develop a real plan; an outline to guide you through this complicated activity. What if you could just sit down at your computer and freely type in your thoughts—having a ready-made framework to hang your ideas on? Then you could jump around on this structure, filling it in as you go, until all the elements of your plan sit in their proper places, and your scheme takes its final shape. This sounds like a job for *The Organizer*!

Quite simply, *The Organizer* is a program that allows you to formulate thoughts and place them into an outline-like structure. You may also use the program's word processing functions to edit text or expand in detail any item in the outline—and then print the finished product on paper.

Organize It Yourself

The best way to learn about *The Organizer* program is to use it. When you first start the program *Organize*, you will see the title screen, and the main menu:

Main Menu	
1.	Outline Editor
2.	Reports
3.	File Manager
4.	Quit

To begin, select 3, File Manager, for the next menu:

- | | |
|----|-----------------------------|
| 1. | List file names on disk |
| 2. | Create a new Organizer file |
| 3. | Delete an Organizer file |
| 4. | Expand an Organizer file |
| 5. | Return to Main Menu |

First select number 2. A new screen will prompt you to enter a new file name. In Figure 1, we show a short example of an outline covering a kitchen remodeling project. For this example, enter **REMODEL** as the file name. You will also be asked to specify how many records you expect to use, up to a limit determined by your machine. A record corresponds to one item in your outline; about 200 is a good place to start. (The process of creating this file can take your computer from a few seconds to a few minutes depending on the file size and the machine brand you are using.) After this entry, you are taken back to the File Manager menu. Now select option 5 to return to the Main Menu, and select option 1, Outline Editor. After entering the name of the file you wish to work with, the file and the first screen will be loaded. When this new screen appears, you may begin your outline.

All thoughts are *not* created equal. Every idea potentially has subordinate ideas to support it. In an outline structure, an idea is represented by a "heading," and each supporting idea as a "subheading." In *The Organizer*, a "generation" is simply one heading (which we will call a "parent") and its sub-headings (which we will call "children"). Usually, as you move from one generation to the next, you go from the general to the specific. *The Organizer* causes you to look at only one generation—one parent and its children—at a time. But, at the same time, it keeps each generation in its proper place as part of a larger structure.



On the Outline Editor screen, you will see several numbers displayed, showing the: generation (Gen); number of records used; number of records free; and the row and column of the pointer. The second line displays the name of the current parent, or the current child (if using the text editor). On the third line, you will see the *line pointer*, which is a greater-than (>) sign.

Generation Gap

Understanding the role of the line pointer is crucial to using *The Organizer*. This pointer is the key to moving between generations in the outline, and to performing all the editing functions, including adding new children. Equally important is to understand that, as you work on your outline, what you see on screen is *only one small part* of the entire document—a generation of children under one parent.

On this Outline Editor screen, you are usually in one of two modes: Edit Line or Outline Entry. You are in Outline Entry mode when your cursor sits on the line pointer. When you move off the line pointer onto a new line, you are automatically transferred to Edit Line mode—as you do on this first new line of the Outline Editor screen. Here you enter the first child of the primary parent. Each outline record (child) is limited to one screen-line. (With the Text Editor, you will be able to add any number of text lines to a child, as explained later.) Starting with the two most general categories, "Owner supplies" and "Contractor supplies," we would enter these as children to the main parent, "Remodel." Here we are at Generation 0.

First type in the name of the first child, "Contractor Supplies" and press [RETURN]. You will automatically jump back to the line pointer. Now move the pointer down to the next line and enter the next child, "Owner supplies."

As mentioned, the line pointer is depicted by the greater-than (>) sign. This sign serves as more than just a *pointer*, however. Greater-than (>) and less-than (<) command keys are also used to *change generations*. When you return to the line pointer, press (>). A new, blank screen will appear with the Generation number increased from 0 to 1, and the name "Contractor supplies"—now the current parent—on the second line. The

line pointer is again on the third line, which is blank—awaiting a new entry. Here you may add new children under this parent or return to Generation 0 by pressing the less-than (<) sign. It doesn't matter which line you are on when you press <, it will still take you back to the preceding parent with its list of children. Remember: > takes you *forward* a generation and < takes you *back* a generation.

Now try entering the 4 items under "Contractor supplies" as its children. Move the line pointer back to the "Contractor supplies" and press >. On this new screen, with "Contractor supplies" named as the current

parent, type in one child, go to the next line and type in the second child, and so on. In Figure 3, we show an expanded version of Figure 1. How did we expand it? Simply by adding generations to each item as we thought about them, one at a time, until—by the fourth generation in some cases—we had "thought it all through."

One of 3 other characters may appear to the left of a child's name, each one telling something about that child. The pound sign (#) means that the child has children of its own. The ampersand (&) means that there is text associated with that child, and the asterisk (*) means that *both* text and children accompany the child. Notice that the less-than sign (<) also appears on the screen's second line, to the left of the current parent name. This simply means that—unless you are at Generation 0—you may return to the previous generation to see this parent displayed under *its* parent by pressing <.

An outline can take many forms and can include as many generations—branching off into as much detail—as you need to cover the subject. Figure 2 shows the general structure of the outline in Figure 1, and demonstrates how items branch off of other items to create new generations. And as you can see in Figure 3, the example in Figure 1 can expand into great detail just by branching off each item—eventually creating a complete document containing all relevant information on the main heading.

You can use *The Organizer* to build the same sort of outline—creating your own headings and adding to

**"What if you could just
sit down at your computer
and freely type in your thoughts—
having a ready-made framework
to hang your ideas on?"**

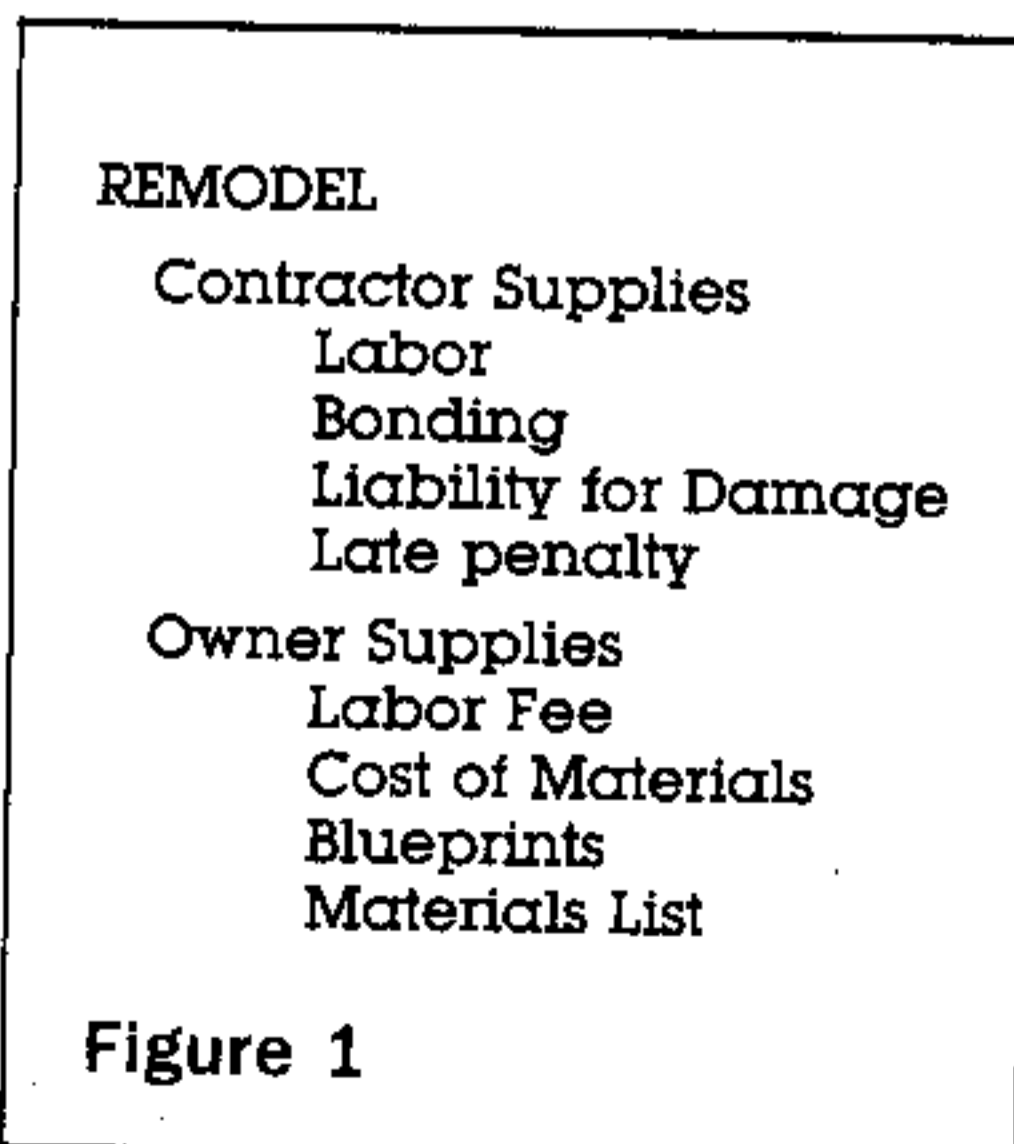
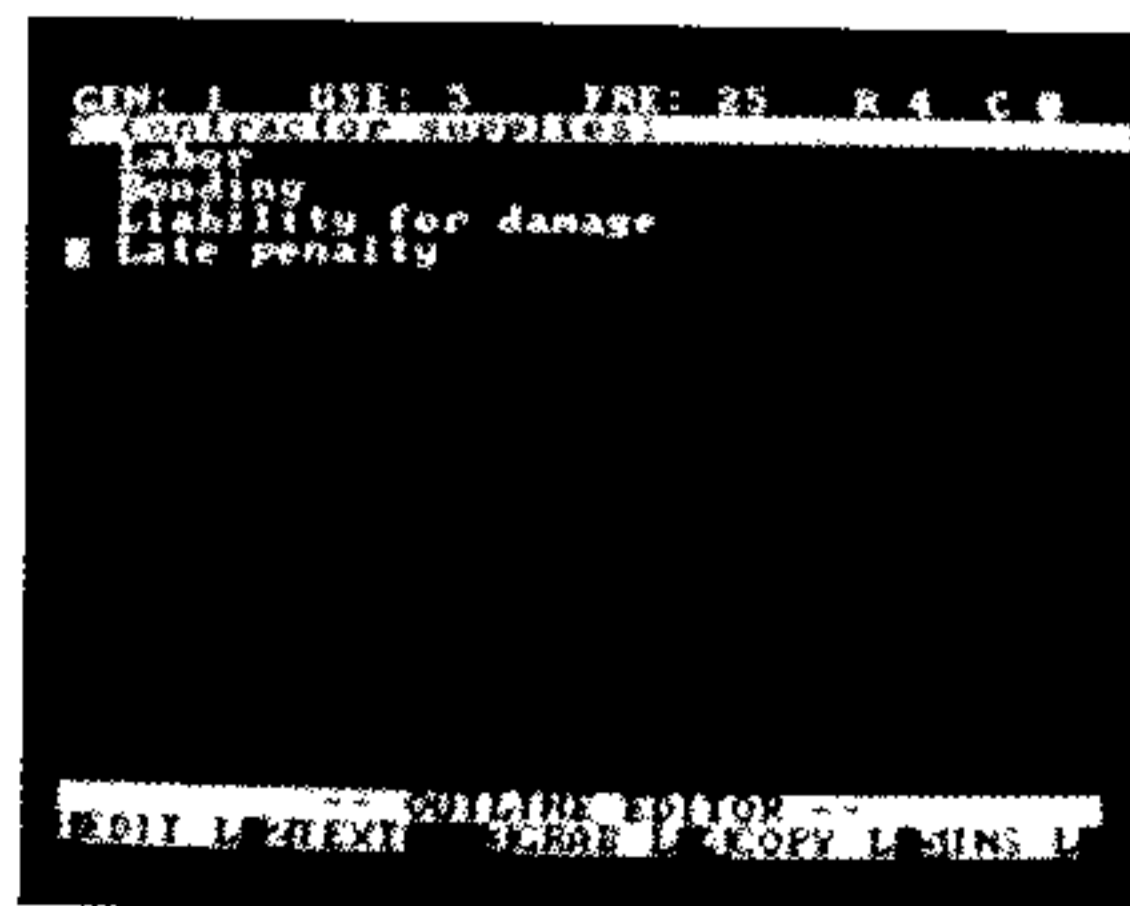


Figure 1



A representative screen photo of *The Organizer* on the IBM PCjr showing the Outline Entry screen.

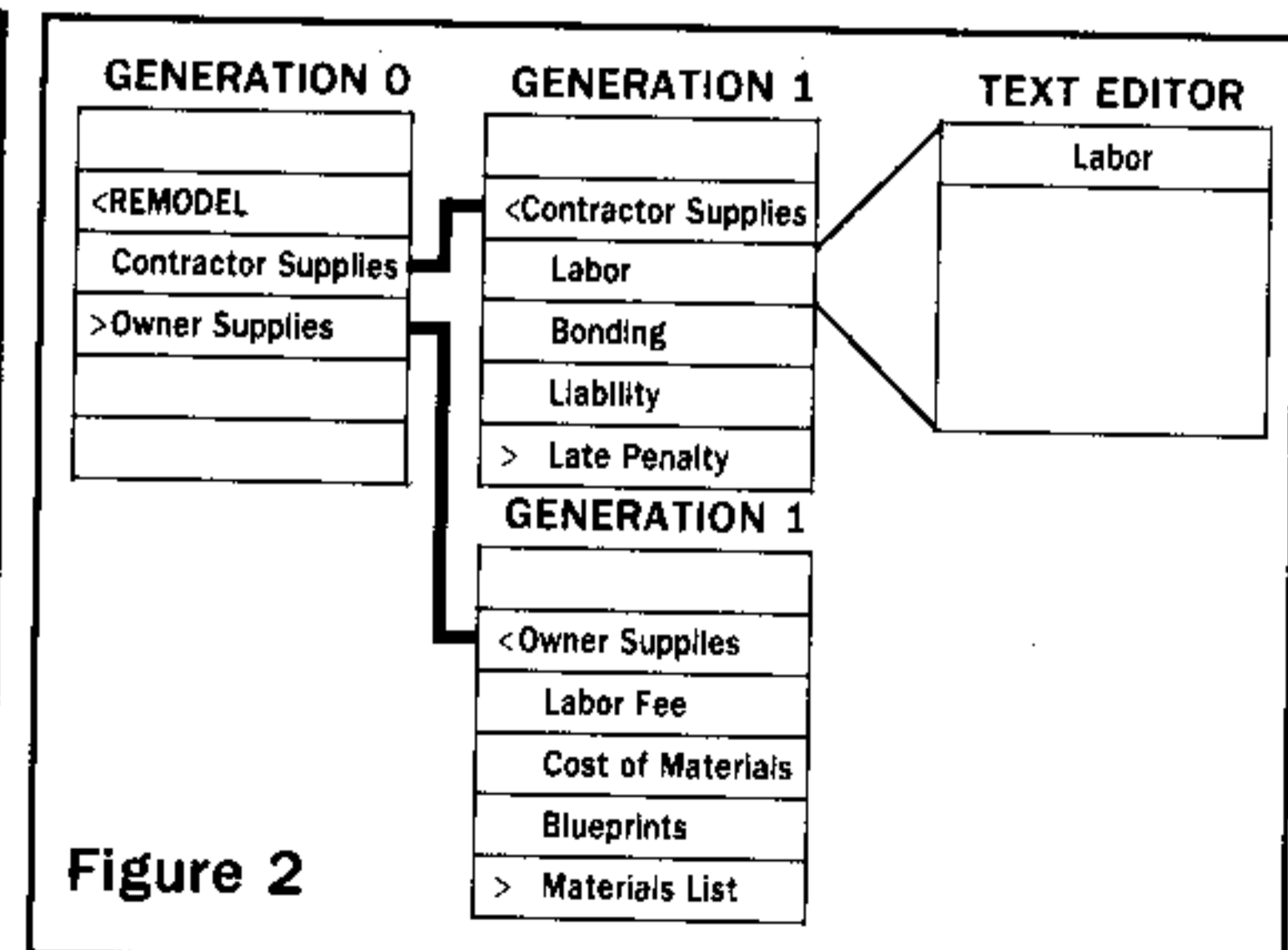


Figure 2

TABLE 1

Move Pointer—The pointer indicates which child of the current parent is to be worked on. The pointer cannot move above the third line on the Outline Entry screen; but if the number of children more than fill the screen, you can scroll up or down by attempting to move the pointer off the top or bottom of the screen.

Change Generation—At the line pointer, press < to go back a generation, and > to go forward a generation.

Edit—To modify an existing child, move the pointer to that line and press the Edit key. Moving the pointer to a new line will automatically put you in Edit mode. The insert function will also put you into Edit mode. Several editing functions are available in this mode: (1) type over, (2) insert character, (3) delete character, (4) erase line, and (5) backspace. Erasing the entire line erases all characters on the line, but will leave the blank line as a child. While editing a child, the other Outline Entry functions are not available—you must press [RETURN] or [ENTER] to return to the line pointer before you can exercise these functions.

Insert—Move the line pointer to where you want to insert a line and press your Insert key. The lines on and below the pointer will move down, opening a blank space for the new line.

Grab—Use this function to move one or more children around in the outline. Grabbing removes the selected children from the current parent and places them in the hold buffer, where they remain until pasted elsewhere, or until other children are placed in the buffer. When a child is grabbed, its children are grabbed with it. Move the pointer to the first line to be grabbed and press the Grab key. The line pointer will be replaced with the (@) symbol. If grabbing one line, press [RETURN]. For more than one line, move the the pointer down by pressing the [down arrow] key so that a second (@) symbol appears beside the last child to be grabbed, and press [RETURN]. Items in the hold buffer are kept on disk, and will not be lost at the end of your current work session with the computer.

Copy—Use this function to make a copy of one or more children. Copies are stored in the hold buffer until pasted or replaced. Copying a child also copies its children. Move the pointer to the first line that you wish copied and press the Copy key. Copy multiple children in the same way you do with the Grab-Line function.

Paste—Use this function to insert the contents of the hold buffer into the outline. Move the line pointer to the point of paste, and press the Paste key. If the hold buffer contains a copy and not a grab, the items will be physically copied at this time. If you make any changes in the original items before pasting their copy, these changes will show up in the copy. Once a grab is pasted, it is removed from the hold buffer. A copy remains in the hold buffer to be used over and over until it is replaced.

Hold Buffer Display—You may view the contents of the buffer at any time, to prevent deleting the contents before grabbing or copying material. You cannot alter any records in the buffer, or view their children. Simply press the Hold Buffer Display key.

Delete Record—Move the pointer to a child and press the Delete Record key. Deleting a record also deletes its descendents and adds to the records-free count.

Sort Outline Mode—You can have the program sort all or part of the records in the outline numerically or alphabetically (or strictly speaking, by ASCII code). Press the Sort Outline Mode key, and a menu screen will appear with 3 options: (1) Sort children of current parent, (2) Sort a generation (enter a generation to sort:), and (3) Sort entire outline.

Text Editor Mode—Move the pointer to the child to which you want to add text, and press the Text-Editor key. This mode has its own set of editing functions, which are explained in the main article under the subhead, "Entering Text," and for which the proper keys are designated in your Control Capsule.

them as you wish. You can also write text to attach to any heading as an explanation, or to expand a heading without creating more subheadings. By the time you have built a detailed outline for, say, a term paper, the paper will be nearly written—simply put the text for each heading together with all the others and fill in as needed.

For the purpose of *The Organizer* program, we will say that the outline is like a system branching from a few, general items to an expanding number of more specific items—each item spawning a new generation of "children." In a given generation, any text you write for a particular child will also be of that same generation—because the text is an *extension* of the child for which it is written.

The Organizer is capable of creating any number of generations. It's limited only by memory or disk storage space. Almost all of the headings and text are maintained on disk, with only the current parent (the one you're working on) and its own children in memory at one time. This offers protection from major data-loss due to a power failure, or other program interruptions. It also means that you should *not* remove the disk while running the program.

***"All thoughts are not
created equal.
Every idea potentially has
subordinate ideas to support it."***

Outline Entry Mode

As you type-in an entry, you are in Edit Line mode. Every time you finish typing an entry or "child" and press [RETURN], you will jump back to a spot one space to the left of your entered line, where the line pointer sits. Here you automatically return to Outline Entry mode. In this mode, you can make use of a large number of functions, as explained in Table 1. These functions correspond to the proper keys designated in your machine's Control Capsule. Experiment with each of these functions using the sample outline in Figure 2, or one of your own.

Entering Text

From the Outline Entry Mode, you can select Text Editor mode to add text under any item in the outline. (See Table 1.) This is the *word-processing* aspect of *The Organizer*. When you make this selection, a new screen will appear with the cursor on the third line. The first line contains the same information as the first line of the Outline Entry screen. The second line contains the name of the child to which you are adding text. Our sample in Figure 1 contains text (color-keyed) with which you can experiment using all of the text-editing functions—or you may just wish to dive into your own outline right away. These editing functions include: Moving the cursor up, down, left, or right; inserting characters; deleting characters; backspacing; and formatting.

Automatic word-wrap is always in effect while typing. If a line becomes too long either from simply typing characters, or inserting them, the last word in the line will be removed and placed on a new line below the one you are working on. When you've completed your entry, press the [FORMAT] key and the program will go back and check the end of each line for spaces, then check the first word of the next line to see if it will fit on the line above. If it does fit, the word gets moved up. This packs the document so that there are not a lot of empty lines. Usually a formatted document requires

fewer lines. The unused lines dropped by the formatter are returned to the free stack of available records. The Format command nicely formats the entire text under the current child.

To mark paragraphs, type *P at the beginning of a blank line above the new paragraph. When you print your outline with the Reports option from the Main Menu, it will indent 3 spaces at each paragraph—not printing the blank line or the *P marking. For an intentional blank line—one that you want printed—type *B at the beginning of your blank line. Using *P and *B will prevent the formatter from wrapping these lines on the screen display. Instead, they will remain as you entered them.

Text Editor can also use Grab, Copy, Paste, Display Hold Buffer, Delete Line, and Insert Line. Hold Buffer is for text only when you're in Text Editor mode. There are actually 2 buffers—one for outline, one for text. (These functions are also detailed in Table 1.)

Reports Mode

From the Main Menu, you can select the Reports option to print a hard copy of your outline. Here a new menu will ask you if you want it indented. If you answer yes, the printer will print your outline with indents for each generation, as formatted in Figure 1. The second option will print the outline showing no indents, but with the children in order under their respective parents. Under both options, a minus sign in front of each child will differentiate children from text. Text will appear under the child with which it is associated, and—with indentation—will be indented to the same generation.

Additional Options

The File Manager menu contains 3 more options which we have not yet discussed. From this menu, you can: list all the files on disk (Option 1); delete a specified file (Option 3); or increase the size of any file by redefining the number of records (Option 4). From the Main Menu, Option 4, Quit, will halt the program, returning you to BASIC. Appropriate screen prompts will guide you through each of these options.

Use It!

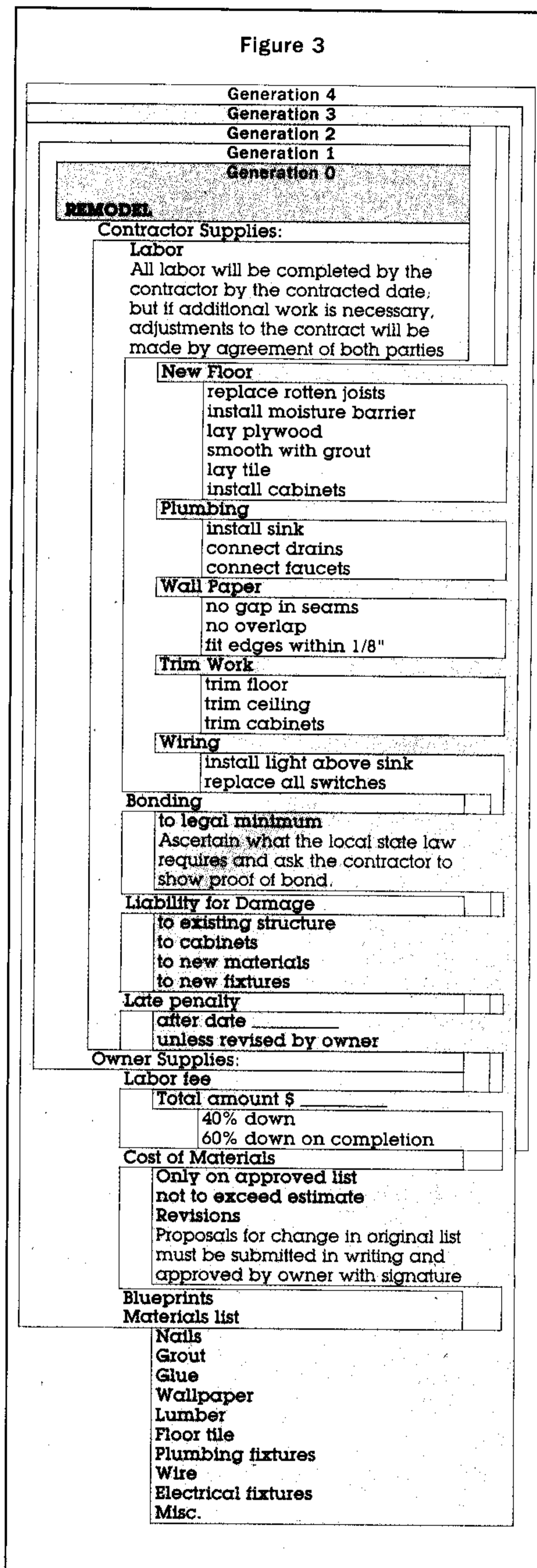
Now that we have given you the skeleton, you may dress him as you please. You will find that this program is a very handy rack to hang your thoughts on. So when important projects loom ahead—and you get that queasy, unorganized feeling in the pit of your stomach—don't panic! Just turn to *The Organizer*.

The Program

The Organizer uses random-access type files to link its records together *two-dimensionally*. Most data file programs link records *sequentially*—in one direction. When these programs search for or add records, they go from one end of the file to the other until they find what they're looking for. A *two-dimensional* file links its records not only top-to-bottom but side-to-side. Figure 4 charts the file structure of *The Organizer* and shows how this two-dimensional linking system works. This structure reflects the user-interface of the program itself. It may be useful to compare Figure 2 with Figure 4 as you follow this explanation.

Figure 4 shows how one record links to others. On the left side are 2 boxes which represent the Outline Linkage Blocks. The upper box contains the links for the screen's current parent. The second box contains the links for the first child. Each box is divided into 5 "compartments," numbered 0 through 4, each representing a link to another record. The first link (starting at the top) of the upper box goes back to the parents.

Figure 3



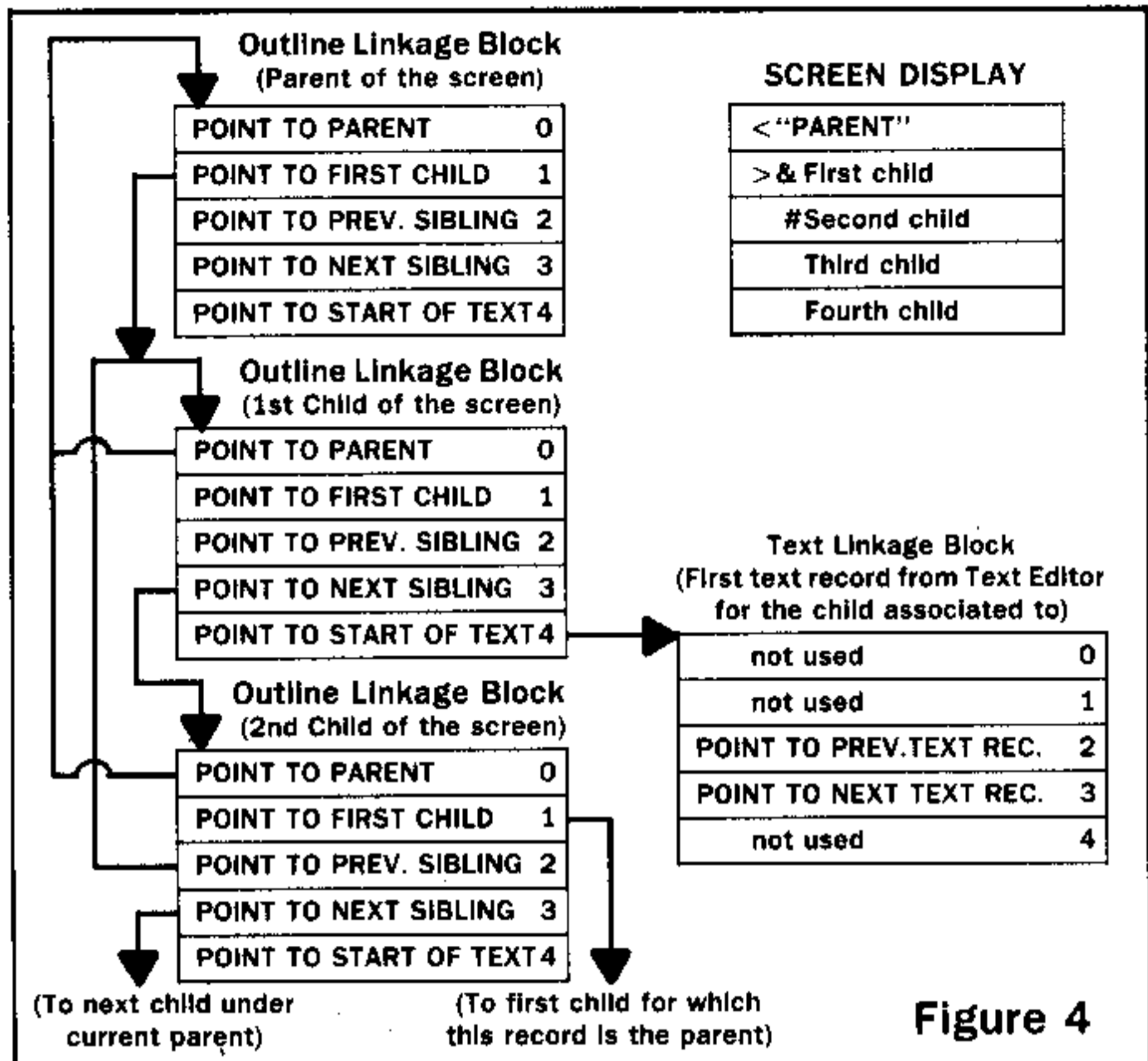


Figure 4

The next link is to the first child of the screen. Link 2 of the second box normally goes to a previous child (a "sibling") under the current parent here. However, the link will have a value of zero because it is the first child under the current parent. Link 3 goes to the next sibling. This leaves Link 4, which links the record to the box (the third box), which is the text associated with this record.

In the text record, the program uses only 2 out of the 5 possible links. Links 2 and 3 are used to connect together all the text records in the entire file serially. Link 2 goes to the previous text record; and link 4 goes to the next text record in the file.

If a one-dimensional file links its records like a string of beads, this two-dimensional file structure is more like an intricate weave—with the final pattern too complicated to represent here. In fact, this "pattern" created by all the records linked in this fashion is invisible to the user, who in *The Organizer* looks at only one selected portion (a generation) of the file at a time.

This same two-dimensional linking system is used by all the machine-specific versions of *The Organizer*. Each computer, however, has its own way of keeping track of the linking algorithm. Disk access and loading times vary considerably between machines.

For your key-in listing see HCM PROGRAM LISTINGS Contents.



The Apple version of the program stores the linkage block—the values that link records together—in the same physical record that the outline text for that record is stored. For example, Record No. 37 of "File X" will contain both the linkage block and the "text" for that record—whether that "text" is entered with the Outline Editor or the Text Editor. Because the program maintains the identical link structure in both the Outline Editor and the Text Editor, the records are identical to the computer, and can therefore be contained in the same file. On the Apple version, you can Paste only once from the Hold Buffer—even from a Copy.

To allow the use of all characters (including commas) in your file, the GET statement is used in disk access—so it will be moderately slow. There will also be a time delay as the Outline Editor loads.

In the Commodore version of *The Organizer*, both the linkage block and the contents of each record are kept in the same file on disk. However, the DOS "P" (Position) command allows the program to keep the linkage block as a single string in each record, and this string is converted into part of a separate integer array after it is brought into memory. This link string includes a value that corresponds to the record number in the file, so that the program can identify a linkage block with the contents of the proper record.

On the C-64, any loading procedure or operations involving disk access can be quite slow; however, the program functions proceed relatively quickly.



In the IBM version, the linkage block for a record is stored in a file separate from the contents of that record, although the two records will have the same number in each file. For example, Record No. 37 in the "link file" will be directly associated to Record No. 37 in the "text file" (whether that "text" was entered with either the Text Editor or the Outline Editor). The links file actually requires the use of ASCII characters, rather than integers, as identifiers. The program must convert integer values for the record's linkage block into ASCII string values and back again as it handles each record. Each linkage block is stored in a 10-byte string. These 10 bytes contain 5 numeric values that are converted by the MKIS function into ASCII string values which the computer can then handle as "random access" fields. Later, these ASCII values are reconverted into integers by the CVI function. In the other "text" file, the program stores up to 38 characters per record. Record No. 1 always contains the "environment" of the outline: total size of file; the pointers for the Outline Editor and Text Editor hold buffers; the empty list pointers; and the pointer to the first record used.

On the IBM machines, disk access and functions involve almost no noticeable delay. Expect a very minor delay when loading.



Like the IBM version, the TI program maintains two separate files—one for linkage blocks and one for the text of the outline. These two files are associated by the record number. Each linkage block record is a string of 10 characters which comprise 5 integer values. Each integer value requires a 2-byte segment of the string. Two functions are used to handle these values: the first function converts an integer value to a 2-byte string and the second function reconverts the 2-byte string to an integer value. Two subroutines—PL and GL—are used to manipulate the 10-byte string used to contain the links. PL places an integer value into a specified position in the 10-byte string. GL retrieves an integer value from the 10-byte link string. This method allows the compact storage of a large amount of information in a small space. For example, an integer number which requires 9 bytes of memory could be stored as a character string—taking up only 2 bytes of memory.

Even though this program disables all sprites (see this issue's TI "Tech Note"), TI Extended BASIC is fairly slow, decreasing the speed of operation somewhat. There will be considerable delays in loading and disk access operations.

CONTROL CAPSULE The Organizer



Line Pointer Edit Keys

KEY	FUNCTION
<	Back a Generation — make the parent a child.
>	Forward a Generation — make the child a parent.
Ctrl E	Edit — use [RETURN] to go back to line pointer.
Ctrl T	Text Editor — use [Esc] to go back to Outline Editor.
Ctrl L	Insert — Insert a record in the outline.
Ctrl G	Grab — place line(s) in Hold Buffer; remove from the screen.
Ctrl X	Copy — place line(s) in Hold Buffer; don't change original line(s).
Ctrl P	Paste — insert contents of the Hold Buffer.
Ctrl H	Display Hold Buffer — display outline's Hold Buffer.
Ctrl D	Delete Record — purge record from file; place in empty list.
Esc	Quit — return to the main menu.
Ctrl R	Sort Outline Mode — clear screen and prompt user for sort option.
[Return]	Verify — accept current selection.
Ctrl Q	Change Scrolling Speed.
	Cursor Up.*
	Cursor Down.*

Line Edit and Text Editor Keys

KEY	FUNCTION
Ctrl A	Insert Character — insert a character on the line.
Ctrl Z	Delete Character — delete a character on the line.
Ctrl B	Erase Line — clear line from screen; don't remove from file.
-	Cursor Right — move edit cursor right one character.*
-	Cursor Left — move edit cursor left one character.*
[Return]	Return to Line Pointer — only when in Edit Mode.

Additional Text Editor Keys

KEY	FUNCTION
Ctrl F	Format Text — format entire document currently being worked on.
[Return]	— next line, first position
Esc	Return to Outline Edit Mode.
	Cursor Up — same as above.*
	Cursor Down — same as above.*
Ctrl L	Insert — same as above.
Ctrl G	Grab — same as above.
Ctrl X	Copy — same as above.
Ctrl P	Paste — same as above.
Ctrl H	Display Hold Buffer — same as above.
Ctrl D	Delete Line — same as Delete Record, above.

*SPECIAL FOR II+ USERS:

Ctrl K	Cursor Up
Ctrl J	Cursor Down
Ctrl U	Cursor Right
Ctrl H	Cursor Left



CONTROL CAPSULE The Organizer

Line Pointer Edit Keys

KEY	FUNCTION
<	Back a Generation — make the parent a child.
>	Forward a Generation — make the child a parent.
F1	Edit — use [RETURN] to go back to line pointer.
F2	Text Editor — use [Esc] to go back to Outline Editor.
F3	Grab — place line(s) in Hold Buffer; remove from the screen.
F4	Copy — place line(s) in Hold Buffer; don't change original line(s).
F5	Insert — Insert a record in the outline.
F6	Paste — insert contents of the Hold Buffer.
F7	Display Hold Buffer — display outline's Hold Buffer.
Ctrl F8	Delete Record — purge record from file; place it in empty list.
F9	Sort Outline Mode — clear screen and prompt user for sort option.
Esc	Quit — return to the main menu.
	Cursor Up.
	Cursor Down.

Line Edit and Text Editor Keys

KEY	FUNCTION
Ins	Insert Character — insert a character on the line.
Del	Delete Character — delete a character on the line.
Shift F8	Erase Line — clear line of text; don't remove from file.
-	Cursor Left — move edit cursor left one character.
-	Cursor Right — move edit cursor right one character.
Esc	Return to Line Pointer — only when in Line Edit Mode.

Additional Text Editor Keys

KEY	FUNCTION
F10	Format Text — format entire document currently being worked on.
[Enter]	— next line, first position.
Esc	Return to Outline Edit Mode.
	Cursor Up — move edit cursor up a line.
	Cursor Down — move edit cursor down a line.
F3	Grab — same as above.
F4	Copy — same as above.
F5	Insert — same as above.
F6	Paste — same as above.
F7	Display Hold Buffer — same as above.
Ctrl F8	Delete Line — same as Delete Record, above.

CONTROL CAPSULE The Organizer



Line Pointer Edit Keys

KEY	FUNCTION
<	Back a Generation — make the parent a child.
>	Forward a Generation — make the child a parent.
F1	Edit — use [RETURN] to go back to line pointer.
F2	Text Editor — use [Left arrow] to go back to Outline Editor.
F3	Grab — place line(s) in Hold Buffer; remove from the screen.
F4	Copy — place line(s) in Hold Buffer; don't change original line(s).
F5	Insert — Insert a record in the outline.
F6	Paste — insert contents of the Hold Buffer.
F7	Display Hold Buffer — display outline's Hold Buffer.
F8	Delete Record — purge record from file; place it in empty list.
Cmdr S	Sort Outline Mode — clear screen and prompt user for sort option.
-	Quit — return to the main menu.
Crsr Up	Cursor Up
Crsr Dn	Cursor Down

Line Edit and Text Editor Keys

KEY	FUNCTION
INST	Insert Character — insert a character on the line.
DEL	Delete Character — delete a character on the line.
Cmdr E	Erase Line — clear line from screen; don't remove from file.
Crsr Right	Cursor Right — move edit cursor right one character.
Crsr Left	Cursor Left — move edit cursor left one character.
[RETURN]	Return to Line Pointer — only when in Line Edit Mode.

Additional Text Editor Keys

KEY	FUNCTION
Cmdr F	Format Text — format entire document currently being worked on.
-	Return to Outline Edit Mode.
[RETURN]	— next line, first position.
Crsr Up	Cursor Up
Crsr Dn	Cursor Down
F3	Grab — same as above.
F4	Copy — same as above.
F5	Insert — same as above.
F6	Paste — same as above.
F7	Display Hold Buffer — same as above.
F8	Delete Line — same as Delete Record, above.



CONTROL CAPSULE The Organizer

Line Pointer Edit Keys

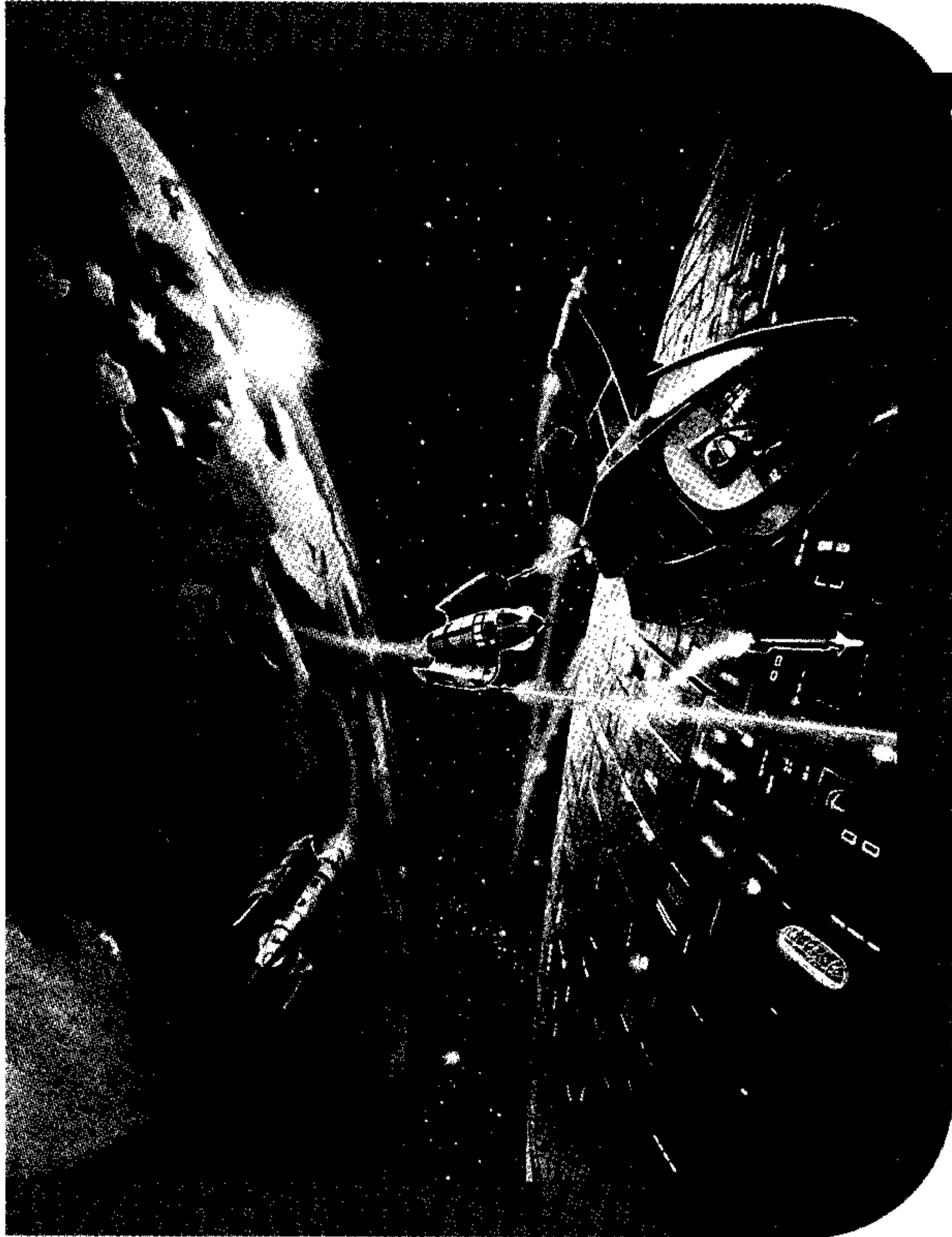
KEY	FUNCTION
<	Back a Generation — make the parent a child.
>	Forward a Generation — make the child a parent.
Fctn 8	Edit — use [ENTER] to go back to line pointer.
Ctrl 8	Text Editor — use [FCTN 9] to go back to Outline Editor.
Fctn 6	Grab — place line(s) in Hold Buffer; remove from the screen.
Ctrl 6	Copy — place line(s) in Hold Buffer; don't change original line(s).
Ctrl 2	Insert — insert a record in the outline.
Ctrl 7	Paste — insert contents of the Hold Buffer.
Fctn 7	Display Hold Buffer — display outline's Hold Buffer.
Ctrl 1	Delete Record — purge record from file; place it in empty list.
Fctn 5	Sort Outline — clear screen and prompt user for sort option.
Fctn 9	Quit — return to the main menu.
Fctn E	Cursor Up.
Fctn X	Cursor Down.

Line Edit and Text Editor Keys

KEY	FUNCTION
Fctn 2	Insert Character — insert a character on the line.
Fctn 1	Delete Character — delete a character on the line.
Fctn 3	Erase Line — clear line of text; don't remove from file.
Fctn 5	Cursor Left — move edit cursor left one character.
Fctn D	Cursor Right — move edit cursor right one character.
[ENTER]	Return to Line Pointer — only when in Line Edit Mode.

Additional Text Editor Keys

KEY	FUNCTION
Ctrl 5	Format Text — format entire document currently being worked on.
[ENTER]	— next line, first position.
Fctn 9	Return to Outline Edit Mode.
Fctn E	Cursor Up — move edit cursor up a line.
Fctn X	Cursor Down — move edit cursor down a line.
Fctn 6	Grab — same as above.
Ctrl 6	Copy — same as above.
Ctrl 2	Insert — same as above.
Ctrl 7	Paste — same as above.
Fctn 7	Display Hold Buffer — same as above.
Ctrl 1	Delete Line — same as Delete Record, above.



Orbital Defender

by **Scott Williams**
and the HCM Staff

*As you seem to hang in the heavens,
Earth hangs its hopes on you.
With only a split-second's warning,
will you recognize the enemy?*

Friend or Foe? As a lonely guard stands ready, this is always the bottom line. True of sentries everywhere, at all times, this question now presses on the entire planet—and you are all that stands between Mother Earth and the invading hordes from outer space. *Orbital Defender* is a game based on reflexes and hand-eye coordination—placing you in command of a patrol ship orbiting Earth. Your mission is to recognize and destroy any hostile ship approaching the planet, but to let friendly ships pass unharmed. Your enemies are the Sandian hordes, and the space pirates from Alpha II. Traffic is heavy, and you have to make instant decisions; or, you may unwittingly miss a target, destroy an ally, or possibly be shot down yourself!

Think Fast

As Planet Earth slides slowly beneath, and the stars appear to rise over a curved horizon, you fly a lonely and dangerous vigil. Your ship is armed with a short-range particle-beam discharge cannon. A radar scope in your control panel homes in on any passing spacecraft and displays its shape. It is your decision to fire or not—and it must be a split-second judgement: friendly or hostile? Before you see the craft on the screen, a warning light and alarm brings you to attention. If you recognize the ship as an enemy, press the [SPACE BAR] to fire. Your ship's computer locks in the target, but you must decide who's who. Earth law declares that only a human being—not a computer—will decide whether life is to be taken in defense of the planet. You'll be awarded points

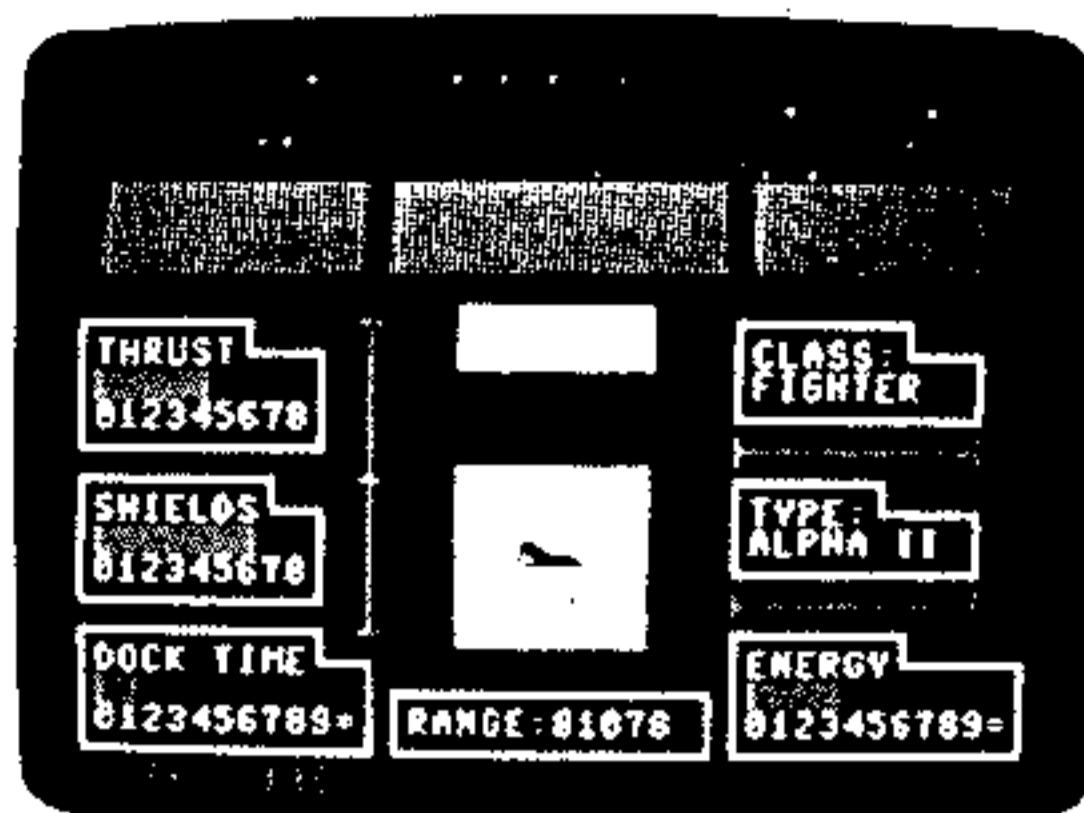
for every enemy you shoot, but docked for each Earth ship that you mistakenly destroy.

Your ship's instrument panel is an active one, displaying several factors important to your survival and success. Three sliding scales indicate thrust, your shield strength (if an attack catches you with your shields down, you're dead), and dock time—the time left before your ship reaches an Earth base satellite. Three information displays show the class, type, and firing range of any ship on the radar screen, and a fourth sliding scale shows the level of energy remaining in your ship.

Energy and Skill

Your thruster, shields, and cannon all consume energy—running out of energy makes you a perfect target for the Sandians or Alpha II pirates. The only way to get more energy is to dock with an Earth base, which is easy—as long as you don't blow *it* out of the universe. If your itchy trigger finger destroys the base before you get there, you'll have to conserve energy until the next dock. You can, for example, turn off your shields to conserve, but you will have to shoot perfectly to survive until you can reach the next base. If you shoot more than 6 *Earth* ships though, you will not be allowed to dock with an Earth base for the rest of the game.

From the first menu, you can choose 10 different skill levels, ranging from Rookie Cadet to Commander. Skill levels vary according to how much time you have to react before firing or taking a blow. The program keeps track



A representative photo of Orbital Defender taken from the Commodore 64 screen.

"Earth law declares that only a human being—not a computer—will decide whether life is to be taken . . ."

of how many ships of what type are destroyed, and it displays this along with your score at the end of the game.

Now sit down at the controls and do your best to defend our Mother Planet. Just be sure to stay on your toes, and—before you fire—remember to ask, *Friend or Foe?*

For your key-in listing see HCM PROGRAM LISTINGS Contents.



CONTROL CAPSULE *Orbital Defender*

KEY	FUNCTION
Space Bar	Fire
A	Increase Thrust
Z	Decrease Thrust
S	Raise Shields
X	Lower Shields

The Apple version of this program uses four assembly language routines. These routines control sound effects, character graphics, and two other very interesting functions: shape expansion and page switching. In the shape-expansion routine, the program takes a small shape from the shape table and enlarges it on the screen. The page-switching routine rapidly switches between two screens stored separately on high-resolution graphics Pages 1 and 2. (For more on these graphics pages, see the Apple "Tech Note" in this issue, on page 60.) The list below shows the line number where the data statements for each routine are located:

Routine	Data Line Nos.
1. Char. Graphics	1230-1240
2. Sound	1240
3. Page Move	1240-1250
4. Shape Expansion	1250-1280

The call addresses for each routine are all listed in lines 250 and 260 of the program:

```

250 PAUSE = 30:NS = 25:P1 = 32:P2 =
    64:BASE = 2048:DIM XS(NS),
    YS(NS):FX(1) = 39:FX(2)
    = 139:FX(3) = 239:C(1) = 2:C(2) =
    5:C(3) = 6:C(4) = 0
260 HCHAR = BASE:SOUND = BASE + 55:SPKR
    = BASE + 67:MOVE = BASE + 75:OUT =
    BASE + 115:TABLE = BASE
    + 300:SHPTB = 768

```

Line 250 sets the base address for all the routines in memory, and line 260 defines each address relative to the base. When one of these routines is called by the program, a parameter is passed to the machine language routine, causing the routine to run in a certain way (depending on the value of the parameter). For example, line 790 calls the sound routine with a parameter value of 255, creating a sound for approximately 1/4 second, starting with a high pitch and decreasing. If you change this value to 63, it will create several fast oscillations from high to low pitch. Try it. If you wish, you may try other values in this parameter, or find new lines in which other routines are called, and change their parameters—just to see what happens. Or try this: After running the program, the sound routine remains in memory. Halt the program and enter the following line:

```

FOR Z = 0 TO 255:HOME:PRINT Z:CALL SOUND, Z:
FOR TD = 1 TO 1500:NEXT:NEXT

```

Now as you change values in the sound parameter, you will hear the immediate results.



CONTROL CAPSULE *Orbital Defender*

KEY	FUNCTION
Space Bar	Fire
T	Increase Thrust
Shift T	Decrease Thrust
S	Raise Shields
Shift S	Lower Shields

Although the Commodore 64 provides 8 different sprites, all of which can be used simultaneously, this program uses only one sprite—which it redefines to get all 9 different shapes of the hostile and friendly crafts displayed on the radar screen. Because it displays only one shape at a time, the program avoids having to redefine more than one sprite. Line 1430 sets an offset that determines which shape will be POKED to the sprite. Line 1440 POKES the shape data to the sprite from a shape table stored in memory. Data for the shapes are in separate data statements at the end of the program.

Continued on next page.



CONTROL CAPSULE
Orbital Defender

KEY	FUNCTION
Space Bar	Fire
Cursor Up	Increase Thrust
Cursor Down	Decrease Thrust
Cursor Left	Lower Shields
Cursor Right	Raise Shields

This version uses IBM's GET and PUT commands to generate changes in the graphics screen. The GET command allows the program to grab a rectangular section of the screen and save it to an array. (Two parameters define the rectangle by the position of its upper left- and lower right-hand corners.) The PUT command allows you to place graphics stored with the GET command back on the screen.

The use of GET and PUT allows simple animation. Several options can be used with the PUT command to determine how the image will be placed on the screen. In this program, we use the PSET when displaying ships on the radar, which will place the entire image back just as it was when we grabbed it with GET. Then we use the LINE command to erase the radar image. The BF (Box Fill) option is used with a black background color—a very fast and effective way to erase controlled areas of the screen.



CONTROL CAPSULE
Orbital Defender

KEY	FUNCTION
Space Bar	Fire
E	Increase Thrust
X	Decrease Thrust
D	Raise Shields
S	Lower Shields

[Note: This program has been converted from the original in Extended BASIC to a BASIC version. To conserve space, we are publishing only the BASIC version in this issue of the magazine. However, the Extended BASIC program will be included with the BASIC program on our disk and cassette media service (ON DISK and ON TAPE) for Vol. 5, No. 1.]

The most significant aspect of the TI version of *Orbital Defender* is its use of the CALL COLOR command to enhance graphics. With CALL COLOR, the program can "hide" parts of the graphics screen until they are needed to create certain effects. This is very helpful in creating the illusion that extensive graphics are being rapidly and simultaneously written to the screen when, in fact, they were there all the time.

HCM

Orbital Defender (Apple II Family)
Explanation of the Program.

Line Nos.	Explanation
100-200	Program header.
210-270	Initialize program.
280-290	Display title screen.
300-350	Read program data for shapes.
360-370	Start sound routine.
380-390	Get skill level.
400-530	Display playing screen.
540-700	Main control loop.
710-870	Radar picks up a ship.
880-940	End of game routine.
950-1010	Dock with Earth base.
1020-1050	Radar display routine.
1060-1290	Program data.
1300	Error routine.

Orbital Defender (C-64)
Explanation of the Program.

Line Nos.	Explanation
100-180	Program header.
190-260	Display title screen.
270-520	Initialize program.
530-630	Display level option menu.
640-880	Display the playing screen.
890-1050	Main control loop.
1060-1120	Scroll stars.
1130-1160	Scroll the Earth.
1170-1570	Radar picked up a ship.
1580-1640	Read keyboard for controls.
1650-1770	End-of-game routine.
1780-1930	Dock with Earth base.
1940-2930	Program data.
2940-2980	Sound data.

Orbital Defender (IBM PC and IBM PCjr)
Explanation of the Program.

Line Nos.	Explanation
100-220	Program header.
230-350	Initialize program and graphics.
360-440	Main control loop.
450-630	Display title screen.
640-710	Display playing screen.
720-760	Flash warning light.
770-970	Display controls.
980-1160	Rotate the Earth.
1170-1190	Input skill level.
1200-1250	Update controls.
1260-1460	Main control loop.
1470-1700	Sound and graphics routines for lasers and blasts.
1710-1790	End of game. Option to play again.

Orbital Defender (TI-99/4A)
Explanation of the Program.

Line Nos.	Explanation
100-180	Program header.
190-230	Initialize program.
240-250	Branch to display level option.
260-340	Display playing-screen control panel.
350-420	Main control loop.
430-480	Routine to scroll the earth.
490-890	Radar picked up a ship.
900-990	Read keyboard for controls.
1000-1040	End of game—option to play again.
1050-1160	Dock with Earth base.
1170	Display screen-graphics routine.
1180-1630	Program data.
1640-1680	End of game data for display.



QUIZ- PRINT

A Finishing Tool
for your
Quiz Construction Set*

by William K. Balthrop
and the HCM Staff

Calling all teachers, students, trivia and non-trivia buffs—now you can create a custom-organized printout of all your self-made quizzes with this do-it-all program!

*In the last issue of *Home Computer Magazine* (Volume 4, Number 5) we presented "Quiz Construction Set," an entertaining and educational set of programs designed to enhance your personal library of computer tools. We now offer this further addition that allows you to control the "shape-of-things-to-come."

Mary is studying for her history exam of next week, and as she reads her textbooks she devises questions and answers on her computer and later prints them out so that she may quiz herself and her study group, as well as highlight information presented. Jim is getting ready for a dinner party, and after shoving a roast in the oven, he sits down at his computer to create a set of trivia questions and answers for a little fun after dinner. And Karen types up and prints out a multiple choice test (and an answer sheet) that she will distribute for her second grade class' spelling test tomorrow.

All of these people are using *Quiz-Print*, a helpful, easy-to-use program designed to be a supplement to the *Quiz Construction Set* programs, *Quiz-Make* and *Quiz-Take*, published in the previous issue, Vol. 4, No. 5. *Quiz-Print* is a reporting utility which is capable of producing hard-copy quizzes from a quiz data base created with *Quiz-Make*.

A number of options make this more than just a reporting program. You can reorganize the quiz, use multiple-choice formats, or blind-answer questions.

When you RUN the program, you will be presented with a menu screen first:

MAIN MENU SCREEN

- 1) SETUP
- 2) PRINT
- 3) SAVE
- 4) LOAD
- 5) EXIT

Before using *Quiz-Print*, you must create a quiz using the *Quiz-Make* program. To start, select the Setup routine and insert a disk or cassette containing a *Quiz-Make* file into the drive or recorder. After selecting 1) SETUP, you will be asked to enter the quiz file name that was created using *Quiz-Make*. That file will then be loaded into memory. Do not use LOAD to load this file—it is used *only* to load your quiz report once you have set it up and saved it.

Option 1, Setup, is used to define the parameters of the hard-copy quiz that you wish to produce. This option first helps you select a format for your answers, and then lets you choose the questions to be asked if you do not want the computer to randomly choose them.

Format The Answers

The next question you will be asked is whether you would like to print multiple-choice style questions:

PRINT MULTIPLE CHOICE (Y/N)?

If you press N, then the program will skip down to the menu described under "Choosing Questions." When you choose not to have your questions arranged in a multiple-choice format, the printout simply includes the question alone, and a blank line for the answer.

If you press Y, you will be prompted for the following information in reference to a multiple-choice quiz. First enter the number of answers you would like to have appear below each question:

HOW MANY CHOICES (2 to 10)?

Next, you can either have the computer randomly select answers from within the quiz to fill in the incorrect multiple choices, or you can enter your own wrong answers to each question:

SELECT ONE:

- 1) USE RANDOM ANSWERS FROM THE QUIZ
- 2) ENTER YOUR OWN ANSWERS

Select the first option if you want the computer to select multiple-choice answers for you after you have finished choosing your questions. It will display its selection for the first question and ask if it's OK. If you press N for no, then it will select a different set of random answers for your inspection. No answer will ever be repeated twice within one multiple-choice question. For this reason, you should have at least as many questions in the file as there are number of choices per question, or else choose to enter the answers yourself for each question.

If you elect to enter your own answers for your questions (option 2), you will need to enter one answer for each choice, determined by the number of choices per question that you indicated in an earlier option. The number of answers that you will enter for a question is actually one less than its total number of possible answers, because one of them will be the correct answer—which you cannot change.

Pick The Proper Place

In the next option, you can either let the computer place the correct answers within the proper fields of multiple answers randomly, or select the position that the answers will appear in for each question yourself:

SELECT ONE:

- 1) RANDOM ANSWER POSITION
- 2) SELECT ANSWER POSITION

If the computer randomly picks the position of the correct answer within each multiple choice selection, it will do so and then ask you if it's OK. If it is not, it will keep selecting different positions until one is satisfactory. If you want to enter the position of the correct answer, the computer will display all of the wrong answers for a question, each next to a letter. The last letter is on a blank line, and the question's correct answer will be displayed below it. Press the keyboard letter corresponding to where you would like to place the correct answer. The answer on the chosen letter—if there is one—will be bumped down, and the correct answer will be inserted.

Choose The Questions

This next menu will always appear next when you set up a quiz, regardless of whether you selected the multiple choice option:

SELECT ONE:

- 1) SHOW QUESTIONS IN SAME ORDER AS FILE
- 2) RANDOM QUESTION ORDER
- 3) PICK AND CHOOSE QUESTION ORDER

In the above menu you are given three choices. In choice 1, the questions in the quiz will be printed in the same order in which they appear in the original *Quiz-Make* file. If you are working on a multiple choice quiz, you are then shown the first question, some answer choices, and the correct answer and asked:

IS THIS OK (Y/N)?

If you press N, then the program will continue to show you answer choices until you press Y. If you press Y, then the program will tell you how many records (questions) you have selected, and inquire whether you want to add another. If you are not working with multiple choice questions, then you are simply shown each question and asked whether you want to add it to the file. In both cases, you are taken back to the main menu when you decide to stop adding questions.

In the second choice, the computer will mix up the order in which the questions will be printed. You will be shown each question that the computer has selected and asked to accept or reject it. From here on, choice 2 operates just like choice 1 above.

***"You can reorganize the quiz,
use multiple choice formats
or blind-answer questions."***

In the third option, you will be able to scan through the quiz file and pick the questions that you would like to include in the quiz; they will be printed in the order in which you select them. Each question can be selected only once. Once you select a question, it will be removed from the list of questions from which selections can be made. Use the arrow keys to scroll through the selections. Enter the number of the question you would like and press [ENTER] or [RETURN]. If you already have a list of the questions printed out or written down, you can simply enter the numbers of the questions desired in the order that you want them, without scrolling the screen. The question does not need to be on the screen to be selected. If you are required to enter more information for a question after making a selection (such as your own wrong answers for the multiple choice option), you will be asked for that information before making your next selection.

Once you have selected your questions in any of these options, you will not be able to view them again until you obtain a printout of your report file.

Now For The Cheatsheet!

The final prompt you will need to answer to set up your quiz will give you the option of printing an answer sheet at the end of the quiz to be used in grading papers.

PRINT ANSWERS AT END OF REPORT (Y/N)?

The answer sheet includes the report title, a second heading of your choice, and the date, in addition to the number of each question and its correct answer.

The other 4 options on the main menu are fairly self-explanatory: Option 2, Print, will neatly generate the quiz that you set up in option 1. Like the answer sheet, it includes the report title, second header, and date. Option 3, Save, will save the quiz report parameters to disk or tape. By doing this you will need to design your quiz only once, loading the quiz from disk or tape to get another copy. Option 4, Load, will allow you to load the quiz report parameters previously saved with option 3. Option 5, Exit, allows you to gracefully exit the program. Each option except 5) EXIT automatically returns you to the main menu when you are done working in it.

We think you'll find that with the flexibility in print formatting that *Quiz-Print* offers, the spectrum of applications for the *Quiz* programs is extremely broad. Now take a look at *Quiz-Print Tutorial* on the next two pages for some technical insight into print formatting.

HCM

For your key-in listing see HCM PROGRAM LISTINGS Contents.

Quiz-Print (Apple II Family) Explanation of the Program

Line Nos.	Explanation
100-200	Program header.
200-290	Initialize program.
300-360	Main menu selection screen.
370-890	Control loop to set up initial report.
370-500	Load Quiz-Make file.
510-520	Prompt for multiple choice.
530-540	Number of choices.
550-560	Location of answers.
570-590	Answer position.
600-610	Order of questions.
620-650	Select answer sheet at end of report.
660-800	Control routine for building a quiz report.
810-890	Is question OK? Add another?
900-1130	Pick and choose questions.
1140-1200	Select question at random.
1210-1260	Select random answers for multiple choice.
1270-1320	Enter multiple choice answers.
1330-1380	Random position for answers.
1390-1440	Choose position of right answer.
1450-1610	Save quiz report.
1620-1750	Load a quiz report.
1760-1920	Print quiz report.
1930-2050	Print answer sheet.
2060-2330	Key-scan routine.
2340-2490	Error routine.
2500-2570	Exit program routine.

Quiz-Print (IBM PC and PCjr) Explanation of the Program

Line Nos.	Explanation
100-180	Program header.
190-240	Initialization.
250-290	Main menu. Input user's selection.
300-490	Get user's report options.
300-360	Load Quiz-Make file.
370	Select multiple choice.
380	Number of choices.
390-400	Location of answers.
410-440	Select answer position.
450-460	Order of questions.
470-490	Select answer sheet at end of report.
500-610	Control the construction of the quiz report.
620-780	Pick and choose questions.
790-840	Select questions at random.
850-900	Random multiple-choice answers.
910-960	User multiple-choice answers.
970-1020	Select random position for multiple-choice answers.
1030-1060	User selects position for multiple-choice answers.
1070-1110	Save quiz report.
1120-1160	Load quiz report.
1170-1270	Print quiz report.
1280-1360	Print answer sheet.
1370-1420	Key-scan subroutines.
1430-1500	Error-trapping routine.
1510-1540	Exit the program.

Quiz-Print (C-64) Explanation of the Program

Line Nos.	Explanation
100-190	Program header.
200-270	Initialize program variables.
280-380	Main-menu selection screen.
390-990	Get user's options.
390-670	Read Quiz-Make file.
680-720	Select multiple choice.
730-780	Enter number of answers for multiple choice.
790-830	Location of answers.
840-880	Enter answer position.
890-940	Select question order.
950-990	Select answer sheet.
1000-1210	Control routine to construct the quiz report.
1220-1510	Pick and choose questions.
1520-1560	Select questions at random.
1570-1610	Select random answers.
1620-1680	Enter multiple-choice answers.
1690-1730	Select random position for right answer.
1740-1780	Choose position of right answer.
1790-2020	Save quiz report.
2030-2250	Load a quiz report.
2260-2590	Print quiz report.
2600-2710	Print answer sheet.
2720-2730	Locate-cursor routine.
2740-2860	Input routine.
2870-2890	Single-key input routine.
2900-2950	Illegal-entry routine.
2960-2980	Exit routine.

Quiz-Print (TI-99/4A) Explanation of the Program

Line Nos.	Explanation
100-180	Program header.
190-290	Initialization.
300-450	Main menu. Input user's selection.
460-880	Get user's report options.
460-530	Load Quiz-Make file.
540-580	Select multiple choice.
590-640	Number of choices.
650-700	Location of answers.
710-760	Select answer position.
770-820	Order of questions.
830-880	Select answer sheet at end of report.
890-1050	Control the construction of the quiz report.
1060-1550	Pick and choose questions.
1560-1650	Select questions at random.
1660-1760	Random multiple-choice answers.
1770-1850	User multiple-choice answers.
1860-2000	Select random position for multiple-choice answers.
2010-2080	User selects position for multiple-choice answers.
2090-2200	Save quiz report.
2210-2340	Load a quiz report.
2350-2760	Print quiz report.
2770-2950	Print answer sheet.
2960-3100	Key-scan subroutines.
3110-3200	Exit the program.



Quiz-Print Tutorial

by the HCM Staff



Accessing the Printer

There are primarily two types of DOS (Disk Operating System) currently being used on the Apple: DOS 3.3, and ProDOS. DOS is responsible for interfacing the computer to the outside world. ProDOS has fixed several bugs that existed in the earlier DOS 3.3. One such bug affects the way we initiate communications with a printer.

Both DOS manuals tell you to use the following command to start communications with a printer:

```
PRINT DS;"PR#";SL
```

But many DOS 3.3 programmers prefer to use a shortcut around DOS with the following command:

```
PR#1
```

This command will not work at all with ProDOS. If you attempt to use it, your program will not function properly. Use the following command to redirect information back to your screen:

```
PRINT DS;"PR#0"
```

Output Algorithm

The basic algorithm for figuring out the number of questions that will appear on a page is identical to the one used on all the other machines. The formula is located in lines 1860. See the IBM explanation for formulas and details.

Formatting

The *Quiz-Print* program is written to output to the 40-column Apple screen, but printers can normally also output in 80-column format. In order to have the printouts take advantage of this 80-column format without requiring an 80-column card in your Apple II+ or IIe, line 1840 contains a command that turns off the screen display while printing, and sets the width to 80 columns:

```
1840 PRINT DS;"PR#";SL: PRINT CHR$(9);"80N"
```

The commands VTAB, HTAB, INVERSE and NORMAL have no affect on output to the printer. If you wish to format your document across the paper, you will need to use the TAB(col) command, where col is the column you want to TAB up to.

HCM

Accessing the Printer

Quiz-Print on the Commodore 64 uses the standard printer which attaches to the special serial port (the same port which connects the disk drive). The command format to turn on the printer is `OPEN lfn,dn`. The *lfn* is the logical file number—and we use 4. The *lfn* is then used in all the `PRINT#` statements in the program to output to the printer. The *dn* is the device number. We again use 4 because this is the default value on Commodore printers. Selecting a logical file number that is the same as the device number helps avoid confusion in reading the program's code.

Each time something is sent to the printer, we use the `PRINT#4,var` command—where *var* is the name of the variable or string to be printed. Always place the # symbol immediately after `PRINT`—including a space causes a syntax error. To terminate output to the printer, the buffer must first be cleared with a `PRINT#4` command and is not followed by a variable. The channel is closed with a `CLOSE4` command.

Output Algorithm

The basic algorithm for figuring out the number of questions that will appear on a page is identical to the one used on the other machine brands. Its formula is located in lines 2440. See the IBM explanation for formulas and details.

Formatting

The major formatting consideration here stems from a lack of a form feed on Commodore printers. To approximate this function, the program keeps track of the number of lines that have been printed on any page by using the NL variable. This value is then subtracted from 66 to determine how many blank lines are to be printed to reach the top of the next page.

Another important formatting consideration is the answer sheet. The TAB function does not work the same way on a printer as it does when printing to the screen. Thus, when multiple-choice questions are selected, a special function is used in lines 2630 through 2650 to space the answers with five answers in each row. By taking the two rightmost characters from the `STR$` of the number of the answer, a one-digit number lines up in the same column as a two-digit number.

HCM

One of the main arguments in favor of purchasing a computer is that it will *reduce* the amount of paperwork a task involves. Occasionally though, we need computers to *produce* paperwork for us. The computer is capable of taking a lump sum of information, mixing it around, and spitting it out in a formatted, easy-to-read report. *Quiz-Print* is just such a program.

This article serves a dual purpose: It will further enhance your understanding of the *Quiz Constuction Set* of programs, especially *Quiz-Print*; and it will also increase your general understanding of how to get a printer to do what you intend—by translating your specific format requirements into simple BASIC commands. With this new knowledge, you should be off to a great start at developing your own custom programs to generate reports.

We have placed all the explanations for each machine brand directly beside each other so that they will be easy to compare—both in their differences, and in their similarities.



Accessing the Printer

The IBM computer makes communication with the printer a breeze—with such easy-to-use commands as LPRINT. You don't need to worry about opening a printer port. The system automatically outputs to the default printer device. If you wish to use a device other than the normal (default) printer channel, you will need to use the OPEN "COM" command (which is beyond the scope of this article).

Output Algorithm

Quite often a report needs to span more than one page. One formatting rule which we have adhered to in *Quiz-Print* is that no question is cut in half by a page break. Some printers have the ability to automatically skip the page breaks, but this, in itself, is not satisfactory for our application.

Each question in the printed quiz uses several lines on the printer. If the number of lines used by a question were always the same, it would be a simple matter of limiting each page to a fixed number of questions. However, the number of lines used by each question varies depending on whether the questions are multiple choice, and on the number of choices supplied with each question.

By dividing the number of lines per page by the number of lines used for each question, we arrive at the number of questions per page. To find the number of lines used for each question, you add the number of multiple choices, if any, to a fixed overhead number of lines. In this program, the minimum number of lines needed is seven. Line 1220 does all of this:

```
1220 NPP = INT(60/(7 + NC))
```

NC = the number of multiple choices selected

Formatting

For the program to properly format your quizzes, you must have a printer capable of performing a form feed that is implemented by the program. After printing the specified number of questions, a form feed (ASCII 12) is sent to the printer. This is done in lines 1210, 1230, 1250 and 1340.

HCM

Accessing the Printer

In TI BASIC, the INPUT command allows you to enter any printing parameters required for a specific printer. In any printing operation, including *Quiz-Print*, you will be prompted for this information before you begin. The kinds and number of parameters are determined by the type of printer and interface your system includes.

Most printers for the TI-99/4A require a serial interface card, which plugs into the peripheral expansion box. This card actually allows *either* serial (RS232) or parallel communications to the printer. If the printer is set up for parallel communications, you will only need to specify *PIO* to satisfy all parameters. If you are using the RS232 serial interface, the parameters are more complex. In this case, you must specify: (1) baud rate (bits per second); (2) whether each ASCII character sent will consist of either 7 or 8 bits; and (3) even, odd, or no parity.

If you don't know what to specify for your printer, consult your printer's user handbook, which should contain the proper information. Most TI-compatible printers come with a default setting that matches the 99/4A's RS232 serial interface. This would require that you specify a baud rate of 300, 7 bits, and odd parity.

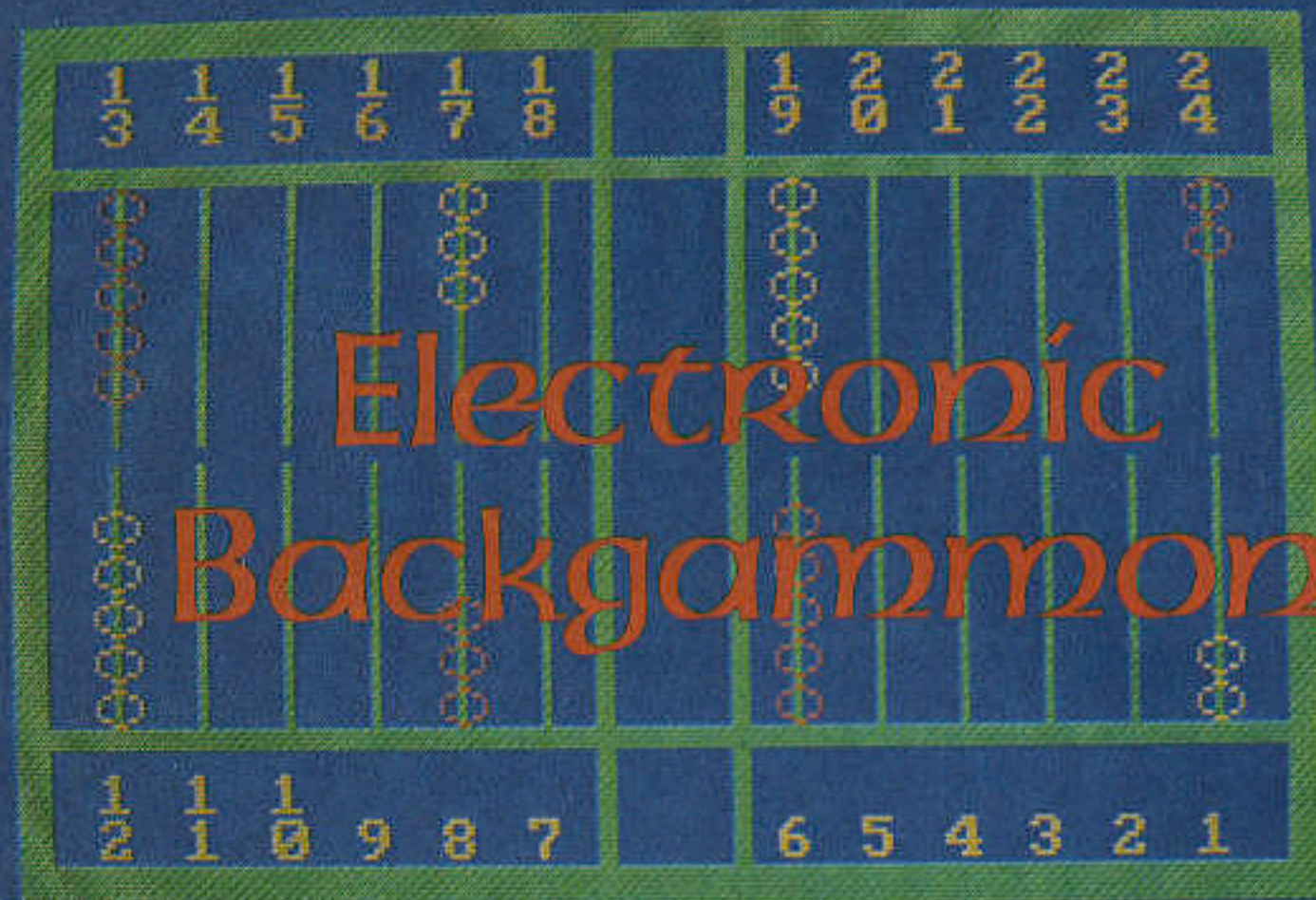
Output Algorithm

The basic algorithm for determining how many questions in *Quiz-Print* will appear on a page is identical to that used for the other machines. See the IBM explanation under this heading for formulas and details.

Formatting

For nice, neat pages in *Quiz-Print*, you want your printer to print a specified number of questions per page, and then skip to the top of the next page before continuing. Thus, the program sends ASCII code 12 to the printer after sending each page's questions, which tells the printer to do a form feed. Most printers are capable of recognizing this code—but if your printer cannot, it will simply ignore the code and continue printing *without* a form feed.

HCM



FROM--



by Dennis Webber
and the HCM Staff

ME

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When it comes to making a logical move in Backgammon, the Ur of Chaldees didn't have anything on your home computer.

Predecessors of the classic game Backgammon have been found to exist in several ancient civilizations, including those of the early Greeks and Romans. But the earliest version of the game is believed to have been created in 3000 B.C. by the Ur of Chaldees. (A land called Chaldea was a region of South Babylonia along the Euphrates and the Persian Gulf.)

Perhaps you are already an old hand at this old game, or maybe you're one of those who has always wondered "What's this strange design on the back of my checkerboard?" Anyone familiar with Backgammon, however, knows that it can challenge Checkers or even Chess in its ability to involve and interest players from all around the world. In this version of the game, the computer is your opponent—and a darn good one at that.

Know The Rules

The Backgammon board contains 24 positions—12 on each side. Players move their checkers (commonly called pips) around the board on these locations through rolls of 2 dice. (See title picture.)

The computer plays black and moves clockwise, while the user plays white and moves counterclockwise. The game board is set up in the following manner:

POSITION	PLAYER	# OF PIPS
1	computer	2
6	user	5
8	user	3
12	computer	5
13	user	5
17	computer	3
19	computer	5
24	user	2

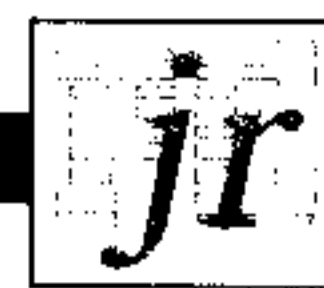
The computer's "inner table" is positions 19 through 24, and the user's inner table is positions 1 through 6. The object of the game is to first move all of your pips to your own inner table, and then off the board. The computer rolls the dice for you; on the first roll, the one with the highest number will begin the game first. Your computer opponent will tell you to press any key to roll the dice. After the roll is determined, you may move one or two of your pips, using both dice (one at a time) to move one pip, or moving two pips—one with each die.

Once the computer has rolled the dice, it will ask you to enter a move. Numbers less than 10 must be entered with a leading zero: 01, 04, 07, etc. The prompt FROM— indicates that the computer expects you to enter the current location of the pip you would like to move. After entering a legal location, it will then add to the prompt. For example, if your first entry was 13, the display would look like this: FROM—13 TO— You would now need to enter the location where you would like to move the pip. If the move is legal, the graphics display of the board is updated to show the pip at its new location. With each move, all versions except the IBM actually redraw the entire board.

You can land only on an empty position, on a position occupied by your own pips, or on top of a *single* pip of your opponent. When this happens, the computer's piece is placed on the Bar, which is in the center of the board. If one of your pips is relegated to the Bar, you must place it back on the board before you can move any other pips. To get back on the board, you must roll a value that can move the pip onto the board without landing on a position occupied by 2 or more opponent's pips. You move onto the board at position 24. You could place your pip on position 24 if you rolled a 1, on 23

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if you rolled a 2, on 22 if you rolled a 3, and so on, depending on how many pips occupied those positions. The computer must do the same if you knock its pips onto the Bar. The computer re-enters the board at position 1.

Once all of your pips are on your inner table, you can start moving them off the board. The first player to get all of his or her pips off the board is the winner. Imagine now that there is a position 0; you must move your pips to position 0 to get off the board. You can do this by using an exact roll of the dice, or you can use exact values of the dice to move your pips closer to the board's exit. Using a value larger than what is needed to get your innermost pips off the board is also legal. For example, if you have only two pips left on the board at locations 3 and 5, and you roll a 2 and a 6, you would do the following:

FROM—05 TO 00

FROM—03 TO 01

You would then have 1 pip left on the board. Notice that the exact value needed to move off the board was entered, even though the value on one die was greater than this value. This is important because the computer keeps score of the remaining number of moves each player will have to make to get all pips off of the board. When one player moves all of his or her pips off of the board, that player's score is 0. The other player loses by the number of moves remaining in his or her score.

The Program's Logic

As an opponent, the computer is very aggressive—placing a higher priority on *offense* than on *defense*. Ideally, the computer would weigh offensive against defensive moves and then choose the best move to suit an overall winning strategy. However, memory considerations dictate that we use a purely offensive strategy, one based on moving pips off the board as rapidly as possible. So, the computer often will pass up chances to bump your pip to the center Bar in favor of moving one of its pips forward. This is literally a measure of its intelligence—the *artificial* intelligence created by the interaction of the computer and the program.

Electronic Backgammon uses the same basic algorithm for all of the machine versions. When a move is indicated, the computer goes through a series of logic steps, searching for the optimum place to move. After rolling its dice, the computer first checks every pip on the board; if it determines that there are no legal moves, it displays a move-blocked message and the opponent gets to move. The computer begins this move sequence by first locating all of the pips that are the farthest from its inner circle. If there are no pips in its home territory, then the program checks each quadrant of the board, looking for the best possible move it can make while protecting its other pips as well as possible. If there is a legal move, the computer first determines whether it can move into the inner circle. It then checks to see whether there is a pip that is open (unprotected) and whether it can move to protect the pip. Next, the program locates the enemy pips on the board and determines whether there is an open pip among them. If there

is, it checks whether it can bump the pip from the board to the Bar. If there isn't an open pip, it makes its first move, then rechecks the board and determines whether the pip it just moved is open. If the pip is open and the computer can protect the pip, it will do so on its next move. If all of the pips are in the home territory, the computer goes through another sequence of loops to determine which pip it can remove from the board.

The program checks for all legal moves. It will not let you move from a position you do not occupy. It will not let you move to a position other than forward, toward your inner table; you could not move

from 13 to 18 because this would be going away from your inner table. The program will also prevent you from moving off the board if you do not have all of your pips in the inner table. It will also stop you from placing your pip on top of a position that contains two or more computer pips. Likewise, the computer will always make a legal move.

Because of limited memory space, the program cannot have a large set of different moves to choose from, so it chooses the first move that satisfies the conditions that it is working under. The program always does this checking in a fixed pattern, not randomly.

***“As an opponent,
the computer is very aggressive—
placing a higher priority on offense
than on defense.”***



This is a representative screen photo taken from the TI-99/4A version.

For your key-in listing see HCM PROGRAM LISTINGS Contents.



The Apple version of *Electronic Backgammon* uses the DRAW command with shape tables to create the pips, and the numbers which indicate the positions of the pips. After a move is registered, the XDRAW command removes the number and redraws the line. With each move, all 24 positions on the board are redrawn with an updated count on each position.

In the Apple version, the computer's pips are open circles, while the user's pips are solid white circles.



The C-64 version of *Electronic Backgammon* uses standard character graphics to create the backgammon board design. When the computer moves one pip, it erases and redraws all 24 pips in their proper positions.

**Electronic Backgammon
(Apple II Family)
Explanation of the Program.**

Line Nos.	
100-190	Program header.
200-220	Protect hi-res page.
230-290	Initialization and title screen.
300-370	Determine who is first.
380-440	Roll dice and branch.
450-750	Player's move.
760-780	Computer blocked?
790-840	Must computer move from Bar?
850-1970	Computer move logic.
1980-2140	Update computer's pip location.
2150-2210	End-of-game options.
2220-2230	Blocked- and invalid-move messages.
2240-2390	Get player's input.
2400-2910	POKE shape table and set hi-res.
2920-3260	Draw board and move pips.
3270-3290	Display dice roll.

**Electronic Backgammon
(IBM PC and IBM PCjr)
Explanation of the Program.**

Line Nos.	
100-230	Program header.
240-260	Initialization and title screen.
270-310	Display playing screen.
320-380	Determine first player.
390-590	Player's turn.
600-670	Is computer blocked?
680-870	Complete computer's choice.
880-890	Update computer's pip location.
900-920	End-of-game routine.
930-1020	Routine to display dice on the board.
1030	Time-delay routine.
1040-1050	Display routines.
1060-1140	Calculate pip positions.
1150-1310	Display pips routine.
1320	Scan keyboard.
1330	Program data.

**Electronic Backgammon (C-64)
Explanation of the Program.**

Line Nos.	
100-190	Program header.
200-300	Initialization and title screen.
310-560	Draw board routine.
570-670	Determine who is first.
680-750	Get player's input.
760-1530	Check movement from Bar.
1540-2770	Main logic to determine computer's moves.
2780-2940	Update computer's pip variables and move.
2950-2980	Determine dice roll.
2990-3120	POKE inputs to screen.
3130-3190	Keyboard-input routines.
3200-3440	Move pieces.
3450-3480	Invalid-move message.
3490-3650	End of game options.
3660-3760	Computer's-move control loop.
3770-3810	Can't-move routine.

**Electronic Backgammon (TI-99/4A)
Explanation of the Program.**

Line Nos.	
100-180	Program header.
190-290	Initialization and title screen.
300-340	Determine who is first.
350-390	Roll dice and branch.
400-640	Draw pieces on board.
650-870	Player's turn.
880-900	Is computer blocked?
910-940	Must computer move from Bar?
950-1660	Complete computer's choice.
1670-1740	Update computer's pip location.
1750-1770	Make move.
1780-1840	End-of-game routine.
1850	Invalid-move subprogram.
1860	Time-delay subprogram.
1870	Can't-move subprogram.
1880	Inner-table-blocked subprogram.

 *Electronic Backgammon* requires TI Extended BASIC.

The computer's pips in this version are black, open circles while the user's pips are solid white circles. When stacked, the black open pips become blue open circles, and the user's white pips become solid blue.

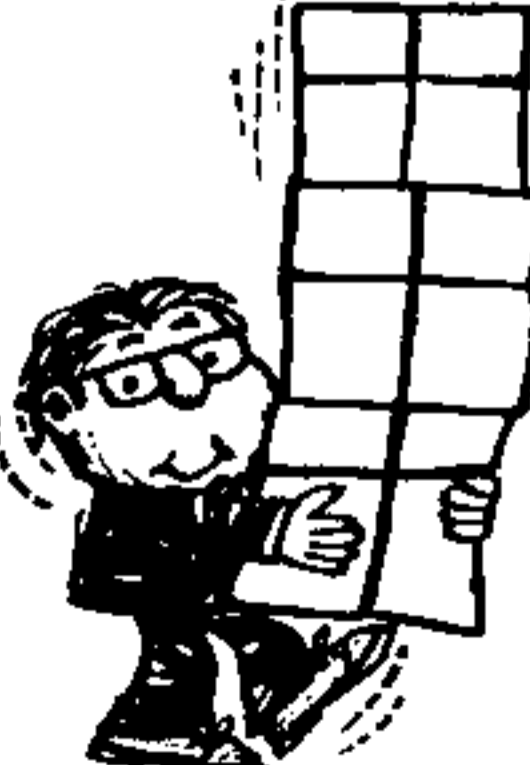
to create the backgammon board. Every time a pip is moved, the computer redraws all 24 positions on the board.

In this version, the computer's pips are black, and the user's pips are blue. It is possible to stack pips on a line, because the computer just changes the colors of the stacked pips—the user's pips will be a light grey color, and the computer's pips will be a dark blue.

In the IBM version of *Electronic Backgammon*, the algorithm for moving the pips is comparatively simple—and thus very efficient. Instead of redrawing all 24 pips each time one is moved, the program simply erases the pip being moved and redraws it at its new location on the board.

In the IBM version, the computer's pips are red open circles, and the user's pips are brown. When stacked, the computer's and the user's pips become solid shaded. The IBM computers create the pips using the CIRCLE command. When they stack a pip, they draw the shape of the pip with the CIRCLE command, and then fill the circle with the PAINT command.

The TI version of *Electronic Backgammon* is written in Extended BASIC only. It uses only character graphics



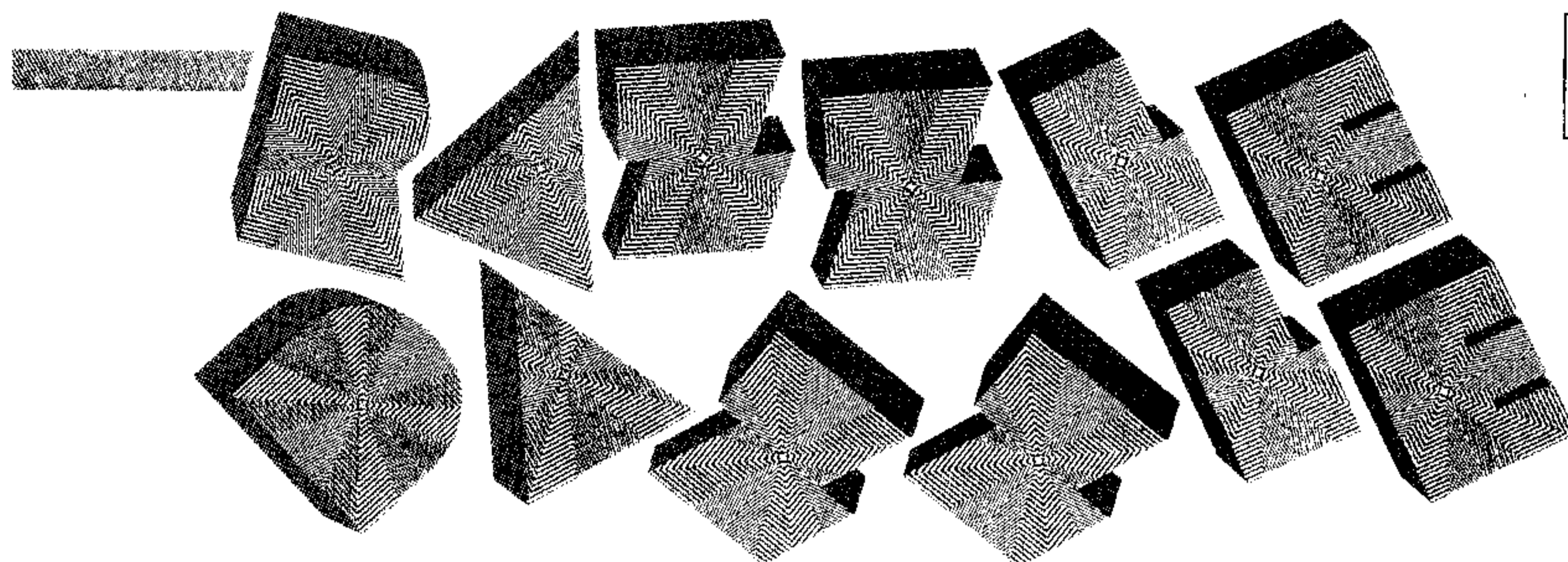
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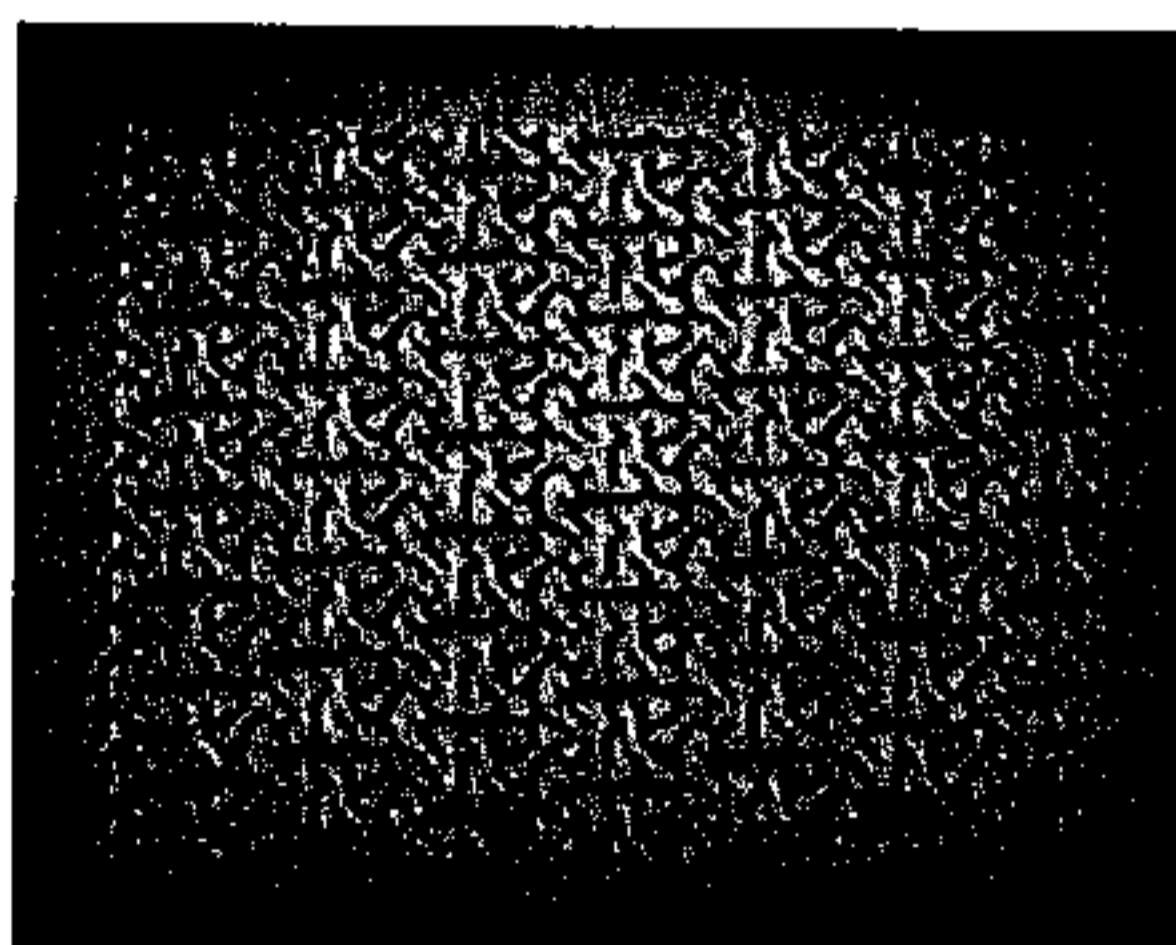


by **William K. Balthrop**
HCM Staff

*Worm your way into character graphics
 with this hypnotizing—but easy—BASIC routine.*

The design team at Texas Instruments went to great pains to build a computer which is versatile, yet easy to use. The BASIC graphics commands are a case in point. They allow you to build graphics characters, and then place those characters anywhere on the screen. Each character can be placed repeatedly on the screen as many times as you wish. And when you change the graphics pattern for that character, its shape is automatically changed on the screen at each location where the character appears.

By placing characters in a fixed pattern throughout the screen, it is possible to play with their individual graphics patterns to create seemingly random, yet symmetrical, screen patterns. In this program, we have designed several characters with squiggly lines. When placed on the screen, they appear to resemble the inside of an old log which has been half-eaten by worms. Hence the title of our program: *Worm Wood*.



Painting With Characters

You could paint the screen with graphics characters in a number of ways. Perhaps the simplest is just to print them on the screen. This presents a problem, however. In *Worm Wood*, we need to print each line of characters slightly offset from the previous line. The print statement doesn't really do the trick, for even if we place a semicolon after the last item printed, any item longer than the rest of the line will automatically print onto the next line. To avoid this, it is necessary to print one character at a time. We could have placed the characters on the screen with the CALL HCHAR statement, but this would have required an additional loop. Instead, we use just one loop to print 672 characters.

By changing the patterns of the characters on the screen, we can now make the entire screen change. This can often have a hypnotizing effect, as you can see with *Worm Wood*. Let's take a look at the letter A, which appears on the screen quite a few times dur-

ing this program, though you may not recognize it. This is because the shape of the character you know as A has been changed. Whenever A is placed on the screen, the new shape is used. Now for the best part: If you change the shape of A again, you will see every character A on the screen change to the new shape at the same time. Because of this effect, we are able to change large parts of the screen in a very short time.

After you have watched the screen wriggle around for awhile, press [ENTER] to advance to the next screen—which is just like the previous one except that the characters are placed at random, with no predetermined order. After each screen begins to change, you can press [ENTER] at any time to restart a new screen.

The TI-99/4A home computer is capable of taking you into a graphics wonderland. With only a few basic principles and a little imagination, you'll be able to create your own dazzling displays. Experiment with the program below by changing the patterns used for the graphics characters. Discover the magic that is literally at your fingertips, and have fun.

HCM

For your key-in listing see HCM PROGRAM LISTINGS Contents.

**Worm Wood (TI-99/4A BASIC)
 Explanation of the Program**

Line Nos.	Explanation
100-190	Program header.
200-240	Set up the WORM\$() array which contains the graphics shapes.
250-270	Assign graphics patterns to characters.
280-340	Paint the first screen of graphics—symmetrical pattern.
350-400	Constantly change the shapes of the characters—scan keyboard to exit.
410-450	Paint second screen of characters—random patterns.
460-470	Graphics shape data.

Kors-Elf

by Shawn Blevins
and the HCM Staff

Work a little magic with the keyboard as you try to free the Kors-Elfs from the evil Overlord by waking up the letters.

Hail to you, mighty hero of the Kors-Elfs! Only you can save us—and our fallen friends, the Letters—from the spell of the evil Overlord! Our fate is placed in your nimble fingers as you attempt to end the Overlord's domination of our people.

Hordes of letters with glazed alphabet eyes suddenly advance single-file upon you. They've been drained of their will to spell because the evil Overlord has broken their syntactic order. As defender of the elfen race, you must act quickly, or else the wicked prince of letter darkness will ex-spell all words—and eventually elfs—from the land of Kor.

You are the new leader of the Kor-Elfs (not Kors-Elves, this is before the modern plural of the word *elf*), a race of creatures in a fantasy land whose survival is threatened by the cruel Overlord of Kor. He rules this land from his castle with the aid of a mystic sword. With this sword, the Overlord has hypnotized and enslaved the long-time friends of the Kors-Elfs, the Letters, and now uses them as guards in his castle. His dispatchers stand ready to release the Letters to attack anyone who invades the castle.

Break the Spell

You have only one weapon—a spell you learned from another race of small, blue creatures (to remain unnamed) many years ago. This spell will awaken the Letters and send them to another world from which you can bring them back once your mission is accomplished. As you might have guessed by now, that mission entails entering the castle, fighting the Letters all the way, in order to steal the mystic sword. Once the sword is stolen, you can use its powers to defeat the Overlord, thereby freeing the Letters and saving your people.

You can stop this character assault if you can type, even if you're a "hunt-n-peck" keyboard whiz. When you correctly type the randomly-displayed Letters that march two-by-two across the screen toward you, you can accomplish your worthy task—awaken the letters from their trance and gain entrance to the inner chamber where the mystic sword is hidden. You, the

Kors-Elf, advance from the right side of the screen; and the letters (coming in pairs) advance from the left side. As you get closer to the entrance of the castle, the letters have less distance to travel—which makes it more difficult to type them before they make contact with you. But beware: if you are not fast enough at typing the right letter before it touches you, it will zap you, and you will have to start all over again.

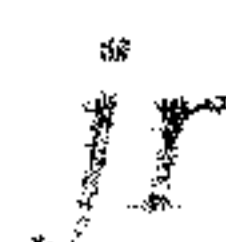
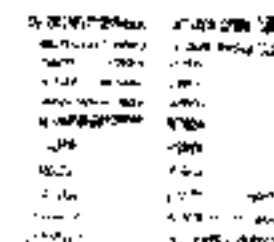
An Eight-Fingered Success Story

Kors-Elf is not just an adventure game, it is a true test of your keyboard mastery—an exciting typing tutor for young children and on the upper levels, a challenging keyboard drill for the experienced typist. There are three levels of difficulty: beginner, intermediate, and expert. On the beginner level, you have five chances to get past the letter guards and find the sword. The two upper levels allow you only three tries, and each one requires considerably more typing speed: the letters are cast upon the walkway more quickly, and typing them to squelch them is more difficult. Once you successfully get past the letter guards and steal the sword, you are given the option to continue on at the same level, or begin again and change the level of difficulty.

For your key-in listing see HCM PROGRAM LISTINGS Contents.



The Apple version uses a shape table to define the letters with the `DRAW` and `XDRAW` commands. The shape table numbers correspond to all the letters in the alphabet—A is 1, B is 2, etc. The ASCII of the keyboard code is translated into the number of the shape of the letter you enter by subtracting 64 from it. The `XDRAW` command is used to move the letters and the elf. To determine whether the elf and the letters are touching, the values of the variables (which determine the position of the elf and the letters) are compared. If they are the same, the elf is sent back; if not, he advances.



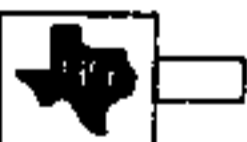
**"Kors-Elf is
not just an adventure game,
it is a true test
of your keyboard mastery—
an exciting typing tutor
for young children
and on the upper levels,
a challenging keyboard drill
for the experienced typist."**



In the Commodore version of *Kors-Elf*, the letters are placed on the screen with character graphics, and the elf is a sprite. The C-64 uses coincidence checking to determine whether the elf is touched by one of the advancing letters. This is done by checking the sprite-to-foreground collision register at memory location 53279 in line 370. If a blank is the only character in contact with the elf, the coincidence flag is not set and the elf continues advancing on the castle. But if the elf comes in contact with one of the letters, he is sent back to the beginning and the number of tries is incremented by 1. When the number of tries completed equals the number of tries for that level, then the game is over.



The IBM version of *Kors-Elf* uses three variables to keep track of the position of the elf and the letters. The variables refer to the screen location of the elf and the two letters that are attacking it. The program compares the location of the elf with the location of the letters to determine whether they are touching. It also checks the letter that you key-in to free the "zombied" letter. A 16-key buffer is cleared after each key press.



The TI version is written in BASIC and character graphics are used for the elf and the advancing letters. Each character used for the letters and the elf is a variable which is checked to determine whether the letter is touching the elf (both variables are the same). If they are, the elf is sent back; if they are not the same, the elf continues on his quest. Because of this, the motion of the letters and the elf will be a little jerky, but the action is still fun. Because there is no keyboard buffer, you have to hold down the key for the character that you want to wake up until you hear a beep. This will tend to make the program respond more slowly.

HCM

Kors-Elf (Apple II Family) Explanation of the Program.

Line Nos.	Explanation
100-210	Program header.
220-240	Protect hi-res.
250-260	Jump to initialization.
270-560	Main program loop.
570-660	Award sword screen.
670-760	End game; replay.
770-800	Graphic subroutines.
810-870	Music routines.
880-1130	Initialization subroutines.
1140-1360	Music and graphic data.
1370-1590	Setup subroutines.

Kors-Elf (C-64) Explanation of the Program.

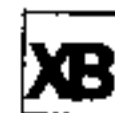
Line Nos.	Explanation
100-190	Program header.
200	Jump title screen and initialize.
210-430	Main control loop.
440-470	End of a round.
480-710	Player reached the sword.
720	Player is out of lives.
730-1170	Music routines.
1180-1690	Title screen and initialization.
1700-2080	Program data.
2090-2380	Screen-setup routine.
2390-2670	Program setup.
2680-2730	Set-and-clear-bits routine.

Kors-Elf (IBM PC, IBM PCjr) Explanation of the Program.

Line Nos.	Explanation
100-220	Program header.
230-290	Program sequence control.
300-420	Define graphics.
430-960	Display title screen. Get level.
970-1370	Display playing screen.
1380-1700	Routines for Wizard & Elf.
1710-1770	Update score.
1780-1800	Collision.
1810-1920	Initialization.
1930-2140	Release-letter routine.
2150-2270	Graphics subroutines.
2280-2740	End of game. Play again?
2750-2990	Sound-effects routines.

Kors-Elf (TI-99/4A) Explanation of the Program.

Line Nos.	Explanation
100-190	Program header.
200-240	Display title screen and initialize.
250-420	Main control loop.
430-490	End of a round.
500-610	Player reached the sword.
620	Player is out of lives.
630-740	Music routines.
750-770	Screen-setup routine.
780-930	Program data.



Kors-Elf requires TI Extended BASIC.



Personal Loan Calculator

in BASIC for the TI-99/4A

by H. W. Button
and the HCM Staff

Personal Loan Calculator originally appeared in Vol. 4, No. 5 for Apple, Commodore 64, IBM PC and PCjr, and TI-99/4A (Extended BASIC) systems. Here we present a BASIC version for 99/4A computer users with "bare bones" or minimal systems. This is a handy companion program to the *Savings* program published for the TI-99/4A in Vol. 2, No. 6. The two programs together form a comprehensive software package for everyday personal financial decisions. For additional information, please refer to these previous issues.

To the uninitiated, borrowing money can be an intimidating experience. But if you know how much you can afford to borrow by computing the amount and frequency of your payments—toward both the principal and interest—you can feel more confident when taking the loan plunge. And you can compute the relevant figures with our *Loan Calculator* program.

The main menu of the *Loan Calculator* contains 5 options, which may be selected in any order. They are:

1. Payment amount
2. Number of payments
3. Loan amount
(How much you can afford to borrow.)
4. Amortization Schedule
5. Exit the program

Two questions are initially asked of you in options 1, 2, or 3: the first inquires whether your payments will be made monthly or annually, and the second asks whether the length of the loan period is expressed in months or years. Input from options 1 and 2 will help determine how often interest is compounded. According to the amount of principal still owed on a loan and the way the interest is compounded, the amount of interest due for each payment will change.

Option 1 also asks for your:

- Interest rate?
- Months (years) of loan?
- Amount of Loan?

Option 2 requests your:

- Interest rate?
- Monthly (annual) payment?
- Amount of loan?

Here the program will test to make sure that the payment amount you indicated in option 2 is higher than the interest generated during each payment period. If it is not, you will receive an error message and be returned to the main menu.

Answering any of the questions in option 3 will generate a report consisting of the following information—the data that you have already entered, and the data you wish to know:

- Interest rate
- Compounded (monthly or annually)

- Loan Amount
- Payment Amount
- Number of payments
- Term of the loan
- Total interest
- Total cost (principal + interest)

Option 4, Amortization Schedule, provides your monthly and final payment amounts and your payment schedule after you enter data for the following:

- Loan amount?
- Number of monthly payments?
- Interest rate?

You will be prompted to enter the starting and ending payments that you want included in the report, which will display:

- Payment #
- Interest for this payment
- Principal for this payment
- Loan balance for this payment

When you finish scrolling through the report, the program will return you to the main menu. Pressing (ENTER) when you finish any of the main options will also return you to the main menu.

This *Loan Calculator* program is a handy, flexible tool for anyone who is either considering or already paying off a loan. If you are in one of these positions, this program is "just what the banker ordered." **HCM**

For your key-in listings see HCM PROGRAM LISTINGS Contents.

Loan Calculator (TI-99/4A BASIC) Explanation of the Program

Line Nos.	Explanation
100-190	Program headers.
200-330	Initialize program and display title screen.
340-440	Input term and expression of loan payments.
450-760	Solve for the amount of the payment.
770-1090	Solve for how much you can borrow.
1100-1500	Solve for number of payments.
1510-1700	Calculate and display report screen.
1710	Halt program.
1720-2160	Routine to calculate and display amortization schedule.

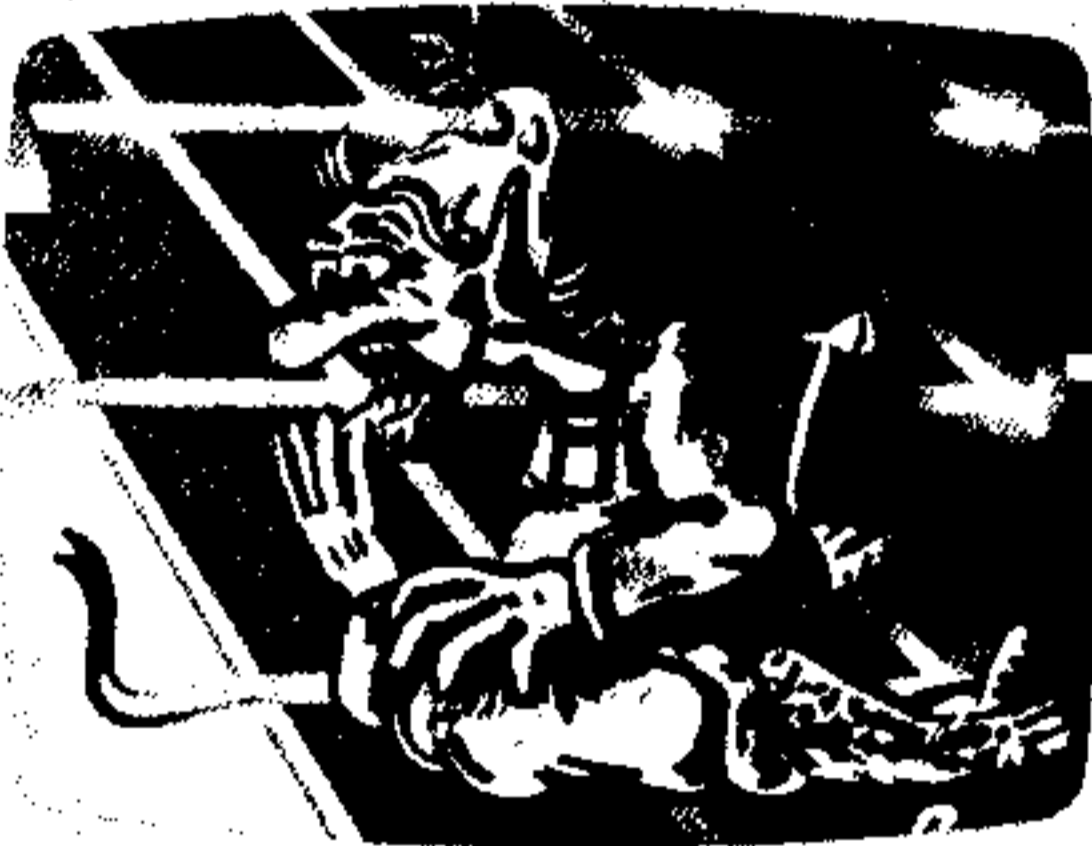
HCM Review Criteria

Each month, *Home Computer Magazine (HCM)* reviews products designed for the Apple II Family, Commodore 64 and VIC-20, IBM PC and PCjr, and Texas Instruments 99/4A computers. *HCM* reviews take a detailed look at the quality, utility, and value of commercially available packages for these machines. Because our publishing charter forbids accepting outside advertising, we strive to make the scope and content of our review pages shine with a unique blend of humanistic frankness and objectivity.

Not only will you find all relevant information for making a wise purchase decision, but in some special cases we also provide nuggets of compu-prestidigitation.* For example, we frequently include essential documentation not furnished by the manufacturer. Additionally, each issue of *HCM* tries to review at least one outstanding product—a "Diamond in the Rough"—which, because of company size, marketing clout, or for some other reason, has not received the attention it deserves.

At the beginning of each review, a review-at-a-glance box provides the user with an instant assessment of the product. Each item will be evaluated, where relevant, with the criteria below.

HCM Review



Name: Old Art
Program Type: Recycled Graphics
Machine: Apple II Family, C-64 & VIC-20, IBM PC & PCjr, TI-99/4A

Distributor: Hit 'n' RUN Software, Inc.
Price: \$99.99 (or trade for '72 Pinto)

System Requirements:
 Disk Drive, Joystick, Trash Can optional

Performance:
Engrossment:
Documentation:

*** Performance—**

How well the product performs as intended, how well it takes advantage of a specific machine's capabilities, how well it responds to the user's commands, how effectively the graphics, sound effects, music, or speech are integrated with the software.

*** Engrossment—**

Whether the game or activity has that intangible quality that holds players on the edge of their seats while the hours tick by unnoticed.

OR

*** Ease of Use—**

The degree to which a user can interact with the product without outside help; the ease and effectiveness of error-handling features; whether the actual reading level of the activity is appropriate for the suggested audience.

OR

*** Ease of Set-up—**

How well the product design facilitates easy installation.

*** Documentation—**

The quality of the printed matter that comes with the product; whether the instructions are clear and comprehensive; whether the machine configuration requirements are spelled out. Information such as how to load a program, use the keyboard, and restart an activity contributes to the documentation rating, as do tips on performance peculiarities.

Products may also be evaluated in the following areas:

*** Flexibility—**

Can the product be adapted to the specific needs of the users?

*** Cost/Benefit—**

Is the product worth the user's investment in time and money?

*** Necessity—**

Is the product a solution for which a problem already exists?

*** Originality—**

Is it unique in concept, or simply a "me too" product?

*** Longevity—**

The "Boredom Factor." Does the program sustain interest?

*** Rewards—**

Are the audio-visual rewards motivating and appropriate?

*** Concept Presentation—**

Are the concepts presented clearly, logically, and in depth?

*** Special Effects—**

How does quality of sound and visual effects rate? Do they enhance or detract from the product or learning process?

Attention Software Authors & Peripheral Inventors:

* WANT TO BE DISCOVERED? *

Home Computer Magazine Wants To Give You A Chance!

We are looking for home computer products that have not received the attention they deserve. Each month, we will be singling out one such package for special review. If you have a unique commercial product of exceptional quality—but your advertising and promotion budget has

not allowed you to capture major media attention—we want to see it. We will consider reviewing any product that meets our high standards.

We are an Equal Opportunity Reviewer!

In order to qualify for possible review, your product must:

1. Currently be available for purchase to readers of this magazine.
2. Make a unique and important contribution to the home computer industry.
3. Be of outstanding merit, quality, and value.
4. Be consistent with the type of machines and products we normally cover.

If you feel that your product qualifies, mail it to:

Home Computer Magazine
 Attn: Editorial Submissions
 1500 Valley River Drive, Suite 250
 Eugene, OR. 97401

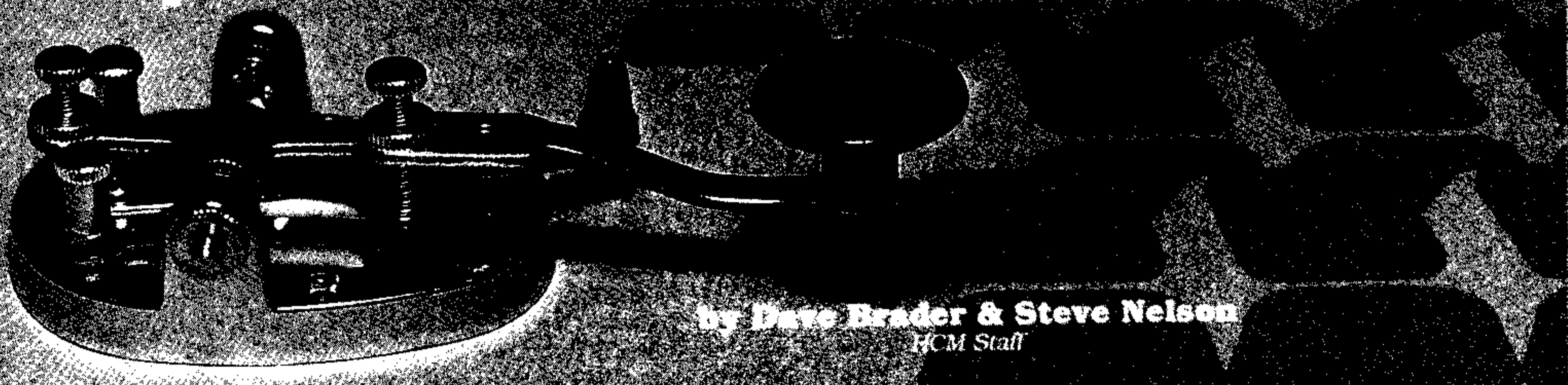
We reserve the right *not* to reply to each inquiry, so please do *not* contact us except to request return of your product. If you want your product to be returned, please include sufficient return postage.

***Compu-prestidigitation**

(kóm•pū•prēs•teh•dī•jeh•tā•shŭn) —n 1. The magical quality of unexpected comprehension that results from presenting technical information about computers in a lively, entertaining, visually attractive and easy-to-understand format. 2. The magical tricks that make a computer sing, dance, and do all sorts of wonderfully useful things.



Computer Links to Amateur Radio



by Dave Brader & Steve Nelson
HCM Staff

Out with the old and in with the new. Computer/ham radio links offer exciting possibilities in data transfer and communication.

A Dash Of History

Amateur radio operators have been around since Marconi discovered the wireless. As radio grew, hundreds of private citizens began experimenting with sending messages. These early amateur radio operators (affectionately referred to as hams) first started sending messages locally, but as they experimented, they were soon able to send and receive messages at greater distances. At first, operators had to relay messages in order to send them over large distances because the range of the early short-wave radios was limited.

By 1914, when a man named Hiram Maxim founded the American Radio Relay League (ARRL), amateur radio had grown into a popular hobby. The purpose of the ARRL was to unify and organize amateur radio operators and regulate the distribution of the airwaves. But, in 1917, the United States went to war. Most of the amateur radio operators served in the armed forces, and the ones that didn't were out of luck because the government soon banned amateur radio on the airways.

When World War I ended, the ban on amateur radio continued until the ARRL convinced the government to drop it in 1919. After the war, the ranks of the amateurs swelled, and the distances that messages were transmitted increased. By 1924, amateur radio operators were sending and receiving messages across the Atlantic and around the world. Ham radio operators even have their own satellite—OSCAR for "Orbital Satellite Carrying Amateur Radio."

There are now more than 250,000 amateur radio operators in the United States, and many more around the world. These hobbyists perform valuable services in times of disaster or national emergency, working hand in hand with the authorities to keep vital communication lines open.

Although computer hobbyists didn't really increase to significant numbers until about ten years ago, private use of two-way radio communications has been around since before 1914, when the American Radio Relay League was first formed by Hiram Maxim. Radio hobbyists, as some of you may know, are called amateur radio operators (or hams) and must be licensed by the Federal Communications Commission to transmit in this country, and by other government agencies to transmit in foreign countries. To obtain an amateur radio license, each one has had to pass exhaustive technical tests, and demonstrate proficiency in Morse code. Currently, there are just under a million amateur radio operators world-wide.

"With this new equipment connecting the computer to the amateur radio station, the old brass Morse code key is truly obsolete."

The Old and the New

Modern electronic technology in the United States and elsewhere has been boosted over the years by these amateur tinkerers. Ham radio enthusiasts, like computer hackers, are always fiddling with their equipment, trying new things—inventing, innovating and patching new gadgets into their systems.

An interesting combination of these two stable forms of electronic technology is now taking place. This new combination (home computers and amateur radio) is opening the doors to a new frontier—that of instantaneous, world-wide, low-cost computer networking. This union is made possible by a radio transceiver-to-computer terminal which, with appropriate software, allows you to turn your CW station into a completely "CW/RTTY/ASCII" station.

Continued

Morse Code

One of the original ways of communicating using amateur radio was, and still is, via a single tone that is interrupted at different rates to produce Morse code (named after Samuel Morse). This code was originally transmitted using a device called a Morse code key, which allowed the operator to tap out the signal through the transmitter. But with this new equipment connecting the computer to the amateur radio station, the old brass Morse code key is truly obsolete. Now, instead of tapping out the code, the operator merely types the words on the computer keyboard. The computer then generates the Morse code for each of the characters typed and sends it to the transmitter for broadcast via Continuous Wave transmission (CW). Other radio operators can then receive this signal, and either convert it by ear or—if they are equipped with another computer/radio link—use their equipment to translate the Morse code to text on screen. This method of using the computer/radio is probably most interesting to the amateur radio operators themselves. Computer hobbyists may be more interested in just getting information from point A to point B without any errors.

Combining a computer with amateur radio in such a way could mean that hearing-impaired hobbyists will now be able to "get on the air," because they will be able to see the transmitted words on their computer screen. In some cases, this text can be saved to cassette or disk—depending on the configuration—and even printed out on a printer that is connected to the system.

Low-Cost Data Transmission

Error-free transmission of computer-generated signals is another unique area in the computer/ham connection. While experimenting with their computers, amateur radio operators have devised various methods of transmitting information during poor broadcasting conditions so that an error-free message is received on the other end. Obviously this is important if you are trying to send someone a computer program. (Have you ever tried to run a program that had a crucial comma out of place?) One of these methods of transmission is entitled AMTOR (Amateur Teleprinting Over Radio), which is a microprocessor-controlled, error-correcting data communications protocol. Another method is "packet" radio, where data is transmitted using ASCII or baudot codes on a point-to-point basis, similar to a telephone modem. The transmission is broken into pieces called packets, which are checked for errors by the computer.

If you want to experiment with ham data transmission, there is one possibility we have not yet mentioned: phone patching. Those of you who already "network" over the telephone lines probably pay the price in higher phone bills. But a connection can be made from your computer over a modem to a ham transceiver with just a local call. Then, whatever you send to this local ham can be transmitted to a distant ham station and—through another phone patch—relayed to another computer in your network, thus saving you a long distance phone call.

Electronic Mail

Imagine, if you will, sitting down at your "rig," typing in a letter on your computer, giving a couple of com-

mands, and in a few moments receiving acknowledgement of your letter's receipt from the other side of the world. What we are imagining is not yet taking place on a minute-to-minute basis—perhaps at this time only once or twice a week. But messages are flying around in text form in the airwaves over shorter distances—say across the United States—many hundreds of times per day. So, you might ask, what is the application to me? With just one willing ham operator, your club now becomes a node in this potential network of clubs across the country—even the world. With preset operation of your club's computer radio station you will be able to communicate and pass messages, club newsletters, or programs that are in the public domain, all for just the cost of the amateur radio operator's time, the electrical power, and the initial cost of some special hardware and software to link the computer to the amateur radio transmitter/receiver. Just as with "land line" communication networks, your computer can be left on in the receive mode while you are away, and as other computer/radio systems transmit to your station, it will receive and record automatically.

To help get you started in your own club, or if you are an amateur radio operator and a computer hobbyist, we have included a chart that shows a few of the hardware "computer link" packages available for all of the computers that we cover in *Home Computer Magazine*—along with a summary of their capabilities and the costs involved. Bear in mind, of course, that the cost of the radio equipment is not in-

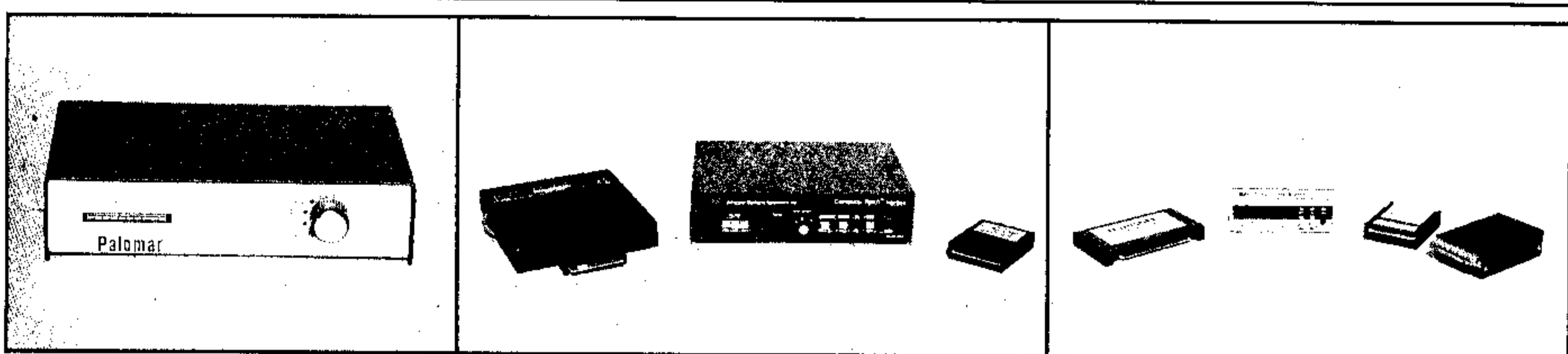
cluded in this chart. Also be aware that before this equipment can be used to transmit information on the air, either you, a member of your club, or a willing friend must be an amateur operator duly licensed by the Federal Communications Commission (in the United States). Please note that a license is not required to receive information from amateur radio airwaves. This means anyone can buy a shortwave receiver that covers the proper frequencies, one of the interfaces to the computer, and the supporting software and receive text right out of the air—without a modem, without a telephone.

What kind of text, you ask? How about the Reuter's News Service; or perhaps you'd like to receive the news coming out of Iran in print form. Radio Iran sends out radio teletype signals with their news, as does Great Britain, Russia, and many other foreign countries (wire services in the United States, such as the Associated Press, encode their signals because they charge their customers for receipt; therefore, amateur stations are not able to pick up the text and unscramble it).

The ARRL sends a news bulletin over the airways 3 times a day, Monday through Friday, reporting on FCC actions, ham-fests, satellite positions, and other information of general interest to amateur radio operators.

We feel this area of computer/amateur radio has a great deal of potential. Let's hear from those out there who have experience in this field. Send in some letters to the editor that we can share with the rest of our readers—or send us a review of one of these products for possible publication.

*"Imagine, if you will,
sitting down at your 'rig,'
typing in a letter on your computer,
giving a couple of commands,
and in a few moments receiving
acknowledgement of your
letter's receipt from the
other side of the world."*



The CI-103 Interface from Palomar. This unit works with the Kantronics Hamsoft and Hamtext software.

The CP-1 Interface, MAP-64/2 micropatch, and MBA-TOR C-64 from Advanced Electronics Applications.

The Interface, Hamtext C-64, and Hamsoft for the TI-99/4A and the VIC-20 from Kantronics.

A Partial List of the Available Hardware and Software Computer Links for your Amateur Radio

Advanced Electronic Applications

P.O. Box C-2160
Lynnwood, WA. 98036
(206) 775-7373

IBM/Computer Patch Interface

Requires RS232-2 option for CP-1, cost \$39.95. Requires RS232 cable to IBM serial port.

Hardware needed: The Advanced Electronics Applications model CP-1 computer interface priced at \$239.95.

Software needed: CP-1/IBM-PC by Hamcom, cost \$59.95.

Capabilities: Send/receive Morse code from any speed up to 100 words per minute; send/receive radio teletype, 60-100 words per minute; send/receive ASCII, 110-300 or any other baud rate allowed by PC-DOS.

Apple/Computer Patch Interface

Hardware needed: The Advanced Electronics Applications model CP-1 priced at \$239.95.

Software needed: CP-1/Apple-1, cost \$39.95.

Capabilities: Send/receive Morse code at variable words per minute; send/receive radio teletype at variable words per minute; send/receive ASCII at 110 and 300 baud.

VIC-20/Computer Patch Interface

Hardware needed: The Advanced Electronics Applications model CP-1 priced at \$239.95.

Software needed: MBA-TOR/20, cost \$119.95.

Capabilities: Send/receive Morse code up to 99 words per minute; send/receive radio teletype from 60-100 words per minute; send/receive AMTOR (Amateur Teleprinting Over Radio).

C-64/Computer Patch Interface

Software needed: MBA-TOR/64, cost \$119.95.

Capabilities: Send/receive Morse code up to 99 words per minute; send/receive radio teletype from 60-100 words per minute; send/receive AMTOR (Amateur Teleprinting Over Radio).

VIC-20/Micropatch MAP-20

Software is built in—no added cost.

Capabilities: As it turns out, this option is not available at this time.

C-64/Micropatch MAP-64

Hardware needed: The Advanced Electronics Applications model CP-1 priced at \$239.95.

Software needed: none—included with package. Additional cost—none.

Capabilities: Send/receive Morse code up to 99 words per minute; send/receive radio teletype from 60-100 words per minute; send/receive AMTOR (Amateur Teleprinting Over Radio).

Kantronics

1202 E. 23rd st.
Lawrence, Kansas 66044
(913) 842-7745

TI/Kantronics

Hardware needed: The Kantronics interface priced at \$269.95.

Software needed: The Hamsoft for the TI-99 from Kantronics priced at \$99.95.

Capabilities: Send/receive Morse code, 5-99 words per minute; send/receive radio teletype, 60-100 words per minute; send/receive ASCII, 110-300 baud; parallel printer interface accessible from TI BASIC.

C-64 Kantronics

Hardware needed: The Kantronics interface priced at \$269.95.

Software needed: The Hamtext for the C-64 priced at \$89.95.

Capabilities: Send/receive Morse code, 5-99 words per minute; send/receive radio teletype, 60-100 words per minute; send/receive ASCII, 110-300 baud; VIC serial printer compatibility.

VIC-20/Kantronics

Hardware needed: The Kantronics interface priced at \$269.95.

Software needed: VIC-20 priced at \$49.95.

Capabilities: Send/receive Morse code, 5-99 words per minute; send/receive radio teletype, 60-100 words per minute; send/receive ASCII, 110-300 baud; serial or parallel printer support.

Apple/Kantronics

Hardware needed: The Kantronics interface priced at \$269.95.

Software package needed: Hamsoft Apple (disk), priced at \$19.95.

Capabilities: Send/receive Morse code,

5-99 words per minute; send/receive radio teletype, 60-100 words per minute; send/receive ASCII, 110-300 baud; support for parallel printer.

Palomar

P.O. Box 1924-FW. Mission Rd.
Escondido, CA. 92025
(619) 747-3343

TI/Palomar

Hardware needed: The Palomar CI-103 priced at \$139.95.

Software needed: The Hamsoft for the TI-99 from Kantronics priced at \$99.95.

Capabilities: Send/receive Morse code, 5-99 words per minute; send/receive radio teletype, 60-100 words per minute; send/receive ASCII, 110-300 baud; parallel printer interface accessible from TI BASIC.

C-64/Palomar

Hardware needed: The Palomar CI-103 priced at \$139.95.

Software needed: Hamtext C-64, priced at \$89.95.

Capabilities: Send/receive Morse code, 5-99 words per minute; send/receive radio teletype, 60-100 words per minute; send/receive ASCII, 110-300 baud; VIC serial printer compatibility.

VIC-20/Palomar

Hardware needed: The Palomar CI-103 priced at \$139.95.

Software needed: Hamsoft VIC-20 priced at \$49.95.

Capabilities: Send/receive Morse code, 5-99 words per minute; send/receive radio teletype, 60-100 words per minute; send/receive ASCII, 110-300 baud; serial or parallel printer support.

Apple/Palomar

Hardware needed: The Palomar CI-103 priced at \$139.95.

Software package needed: Hamsoft Apple (disk), priced at \$29.95.

Capabilities: Send/receive Morse code, 5-99 words per minute; send/receive radio teletype, 60-100 words per minute; send/receive ASCII, 110-300 baud; support for parallel printer.

INDUSTRY WATCH

GAMES THAT BOTH ENTERTAIN AND EDUCATE – GUARANTEED

Officials at Springboard Software, Inc., a Minneapolis-based educational software company, are so concerned that many buyers of learning games are disappointed (because many games' educational value is questionable), that they are offering parents a unique, money-back guarantee. A refund of the full purchase price of one of its learning games will be given to any customer who feels that the software is not helping to improve the designated skills of a child using the product. The designated skills vary according to the individual game programs. To date, no consumers have returned a Springboard product under the guarantee.

LAP-SIZE IS NICE, BUT DOES IT HAVE A MARKET?

Texas Instruments has introduced a lap computer with a full 24-line flat screen that may provide some stiff competition for the Data General One, the first full-size flat-screen lap computer. TI's Pro-Lite is a 10-1/2 pound computer that fits in a briefcase, and comes with a single 3-1/2 inch floppy disk drive and 256K RAM, expandable to 720K. Selling for a cool \$2,995, the Pro-Lite supposedly does not suffer as badly from a dim, low-contrast screen display, which is characteristic of the 128K Data General One selling for \$2,895. The Pro-Lite can also exchange files with other TI Professional Computers and IBM PC products when an interface cable is connected. However, the success of either machine is anybody's guess. According to a Yankee Group survey, portability is at the bottom of the list of criteria of general computer buyers for judging personal computers.

EXPERT SYSTEMS ARE FINDING THEIR NICHES

Expert-system software is carving its way into more and more daily office applications, and may be quite the mass-market product for the home by the 1990's, predicts DM Data Inc., an Arizona research firm. Whereas conventional programs contain large data bases and allow the computer to retrieve whatever information the user wants to see, expert systems do the same and then draw conclusions from the information according to the same analytic methods specialists use. Expert systems are widely used in the medical field to analyze patient symptoms and then suggest possible diagnoses and treatments, and by bankers to assess risks in loans and policies. Home users may soon be able to get disks that, for example, advise them on how to fix household or car problems.

THE HOUSE KEY, THE CAR KEYS, AND THE COMPUTER KEY?

Software protection devices are taking a turn in two directions: booby traps, and hardware-based devices. Vault Corp. and Defendisk have reportedly offered (and later retracted—under pressure) software publishers the option to protect their products from being illicitly copied by putting booby-traps in their programs that could plant a "worm" in the unauthorized copier's disk operating system, or cause other havoc. Already the legalities of such a strategy are being decried and questioned, while other manufacturers in the industry say the traps could cause more problems than they're worth. Meanwhile, Lotus Development Corp. is taking another tack. They have developed an inexpensive box that plugs into some of the lines in a system's RS-232 port, accessible only with a key containing a protection code. This alternative does not "lock out" those who need to make legitimate backup copies.

IS ANOTHER TI HOME COMPUTER ON THE HORIZON?

Rumor has it that an East Coast third-party company is presently working on a new Texas Instruments-compatible computer that will be released sometime in the spring of 1985. The machine (supposedly a clone of the never-released TI-99/8 computer), is said to contain 64K RAM and 16K video RAM, and will sport the newer, 16-bit TMS9995 microprocessor. It is expected to be upwardly-compatible with existing TI software. The success of such a computer may depend on its price, its support, and the number of existing TI users that would opt for this higher-performance machine. The machine is expected to sell primarily to a residual user base already locked into a high investment in TI software and peripherals.

LISA LOSES TOP BILLING AS POWER MACHINE; NAME MIGHT CHANGE

No, the Lisa is not the most powerful computer Apple makes, according to Big Red's latest pitch to national accounts. This claim to fame is said to belong to Apple's new laser printer, which has 1.5 megabytes of RAM, 512K of ROM, and a 12-megahertz clock speed. It produces 7 pages per minute. Speaking of the Lisa, an Apple insider reports that it is not the "machine" that Apple plans to drop, but its "name." Lisa's third upgrade will supposedly unify Apple's 32-bit family, and rather than name this prima-donna Mac something like Lisa III, Apple will probably drop the "Lisa" name altogether.

IBM STRIKES OUT TO INCREASE BOTH DIRECT AND RETAIL SALES.

IBM retail dealers are receiving mixed signals from Big Blue. The November mailing of IBM's 36-page, personal-computer sales catalog to hundreds of thousands of IBM customers and others in an effort to increase direct sales is seen by many dealers to be "a direct assault on the retailer." However, prices in the catalog of hardware, software, and supplies were reportedly not aggressive enough to seriously damage retail sales. At the same time, IBM launched a multimillion dollar software inventory financing program that will provide each participating dealer with a kiosk of IBM-labeled software worth up to \$15,800. Most companies require dealers to finance their own software inventory, but IBM's dealers will not pay for the program's packages until they are sold. While helping dealers get their cash flow under control, the move may spell trouble for smaller software distributors vying for shelf space, who cannot afford to follow IBM's lead.




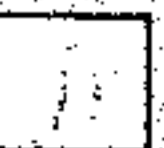

APPLE & IBM SWITCH TACTICS TO GAIN EACH OTHER'S MARKET

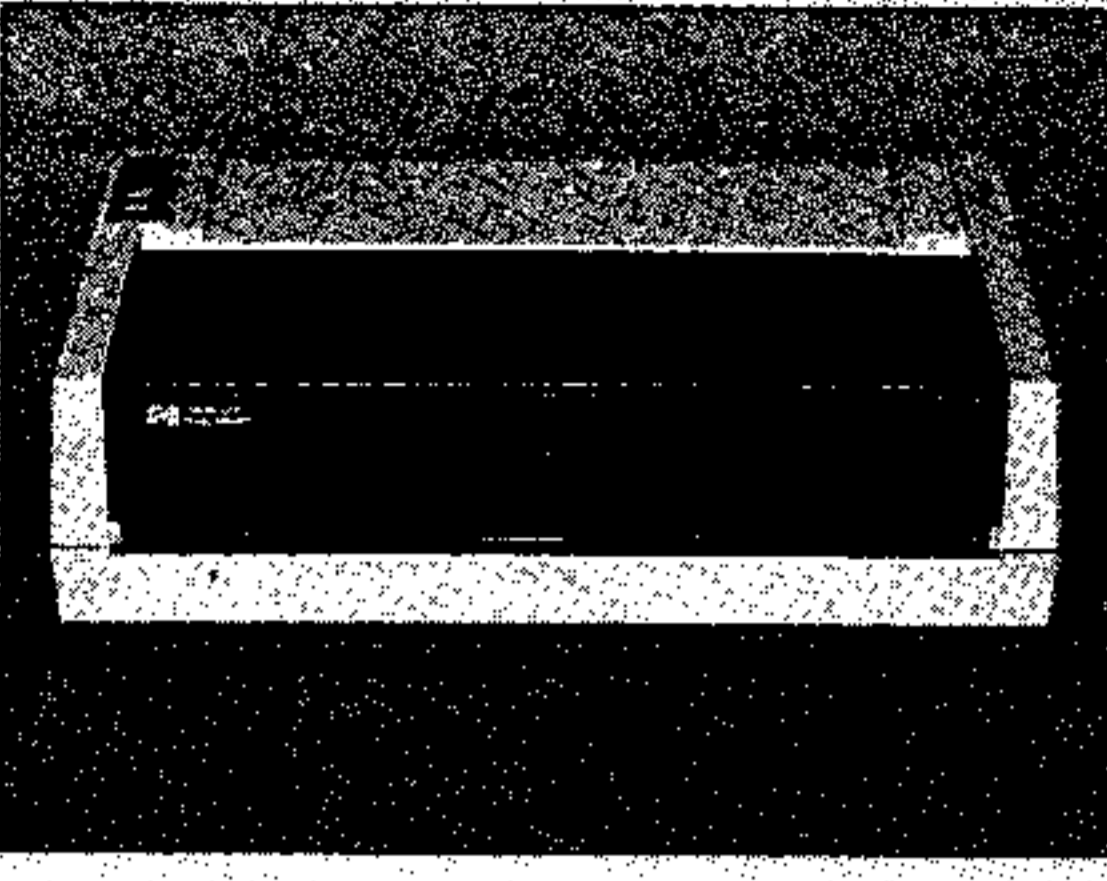
Not satisfied with the market segments they do own, the leaders of the business and home computer markets are now attempting to overtake each other's turf—and are sparing no expense to do it. Apple is using the 512K Macintosh to finally forge its way into the corporate market, and IBM has done exactly what it said it would always avoid—"mass merchandised" its PCjr. Apple is counting on the Fat Mac's easy-to-use environment and on Lotus Development Corp.'s Jazz integrated program to spur sales in the Fortune 2000 market. A low-cost networking product to be introduced by mid-1985 also figures into their plans. The company has reportedly allocated nearly \$200 million for its advertising efforts. IBM, on the other hand, is seeking to break Apple's stranglehold on the home and school market with its PCjr. IBM has spent \$40 million to advertise the PCjr during 1984, and has arranged a promotional coupon tie-in with marketing giant Procter & Gamble. This, coupled with its extensive price reductions and direct mail campaign for PCjr system/equipment packages, has sent the retail takeaway of the once-floundering PCjr soaring.

The HP Thinkjet Printer

A review by Steve Nelson
HCM Staff

HCM REVIEW



Name: Thinkjet
Product Type: Printer
Machines: TI-99/4A, IBM PC, PCjr, C-64, Apple II Family
Distributor: Hewlett Packard
 19420 Homestead Rd.
 Cupertino, CA 95014
Price: \$495
System Requirements: Centronics-compatible parallel interface

	Poor	Fair	Good	Excellent
Ease of Use:	████████████████████			
Ease of setup:	████████████████████			
Performance:	████████████████████			
Documentation:	████████████████████			

If you think the noise of a printer will drive your household crazy, the Thinkjet may be able to help—it's a peaceful dream come true.

One of the most annoying sounds to me is the noise of a line printer screeching across the page as it generates text. In the offices where I work, there are often 3 or 4 of these printers going at the same time. The din from all this can make even the toughest veteran of office work chuck it all and join the granola crowd living in a tepee in Northern California. If you feel the same way I do about noisy printers, you will undoubtedly appreciate Hewlett Packard's new offering—the *Thinkjet* printer.

The *Thinkjet* printer utilizes a disposable drop-in cartridge that incorporates both the print head and the ink supply. It is extremely easy to install and lasts for about 500 pages. Like a dot-matrix printer, the *Thinkjet* printer uses tiny dots to print a character. The difference between them is in the method used to transfer the ink to the paper. The *Thinkjet* printer actually squirts tiny drops of ink onto the paper from the print head. Since the head doesn't strike the paper, the only noise you hear is the sound of the print head sliding on the carriage. It's very quiet.

The print head is also much lighter than a conventional impact head, which makes the *Thinkjet* operate faster—it prints about 150 words per minute.

Special Features

The HP *Thinkjet* printer has 4 different print pitches: Normal (80 characters per line), Expanded (40 characters per line), Compressed (142 character per line), and Expanded-Compressed (71 characters per line), allowing you to have some flexibility in printing.

You also have two other special functions available: Underline, and Bold print. Both of these features can be used to affect a single word or entire lines with no loss of speed. You can even mix all of the modes together, printing an expanded, underlined, bold word for instance. Changing the print pitch or adding bold or underlines is a simple process.

The print head is set to print in both directions, but you can specify one direction if you wish—it gives you slightly better alignment between lines. You can also adjust the line spacing for either 8 lines per inch or 6 lines per inch.

"The graphics modes are fully programmable and work with most popular software packages."

Graphics

The *Thinkjet* printer uses a form of graphics called "dot image," where the paper consists of a grid of dot positions. Graphics data specifies which dot positions are printed and which are left blank. This printer has two graphics modes: Default (96 by 96 dots per inch) and High Density (192 by 96 dots per inch). The graphics modes are fully programmable and work with most popular software packages.

What impressed me the most about this printer—besides its quiet operation—is its friendly nature. It is very easy to set up, and print-head changes are fast—you don't get your fingers or the paper all covered with

ink. The mode-select switches are conveniently located on the back of the machine.

Loading the paper into the printer is easy, but setting the paper where you want it is a nuisance as there is no platen knob. You must use the line-feed button to position the print head at the top of the page.

Although the printer works best when using the special paper designed for it, it also works with any other computer paper, but the print quality is poor, and the print head clogs up—needing cleaning every few days. With the special paper, the print is crystal clear—almost letter quality. Unfortunately, this paper is much more expensive (\$50 for a box of 2500 sheets) than regular paper (averaging \$22 per box of 2500).

After using the *Thinkjet* printer for a few days, I really got to appreciate its small "footprint" on my typically cluttered desktop, and its ultra-quiet printing. The only real drawback I can see is its price: \$495. For that much money, there are several printers that will give you letter-quality output on regular paper and that provide more features than the *Thinkjet*. You'll have to decide whether the added expense of both paper and printer is worth the silent, compact advantage.

Personally, I don't see too many home users opting for this little trend-setting peripheral at its current price/performance ratio. Hewlett Packard will soon be shipping a new Unix-based portable computer that has the *Thinkjet* printer built-in. Being incorporated into this kind of "luggable" computer may ultimately prove to be *Thinkjet's* best application.

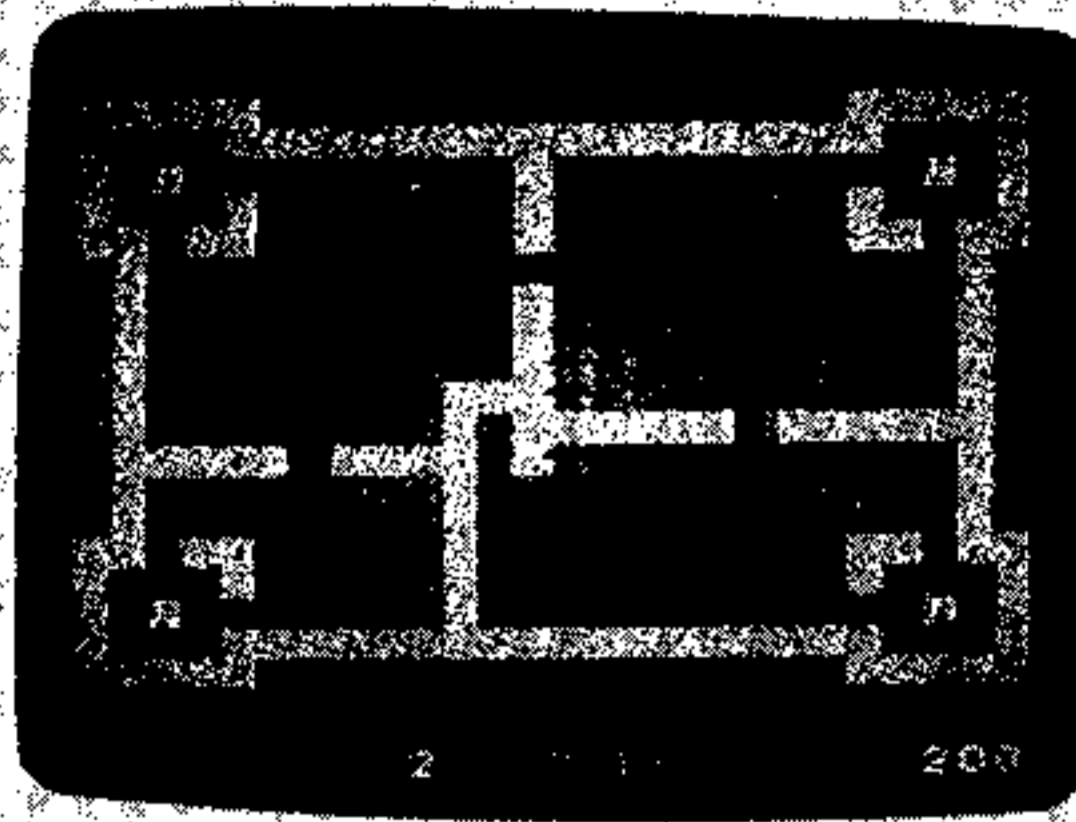
HCM

King of the Castle

A review by
Dana M. Campbell
HCM Staff

HCM Review

◆ Diamond-In-The-Rough



Name: King of the Castle
Program Type: Arcade game
Machine: TI-99/4A
Distributor: Cydex Software
P.O. Box 14471
Portland, OR 97214
Price: \$17.95
System Requirements: joystick; cassette recorder and Mini Memory; or disk drive, 32K memory, and Editor/Assembler or Extended BASIC cartridge.

Performance: Poor: Fair: Good: Excellent
Engrossment:
Documentation:

Vikings are rapidly taking over the castle . . . but all is not yet lost! The King has a few tricks up his sleeve—tricks borrowed from a star-studded Oriental cast.

Startled awake from the sound of horns blown by Viking invaders as they storm your castle, you, a Norman king, rush downstairs to defend what is left of your home. Unfortunately, your servants and guards confirm your long-standing suspicion that they are all spineless cowards who flee at the first sign of trouble. This leaves you there all alone to battle the army of intruders.

But you are no ordinary king of medieval times—facing the onslaught with only sword in hand. No, you wield some deadly Ninja throwing stars and land mines, weapons recently acquired in your travels through the Orient. What a lucky break . . .

Okay. So the premise of *King of the Castle* is a bit hokey. But that doesn't prevent it from being a good, entertaining, fast-moving game for the TI-99/4A. In fact, the first thing one notices about this game is its speed. The program is written in TMS9900 assembly language, which accounts for its speed of execution and keeps the action at a high level.

and outside (or back upstairs if you're already outside).

The floor plans hardly, if ever, change between the two floors or between the 8 difficulty levels—which is a shame. A little more variety and challenge might be added with the doorways and stairwells appearing in different places. While I'm at it, let me add that in general, the game's graphics are strictly geometric in shape, and the screen as a whole is pretty simple. It could use some dressing-up.

Shooting Stars

Your job is to run around setting land mines for the Vikings and felling them with stars, while avoiding running into them. Contact with Vikings (which look like little spiders) is not only unsavory, it will result in damage points being counted against the king, and the destruction of the Viking contacted. With each higher difficulty level, the attackers get quicker and smarter, using more direct routes to track down the king.

King of the Castle offers nothing

storm the upper floor is a waste of time, for only a couple will come up if you remain stationary. Ditto on the semi-crowded lower floor if you hide out in a corner and wait for them to approach you. These tricky Vikings prefer to cool their heels behind a nearby wall and wait for *you* to approach *them*.

Pursuing them is not always easy either. Often it is difficult to bring the king to a complete stop and move him through the doors or onto the stairs. This can be quite frustrating, especially when you try to get the king *facing* the right direction to fling a star, and he starts *moving* in that direction, walking right into his target!

The documentation for this game is quite brief, but complete. It just happens that everything you need in order to understand and set up the game—whether you're using cassette tape or a disk drive—can be stated on one sheet of paper.

The only suggestion I would make for this Diamond-in-the-Rough is to have it display the current difficulty level throughout the course of each game. With 8 levels and little variation between them, it's easy to forget which one you picked when you began your game. And if you play extra well or poorly, you'd want to know the game's level for later reference.

So, if you're a TI-99/4A user tired of the slowness of BASIC programs, pick up *King of the Castle*. It's a fast-playing game that puts up quite a challenge and will keep you engrossed for hours.

HCM

“These tricky Vikings prefer to cool their heels behind a nearby wall and wait for you to approach them.”

That action occurs on two floors of the castle—the second floor, where the king sleeps, and the main floor, where the Vikings first come in. Stairs in each of the 4 corners of the castle zap you from floor to floor, and a secret passageway takes you down

for those with lazy, passive strategies; you've got to work to earn any points, or even to make the game proceed. You must actively seek out the Viking warriors on the lower floor and chase them down. Hanging back on the first floor waiting for them to



LOGO Sailing

by Ted Barnicoat
and the HCM Staff

Turtles take to the water as they sail for the America's Cup.

My passion is sailing. Unfortunately, I live in Edmonton Canada, a prairie city not known for its sailing facilities. I have therefore developed this model of a yacht race to quiet some of my passion, and pass the long northern nights. Although it is not a typical computer game, it should give sailor and non-sailor alike a feeling of the excitement of last year's America's Cup series.

Let's Bring America's Cup Home

The United States has dominated the America's Cup since the race began in 1851. That is, until the summer of '83, when the Aussies took the trophy down under. Well, it's time to bring the America's Cup back to North America—preferably to Canada! You can't start practicing soon enough, and with your LOGO-equipped TI-99/4A and joysticks, *LOGO Sailing* can help.

This game is a model of a "match" race between two yachts, just like the America's Cup. It can be used to teach the principles of sailing before venturing out in a real yacht. It could also help as a tactics analyzer for experienced yacht racers. Or, it might just get the adrenaline going as you and your crew are waiting for the start of the sailing season. Good sailing mate!

The Principles of Sailing

The sort of yacht used in *LOGO Sailing* has one mast and two sails. The "jib" is the sail in front of the mast, and the "mainsail" is the larger one behind or "aft" of the mast. The mainsail is secured along the bottom to a wood or metal pole called the "boom," which swings back and forth allowing the yacht to make maximum use of the wind.

The "rudder" is a plate secured at the back of the yacht which controls the yacht's direction. The "tiller" is a lever attached to the top of the rudder which allows you to turn the yacht. The rudder moves in the opposite direction to the tiller. That is, if the tiller is pulled to the left, the yacht moves to the right. Also, sailboats do not react immediately, so you must hold the tiller in the proper direction for the turn until the yacht responds. In *LOGO Sailing*, you use the joysticks exactly the same way.

A yacht moves because its sails convert wind energy into a driving force that acts roughly at right angles to the sails. This is split into a forward force (F) and a sideways force (S). Because a yacht has an underwater fin called a "keel," any S motion is reduced and converted into F motion—a bit like squeezing an orange pip between your fingers. These forces move the yacht forward dependent on the speed and direction of the wind in relation to the direction the yacht is moving. If the wind is right behind you, there is lots of F and little or no S. If you are moving into the wind, there is more S, and this reduces the F.

The four primary ways that a yacht moves in relation to the wind are called "points of sail." They are:

1. **Head to Wind** - When you point the front (bow) of the yacht directly into wind, the sails flap, the boom bangs around dangerously, and the yacht moves backward because the sails are generating no forward force.

2. **Tack** - When you pull the tiller until the yacht moves away from "head to wind" and the sails begin to fill with the wind. This is called a "port tack" if you are going to the right but the wind is coming over the left (port) side of the yacht as you look towards the bow. It is a "starboard tack" if you are going to the left with the wind coming from the right, or starboard side of the yacht.

3. **Reach** - When the yacht is moving at 90 degrees to the wind you are "reaching." It is probably the fastest point of sailing. Again, there is a "port" and "starboard" reach.

4. **Run** - When the wind is behind you, your sails act like kites and pull you forward. At this stage, your yacht uses one of those big balloon-shaped sails called a spinnaker, which allows the yacht to "run" faster.

Racing in LOGO

Before you begin, you must not only key in the procedures, but also define the 25 shapes and 3 characters (tiles) according to the figures on the right. Use the **MAKESHAPE** and **MAKECHAR** commands to define these shapes. Once they are created, be sure to **SAVE ALL** and not just the procedures, so you won't have to do it again. [To save you from the somewhat-tedious task of entering the shapes, we'll include them in this issue's edition of ON DISK and ON TAPE—Ed.] Begin the program by typing **AMCUP** from the LOGO command screen. This game requires the use of joysticks for control of the yachts.

A typical yacht race is run round a triangular course (see Figure 1). Although winds change in real yacht racing, due to memory limitations we always have the wind coming from the north.

LOGO Sailing keeps track of both yachts' progress in the **CHK** procedure through the letters (A-J) designated on the map in Figure 1. Each yacht's status is displayed

in the upper-left corner of the screen. The first yacht to successfully complete the course (reach letter J) wins the race.

The yachts in this race are sprites, and while sprites "wrap" on the screen, yachts on real race courses don't. Thus, our rules prohibit going off the bottom or top of the screen—a yacht loses when it does so. Due to memory limitations, no such check is made for side-to-side wraps. The race is *always* between two yachts, and only because of this lack of checking can one person use the program alone. To practice the game alone, just set one yacht on a reach (moving horizontally across the screen) with one joystick, then practice racing with the other yacht.

If you have LOGO II, you have considerably more memory available to you. You might try enhancing the program to include the side-to-side check as well. The top-to-bottom check is made at the beginning of the **CHK** procedure, with the **:Y** and **:X** variable containing the respective row and column locations of the yacht. This enhancement would require you to add some method of anchoring one yacht so you could practice with the other. [Keep us informed of your enhancements in a "Letter to the Editor."—Ed.]

A Collision Ends the Race

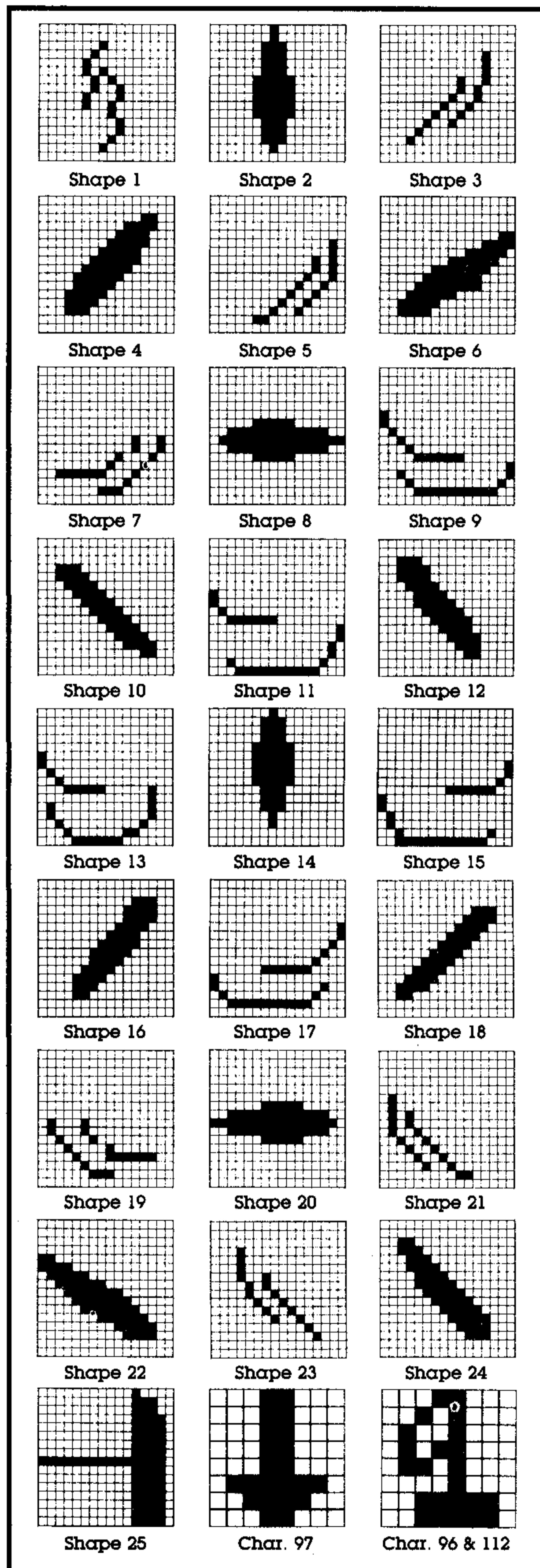
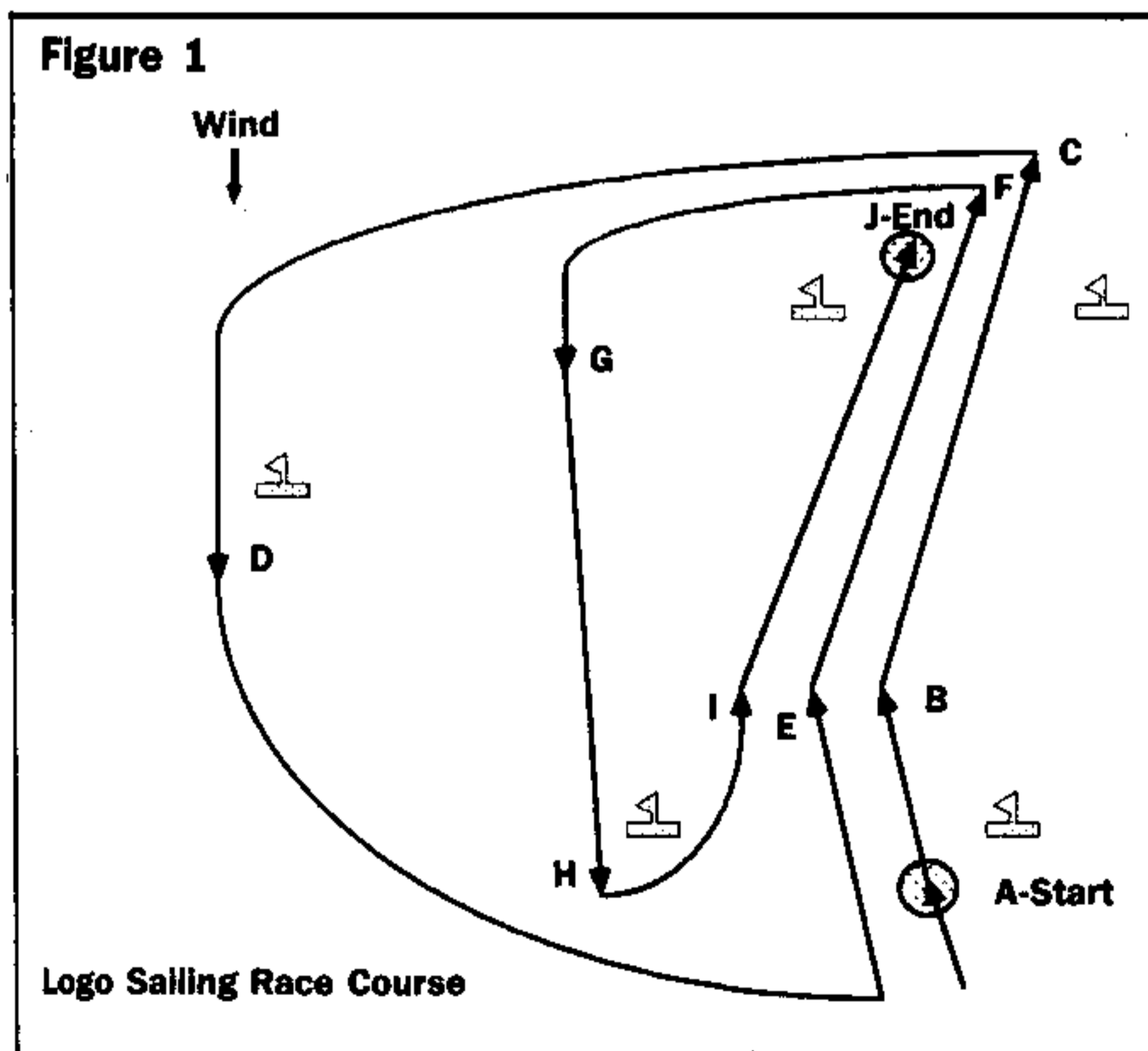
When the two yachts are on a collision course, the yacht that is traveling more "with the wind" has to yield to the other. If they both have the wind in the same relation to their yacht (i.e., the same "point of sail"), the one with the wind coming over its starboard bow has the right-of-way. For example, a yacht tacking northeast (we say it is on a starboard tack) has the right-of-way over one tacking northwest (on a port tack). If the yachts do collide, they sink, and the yacht with the right-of-way is awarded that race.

No part of your yacht, including the sail, is allowed to touch the mark. If you do, you must go back around that mark again without touching it.

Each race follows the same course and the America's Cup is awarded on the basis of the best 4 of 7 races. If, when asked whether you want to replay, you choose **N** (for No) the program is cleared with the **BYE** command.

We hope you enjoy LOGO Sailing, and don't forget to give your TI-99/4A credit when you bring the America's Cup back to North America in 1987. **HCM**

For your key-in listings see **HCM PROGRAM LISTINGS Contents**.





Speeding Up Extended BASIC

One of the complaints we frequently hear about programming on the TI-99/4A is the speed of the computer when running BASIC or Extended BASIC programs. Compared to other home computer BASICs available, the TI variety is fairly slow. A number of reasons account for this—too many to explain fully in this limited space. However, if you have Extended BASIC, there are some things you can do to improve your computer's execution speed. And, if you have the 32K Memory Expansion card, you can increase that speed even more.

The first method involves inserting a special code in your programs that will turn the "pre-scan" on or off. Each time you **RUN** a program on the 99/4A, the computer pre-scans it, setting aside room in memory for variable storage. This is why the computer seems to hesitate—sometimes at considerable length—before executing a program.

It is not necessary to scan a whole program, however, and a lot of time is wasted by doing so. By turning the pre-scan off and on at selected points, you can decrease the time it takes your program to start. Use a bit of caution here, though. All variables and subprograms must be pre-scanned before a program starts executing. The following lines will ensure that these items do come under pre-scan:

(Program starts in pre-scan mode)

```
100 VAR1 :: VAR2 :: SVAR2$ :: VAR3 :: VAR4 :: DIM A(100)
110 CALL CHAR :: CALL SOUND :: CALL HCHAR :: CALLVCHAR :: CALL KEY
120 !@P- (turn pre-scan off)
```

(place main program here)

```
750 !@P+ (turn pre-scan on)
CALL SPRITE :: CALL SUB1 :: CALL SUB2 :: !@P- (turn pre-scan off)
```

(place main program or sub-routines here)

In the example shown above, **SUB1** and **SUB2** are Extended BASIC subprograms. The codes to turn the pre-scan off and on are as follows:

!@P- Turns pre-scan off.
!@P+ Turns pre-scan on.

The second method requires that you have the 32K Memory Expansion card installed in your system. To increase overall execution speed, you can disable the automatic motion of unneeded sprites—which eats up processor time—so that your computer has more time to work on other tasks. Usually, the computer is constantly updating all 28 sprites—even when they are not being used. You can make the computer update fewer sprites, or disable them completely if your program doesn't need them. The following command will disable all of the sprites:

```
100 CALL INIT :: CALL LOAD(-31878.0)
```

By changing the second parameter in the **CALL LOAD** statement from 0 to 5, you would enable 5 sprites (#1 through #5), while still significantly increasing execution speed. Just change this parameter to enable the maximum number of sprites which your program needs to use.

—William K. Balthrop

Group Grapevine

News, information and upcoming events of home computer users groups around the world.

Looking to join a users group, exchange newsletters or software, increase your users group's membership or pep up your next meeting's agenda? For the latest users group news, put your ear to the Group Grapevine. And if you have a message to put out to other groups, if you are starting a new group, or have an interesting item to share, send a note or picture—or better yet, a group newsletter—to the Users Group Editor, Home Computer Magazine, 1500 Valley River Drive, Suite 250, Eugene, OR 97401, (503) 485-8796.



Bradenton, Florida now boasts its own TI-99/4A users group. The **Bradenton Users Group** is made up of over 30 members who are considering the possibility of forming a statewide users council and a billboard-type service. They have a library of tapes and disks and would very much like to correspond with other users groups in the Southeastern United States. Persons living outside the Bradenton area may join as a library club member for only \$5 per year, which entitles members to use of the library and to receive the monthly newsletter. Being a young group, they would appreciate any tips from "old-timers" to help them become a long-lived success. If you are interested in becoming a member of this group, contact: Louis J. Fabiano, 4515 26th Street West, Bradenton, FL 33507; (813) 755-6400.

Group Grapevine received a telephone call from Mickey Shortencarier, secretary/treasurer for the **Bernadillo Users Group (BUG)** in Albuquerque, New Mexico, informing us that this group (which has been in existence since June 1983) is finally taking off. Special Interest Groups (SIGs) are introduced on a demand basis and continue as long as there is an interest in that particular SIG. At present, Editor/Assembler and FORTH SIGs are offered, and the group hopes a SIG for children can be formed. A library consisting of more than 500 programs, and a newsletter, are offered to members. Membership is \$15 per year and the club meets the first Tuesday of each month. For more information, contact: Mickey Shortencarier, 9427 Osuna Place, NE, Albuquerque, NM 87111, (505) 292-3575.

Bonnie L. Snyder, secretary for the **Front Range 99'ers Computer Club** in Colorado Springs, Colorado, sent a letter to Group Grapevine with information on their one-year-old group. Would you believe that in only twelve months they have grown to 100 members? Their group library boasts over 250 programs for the use of these members, and they have their own TIBBS bulletin board which is run by Sysop John L. Williams. Besides their library and newsletter, they have many Special Interest Groups (SIGs) which meet on their own as offshoots of the club. Front Range 99'ers Computer Club would like very much to get in contact with other TI-99/4A users groups to exchange newsletters and programs. For more information, contact: Bonnie L. Snyder, 62 South Roosevelt Street, Colorado Springs, CO 80910.

Licking, Missouri is the home of the **Licking Users Group (LUG)**. A representative of this group called Group Grapevine to inform TI-99/4A readers of their existence. LUG produces a software catalog of the programs they have in their library, which consists of close to 300 programs in BASIC, Extended BASIC, and some Editor/Assembler languages. The cost of the catalog is \$1 and software can be purchased by members for \$3 per program and for \$4 by non-members (the group provides the cassette). If you are interested in joining this active club, they meet the first Monday of each month. Or, you can contact: LUG, P. O. Box 439, Licking, MO 65542-0439, (314) 674-3922.

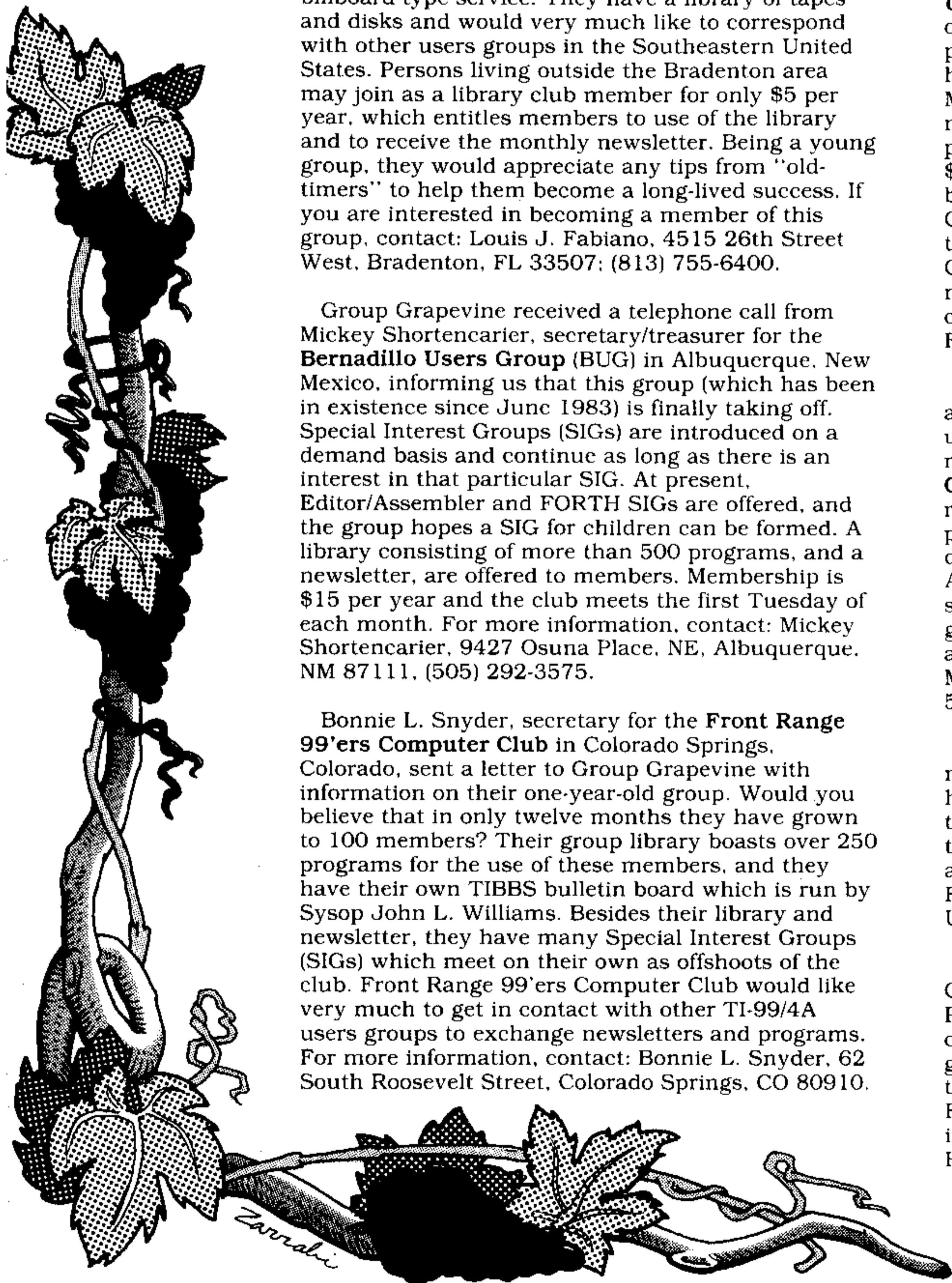


Secretary Debbie Johnston of the **Commodore Users Group of Pensacola** would like to "welcome one and all to the world of Commodore." The purpose of this group is to expand each member's horizons regarding their Commodore computers. Meetings are conducted the third Tuesday of each month in the Hygeia Coca Cola Bottling Company plant at 7 p.m. Dues are \$1 a month per person and \$1.50 a month per family. Members have numerous benefits, which include access to VIC-20 tapes and C-64 disks containing public-domain programs. Also, their library contains various books pertaining to the Commodore computer which are available to paid members. Anyone desiring further information can contact Debbie Johnston, P. O. Box 3533, Pensacola, FL 32516, (904) 455-5804.

Commodore users in the Morrisonville, New York area can now get together with fellow Commodore users on the fourth Thursday of every month at the meetings of the recently formed **Plattsburgh Commodore Users Group**. Demonstrations and reviews of software and hardware, tutorials on programming techniques, and informal open discussions are some of the features this club offers. A newsletter, a "disk of the month" of public-domain software, and a bulletin board are also offered by this group. Dues are \$12 per year. For information, anyone can feel free to contact Steve Nolan, 61 East Main Street, Morrisonville, NY 12952, (518) 563-5764.

Tri-County Commodore Users Group is the monicker the Commodore users in Ocala, Florida have chosen for their recently-formed club. According to President Don Vandeventer, the group has grown to more than 45 members in less than six months and now offers a newsletter, "Syntax," to members. For more information, write: Tri-County Commodore Users Group, P. O. Box 1151, Ocala, FL 32678.

Curtis Miller of the **Suncoast 64s** wrote to Group Grapevine with information regarding their group in Palm Harbor, Florida. Their public domain library contains over 1,000 programs on 34 disks and is growing rapidly. This is the group's second year, and they have members as far away as West Germany, France, Italy, and Belgium. For more information, get in touch with: Curtis Miller, 2419 US 19 North, Palm Harbor, FL 33563, (813) 785-1036.



Get Back to Your Roots

Record Your Ancestry

Roots II, a program that tracks family trees back as many as 99 generations, is now available for the IBM PC and PCjr from Comm-Soft. Information for more than 4000 individuals can be stored and rapidly recalled. Once a family's data has been entered, Roots II prints a family book (up to 999 pages long) containing 4 types of forms or

charts, biographical sketches, source documentation, and an alphabetized index of the book's contents. In addition, the program will store maps and pictures of people for display on a monitor. A 220-page manual covers program operation and instructions for starting a search for family roots. The package's price is \$99.

Comm-Soft
2452 Embarcadero Way
Palo Alto, CA 94303
(415) 493-2184



Do More Than Before With the C-64

Word Processing, Assembler, & Pascal

A word processor and two utility programs, all for the Commodore 64, compose some of the latest offerings from Abacus Software. Textomat-64 accommodates form letters, chaining of documents, block operations, and a complete printer setup. Horizontal scrolling allows for 80-column line width. Assembler/Monitor 64 assists with the development of machine language programs. The assembler

features a fast macro assembler, full screen editing of source programs, and a complete symbol table listing; the monitor has 15 other functions. Pascal-64 is a Pascal compiler and language development package with file-handling capabilities for sequential and relative data management. It also features multi-dimensional arrays, high resolution graphics, and sprites. All three products are priced at \$39.95 apiece.

Abacus Software
P.O. Box 7211
Grand Rapids, MI 49510
(616) 241-5510



Tennis, Anyone?

Tennis Simulation With the Pros

Gamestar, Inc. has introduced On-Court Tennis for the Commodore 64. It offers full racquet control over groundstroke angles and spins, serves, lobs, and smashes, and a choice of grass, clay, or hard courts. When playing against one of the computer's 4 superstar challengers, the computer's

play intelligence "floats" according to your skill. The real characteristics and playing style of each superstar are incorporated into the opponents. Beating the computer entitles you to join Gamestar's exclusive "Top Seeds" Tennis Club. On Court Tennis retails for \$31.95.

Gamestar, Inc.
1302 State St.
Santa Barbara, CA 93101
(805) 963-3487



Getting A Good Return

A Year-End Tax Planning Program

A way to compare the effects of financial decisions on taxes is available with the Tax Command Planner, a program by Practical Programs, Inc. for Commodore 64, Apple II Family, and IBM PC systems. Designed for end-of-year tax planning, the program lets the taxpayer quickly try up to 6 different strategies for periods of up to five years simultaneously. For example, it can assist with decisions on how to depreciate equipment, whether to sell stock, or make contributions at the lowest cost. Recalculations are automatically completed when an entry is changed or



added. Recently revised tax tables for 1984, including the new rules on income-averaging passed by Congress, have been incorporated into the program. Tax Command Planner for the C-64 is \$49.95, for the IBM PC \$99.95, and for the Apple II Family \$79.95.

Practical Programs, Inc.
P.O. Box 93104
Milwaukee, WI 53203
(414) 278-0829



Keyboard With the Works

A Keyboard/Trackball Peripheral

Wico Corp. has released its SmartBoard, a combination keyboard/trackball peripheral for IBM PC and Apple II, II+, and IIe computers. The SmartBoard is fully programmable, allocating 256 bytes to the 10 function keys according to need. The mouse-emulator trackball can be programmed with up to eight

characters in any of the 4 primary directions. It comes factory-programmed with both the QWERTY and DVORAK layouts. A type-ahead buffer and N-key rollover are standard, with a serial expansion port also provided. The SmartBoard retails for \$399.95, and an adapter for Apple owners is an additional \$50.

Wico Corp.
6400 West Gross Point Rd.
Niles, IL 60648
(312) 647-7500



A More Flexible Connection

TI Interconnect Turns Corner

The Peripheral Expansion Box Interconnect by Ten-X Precision is a new device that plugs into the TI-99/4A's I/O port or speech synthesizer and the existing cable, which then plugs in from behind the console. It is designed to alleviate the problems associated with

the expansion box's heavy cable and interface connection, preventing accidental disconnection of the system. The Ten-X Peripheral Expansion Box Interconnect is available for machines with or without the speech synthesizer for \$43.85.

Ten-X Precision
P.O. Box 163
Concord, CA 94522



HOME COMPUTER™

product news

Of Magic, Math, and Mayhem

Develop Math and Memory Skills

Math Magic, for ages 4 to 9, and Race The Clock, for ages 5 to 12, are two recent educational program releases from Mindplay. Math Magic is an arcade game that helps children develop counting, addition, and subtraction skills while knocking down walls to make monsters disappear. Race The Clock helps kids

sharpen their memory and thinking skills as they race to match pictures and words. Graphics are used to illustrate active verbs. Both programs can be customized by parents or teachers, and are available for \$39.99 each. They run on the IBM PC and PCjr as well as Apple II Family computers.

Methods & Solutions, Inc.
82 Montvale Ave.
Stoneham, MA 02180
(617) 438-5454



It's All In the Wrist

A New Joystick for the C-64 & 99/4A

Suncom has designed a new joystick for TI-99/4A and Commodore 64 computers. The TAC-3, which stands for Totally Accurate Controller includes three fire buttons: two buttons on the base, and one on top of the handle. The joystick has a two-year warranty, and costs \$14.95.

Suncom
260 Holbrook Dr.
Wheeling, IL 60090
(312) 459-8000



Make Your Home Your Castle

Design Your Own Home and Yard

Design Your Own Home is a new, three-package series of programs by Avant-Garde Publishing Corp. for Apple II Family computers. Architectural Design (\$99.95) offers 126 individual detail shapes that can be rotated and arranged in any way. The program calculates distances, diagonals, and angles, and lets the user construct floor plans, top views and side views of each creation. Interior Design (\$69.95) allows the user to move scaled down furniture around to discover where it will best fit, choose

multi-colored patterns for wallpaper or fabric designs, and look at arrangements from the top and side. Landscape Design (\$69.95) lets the user draw an outline of home and property lines, then arrange flowers, trees, and shrubs around the house or property. Young plants can be aged to preview how they will look when grown, and a "paintbrush" graphics utility allows more artistic expression. Also, north, south, east, and west perspectives are provided, as well as side and aerial views.

Avant-Garde Publishing Corp.
P.O. Box 30160
Eugene, OR 97403
(503) 345-3043



Wage An Historic Battle

Simulate The Ancient Art of War

The Ancient Art of War, Broderbund Software's new strategy game for the IBM PC and PCjr, contains 11 built-in war campaigns from history, each fought by barbarians, archers, and knights from the pre-gunpowder era. The program also features a game generator which allows users to design their own

battles—right down to the condition of the troops and the difficulty of the terrain. Action takes place in real time, and a zoom feature allows the user to see close-ups of battles and issue commands that the troops carry out in detailed animation showing individual soldiers. It retails for \$44.95.

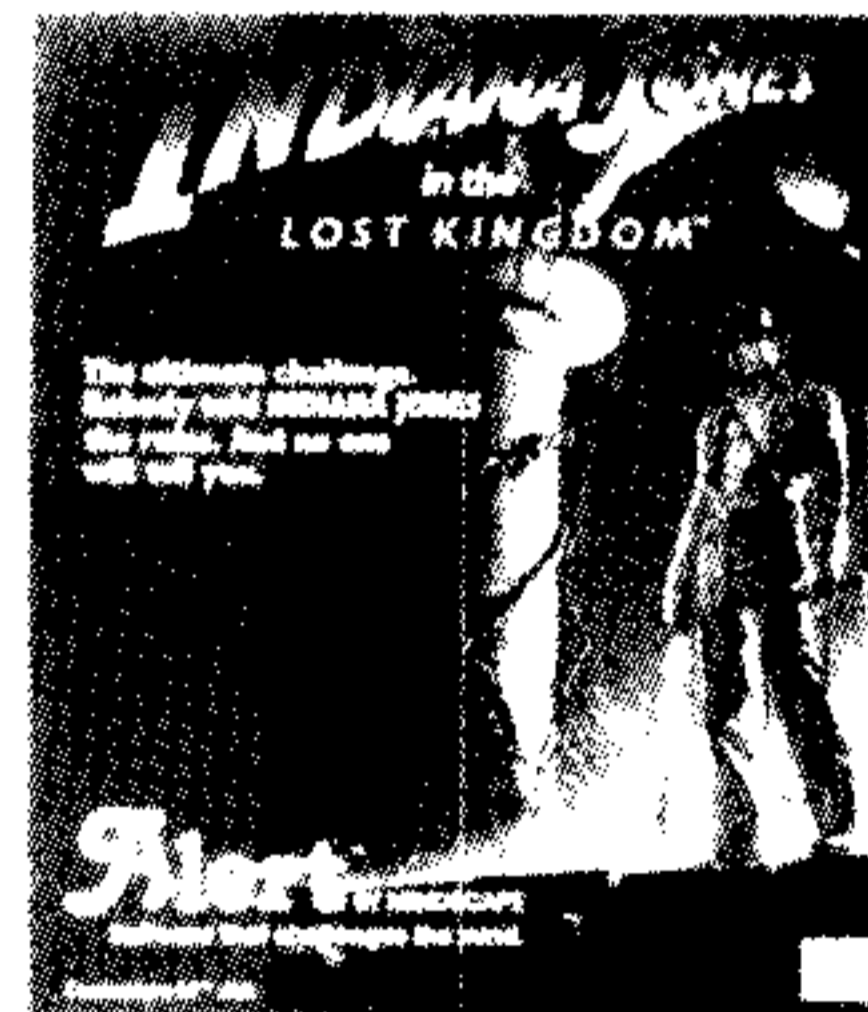
Broderbund Software
17 Paul Dr.
San Rafael, CA 94903-2101
(415) 479-1170



In Search of the Lost Rules

Indiana Jones Meets the Home Computer

Indiana Jones in the Lost Kingdom, developed by Mindscape Inc. in conjunction with Lucasfilm, Ltd., is a unique game for the Commodore 64—it has no rules. Players must first find out what the puzzle is and then solve it for each of six different rooms. The objective is to retrieve an artifact containing the complete history and knowledge of a lost, forgotten civilization. Frustrated players can consult the manual for encrypted clues or dial a telephone "hotline." The game retails for \$29.95.



Mindscape Inc.
3444 Dundee Rd.
Northbrook, IL 60062
(312) 480-7667



Do-It-Yourself Investment Planning

An Investment and Statistical Program

Programmed Press has announced that its Investment and Statistical Software package, containing 50 programs for statistical forecasting, stocks, bonds, options, futures, and foreign exchange, is ready for the Commodore 64. The software also supports Apple and IBM personal

computers. A 220-page Computer-Assisted Investment Handbook by Dr. Albert Bookbinder lists, explains, and gives sample RUN illustrations for all 50 of the BASIC programs. The Investment and Statistical Software package is priced at \$100, and the Handbook is \$19.95.

Programmed Press
2301 Baylis Ave.
Elmont, NY 11003
(516) 775-0933



HOME COMPUTER™

product news

An Assembly Language Guide

TI Programmers Get E/A & MM Help

Learning TI-99/4A Home Computer Assembly Language Programming by Ira McComic includes the basic concepts of assembly language programming and the structure of TI's existing programs. Information is also provided

about the Editor/Assembler Package, and the line-by-line assembler and debugger that are included in the Mini Memory module. Program examples accompany the guide's tutorial material. The book retails for \$16.95.

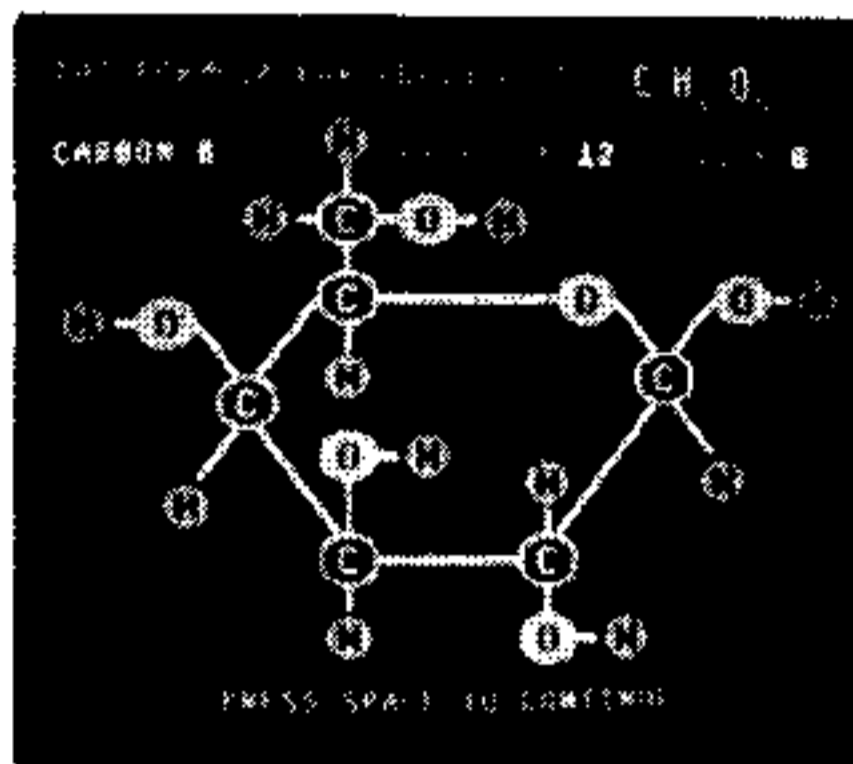
Wordware Publishing, Inc.
1104 Summit Ave. Suite 104
Plano, TX 75074
(214) 423-0090



Light Up Your Learning

Science Programs for the C-64

Tech Sketch, Inc. has introduced 3 new high-school level science-education programs for the Commodore 64. Each of the new titles is the first in a series planned for three subject areas: biology, chemistry, and the structure of matter. The first programs are Structure of Leaves, Molecules and Atoms, and Passive Transport, which explains how substances move through membranes. The new series



of programs is compatible with Tech Sketch's line of light pens.

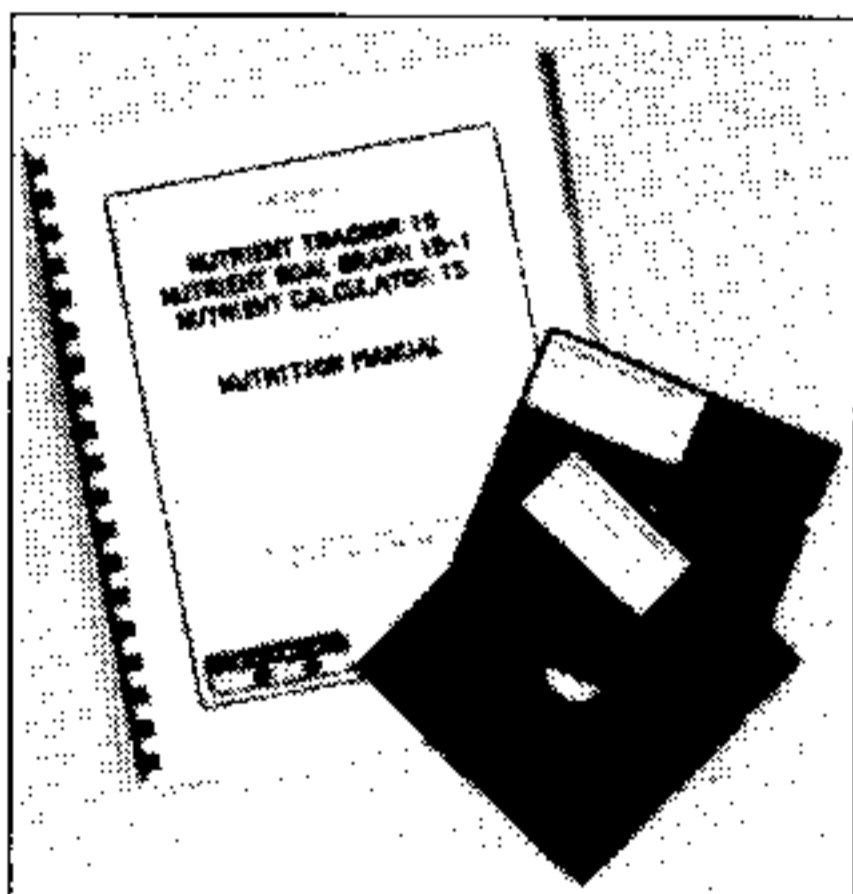
Tech Sketch, Inc.
26 Just Rd.
Fairfield, NJ. 07006



Home Nutritional Planning

Track Nutrients in the Foods You Eat

Three new packages designed to track 15 nutrients in more than 800 foods have been released by Nutritional Data Resources. Nutrient Goal Graph 15-1 analyzes 15 nutrients for one day of food intake and graphically compares them to the Recommended Dietary Allowance goals by sex, age, and weight. Nutrient Calculator 15 analyzes the nutritional content of recipes, menus, and daily food intake. Nutrient Tracker 15 allows the user to select 20 foods from the data base and provides an analysis of 15 nutrients in



each of those foods. The programs will run on the IBM PC and PCjr, and the Apple IIe with 80-column card. Prices range from \$40 to \$60 each.

Nutritional Data Resources
P.O. Box 540
Willoughby, OH 44094
(216) 951-6593



A Turtle Learning Guide

BASIC and Story Structure for Kids

Telly Turtle, a turtle graphics program based on the LOGO language, is one of two new educational programs from Hayden Software Company. Telly Turtle helps children as young as 4 understand BASIC programming through the use of icons and graphic creations. It is available for the Commodore 64 for \$29.95. Adventures in Colorland: Space Sagas was created to provide structure to story

writing for 6 to 10 year olds. Once a child chooses one of four stories, selects the main character, the space ship for travel, and the means to solve the proposed problem, the choices come to life, allowing the child to see how his or her choices affected the story. It is priced at \$29.95 for the Commodore 64, and will soon be available for the Apple II Family and the IBM PCjr.

Hayden Software Company, Inc.
600 Suffolk St.
Lowell, MA 01854
(617) 937-0200



Removing Language Barriers

International Characters Available

IsraComp has released four new programs for the Commodore 64. HebrewWriter II is a Hebrew word processor that prints and displays Hebrew from either the HebrewWriter's right-to-left environment or from user-written programs. Editing and storage is also possible, and the \$19.95 program will print on any C-64 dot matrix printer. Creatagraphics allows a user to create and store character sets (graphic, foreign alphabets,

etc.) and sprites. The Creatagraphics package includes Hebrew, Arabic, Greek, Russian, and Korean character sets, and will print in both directions. It sells for \$24.95. IsraQuiz and Maps & Facts require the user to identify geographical entities and answer randomly-generated questions regarding the geography and politics of Israel (in IsraQuiz), and the world (in Maps & Facts). Both IsraQuiz and Maps & Facts are \$9.95 apiece.

IsraComp
P.O. Box 1091
King of Prussia, PA 19406
(215) 386-0408



Professor Pixel Holds Class

Create Graphics and Sound Effects

Individual Software, Inc. has released Professor Pixel, a program that teaches users how to use the BASIC programming language to create their own graphics, melodies, and sound effects, and then bring it all to life with color

animation. Professor Pixel is menu-driven and uses non-technical dialogue and interactive exercises for all ages and ability levels. It runs on IBM PC and PCjr computers, and costs \$59.95.

Individual Software Inc.
1163-I Chess Dr.
Foster City, CA 94404
(415) 341-6116



Think In TinkTonk Land

Series Features Fantasy Characters

Mindscape, Inc. has released four new programs from their Tink! Tonk! series, which is part of their Sprout line of educational software for children ages 4 through 8. In Tink's Adventure, Tink leads children through a search for treasure as they learn the alphabet. Tonk In The Land Of Buddy-Bots consists of five games that help children develop concentration and critical thinking skills. By helping Tinka travel through TinkTonk Land in Tinka's Mazes, kids develop basic math concepts and solve addition problems. Tuk Goes To Town is an interactive story featuring five different games designed to teach



spelling, build vocabulary, and strengthen reading skills. These programs retail for \$39.95 each, and will run on Apple, IBM, and Commodore computers.

Mindscape, Inc.
3444 Dundee Rd.
Northbrook, IL. 60062



A Striking Offense

Realistic Air-Combat Simulation

Two new programs from MicroProse Software, F-15 Strike Eagle and MIG Alley Ace, simulate modern air combat from an electronic cockpit. F-15 Strike Eagle includes many of the real plane's flight weapons and information systems to use in 7 realistic missions. The Combat Environment has enemy aircraft, radar and infra-red guided missiles, air-to-air missiles, and ground targets. The F-15's defenses include electronic counter measures, after burners, flares, and surface-to-air missile launch indicators. MIG Alley Ace operates in three-dimensional airspace where the pilot must take into account airspeed, turn rates, gravity, and relative position in 3 axes, as well as make



tradeoff decisions on the proper time to attack, defend, or escape. Both programs run on the Commodore 64, with versions of F-15 Strike Eagle to be released soon for Apple and IBM PC and PCjr systems. Each retails for \$34.95.

MicroProse Software
10616 Beaver Dam Rd.
Hunt Valley, MD 21030
(301) 667-1151



Helping At Home

Data Base & Reading Aids for 99/4A

Four new programs for the TI-99/4A have been released by Navarone Industries, Inc. Data Base Management System for home and small businesses (\$69) keeps track of inventory, customer files, and even personalized form letters. Users can create data bases with up to 35 fields in 32,000 records. The System requires a disk drive. Homework Helper for children 8 years and older features a built-in 20,500 word spelling checker with its word processor. The \$49.95 program includes a standard format for book reports and class projects.

Navarone Industries, Inc.
510 Lawrence Expressway #800
Sunnyvale, CA 94086
(408) 866-8579

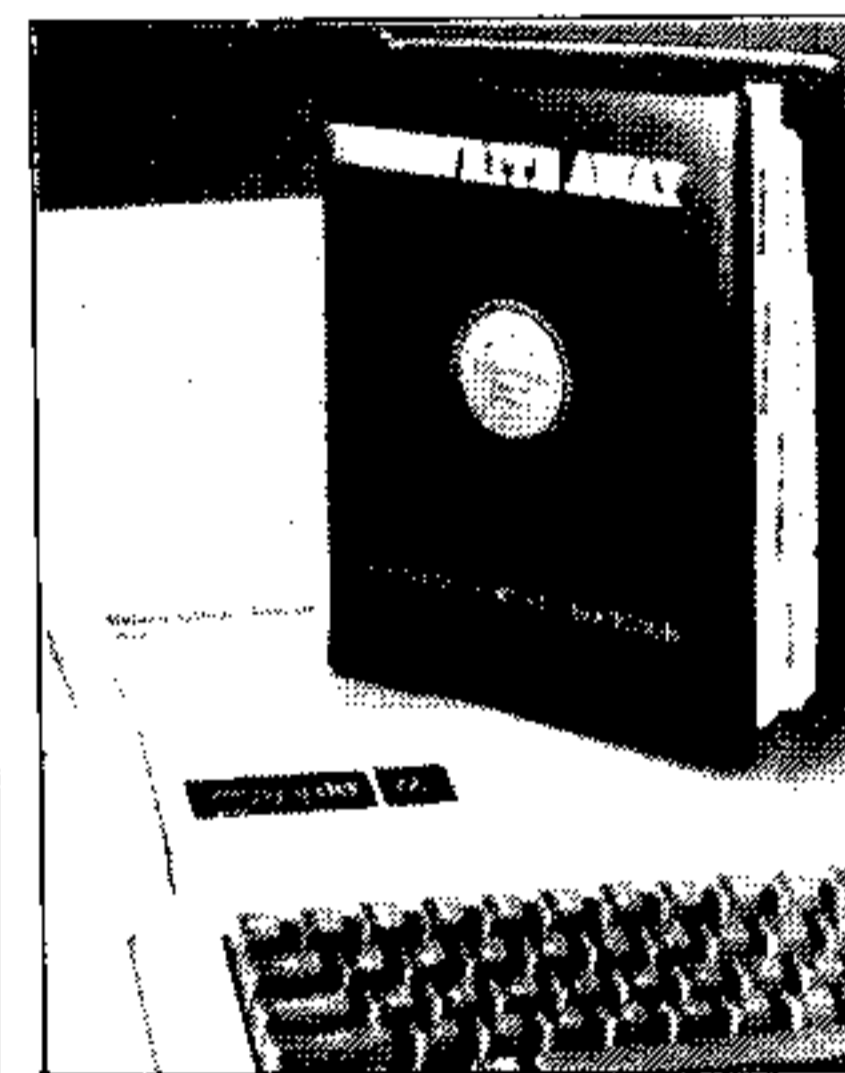


Homework Helper requires a disk drive. Speed Reading, complete with workbook, is designed to improve reading speed and comprehension in versions for both children and adults. Speed Reading is a cartridge, and needs no other equipment. It is \$49.95. The Console Writer cartridge (49.95) allows those without expanded memory and peripheral equipment to do word processing with just the console and a printer. It features a lower-case character set for easy reading, and a full-screen text editor.

It's In The Mail . . .

Electronic-Mail Word Processing

Write Away, Midwest Software Associates, Inc.'s word processing system for the Apple II Family of computers, has been enhanced to accommodate electronic mail. In addition to creating, editing, and printing documents, a user can now transmit them with Terminal, a terminal communications program that has been integrated into the Write Away system. It offers these functions: auto dial, auto answer, read file from disk, write file to disk, transmit file, capture file, full duplex, half duplex, and unattended operations. The Write Away system also includes form letter and mailing list



support; logical operators and conditional text features; data base file reading; block delete, move, or copy; and soft hyphenation. It is priced at \$175.

Midwest Software Associates, Inc.
1160 Appleseed Ln.
St. Louis, MO 63132
(314) 997-2369



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Vol. 5 No. 1

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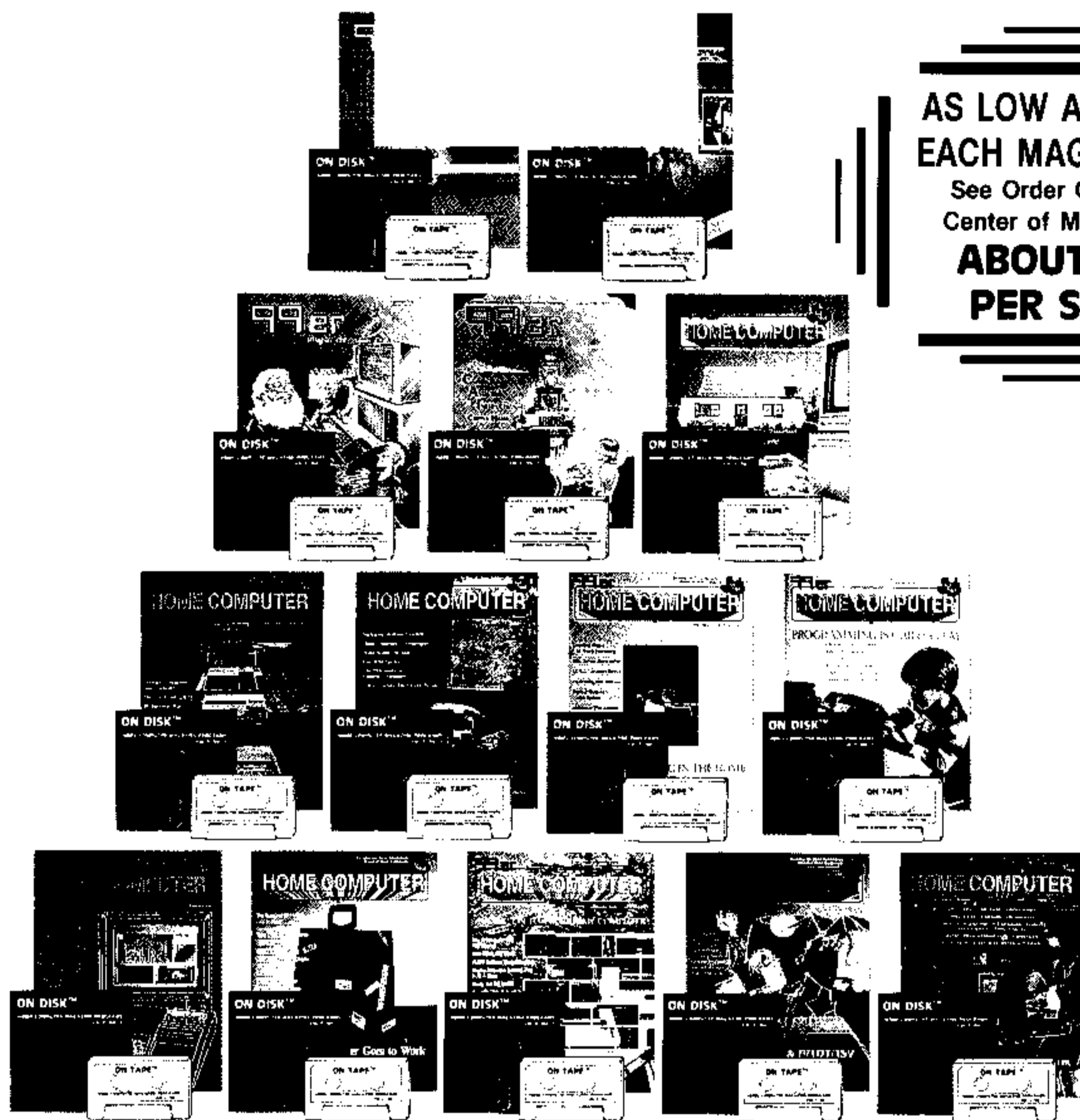
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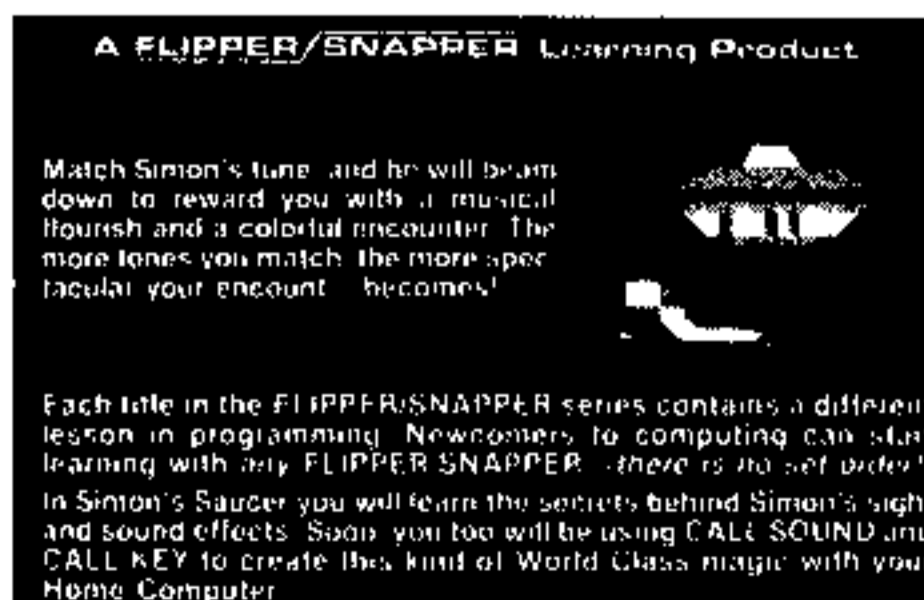
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