

DATA BRIEFS . . .

○ **How much should you pay for E-Mail service?** Identical usage can cost up to two-and-a-half times more on one service than another, according to a survey of 13 leading electronic mail services sponsored by *Electronic Mail & Micro Systems* (EMMS), a newsletter published by International Resource Development, Inc. Ranked least expensive, (on the basis of typical monthly usage statistics) were the tariffs of Canada's CNPC EOS (\$55.80), followed close by Tymshare's OnTyme in the U.S. (\$59.43). Priciest was Western Union's Easylink (\$139.70). The Source and CompuServe ranked at the **more** expensive end (third and second from the last) but their cost figures were not readily available from EMMS.

○ **Computer language for the deaf.** Sign language for technical terms has now been standardized to facilitate verbal communication for deaf computer professionals. *Signs for Computer Terminology*, the first glossary of computer sign language, was initiated by Steven Jamison, an IBM personnel consultant. Prior to his standardization project, three or four different signs were being used just for the word "computer". The book is available for \$10.95 plus \$1.50 for postage and handling. Schools and organizations can get a 20% discount on orders of five copies or more. *The National Association of the Deaf*, 814 Thayer Ave., Silver Spring, MD 20910.

○ **Real Estate Information Network Inc. (REINET)** provides software and information for real estate professionals, appraisers, investors, syndicators, brokers, property managers and attorneys. REINET programs emphasize the TRS-80 Model 100 lap-sized computer. They include newsletters, a financial database and other items of interest to realty professionals. Members also receive a quarterly publication, *REINFRO*. One-time connect charge is \$100; hourly rate is \$4.50. For membership information, send stamped, self-addressed envelope to *REINET*, POB 257, Nyack, NY 10960, or call *CompuServe* 72235,301.

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BARON'S MicroComputing REPORTS

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ON REVIEW:

17 Word Processing Programs Part Two Evaluations and Ratings

Part One of this article discussed options facing the potential buyer of word processing software. Yet features alone do not determine the value of a program.

The seventeen programs which provided the basis for this discussion are assessed below. They have been grouped according to their list price: up to \$100; over \$100 up to \$200; and upwards of \$200. Within each category, the packages are divided into three groups: best buy, good, and acceptable. The rankings are summarized in the accompanying table.

"Acceptable" implies satisfactory features and performance, but with drawbacks. "Good" indicates better than average performance, but also some problems. "Best

Buy" labels those programs with the best price/performance characteristics in a given cost range.

Under \$100: Best buy

Homeward, Sierra On-Line, Sierra On-Line Building, Coarsegold, CA 93614, (209) 683-6858, \$49.95. Icons and pictorial representations of command options, laid out across the bottom of the screen, distinguish this low priced program. To access a particular command, one moves the cursor to the corresponding icon and presses the RETURN key.

Homeward is fast and the editing controls are very good. While editing, a page sketch in the lower right hand corner of the screen

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TURN YOUR PC INTO A STOREFRONT CAMPAIGNER

Microcomputers are turning up these days all over America in storefront headquarters of low-budget political campaigns. With their help, average citizens with only limited financial backing can now make a viable run for public office. Whether you offer the use of your personal computer or your experience as an operator or programmer, you can make an important, perhaps decisive contribution to your candidate's campaign in this Fall's elections.

You won't find anyone on the campaign trail to dispute the fact that volunteer PC aid can make a big difference. There are close to

492,000 elected offices around the United States—from the presidency and congressional seats on down to city and county offices and seats on local PTA boards. The help of PC volunteers counts in many local contests where campaign budgets do not exceed a few thousand dollars.

How micros help out

For all their noisy excitement, political campaigns have traditionally been labor-intensive undertakings in which a large number of volunteers work short shifts at monotonous manual tasks. Today, compu-

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Word Processing *(continued)*

shows what the page will look like, including the page break.

Drawbacks: Documentation does not show all Homeword capabilities such as outlining, or access to special printer features. The commands for boldfacing and underlining are awkward. A fast typist will easily outpace the page sketch: One must pause regularly to give the CPU a chance to update the sketch.

Megawriter, Megahaus Corporation, 5703 Oberlin Drive, San Diego, CA 92121, (619) 450-1230, \$99.85. This program for the IBM PC (Apple version is also available) features an enhanced version of the UCSD editor, with greatly improved disk utilities and a new, flexible printer program. The Editor includes: single keystroke commands; a clear menu-driven command structure; and on-screen formatting flexibility. The disk utilities allow one to give each document a title and description which later can be altered and searched.

Drawbacks: The rather low-priced program has significant hardware requirements: the latest IBM version, 3.0, needs 128K RAM and a double-sided, double-density drive. Document reformatting is somewhat awkward. Some options are limited: page numbers are available only on bottom of page; a header is provided but is automatically centered.

Under \$100: Good

AtariWriter, Atari, Inc., 1265 Borregas Avenue, P.O. Box 427, Sunnyvale, CA 94086, (408) 745-2000, \$99.95. The new Atari standard word processor for the XL series and the old 400/800 line is cartridge based, requires no boot up time, and frees the disk drive entirely for document storage. But the cartridge places limits on the size of the program.

The program has some features found only in more expensive packages, e.g. double-column support (requires a printer capable of reverse line feeds). A screen preview uses horizontal scrolling to display a full 60-80 character line.

Drawbacks: AtariWriter supports only some Atari printers. To use other printers, one must buy an additional \$20 software package.

Bank Street Writer, Broderbund Software, 17 Paul Drive, San Rafael, CA 94903, (415) 479-1170, \$69.95. This popular menu-driven program offers ease of use and good error-trapping. It features fair editing controls; a limited find and replace function; and a block move feature. The print formatter offers single- to triple-spacing, continuous numbering of several documents, top or bottom page number, header and ability to print part of a document (from cursor

position).

Drawbacks: Document size is limited by RAM space (on an Apple IIe, about 3200 words). Block copy is awkward; it is done with "move" and "move-back" commands.

Letter Perfect, LJK Enterprises, Inc., 7852 Big Bend Blvd., St. Louis, MO 63119, (314) 962-1855, \$99.95. This menu-driven program is available either on disk or ROM cartridge. It directly supports Epson, Atari & Qume printers, and can be configured for most other brands. Various features are provided, and control codes are easily embedded in the text.

One can scroll through a document in the edit mode. As speed can be varied, a very fast print preview with adjustable scrolling can be slowed down for proof-reading or interrupted for corrections.

Drawbacks: Lacks some features found in other comparably priced programs.

Under \$100: Acceptable

Cut & Paste, Electronic Arts, 2755 Campus Drive, San Mateo, CA 94403, (415) 571-7171, \$50.00. This is another menu-driven program which is extremely easy for the beginner. It is most useful for memos and letters.

Drawbacks: Accessibility is achieved at a tradeoff for important options in both the editor and the print formatter. It is awkward to over-write (as opposed to insert) text. Much emphasis is placed on block move type of operations — yet the program lacks a find and replace function. Printing capabilities are limited.

Ready-Writer, Executive Software, Two North State Street, Dover, DE 19901, (705) 722-3373, \$39.95. This low-cost program copies a significant subset of WordStar editing and print formatting commands, and adds some others, including "undo". File size is limited by available RAM capacity.

Drawbacks: The program is compromised in two areas. The print formatter is oddly limited: it allows for headers and footers, and full control of line spacing, but makes no provision for such features as underlining, sub- and superscripting, pitch, etc. Also, Ready-Writer lacks any real disk utilities. To see other files on the disk, or to rename, delete, or copy a file, one must exit to the system and then reload the program.

Smoothwriter, Digital Deli, 3258 Forrest Gale Drive, Forrest Grove, OR 97116, (503) 627-9417, \$79.00. A substantial editor provides a very full set of commands, including such powerful features as macros and outlining. A print formatter supports all of the features of the Epson and Epson-compatible printers.

Drawbacks: The editor lacks true, unrestricted word-wrap. This interferes with easy insertion of text.

\$100-\$200: Best buy

Apple Writer II, Apple Computer, 210525 Mariani Avenue, Cupertino, CA 95014, (408) 973-2222, \$150.00. A versatile program with advanced features, including built-in footnotes and split-screen editing. It also includes WPL (Word Processing Language), a very rich, though demanding, programming tool for various text processing tasks (e.g. merge-printing and boiler-plate).

Drawbacks: A major problem is limited support for non-Apple printers. The only way to get all the formatting bells and whistles is by embedding control characters. This is facilitated by the program's "glossary" capability, but the process is tedious and requires some savvy about both hardware and software. The documentation is difficult, particularly on changing page formats and printer controls.

\$100-\$200: Good

The Incredible Jack, Business Solutions, 60 East Main Street, Kings Park, NY 11754, (516) 269-1120, \$129.00. UCSD Pascal-based system which requires a minimum of 64K RAM and at least two disk drives. Incredible Jack is a hybrid product, one of a new breed of software aimed at integrating applications. It combines a word processor, a simple database manager, and a calculator. Its merge-printing capability makes it handy for generating form letters, mailing labels, and invoices.

A setup menu controls a number of print formatting features. In addition, its "Message" option lets one send a sequence of control codes directly to the printer.

Drawbacks: As a word processor, the program is rather constrained.

PIE Writer, Hayden Software, 600 Suffolk Street, Lowell, MA 01853, (617) 937-0200, \$149.95. This command-driven package provides the sophisticated user with full control over the editing and printing process. It offers many non-standard capabilities. Thus, the user can determine the number of lines or the number of words in a document. One can construct "shell files" to perform sequences of repetitive tasks. A machine language monitor lets one examine the contents of the computer's memory. Telecommunications is supported. Programmers are provided with PIE Writer's address tables.

Drawbacks: The numerous commands make heavy use of the CONTROL and ESCAPE keys. The mnemonics are difficult to learn. There is a help file, but it must be loaded separately from the disk. But when this is done, the

amount of available RAM is reduced by 1K — not a trivial loss since the edit buffer is less than 19K.

Over \$200: Best buy

NewWord, Rocky Mountain Software Systems, 1280-C Newell Avenue, Suite 147, Walnut Creek, Calif. 94596, (800) 832-2244 (in CA, 800-732-2311), \$249.00. NewWord offers all commands of WordStar and MailMerge in a single package and at a significantly lower price. Some features have been added: an "unerase" command, multiline headers and footers, etc. At print time, one can choose among various printer drivers, or send a document directly to the screen (users with both a dot matrix and a letter quality printer need not keep differently configured copies of this program). Ability to "protect" a file from unintended changes and "unprotect" it has been added to the utilities. The program works directly in editing and printing mode with WordStar files.

Drawbacks: NewWord essentially mirrors WordStar 2.26. It lacks version 3.3's newer "column move" feature and the powerful "conditional print" commands of the latest 8-bit MailMerge.

There is an annoying aspect—different from WordStar—in how the program handles changes in setting of on-screen formatting features (line spacing, margins, justification, etc.). A "save and exit" operation on a file restores the defaults. When reentering the document, or beginning a new one of the same type, the user must configure them back again.

Volkswriter Deluxe, Lifetree Software, 411 Pacific Street, Suite 315, Monterey, CA 93940, (408) 373-4718, \$285.00. A significant enhancement of the original Volkswriter, the program requires a minimum of 128K RAM and two disk drives. Its very fast performance, ease of use, and a wealth of functions make it a hands-down winner.

Unusual features include the Note Pad key, a function key which allows one, while editing a document, to add text at will to the end of another file. Also noteworthy is the ability to read in only a specified segment of another file into a document.

In the area of printer control and use, the program offers keyboard redefinition (a Dvorak keyboard is possible) and, through embedded "dot" commands, direct access to all the features of one's printer.

Drawbacks: An "undo" feature and split-screen editing are lacking.

Over \$200: Good

PowerText, Beaman, Porter, Inc., Pleasant Ridge Road, Harrison, NY 10528, (914) 967-3504, \$475.00 IBM, \$299.00 Apple (complete system), \$199.00 for Apple owners with p-System.

Based on UCSD Pascal, this program offers almost all advanced and exceptional word-processing features, and then some: multicolumn typing and adjustment; automatic title page and table of contents generation, boxed paragraphs, etc.

PowerText enhances the p-System's Editor and Filer, and adds a Style Utility, a rich Print Utility, and format files which shape different documents at print-time.

Drawbacks: PowerText allows highly sophisticated control over the layout of text, but it is not conducive to easy creation and printing of non-standardized material. User sophistication is required.

both 8 and 16-bit computers. Its "what you see is what you get" approach to editing and formatting has set the standard for word processors. A hybrid in program design, it offers great flexibility in almost every aspect of editing, print formatting, and disk utility operation.

Drawbacks: WordStar lacks some advanced features, including chained and nested printing, standard in newer packages. These can be provided by MailMerge, used by many WordStar owners, but at extra expense. Other available options further enhance it, but all entail additional cost. Even with the many "package deals" offered by MicroPro, price is a serious drawback.

PROGRAM RANKINGS BY LIST PRICE AND COMPUTER BRAND

	Apple	Atari	CP/M	IBM
Under \$100				
Best Buy	Homeword Megawriter	—	—	Megawriter
Good	Bank Street Writer Letter Perfect	AtariWriter Bank Street Writer Letter Perfect	—	Bank Street Writer
Acceptable	Cut & Paste	Cut & Paste Smoothwriter	Ready-Writer	Ready-Writer
\$100 to \$200				
Best Buy	Apple Writer II	—	—	—
Good	The Incredible Jack PIE Writer	—	—	—
Acceptable	—	—	—	—
Over \$200				
Best Buy	—	—	NewWord	Volkswriter Deluxe
Good	PowerText	—	WordStar	PowerText VisiWord WordStar
Acceptable	—	—	—	EasyWriter II

VisiWord, VisiCorp, 2895 Zanker Road, San Jose, CA 95134, (408) 946-9000, \$375.00. This Visi series word-processing package combines—not always happily—many features of the highest priced word processing programs with the transparent simplicity of the low-cost menu-driven products. Logical, well-organized command menus and straightforward on-line explanations make VisiWord self-documenting.

Drawbacks: VisiWord lacks some advanced features of other programs. Given its ambitious minimum hardware requirements of 192K RAM, one would expect more. The VisiFile program is required to provide merge-printing.

WordStar, MicroPro International, 33 San Pablo Avenue, San Rafael, CA 94903, (415) 499-1200, \$495.00. This word processing classic is available for

Over \$200: Acceptable
EasyWriter II, Information Unlimited Software, Inc., 2401 Marinship Way, Sausalito, CA 94965, (415) 331-6700, \$350.00. This powerful program comes in versions for a 64K and a 96K IBM PC. It offers flexible editing and printing features. The disk utilities allow one to keep track of the date on which a document was created, the author, etc. Further enhancement is possible with EasyMailer II and EasySpeller II.

Drawbacks: The documentation is very bad: unfortunately, it reflects the program's lack of elegance and friendliness. There is little rationale in the command structure—e.g., in the control modes of cursor movement. To become really facile in using it would require massive memorization.

— Henryk Baran, Ernest Scatton

DATA BRIEFS . . . (continued)

○ **Do you know what your children are...eating?** is the theme of a computer program from the National Dairy Council. *What I usually Eat* compares kids' selections from among 40 popular foods and the Council's recommended servings from basic food groups. This helps teachers determine whether food choices of youngsters in Grades 3-6 add up to a balanced diet. The program runs on Apple II (48K) and Apple IIe (64K) \$30.00. Contact local or national office of *National Dairy Council*, 6300 N. River Rd., Rosemont, IL 60018.

○ **Earn college degree via your personal computer.** Microcomputers of university-level students and instructors are directly linked over telephone lines by the Electronic University software system. Working with Apple II, Atari, Commodore 64, IBM PC, or TRS-80 computers, students can take courses given by human instructors right in their own homes. They can communicate with instructors and send work in via typed messages. Courses are provided by Electronic University's developers, TeleLearning Systems, Inc., or by individual colleges and universities. Students can earn credits which can be applied toward two-year associate diplomas and four-year B.S. and B.A. degrees. Graduate courses are also planned, as are test preparation courses for the Scholastic Aptitude Test, Medical College Admission Test, and other college examinations.

All TeleLearning courses prepare students for College Level Examination Program (CLEP) tests administered by the College Board of Princeton, New Jersey. Test results can be relayed for course credit to the school selected by the student from among 1,700 accredited institutions. Before granting degrees, most schools insist on some on-campus classes such as laboratory courses. However, much on-campus work is substantially reduced and tuition costs may be cut at least 50%.

Approximately eight institutions are presently involved in a four-year degree program via the Electronic University. Ten more schools are now completing appropriate courseware, while another 200 are about to institute pilot programs. The communications software package which provides interactive access to the Electronic University system is \$90. Individual courseware ranges from \$30-\$100. Available at local outlets. *TeleLearning Systems, Inc.* 505 Beach St., San Francisco, CA 94133.

○ **C-PRO**, a national group for users of CompuPro microcomputers, has been formed to share technical information,

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Storefront Campaigner (continued)

terized campaign systems are performing detail-heavy, time-consuming functions faster and better than human volunteers. For instance, targeting to identify favorable voter groups, which in the past might have taken six volunteers 300-400 people-hours, can be completed today on a computer in 10-20 hours by two people.

What is more, campaign systems are providing candidates with insights and data never before available to them. For example, 60-year-old John Russell used a computer in his successful 1982 race for the Virginia State Legislature to locate thousands of voters over the age of 55. He then mailed letters, as one older person to another, to help him overcome his opponent's labor and newspaper endorsements.

Campaign systems are also paying for themselves in the process. According to William McMillen, a political software developer, their costs can be substantially paid off after a single 1,000-piece mailing, "by eliminating the dollar-per-name direct mail house charge."

Your personal contribution

Here are some considerations you should bear in mind when helping to manage your candidate's campaign.

• **Which computer to use?** If you have a choice, try to use an Apple or IBM system simply because most of the better software has been written for them. If there is money to buy a computer, get an IBM PC. This is the system for which most new political campaign software is written. Also, if you are dealing with 10,000 or more voters, try to get a hard disk system with backup.

• **What software should you use?** Best of all are the new specialized political campaign packages. These cost between \$750 and \$1,000. Campaign volunteers with only slight computer knowledge can use them more easily than standard business software.

Professor Vernon L. Robinson of Winston-Salem State University, who brought his computer savvy along to Harvey Gantt's successful race to become the first black mayor of Charlotte, North Carolina, recalls a previous campaign effort which used dBase II and WordStar. The resulting screens turned out to be too complex for ordinary volunteers to understand. As a result, the campaign manager and other key staff members had to handle data entry.

Yet business software can be used effectively. Mr. Gantt's race in Charlotte used both a VisiFile database and a VisiCalc spreadsheet to keep track of voter turnout in each precinct.

• **How wide a range of applications**

should you tackle? You can aim first at a time-consuming activity such as list management. This task, in fact, can be critical, as in a 1981 school district referendum near Bozeman, Montana where voters turned down a tax levy for a new elementary school. However, two months later, a slightly lower levy was approved, largely due to Dr. John R. Tkach, a Bozeman dermatologist, who used his Apple micro to compile a list of voters with children in school.

Most important in a well-organized campaign are computerized applications which relate closely to decision-making. These include databases to keep track of donors, targeting, scheduling and media-buying decision support. Computerized analysis to determine the best media strategy can be useful to local candidates who often have no more than \$300 or \$400 to spend on radio spots. But best of all, a microcomputer can be used for analysis of polling results.

The human element

Another task that must be shouldered is the selection of volunteers to be trained

Campaign Software Applications

Programs for management of election campaigns usually address seven major functions:

• **List Management**, including direct mail and word processing, to select and contact likeliest prospects for fundraising, voter support, volunteer assistance, etc.

• **Budgeting** and tracking of campaign expenditures.

• **Scheduling** of candidate appearances, checking for scheduling conflicts, determining frequency and effectiveness of coverage of various groups and districts.

• **Media Management**, to determine the most effective advertising strategies.

• **Poll Sampling**, to analyze results of opinion polls.

• **Targeting**, to determine importance patterns of various demographic groups and election districts.

• **Get out the vote on Election Day**—scheduling of volunteers to watch polls and to bring out voters in precincts where vote is lagging.

to run the computer. Professor Robinson recalls that during the Charlotte campaign, the greatest obstacle to volunteers' use of computers was the difficulty of finding their way around the keyboard. Consequently, the search for suitable volunteers focused on people who were proficient in typing. They also turned out to be the most motivated to learn and use the computer.

The complexity of computer software

manuals constitutes another problem. Professor Robinson notes that campaign workers had to write their own simplified manual rather than use the 200-page VisiCalc text.

Last but not least, Professor Robinson notes that in a situation where many people have access to the computer system, the risk of theft or damage is ever present. Therefore, he recommends that hardware in campaign headquarters be covered by both insurance and a maintenance agreement.

Specialized campaign software

As races for public office become increasingly computerized, specialized software for management of political campaigns at every level is being developed. Among programs now available are the following:

• **CAMPAIGN**, \$795. Runs on IBM PC, XT and compatible computers with 128K RAM and two disk drives. Campaign Software, 214 Massachusetts Ave., N.E., Suite 490, Washington, DC 20002. 202/547-7885. CAMPAIGN is not for Radical Vegetarians, Free Silverites or even Democrats. It is only for Republicans. Another system, The Party Organizer, is for local party organizations.

• **Campaign Manager**, \$749.95. Runs on Apple IIe (64K 80-column board), 128K IBM PC/XT and Compaq computers. Aristotle Industries, Box 21, Norwalk, CT 06853. 800/243-4401; in Connecticut, 203/853-6686. Close to 1,000 packages have been sold.

• **POLITECH I**, \$950. Written in dBase II; supported by CP/M-86 and PC-DOS. Runs on 128K IBM PC and Compaq, Columbia, Eagle and Toshiba computers. Politech Limited Partnership, P.O. Box 537, 31 Main St., Ellington CT 06029. 203/875-1234. POLITECH I is being adapted for additional 8-bit and 16-bit computers starting with Apple; Texas Instruments, Kaypro and DEC.

NOTE: For additional information, BMR suggests you consult the political trade publication, *CAMPAIGNS & ELECTIONS*, 1621 Brookside Road, McLean, VA 22101. 703/534-7774. (\$48.00/yr.) ●

Baron's Microcomputer Reports (ISSN 0746-598X) is published 12 times a year, monthly, by Computer Information Resources, at 344 East 49th Street, New York, NY 10017. \$39.95/yr. (Canadian and foreign, add \$5.00.) Second class postage paid at New York, N.Y. and at additional mailing offices. Copyright © 1984 by Computer Information Resources. Reproduction in whole or in part without permission is prohibited. POSTMASTER: Send address changes to Baron's Microcomputing Reports, P.O. Box 305, Dover, NJ 07801.

▷ What are PEEKS and POKES?

Because Basic was designed for beginning programmers, many of the features which would have permitted access to the operating environment were omitted from the language. Instead, peeks and pokes were instituted. By peeking a location in memory, the programmer can learn the value in that address. For example, peeks can be used to determine boundary lines in RAM. Then, if the user wishes to "hide" a portion of the program in a specific area, he can do so by poking the specific address into the computer. By hiding part of the code from the operating system, it can be loaded in afterwards.

▷ With all the off-the-shelf programs, why should anyone learn how to program?

It's true that only a very few need to become expert programmers; however, it doesn't follow that end users should be totally ignorant of programming. In fact, some knowledge is most desirable in order to "patch" certain programs to peripheral devices such as modems and printers, or to permit users to take complete advantage of a database package's features. Programming skills also come in handy when confronted with software filled with bugs. Sometimes, a few lines of simple error trapping make the difference between a disaster and a workable package.

▷ Why do some programmers put the initialization routine at the end of a Basic program?

Because Basic interprets each line before executing it. Every time the operating system encounters a GOTO statement, the program is reread from the beginning. Therefore, if the initialization and other one-time or rarely-used routines are located in the beginning of the program, they have to be read every time the operating system is searching for the GOTO line number. By putting those routines at the end of the program and calling them with a GOSUB, a programmer can substitute one line for a series of lines. This way, the program runs faster.

▷ What are the advantages of a RAM disk?

Since a RAM disk is only a software program that assigns a portion of memory to simulate a disk drive, it does not add memory to the system. What it does do, however, is provide immediate access to whatever is placed within the RAM disk area. Those who use programs which access disk drives often find that a RAM disk can be up to 50

times faster than a floppy disk drive. Users of WordStar who have used RAM disks will readily confirm this. It must be remembered that RAM is volatile. When the computer is switched off, all information in memory disappears.

▷ Why do programs occasionally freeze and require the computer to be turned off and then on?

The computer can freeze while executing a program for a number of reasons. Usually, the problem arises when the CPU transfers control to or accepts control from another device, such as a disk drive. If the transferring is not executed or acknowledged, the CPU refuses to do anything else. The computer will also freeze when the program rewrites an important piece of code through the use of pokes or jumps to an incorrect location in memory. In such cases, the only alternatives are to reboot the program or turn the computer off and on again. For this reason, it is important to save the program or file often.

▷ What is meant by bank switching?

Bank switching (or bank selecting) is a method of expanding the computer's RAM beyond the operating system's addressing capability. Many 8-bit computer systems can only address up to 64K to RAM. By using bank switching, that limit can be exceeded in some respects. The memory to be switched is divided into banks; some of which are then given the same address locations. A program enables and disables the banks according to needs. In this way, the computer always sees the proper amount of memory. Basic programming, unfortunately, cannot take advantage of this feature because the language requires that the locations of all coding be contiguous.

▷ How can a user check whether a computer is truly IBM-compatible?

The best way to check is to bring copies of the most often used programs to a computer store and run them on a compatible machine. Two programs often used for testing are Lotus 1-2-3 and Microsoft's Flight Simulator. By running these, users can determine whether the compatible allows access to the same hardware features as the IBM. Flight Simulator not only tests the unit's graphics, but its calculation capabilities as well. Lotus makes use of almost every hardware feature on the IBM PC. Other software used in testing for IBM compatibility includes PC-DOS 1.1 and 2.0, WordStar 3.3 and Keynote.

solutions to problems, and special purpose application information. Charter membership is \$10. For additional information, contact C-PRO's founder, *William C. Hess, 14075 Jefferson Davis Highway, Woodbridge, VA 22191. (703) 690-3312.*

○ **Free software searches.** A new service offered without charge by Searchmart Corp., a Florida database developer, provides free access to an on-line software library. This database contains lists, descriptions and demonstrations for thousands of individual applications and systems software packages on 40-character by 20-line CRT "pages". *Searchmart Corporation, 631 U.S. Highway 1, Suite 210, North Palm Beach, FL 33408. (305) 845-2996.*

○ **APPLICATIONS BASIC.** Level III business Basic language program for CP/M and IBM PC and compatible computers is described in a free four-page brochure. Write to: *Stacey Taylor, Vice President of Marketing, Soft Gold, Inc., P.O. Box 2718, Newport Beach CA 92663. (714) 476-3004.*

○ **ResQ database management system** for IBM PC and compatible computers is described in a four-page brochure. The brochure explains how ResQ can be used with word processing and spreadsheet programs and includes lists of business applications. *Key Software, Inc., 2350 East Devon Ave., Des Plaines, IL 60018. (312) 298-3610.*

PC Money Talk

● **How do insiders trade?** This information, when viewed over a period of time, can provide a useful pattern for investors and financial analysts. Using a personal computer and a modem, they can learn the full details of transactions in their own company's stock by corporate officers, directors or any stock holder of more than 5% of the outstanding shares. Such transactions must be reported within 45 days to the U.S. Securities and Exchange Commission (SEC). SEC data is now available on-line via Telenet from Florida Computer, Inc.'s FCI Invest/Net. The data is cross-referenced by volume of trade, company name, stockholder name and industry grouping. According to FCI, 4,000 stocks are now listed on Invest/Net with more to follow. Access fees per minute for prime time (9 a.m. to 6 p.m. EST) are \$1 for 1200 baud and 68¢ for 300 baud. Non-prime time fees range from 68¢ (1200 baud) to 34¢ (300 baud). Telenet charge is 33¢ per minute. *FCI, 99 Northwest 183rd St., North Miami, FL 33169. (305) 652-1710.*

● **Save your ribbons.** The cost of replacing computer printer ribbons can mount up, as any PC owner knows. Here are two ribbon re-inkers which can help you save some money:

MacInker is an automatic device which winds your used ribbons around re-inking pads. It is claimed that ribbons can be re-inked more than 20 times at an average cost of five cents per inking.

MacInker costs \$54.95 (including a two-ounce bottle of ink). Additional ink is \$3 a bottle. *Computer Friends, 100 North West 86th St., Portland, OR 97279. (503) 297-2321.*

Ebonize ink comes in a spray which can give up to 20 re-inkings, according to the manufacturer. The top of the ribbon cassette is removed to expose the coiled ribbon. Then, without disturbing or moving it, the surface is sprayed. The specially formulated ink permeates the entire ribbon by osmosis. It is allowed to dry before the top is replaced. \$11.95 from *Upwego Computer Supply Inc., 120 West Madison St., Chicago IL 60602. (312) 372-6692.*

● **Free after-purchase 6-month customer support plan** for users of Datamension software provides product upgrades, \$100 worth of local training, toll-free phone support and a subscription to *New Dimensions*, the Datamension newsletter. Participation is controlled with a gold plastic Data Card which is sent to each user who mails in a product registration card. After the initial 6-month period is over, the Data Card holder can register for the Extended Support Plan at a cost of \$300 for six months, or \$500 for one year. Both options provide an additional \$100 training certificate. Datamension software includes business applications ranging in price from \$495 to \$1,000. *Datamension Corporation, 615 Academy Drive, Northbrook, IL 60062. 312/564-5060.*

HANDS ON...

● **Movie Maker, Interactive Picture Systems, \$60.** Initial version runs on a 48K Atari, with versions for 64K Apple, IBM PC and Commodore 64 to be released through 1984.

The *Movie Maker* is a powerful utility program which enables you to design, film and edit your own animated movies.

The first step in the animation process is to design your characters (shapes) and background. This is all done in the Compose mode. You can either use one of four preprogrammed sets of shapes or draw your own. You can choose four colors at a time (from a selection of 128) and, using a joystick, draw up to 64 shapes. The program's features allow you to zoom in on shapes for detailed work, to duplicate shapes, to color them in, and to design the background. Once the shapes and background are drawn, they can be saved on a disk for future use.

The next step is the Record section where the computer films the action as you use the joystick to move the shapes around the screen. Up to six shapes can be filmed at a time. Each can be recorded separately without disturbing previously filmed animation. Now you can also add music. You have a choice of four independent voices with music ranging from an organ to sci-fi sounds. At the end of this step, you save the animation as one file and the music as another.

In the third step (known as smoothing) all four files—shape, background, animation and sound—are combined to create the actual movie which is put on to a disk. Now, all that you have left to do is to sit back and watch your film.

On the whole, *Movie Maker* is easy to use. However, unless you've really thought out the organization of your movie in advance, filming could become rather tedious. Also, the inability to

change or scroll backgrounds may be frustrating.

Overall, *Movie Maker* presents two problems. The first is that the documentation is presented more as an overview than as a series of step-by-step lessons. You must rely on trial-and-error and your patience to find out how you can fully use the system. (The 85-page manual tells you what you can do but rarely tells you how to do it.) The second problem is that the files take up too much disk space. (Files for an average film can take up as much as one-third of a disk.) However, the quality of the program and its capabilities far outweigh these drawbacks. With time and patience, you'll be amazed at what you can create.

— *Jeremy Goldstein*

(The author of this review has spent close to a quarter of his life around computers. 15-year-old Jeremy is an Atari 800 owner.)

TOOLS AND CONCEPTS

• The Commuter's Computers

At one time, consumers had only one choice if they wanted an inexpensive lap-sized computer: the TRS-80 Model 100. Then came NEC's PC-8200. Both offered approximately the same features at about the same price — under \$1,000.

Today, however, consumers can choose between four computers in that price range, all produced by the same Japanese manufacturer. The two new portables are the Sord IS-11 and the Olivetti M-10. Their entry may be a factor in Radio Shack's recent \$200 price discount on the Model 100. If that discount becomes permanent, expect the cost of the other units to drop, too.

• **Sord IS-11** may not have the most expensive (\$995) startup configuration in the lap-sized computer group (a 16K NEC PC-8200 costs \$4 more), but it has the most powerful (32K RAM, expandable to 64K). It also comes with an 8-line by 40-column bit-mapped LCD display and 64K ROM which houses the following resident programs: I-PIPS for data handling and processing (includes spreadsheet generation, search, sort, graphics, directory and print capabilities); I-CALC which provides subtotal and recompute functions; I-EDIT and I-WP for word processing; and I-COMM for telecommunications, using an RS-232C interface. Application software in 64K-ROM packs will be introduced later.

Currently available IS-11 peripherals include a thermal printer, numeric keypad, 3 1/2-inch disk drives and a bar code reader. The computer weighs 4 lbs. 6 oz. and measures 11-13/16" x 8-7/16" x 1-7/16". Its rechargeable batteries

BMR subscribers can now receive monthly reports for more than one make of computer. The charge for this service (which includes first-class mailing of the monthly newsletter with inserts) is \$10/yr. per additional computer make.

Reports are available for:

- Apple
- Atari
- Commodore
- IBM
- Kaypro
- Osborne
- Texas Instruments
- Timex Sinclair
- TRS-80

operate up to 8 hours on a single charge. *Sord Computer of America, Inc., 645 Fifth Ave., New York, NY 10022. 212/759-0140.*

• **Olivetti M-10** lap-sized computer is perhaps most similar to the Model 100 computers. Each of two versions, an 8K model and a 24K model (expandable to 32K), measures 8" x 11" and weighs 3 lbs. 8 oz. M-10 comes with a built-in, direct-connect 300-baud modem, RS-232C interface, parallel port interface, and a 8 x 40 display. The display screen is hinged for better viewing. Although prices have not been set as of the time of this writing, both models are expected to be competitive.

• **...and yet a fifth portable?** As we go to press, Apple is expected to announce an 8-lb. version of the Apple IIe. The new Apple IIc computer will be only slightly larger than the keyboard of the Apple IIe and will accommodate a 3 1/2-inch disk drive. System specifications include a mouse interface (for Macintosh-like capabilities), 128K RAM, an interface for a second drive, and serial and parallel modem and printer ports. It will not have expansion or plug-in slots. A flat-panel LCD monitor is to be available in late 1984 for display of 80-column text and color graphics.

The Apple IIc's price had been rumored to be as low as \$600. However, it now appears it will be just under \$1,300. This may be pegged to just undercut the IBM PCjr. ●

LAP-SIZED COMPUTER CHARACTERISTICS

Model	Display	Wt. (lbs.)	RAM	ROM	External storage	Price
NEC PC-8200	8 x 40	3.8	16K	32K	diskette cassette RAM cartridge	\$799
			64K	64K		\$1,519
			96K			\$1,914
Olivetti M-10	8 x 40	3.8	8K 24K ^a	32K	cassette	\$799 (approx.) \$999 (approx.)
Radio Shack TRS-80 Model 100	8 x 40	3.8	8K 24K	32K	cassette	\$799 \$999
Sord IS-11	8 x 40	4.4	32K ^c 64K	64K	cassette	\$995 ^b

^a expandable to 32K with an \$119.95 8K RAM expansion.

^b \$1,095 with built-in modem.

^c expandable to 64K with \$239 32K RAM expansion.

SOFTCON SOFTWARE ON THE MOVE

Over 500 software developers and distributors gathered to show their products to a nationwide cross-section of computer retailers at the Softcon show at the New Orleans SuperDome earlier this year. Billed as the first "International Conference and Trade Fair for the Software Industry," the show provided some indication of what software publishers and retailers have in store for users this spring and early summer.

An important and rather discouraging aspect of what users can expect was taken up by Apple chairman Steven Jobs. He noted, in his keynote address, that it now takes 20 to 40 hours for an average computer user to master a software program. This point was reiterated by various speakers such as Ken Scott, vice president of marketing for Microrim, who commented that all the easy software sales to hackers and pioneers had already been made. Now they must go after businessmen and professionals who have never touched a computer keyboard.

Hopefully, software will become easier to learn and use, but the prevailing trend at Softcon was complexity. Exhibitors pushed over 80 software packages labelled as "integrated". Though most were for the IBM PC and clones, there were new integrated packages for the Apple II and Macintosh, and even for the Commodore 64 and 264.

Notable among the Commodore entries was 3-PLUS-1 from Commodore itself. The package combines a word processor, spreadsheet, file manager and graphics. It will be offered on a cartridge for the Commodore 64, and either as a cartridge or built-in ROM option for the new 264 when, or if, it becomes available. Commodore calls 3-PLUS-1 an integrated package "for the masses", as contrasted to Lotus 1-2-3 which, because of its high price and large memory requirements, they consider "for the classes".

"Rodent technology", too, appeared to be taking hold, thanks in large part to Macintosh. I used a mouse (from Mouse Systems Corp.) on an IBM PC to do some manipulations on a Lotus 1-2-3 spreadsheet. After only a few seconds it became so simple to use that I found myself not looking at the mouse at all but at the screen. Using a mouse is next best to having a touch-sensitive screen.

The big "controversy" is how many buttons the mouse requires. Mac's mouse only has one. Microsoft's mouse has two

(continued on page 8)

Words Processed

• **Bowker/Bantam 1984 Complete Sourcebook of Personal Computing.** Edited by Peter Simon. 646 pages. Co-published by R.R. Bowker Company and Bantam Books. \$24.95, hardcover; \$18.95, softcover. Although no reference book can be truly complete, this tome tries hard. Among its many listings: a section on 300 computers with specifications, compatibilities and prices; one on 700 peripheral hardware products, including disk drives, modems and printers; another on 1,100 computer clubs and user groups, alphabetically arranged by state; and a section on 4,000 computer manufacturers and software publishers.

Perhaps the most useful chapter in the book is the listing of over 3,400 software programs by type. Some of the categories are: accounting; computer-aided instruction; mathematics; computer art, music and sound; data management; games and recreation; personal growth and development; and utilities. *The Complete Sourcebook* also includes a 34-page introductory overview of personal computers, a glossary of computer terms and checklists for buying software and hardware. Many people will also find this book invaluable for the listings in the on-line database section. — VP

• **The Handbook of Microcomputer Interfacing.** By Steve Leibson. 261 pages. TAB Books, \$14.95, paper. Among other things, this book explains how to build interface circuits to connect your computer with almost any kind of peripheral. The author describes digital and microprocessor signals, and the fundamentals of communicating with peripherals using both component-level and backplane busses. Although the 6502 processor is not discussed, many others are (the 8080, 6800, Z80, 8086/8088 and 68000). Also covered are handshake protocols, Centronics and IEEE-488 parallel interfaces, and serial interfacing standards from the RS-232C.

It's true that after having read the book, you may still not be able to construct interface circuits. However, you will have learned why and how such interfaces are possible. And along the way, you'll learn about busses; parallel, serial and analog interfaces; interrupts; direct memory accessing; and time. Even if you aren't technically-oriented, this book will help answer many questions regarding busses and interfacing.

• **MS-DOS** By Chris DeVoney. 330 pages. Que Corporation. \$12.95, paper. This tutorial of

Microsoft's popular disk operating system begins with a discussion of the various components of a computer system. Although informative, the section may be a little too brief for novice users. A nice addition would have been a selection of photos and diagrams to further explain the points made.

Starting with the third chapter, the reader should probably sit down with the computer and put it through the various exercises covered. After a section on disk drives and diskettes, including their proper care, the manual discusses most of the DOS commands available, including device and drive names, redirection and piping, hierarchical directories, batch commands, and configuring DOS with CONFIG.SYS. The guide carries a listing of commands, their purpose, syntax, rules, and messages.

Although the book is extremely useful, it should be pointed out that there are some lapses in its coverage. Among the subjects left out are the EDLIN, DEBUG and LINK programs, DOS function calls, and the ANSI terminal control codes.

• **The Microcomputer Users Handbook 1984: The complete and up-to-date guide to buying a business computer.** 324 pages. John Wiley & Sons. \$39.95, oversized paperback. The first portion of this handbook orients the reader to the world of microcomputers and their use in business. Such topics as maintenance, support, growth, and buying a system are discussed. The next two sections deal with computers and application programs. The coverage on databases explains the difference between regular filing systems and databases and then compares two programs, dBASE II and CARDBOX, to provide examples.

• **Guide to Computerized Accounting.** By State of the Art, Inc. \$6.95. A self-pacing study guide designed to give both an introduction to basic accounting and to provide an in-depth look at how a computerized accounting system works in a small business. Each section includes an illustration for reference to help clarify the major concepts and their relationship to each other. At present, available only at selected Software Centre International stores, or contact State of the Art, Inc., 3138-A Airway Ave., Costa Mesa, CA 92626. 714/850-0111.

• **Contemporary Business Letters With WordStar.** by Jane E. Robbins and Dennis P. Curtin. Van Nostrand Reinhold; \$15.50 paper. Designed as a

quick reference guide, its sections are organized around specific functions, such as "collection letters," "Changing the Left and Right Margins," and "Addressing Envelopes." Readers are shown how to write and send ready-to-go form and business letters. Examples of appropriate styles of correspondence included. ●

SOFTCON (continued)

and Mouse System's mouse has three. Which will be the standard mouse? Stay tuned.

A resurgent Apple faced IBM confidently at the show. Over 200 Apple-compatible programs and peripherals were demonstrated, 30 of them at the Apple booth. The starring Apple attraction was the Macintosh—according to one estimate, 350,000 will be shipped this year. Considerable software support is soon expected. This includes a new 1-2-3 version specifically designed for Mac's pull-down menus, windows, icons, and mouse. Microsoft is customizing its Multiplan, Word Chart, File and other programs, as well as its Basic interpreter for the Mac. Other companies include Software Publishing Corp., Odesta, Howard W. Sams (publishers of *Introducing the Apple Macintosh*), Great Plains, BPI Systems, Ashton-Tate, Hayes, Infocom, Penguin and Aardwark / McGraw-Hill.

Educational software was also emphasized, mostly for the Apple II family. Packages to help you learn how to use your computer or specific programs were prevalent, either on diskettes or on audio and video cassettes. For example, FlipTrack Learning Systems introduced a series of audio cassette-based instructions designed to interactively teach the use of Apple or IBM computers, or such programs as Lotus 1-2-3, WordStar and VisiCalc. As you listen to the cassette, you can perform the operations yourself on the computer. If you prefer instructions from a diskette, ATI and QED are among the providers of these educational aids.

— Harry Geist

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PERSONALIZED REPORT FOR: **TRS-80**

May, 1984

Alan B. Abrahamson, Technical Editor

* SOFTWARE

o. THE EXECUTIVE CALCULATOR

This series of twelve program modules calculates many of the mathematical tasks that are part of everyday life for the executive, homeowner or average business-oriented computer user. This simple-to-use, menu-driven program comes with a comprehensive 85-page user's manual, but other than for start-up of your initial system disk, you will probably find you never need to use it again.

The main menu is broken down into the following numbered choices: (1) Pricing & Profit; (2) Interest Calculations; (3) Depreciation Techniques; (4) Real Estate Formulas; (5) Lease Calculations; (6) Graphs & Charts; (7) Personal Loans; (8) Financial Decision-Making; (9) Equivalents & Conversions; (10) Miscellaneous Calculations, and (11) Master Index. Each category contains its own menu of sub-functions, making a grand total of 150 functions. (My particular favorite is Graphs & Charts, which allows the creation of a simple bar or line graph with up to six data fields.) The printout requires an MX-80 printer to produce the TRS-80 block graphics, and the output is an exact duplicate of the generated screen graphics.

If you have need for general calculations within the scope of the categories described above, you will not be disappointed in the Executive Calculator. MCS Software, 809 Parkway, Conway, AR 72032.

o THE HOME ACCOUNTANT

This very fine accounting package for the TRS-80 Model III is relatively simple to use. The average user should find it easy to set up and run.

The main difference between this and most other systems is that this system is driven around budgetary accounting techniques, that is, all income and expense items must be set up as monthly budget items prior to any transaction handling. (The procedure is well-documented in the instruction manual.) The purpose of this type of accounting is to track variances in budgetary categories for analysis by management.

Among the features of this system are the check printing function, the graphing, and an extensive reporting facility. In fact, not much is missing from this package; it even has multiple checkbooks and bank reconciliation features not often found in package programs.

One disadvantage is that the system reacts arduously slow in reading many files and writing files as you step through each phase of operation. A better access method would be desirable to eliminate some of this operator down time. The code is all in Basic, except for the screen handling routines which use a technique that I had not uncovered before. The method, however, is not really good since an average typist would be well ahead of the program in analyzing the input data. If good accounting principles are needed and speed is not important, look into The Home Accountant. \$74.95. Continental Software Co., 11223 South Hindry Avenue, Los Angeles, CA 90045. 213/410-3977.

* LDOS COMMANDS

You have probably read about the Model 4 hardware by now. What seems to have been neglected in the press is information about the operating system TRSDOS 6.0 and the new disk basic by Logical Systems.

Model I or III users who have not used LDOS for their operating system will have much to learn with this new system. The only commands and syntax listed are those that did not exist under Model III TRSDOS 1.3. Where the new commands may have additional options or functions, they also are listed. NOTE: [] indicates optional command or parameter.

o TRSDOS COMMANDS & FILTERS

- . AUTO [:drive,?:drive,=:drive] [*] [command line]
Stores a command line for automatic execution each time TRSDOS starts up.
(AUTO) by itself deletes the current AUTO command line.)
 AUTO BASIC AUTO *DO INIT/JCL:1
- . BOOT [<CLEAR>,<ENTER>,<D>]
Resets the system.
 BOOT
- . CLICK/FLT
Set device [TO] CLICK/FLT
 FILTER *KI device
 Establishes the key-click filter.
- . COM/DVR
 SET *CL [TO] COM/DVR
 Prepares the Communications Line (*CL) for use.
- . COMM device [(XLATES=X'aabb',XLATER=X'aabb',XON=X'cc',XOFF=X'cc',NULL=OFF)]
Lets two computers communicate via a device.
- . DO [\$,=,*] file [(@label,param=value)][;]
Compiles and executes a DO file.
 DO DRIVE/JCL DO = DRIVE/JCL
- . FILTER device [USING] phantom device
Filters data to or from a device, using a filter program.
 FILTER *PR USING *DU
- . FORMS/FLT
 SET *PF [TO] FORMS/FLT
 FILTER *PR *PF
 Prepares the Printer Filter (*PF) for use
- . JOBLLOG
 ROUTE *JL [TO] file
 ROUTE *JL [TO] device
 Establishes the JobLog device (*JL), which sends certain information to
 a file or device.
 ROUTE *JL TO LISTER/JBL
 ROUTE *JL TO *PR
- . KSM/FLT
 SET device KSM/FLT [USING] file [(ENTER=value)]
 FILTER *KI device
 SET *DU KSM/FLT USING ROUTINE/KSM
 FILTER *KI *DU
- . LINK device1 [TO] device2
Links two logical devices.
 LINK *DO *PR
- . MEMDISK/DCT
 SYSTEM (DRIVE=drive,DRIVER='MEMDISK')
 Adds to the system a pseudo floppy memory disk.
 SYSTEM (DRIVE=2,DRIVER='MEMDISK')
- . REMOVE file [file]...
Deletes files from the directory.
 REMOVE ALPHA/DAT:0 BREAKER/DAT:0

- . REPAIR :drive
Updates system info on Model I TRSDOS disks.
REPAIR :1
- . RESET device
- . RESET file
Returns a device to its start-up condition, closes a file.
RESET *PR RESET PRINTER/DAT
- . SPOOL [device] [TO] [file] (NO, MEM=number, BANK=number, DISK=number, PAUSE, RESUME, CLEAR)
Establishes an output buffer for a device.
SPOOL *PR TO TEXTFILE:0 (MEM=5, DISK=15)
SPOOL *PR (NO)
- . SYSGEN [(switch)] [(DRIVE=drive)]
Stores current system options to file (CONFIG/SYS).
SYSGEN (YES) (DRIVE=4)
- . SYSTEM (parameters)
Selects certain options of your TRSDOS system.
 - SYSTEM (ALIVE [=switch])
Displays a moving character when system active.
 - SYSTEM (BLINK=switch)
 - SYSTEM (BLINK=number)
 - SYSTEM (BLINK, [LARGE, SMALL])
Control the cursor character.
 - SYSTEM (BREAK [=switch])
Enables or disables the BREAK key.
 - SYSTEM (DATE [=switch])
Turns on or off the date start-up prompt.
 - SYSTEM (DRIVE=drive, [CYL=number, DELAY=switch, DISABLE, ENABLE, DRIVER="file", WP=switch])
Sets parameters for drive.
 - SYSTEM (SYSRES=number)
Adds TRSDOS overlays to high memory.
 - SYSTEM (SYSTEM=drive)
Assigns drive as system drive.
 - SYSTEM (TIME [=switch])
Turns on or off the start-up time prompt.
 - SYSTEM (TRACE [=switch])
Displays contents of Program Counter.
 - SYSTEM (TYPE [=switch])
Turns on the KI/DVR type-ahead feature.

(TO BE CONTINUED NEXT MONTH)

* MONITORS

No, this type of monitor is not a video device; rather, it is a program designed to look behind the scenes at the inner workings of your computer. There are several good monitors on the market for the TRS-80 Models I/III/4. The best I've seen is called TASMOM, which stands for The Alternate Source MONitor.

If you do any machine language programming, this will be an invaluable aid in debugging your code. If you just would like to learn more about how any machine language program works or if you would like to analyze the instructions in ROM, this is your best avenue. TASMOM has a multitude of functional commands to aid you in your research. It will display memory in ASCII or HEX, set break-points in memory, modify memory, execute at any address, relocate code, move

code, write to or from disk or tape and also allow single stepping through machine language programs.

The best feature is its ability to react directly with the Z-80 CPU registers and display or alter their values. This feature allows the student of machine instruction total control of the hardware. The Z-80 CPU has the following register pairs, AF, BC, DE, HL, A'F', B'C', D'E', H'L', SP and FLAG register. These work spaces (memory cells) can be manipulated by the machine language programmer to store and retrieve values much in the same manner as the RAM memory you are more familiar with.

If you are interested in learning more about your system and the Z-80 CPU, buy a copy of TASMOM for \$29.95 and pick up a book on Z-80 Assembly language by William Barden, Rodney Zaks or Hubert Howe. The Alternate Source Monitor, 1806 Ada Street, Lansing, MI 48910, 517/487-3358.

* ASK ALAN

Q: Can you tell me what the command VARPTR is used for in BASIC?

A: VARPTR is one of the most powerful commands available to the computer user of Microsoft Basic. It is a multifunction command in that it works with either strings or numerics. If you use VARPTR on a string variable, it will return the length of the string as well as the address in memory where that string resides. If you use VARPTR on a numeric variable, the value returned will tell you the type of the variable (single, double or integer) and the value of the variable in exponential format. This format allows your TRS-80 to store integers as two bytes, single precision as four bytes and double precision as eight bytes.

Read the section in your manual once again on the use of VARPTR and experiment with the data retrieved. You will glean additional knowledge about the operation of your computer.

* GRAPHICOM

GraphiCom allows you to create, edit and transmit still and animated pictures and text using a uniquely powerful set of graphics tools. Most of GraphiCom is written in the high-level language, Forth, to give its routines machine language speed.

The system requires a 64K Extended Basic TRS-80 Color Computer with one disk drive operating under Disk Extended Basic version 1.0 or 1.1. (It also operates under J&M Systems Disk Controller with Disk Extended Basic version 1.6 or a later version.)

Also required are dual joysticks or a Koala pad; and a color TV set or a monochrome monitor with adapter (optional at the extra cost of \$35). The system supports the following printers: Radio Shack LP VII, VIII, DMP 200, CGP 115, Epson MX80, Gemini 10, C Itoh 8510, and Okidata 92.

Optional storage and transmission devices include modems (standard telephone modems, not Hayes Smart Modem, at 300, 600 or 1200 baud); cassette recorders and/or "cassette modem" (with an experimental cassette modem, screens can be dumped at 1500 baud). Finally, if access is available, an amateur radio station can be used to transmit GraphiCom-generated pictures in one of three Slow Scan TV formats.

The GraphiCom system is best used with dual joysticks or with a modified Koala Pad designed for Atari, VIC 20 or Commodore 64. Required modification plans for the Koala Pad are included with the package.

The general structure and operation of the system is similar in nature to the Apple Lisa, Macintosh or Windows concepts. In most cases, you simply point to a function on screen and at the press of a button you can create the function in one of three workspaces or "windows." You can also select colors, fonts, animation, screen modes, mirror images, rotations, masking, communications and printouts.

The system is simple to use once you get used to the two-joystick control system. All told, this is a very fine piece of software for the CoCo and at a moderate price considering all of its functions. \$29.95. GraphiCom, TRS-80 64K Extended Basic Color Computer by Cheshire Cat, P.O. Box 115, Lafayette, CA 94549.